

THE IMPACT OF EXPERIMENTALLY-INDUCED PERCEIVED DISCRIMINATION ON SUBSTANCE USE

A Dissertation

Submitted to the Graduate Faculty of the
Louisiana State University and
Agricultural and Mechanical College
in partial fulfillment of the
requirements for the degree of
Doctor of Philosophy

in

The Department of Psychology

by

Kimberlye Elise Dean
B.S., University of Georgia, 2014
M.A., Louisiana State University, 2017
December 2019

For Sarah M. Evans, Viola Walker Dean, Flora McCurry, and Alma Garard Walker

ACKNOWLEDGEMENTS

Thank you to my family (Momma, Dad, Ayeshah, Darryl, Tiffanni, and Victoria) and friends, especially Maya Matheis, Jasper Estabillo, Maysa Kaskas, Paige Ryan, Aiden Byrne, Nia Williams, Tan Tran, Carla Garcia, Morgan Gose, Juliana White, and Ashley Richter. Thanks also to my great lab mates/friends who make Audubon Hall a much more fun place. Thank you to the research assistants in the lab whose work contributed to the success of this project. Thank you to my internship cohort, internship supervisors, and research collaborators at VA Boston Healthcare System and Harvard Medical School. Thank you to my dissertation committee, Dr. Julia Buckner, Dr. Anna Long, Dr. Paul Frick, and Dr. Adelaide Russo for their thoughtful review and support of this project. Thank you to Dr. Julia Buckner for your mentorship throughout several stages of my academic career. Thank you for your continual support that has prepared me for the steps that lie ahead. Finally, thank you Sarah M. Evans, Viola Walker Dean, Flora McCurry, and Alma Garard Walker; without their strength of character, support, and encouragement, this document would not be possible.

TABLE OF CONTENTS

ACKNOWLEDGEMENTS	iii
LIST OF TABLES	vi
ABSTRACT	viii
INTRODUCTION AND LITERATURE REVIEW	1
Perceived Discrimination Increasing Risk for Substance Use Disorders.	1
Additional Relevant Cultural Variables Impacting Substance Use.....	2
Self-Medication Hypothesis for the Perceived Discrimination-Substance Use Relation	4
Study Aims and Hypotheses	6
METHODS	8
Participants.....	8
Procedures	10
Measures	11
Experimental Conditions.....	15
Current Study Conditions	19
A Priori Power Analysis and Sample Size	19
Data Analytic Strategy	20
RESULTS	28
Sample Characteristics.....	28
Manipulation Check.....	33
Effects of PRD on Post-Task Outcomes	36
Effect of PRD on Follow-up Outcomes	38
Anger Mediating Condition and Post-Task Outcomes	38
PRD Mediating Condition and Post-task Outcomes	43
PRD and Anger Mediating Condition and Post-task Outcomes.....	48
PRD, Anger, and Willingness to use Mediating Condition and Follow-up Substance use... ..	58
Age and Lifetime PRD Moderating Condition Post-task Outcomes	63
Post-task PRD Moderating Condition Post-task Outcomes	68
DISCUSSION	72

APPENDIX A. SCRIPTS USED DURING FIRST PILOT TEST	82
APPENDIX B. SCRIPTS USED DURING FINAL STUDY.....	84
APPENDIX C. IRB APPROVAL FORM	86
REFERENCES	87
VITA	95

LIST OF TABLES

1. Test of skew and kurtosis before and after log transformation for mixed model and one-way ANOVAs	28
2. Correlations among study variables at pre-, post-task, and follow-up	31
3. ANOVA results for condition predicting baseline/pre-task variables.....	33
4. ANOVA results for condition predicting PRD change over time.....	36
5. ANOVA results for condition predicting post-task/follow-up distress and follow-up outcomes.....	37
6. Regression results for five mediation models examining effect of condition via post-task anger on substance use outcomes	39
7. Bootstrap estimates for the standard errors and 95% confidence intervals for the indirect effects via post-task anger	42
8. Regression results for five mediation models examining effect of condition via post-task PRD on substance use outcomes	44
9. Bootstrap estimates for the standard errors and 95% confidence intervals for the indirect effects via post-task PRD	47
10. Regression results for five mediation models examining effect of condition via post-task PRD and post-task anger on substance use outcomes.....	49
11. Bootstrap estimates for the standard errors and 95% confidence intervals for the indirect effects via post-task PRD and post-task anger.....	55
12. Mediation effects of post-task PRD and post-task anger on condition and willingness to use substances	58
13. Regression results for mediation model examining effect of condition via post-task PRD, post-task anger, and post-task willingness to use on follow-up substance use	59

14. Bootstrap estimates for the standard errors and 95% confidence intervals for the indirect effects	61
15. Mediation effects of post-task PRD, post-task anger, and willingness to use substances on condition and follow-up substance Use.....	63
16. Interactions of age with condition to predict post-task substance use outcomes	64
17. Interactions of lifetime perceived discrimination with condition to predict post-task substance use outcomes.....	66
18. Interactions of post-task PRD with condition to predict post-task substance use outcomes.....	69

ABSTRACT

Substance use disorders (SUDs) are among the most debilitating psychiatric disorders. Although prevalence rates of SUDs are similar between White and Black adults, these groups experience differential treatment outcomes (e.g., Black adults with SUDs are more likely to report greater pre- and post-treatment substance use). Examining culture-specific correlates of racial differences in substance use is vital to improve understanding of the etiological and maintaining mechanisms of SUDs among Black adults. Perceived racial discrimination (PRD) is prospectively related to various substance use-related outcomes. Thus, some may use substances to alleviate psychological distress (e.g., anxiety) associated with PRD, which may over time result in a SUD. Yet, there is a paucity of experimental examinations of the PRD-substance use relation. Participants were 152 Black undergraduate students (84.2% female, $M_{age} = 19.48$) who reported baseline substance use. We tested the effect of PRD on substance use to determine whether experimentally manipulated PRD was related to greater increases in willingness to use, intention to use, and craving following the PRD induction ($n = 51$) compared to a non-PRD stress condition ($n = 52$) and a non-PRD/non-stress control condition ($n = 49$). Findings suggest that (compared to the control and non-PRD group) the PRD condition is indirectly related to post-task substance use willingness via the serial mediating effects of post-task PRD and post-task anger. The PRD condition is indirectly related to follow-up substance use frequency via the serial mediating effects of post-task PRD, post-task anger, and post-task willingness to use. Contrary to prediction, the non-PRD stress condition is indirectly related to follow-up substance use via post-task anger and willingness when compared to the control and PRD groups. These findings reveal an important pathway in the PRD-substance use frequency relation. Clinical implications, including possible PRD-related interventions for Black adults, are discussed.

INTRODUCTION AND LITERATURE REVIEW

Substance use disorders (SUDs) are among the most debilitating psychiatric disorders and are associated with lower social functioning, problems at work, and poorer mental health (Compton, Thomas, Stinson, & Grant, 2007). SUDs affect approximately 8.1% of adults in the United States (SAMHSA, 2015). Although White and Black adults experience similar rates of SUDs (Compton et al., 2007; SAMHSA, 2003; 2015; Wells, Klap, Koike, & Sherbourne, 2001), these groups experience differential treatment outcomes. For example, Black adults with SUDs are more likely to report greater pre- and post- treatment substance use, are less likely to have previously utilized SUD treatment, and are more likely to prematurely drop out of SUD treatment than non-Hispanic White adults with SUDs after controlling for sociodemographic variables (e.g., education, gender; Marsh, Cao, Guerrero, & Shin, 2009; McCaul, Svikis, & Moore, 2001). Given such racial disparities in SUD treatment outcomes, it is important to examine culture-specific variables that may impact substance use and related problems. Such information is vital to improve understanding of the etiological and maintaining mechanisms of SUDs and disparities in treatment outcomes among Black adults. Further understanding mechanisms that maintain substance use-related problems may inform SUD treatment efforts and ameliorate this public health concern.

Perceived Discrimination Increasing Risk for Substance Use Disorders

Perceived racial discrimination (PRD), defined as the perceptions of beliefs, behaviors, and institutions that denigrate or negatively impact individuals based on racial group affiliation (Clark, Anderson, Clark, & Williams, 1999), is strongly related to the development of substance use-related problems and SUDs in the Black community. Nearly one in six Black adults report experiencing PRD chronically (i.e., at least once a month), and these individuals are

approximately four times more likely to develop a SUD than Black adults who report lower levels of PRD (Clark, Salas-Wright, Vaughn, & Whitfield, 2015). Other longitudinal studies confirm that PRD is positively related to various substance use-related outcomes including increases in substance use and related problems (e.g., Gibbons et al., 2010; Gibbons, Gerrard, Cleveland, Wills, & Brody, 2004).

Further, this association is pervasive as there is a significant PRD-substance use and related problems relation in different subpopulations within the Black community (e.g., Black youth; Brody, Kogan, & Chen, 2012; Choi, Harachi, Gillmore, & Catalano, 2006; Gibbons et al., 2010; Gibbons et al., 2004; Gibbons et al., 2014; Martin, Tuch, & Roman, 2003; Yen, Ragland, Greiner, & Fisher, 1999a). Importantly, in a community sample of non-Hispanic Black American adults and non-Hispanic Black Caribbean adults, this positive relation between PRD and SUDs persisted regardless of whether everyday instances of PRD (e.g., being treated with less courtesy than others because of race) or major instances of PRD (e.g., being fired from a job because of race) were examined, even after controlling for various demographic variables (e.g., income; Hunte & Barry, 2012). The PRD-substance use relation has been observed in a variety of situations – to illustrate, perceptions of lifetime and current discriminatory events in a variety of settings (e.g., jobs, school) are related to alcohol use-related problems (e.g., feeling bad/guilty about alcohol use; alcohol use disorder; Clark et al., 2015; Martin et al., 2003; Yen, Ragland, Greiner, & Fisher, 1999b).

Additional Relevant Cultural Variables Impacting Substance Use

There are other culture-bound variables that impact the development of substance use-related problems, such as cultural mistrust, racial identity and religiosity. Cultural mistrust, defined as the tendency to distrust White individuals and the dominant group culture in the U.S.

as a result of direct or vicarious exposure to racism or discrimination (Benkert, Peters, Clark, & Keves-Foster, 2006), impacts substance use behaviors. Specifically, Black youth (i.e., ages 14-17) who report greater levels of cultural mistrust and lower socioeconomic status report greater levels of substance use than Black youth with lower cultural mistrust (Nasim, Fernander, Townsend, Corona, & Belgrave, 2011). This relationship may be driven by PRD, as it is theorized that cultural mistrust occurs as a result of the perception of discriminatory events, but this hypothesis has not been directly tested (Benkert et al., 2006; Hunter & Schmidt, 2010).

Racial/ethnic identity and religiosity may protect Black individuals from negative substance use outcomes (Gil, Wagner, & Tubman, 2004; Nasim et al., 2011). Racial identity, defined as the degree to which an individual identifies with those with whom they share a common cultural/racial background, traditions, behaviors, and beliefs (Chavez & Guido-DiBrito, 1999; Sellers, Smith, Shelton, Rowley, & Chavous, 1998), is negatively related to alcohol and drug use among Black youth (Gil et al., 2004). Similarly, religiosity is negatively related to substance use among Black adults (Nasim, Utsey, Corona, & Belgrave, 2006).

Despite evidence for the impact of various cultural variables on the development of substance use and related problems, PRD is a cultural variable that is strongly associated with the development of SUDs and other mental health concerns (McLaughlin, Hatzenbuehler, & Keyes, 2010; Okamoto, Ritt-Olson, Soto, Baezconde-Garbanati, & Unger, 2009; Pascoe & Smart Richman, 2009). Further, despite evidence that Black adults who experience PRD multiple times each year are twice as likely to develop substance use-related problems and those who experience PRD at least once a month are nearly four times as likely than Black adults who experience PRD less than once a month (Clark et al., 2015), the vast majority of this literature is based on self-report studies that are susceptible to the negative impacts of recall bias and there is

a paucity of research examining these relations experimentally. This is a major limitation of this literature given the criteria for causation (Garber & Hollon, 1991): (1) significant correlation between the risk factor (e.g., PRD) and outcome (e.g., substance use and related problems); (2) temporal precedence of the risk factor to the outcome; and (3) non-spuriousness (i.e., the risk factor-outcome relation not being due to a third variable).

Self-Medication Hypothesis for the Perceived Discrimination-Substance Use Relation

The prevailing theory for the mechanisms underlying the PRD-substance use relation is the self-medication hypothesis (i.e., SMH; Khantzian, 2003), which postulates that individuals may develop SUDs in an attempt to alleviate psychological distress associated with PRD (Clark et al., 2015). There is partial support for the theory. To illustrate, in a sample of Black young adults, PRD was positively related to lifetime and past-year substance use (i.e., alcohol, cannabis, or tobacco), and this relation was partially mediated by trait depressive symptoms (Clark, 2014). Trait anxiety and depression symptoms mediated The PRD-substance use link among Black adults and youth (Gibbons et al., 2004), and trait depression partially mediated the association between PRD and alcohol-related problems among Black young adults (Boynton, O'Hara, Covault, Scott, & Tennen, 2014). In addition, trait and state anger mediated the relationship between PRD and past three-month alcohol use among Black adults and youth (Boynton et al., 2014; Gibbons et al., 2010), and trait anger partially mediated the PRD-alcohol problems relation among Black men (Boynton et al., 2014). Taken together, these studies provide partial support for the hypothesis that the associations between PRD and substance use-related problems are partly explained by psychological distress among Black individuals.

A limitation of this body of research is that most of these studies did not use experimental methods to test the hypothesis that PRD increases state distress, which leads to substance use and

related problems, as hypothesized by SMH-based models. We know of only one experimental manipulation of PRD to test its impact on psychological distress and substance use. In a sample of Black adolescents (Gibbons et al., 2010), participants were randomly assigned to one of three conditions based on prior PRD induction paradigms (King, 2005; Yoo & Lee, 2008): a PRD condition, a non-PRD stress condition, and a non-PRD/non-stress condition. Participants in the PRD condition reported greater levels of post-task anger and depression than the stress and non-stress conditions, and levels of post-task anger were significantly greater than reported levels of depression within the PRD condition. Post-task anger (but not anxiety or depression) significantly mediated the relation between condition and willingness to use substances.

Although this study is an important initial controlled test of SMH regarding the PRD-substance use relationship, there remain several gaps in our understanding of the utility of this model among Black adults. First, although willingness to use substance is related to actual substance use among Black individuals (Gerrard, Gibbons, Stock, Lune, & Cleveland, 2005; Gibbons et al., 2004; Stock, Gibbons, Walsh, & Gerrard, 2011) and there is a significant association between PRD and willingness to use substances among Black individuals (Gerrard et al., 2012), the study did not directly test whether experimentally induced PRD resulted in greater substance use. Second, pre-task levels of depression, anxiety, anger, PRD, or other cultural variables were not examined to ensure that differential levels of these variables prior to the experimental tasks did not impact the observed findings. Third, despite a positive relationship between age and PRD (Sigelman & Welch, 1994), to our knowledge, there are no experimental studies of the impact of PRD on substance use among Black adults.

Fourth, although craving is related to use of certain substances (i.e., cannabis) on use days/use at a future time point among a racially diverse sample (including Black adults; Buckner

et al., 2015) and greater PRD is related to greater substance use craving among a racially/ethnically diverse sample (including black adults; Kendzor et al., 2014), there are no known tests of manipulated PRD on substance use craving among Black adults. This is a significant limitation given that craving, particularly when co- occurring distress is experienced, is one of the strongest contributing factors to relapse of substance use (e.g., Monti et al., 1990; Rohsenow & Monti, 1999; Witkiewitz & Marlatt, 2004); indeed, the risk for relapse among individuals with higher levels of craving is 2.5 times higher than individuals with lower craving scores (Hartz, Frederick-Osborne, & Galloway, 2001).

Fifth, the impact of induced PRD on intention to use substances was not examined, despite intentions being strongly related with willingness to use/actual substance use among Black individuals (Gibbons et al., 2010) and a positive relationship between PRD and intentions to use substances among certain racial/ethnic groups (e.g., Latino individuals; Kulis, Marsiglia, & Nieri, 2009). Given that intention to use tends to be a better predictor for substance use-related outcomes than willingness after late adolescence among Black individuals (Pomery, Gibbons, Reis-Bergan, & Gerrard, 2009), there is a distinct need to examine the impact of intentions among Black adults who use substances. Further, this is a substantial limitation given that intention to use is a variable vital to informing SUD prevention efforts (DeJong & Langford, 2002) and that interventions aimed at reducing risky substance use significantly reduce substance use among individuals who report greater intentions to use (Neighbors, Lee, Lewis, Fossos, & Walter, 2009).

Study Aims and Hypotheses

The current study is the first examination of the impact of experimentally-induced PRD on substance use (i.e., alcohol and illicit drugs) and substance use-related outcomes (e.g., use,

intention, craving) among Black adults. The current study sought to further elucidate the impact of PRD on substance use among Black young adults in several key ways. First, we attempt to replicate the finding that Black youth experience greater levels of willingness to use substances in response to experimentally induced PRD (Gibbons et al., 2010). We further extended that study by testing whether experimentally manipulated PRD is related to greater increases in willingness to use, intention to use, and craving immediately following the PRD induction compared to a non-PRD stress condition and a non-PRD/non- stress control condition.

Second, we further extended the extant literature in two ways: (1) by testing whether experimentally-induced PRD was related to more substance use at one month follow-up compared to control conditions and (2) by testing whether experimentally-induced PRD was related to lower levels of overall health (specifically, poorer sleep functioning) at one month follow-up compared to control conditions, given research suggesting that PRD negatively impacts individual's overall wellbeing (e.g., sleep patterns; for review see Pascoe & Smart Richman, 2009). Further we examined whether experimentally-induced PRD was related to greater distress at one-month follow-up compared to control conditions.

Third, to examine potential mediators of the PRD-substance relations, we tested the following models: (1) whether post-task distress (anxiety, depression, and/or anger) mediated the relation between condition and post-task willingness/intentions/craving; (2) whether post-task distress mediated the relation between condition and follow-up substance use; (3) whether post-task distress mediated the relation between condition and follow-up sleep problems; and (4) whether there were serial mediating effects of post-task PRD and post-task distress on substance use outcomes. Fifth, to examine potential moderators of the PRD-substance relations, we tested the following models: (1) whether age moderated the relations between

condition and substance use outcomes such that younger age (and not older age) is related to greater substance use, willingness to use, intentions to use, and craving in the PRD condition given that it is hypothesized that there may be a desensitization effect among older participants who may have experienced more PRD over time (thus reporting less of a reaction to discriminatory events); and (2) whether lifetime PRD moderated the relations between condition and substance use outcomes, such that less lifetime PRD (and not more lifetime PRD) is related to greater substance use, willingness to use, intentions to use, and craving in the PRD condition.

METHODS

Participants

Participants were recruited from the greater Baton Rouge community through flyers and on-line advertisements (e.g., Craigslist postings) and campus health fairs (e.g., Seaux Stressed) and were paid \$10 after completion of the baseline survey and for completion of follow-up, paid \$20 and entered into a chance to win a \$100 prize. Participants were also recruited via LSU psychology department's online survey sign-up system and were compensated with research participation credit for completion of the baseline survey and follow-up and entered into a chance to win a \$100 prize for completion of follow-up.

Of the 301 participants that began the baseline survey, 126 were excluded for ineligibility due to the following: not consenting to completing the full study/research procedures ($n = 12$), identifying as a race other than Black/African American ($n = 83$), not having used alcohol or drugs in the past year ($n = 30$), being pregnant ($n = 1$). Of the 175 participants who were eligible to continue with the baseline survey following screening, 16 did not complete the baseline survey and 7 participants were not randomized appropriately due to a malfunction of the randomization tool. Of the remaining 152, 40 were lost to follow-up due to attrition.

Thus, the full sample included 152 (84.2% female) Black adults who endorsed past year alcohol or illicit drug (i.e., cannabis, misuse of prescription drugs, opiates, heroin, cocaine, crack, and synthetic cannabinoids) use. Ages ranged from 18 years to 45 years ($M = 19.48$, $SD = 2.94$) with 21% reporting being 21 years or older and two participants identifying as a non-traditional age for college students (i.e., over the age of 25; Spitzer, 2000), 9.5% identifying as multiracial, 6.3% identifying as Hispanic/Latinx, and 15.8% identifying as a sexual minority.

The mean estimated family income was \$80,725.06, $SD = 112,932.68$ with most (96.3%) currently in college and 50.6% currently working (either part or full time). Conditions did not significantly differ on number of non-traditionally aged college students, $F(1, 149) = 1.83$, $p = .165$, $\eta^2 = .02$. The majority of participants (96.3%) were recruited via the university's online survey sign up system and the remaining participants reported that they were recruited via word of mouth or via social media. All participants who identified currently being in college reported attending Louisiana State University. Regarding past-year substance use, 94.9% reported alcohol use, 57.0% reported cannabis use, 12.0% reported misuse of prescription pills, 3.2% reported cocaine/crack use, 1.3% reported use of either opiates or synthetic cannabinoids, and 4.6% reported use of other illegal drugs (i.e., psychedelics or methylenedioxy-methylamphetamine [MDMA]). Participants reported an average of 5.75 ($SD = 6.38$) substance use related problems in their lifetime. None of the participants endorsed receiving treatment for alcohol or drug related problems and one participant endorsed having been hospitalized for an alcohol or drug problem.

Procedures

Study procedures were approved by the university's Institutional Review Board. Participants provided informed consent online before beginning the baseline survey via www.qualtrics.com, a secure data collection website. The first questions of the baseline survey served as screening questions based on eligibility criteria: (1) identifying as African American/Black, (2) being between 18-45 years old, (3) endorsement of past-year alcohol or illicit drug use, and (4) agreeing to complete two surveys one month apart for the current study. Non-eligible participants were directed to a page informing them of their ineligibility whereas eligible participants went on to complete remaining study measures and their condition's task

(described below).

Participants also provided consent to receive email and text alerts to complete the follow-up survey. Following completion of the follow-up survey, participants were sent debriefing information via email that explained that the purpose of the study was to examine the impact of perceived racial discrimination on alcohol/drug use behaviors among Black adults to help improve understanding of the development of alcohol/drug use disorders in this community and that all material presented, including the experimental task scripts, were developed as tools for research to achieve this aim. These participants were also sent referrals to mental health facilities. Participants who did not complete follow-up assessments but who completed baseline assessments were sent referrals to mental health facilities and the debriefing information via email after two months.

Measures

Baseline Measures. *Schedule of Racist Events* (SRE; Landrine & Klonoff, 1996) is an 18-item self-report measure used to assess lifetime PRD. Each item assessed both the frequency of a discriminatory event in a person's lifetime (e.g., "...treated unfairly by teachers or professors because you are Black?") and the person's appraisal of the stressfulness of each event. Participants rate how often each item occurred on a scale of 1 (*If this has NEVER happened to you*) to 6 (*If this has happened ALMOST ALL OF THE TIME: more than 70% of the time*). The SRE demonstrated excellent internal consistency and excellent test-retest reliability among Black adults (Landrine & Klonoff, 1996). The SRE-frequency scale demonstrated excellent internal consistency in the current study ($\alpha = .91$).

Substance use frequency. The *Timeline Follow Back* (TLFB; Sobell, Brown, Leo, & Sobell, 1996) assessed past month substance use. Participants were asked to report the number of

standard drinks, cigarette-sized cannabis joints, and number of times they have used any other illicit drug (e.g., heroin, cocaine/crack, misuse of prescriptions) in the past month. TLFB administered via the computer has shown good test-retest reliability (Sobell et al., 1996) and has demonstrated convergent validity with urine analysis data among Black substance users (Dillon, Turner, Robbins, & Szapocznik, 2005). Participants also indicated when their last substance use occurred to determine whether participants were under the influence during the study procedures. Given that the effects of substance use intoxication tend to peak one to two hours after use, but that effects may last for up to eight hours after use (Curran, Brignell, Fletcher, Middleton, & Henry, 2002; Schuckit, 1994), analyses were run excluding and including participants who used substances within eight hours of completing the study to determine whether there was a significant impact on the observed results per prior work (O'Connor, Kozlowski, Flaherty, & Edwards, 2005).

Substance use-related problems. The *Michigan Assessment Screening Test/Alcohol and Drug* (MAST/AD; Westermeyer, Yargic, & Thuras, 2004) is a 25-item scale that assesses the lifetime presence and severity of problems related to alcohol and drug use at baseline on a 0 to 5 scale. Participants answered yes or no to items (e.g., “*Have you ever gone to anyone for help about your drinking or drug use?*”). The items are summed, with higher scores indicating more substance-related problems. Although the MAST/AD demonstrated good internal consistency (Westermeyer et al., 2004) and good test-retest reliability among Black individuals in prior work (Brown, Geiselman, Copeland, Gordon, & Richard- Eaglin, 2008), the MAST/AD demonstrated poor internal consistency in the current study ($\alpha = .49$).

Sleep problems. The *Insomnia Severity Index* (ISI; Bastien, Vallières, & Morin, 2001) is a 7-item scale that assesses the presence and severity of insomnia and related sleep problems.

Participants answered items (e.g., “*How satisfied/dissatisfied are you with your current sleep pattern?*”) on a 0 (*very satisfied*) to 4 (*very dissatisfied*) scale. The ISI has demonstrated good internal consistency among a Black adult sample (Huntley, Brown, Kobayashi, & Mellman, 2014). The ISI demonstrated excellent internal consistency in the current study ($\alpha = .90$).

Response Infrequency. Four questions from the *Infrequency Scale* (Chapman & Chapman, 1983) were used at baseline and follow-up to identify random responders who provided random or grossly invalid responses. As in prior online studies (e.g., Buckner, Ecker, & Dean, 2016), individuals who endorsed three or more items (e.g., “I find that I often walk with a limp, which is the result of a skydiving accident”) in either the baseline or follow-up surveys were excluded ($n = 2$ at baseline, $n = 1$ at follow-up).

Task Measures. Substance use cravings were assessed before/after the experimental task (described below) via the *visual analog scale* (VAS; Hayes, 1921). Participants rated how much they were craving their substance of choice on a 0 (*no urge*) to 10 (*extreme urge*) scale. VAS scales of substance use craving positively correlate with longer measures of substance use craving (Buckner, Silgado, & Schmidt, 2011; Lievaart et al., 2015).

State distress. Consistent with prior work (Gerrard et al., 2012; Gibbons et al., 2010; Stock et al., 2011), distress was measured via 12 negative emotion words (in random order) before/after the experimental task and at follow-up. Participants were asked to indicate their current feelings by answering yes (1) or no (0) to whether the emotion corresponds with the way they are feeling at that moment. The depression score included four words (*lonely, sad, hopeless, depressed*). The anxiety score included four words (*tense, stressed, frustrated, worried*). The anger score included four words (*bitter, aggressive, hostile, angry*). Scores for each subscale were summed. Each subscale has achieved strong correlations with the respective distress words

(e.g., the anxiety score demonstrates strong correlations with scores on the words *tense*, *stressed*, *frustrated*, *worried*) among Black youth (Gibbons et al., 2010). This measure of depression ($\alpha = .75$), anxiety ($\alpha = .72$), and anger ($\alpha = .74$) demonstrated adequate internal consistency in the current study.

Willingness to use. Willingness to use substances was assessed before/after the task by presenting participants with a hypothetical situation that describes an opportunity to use each substance (e.g., alcohol available at a party). The hypothetical situation was followed by the questions: “How willing would you be to drink one drink?;...have more than one drink?” (for alcohol); “How willing would you be to take some and use it?;.....use enough to get high?;....buy some to use it later?” (for drugs). Participants rated each item on a scale of 0 (*not at all*) to 6 (*very*) and items are summed. This measure of willingness has achieved good internal consistency among Black youth (Gibbons et al., 2010) and in the current study ($\alpha = .83$).

Intentions to use. Intention to use substances was assessed before/after the task following each hypothetical situation (e.g., alcohol available at a party) via the question “Do you plan to use drugs/alcohol in the next week?” Participants rated the item on 1 (*do not plan to/definitely will not*) to 4 (*plan to/definitely will*). This measure of intentions has been related to substance use among Black youth (Gibbons et al., 2010).

State PRD. PRD was examined before/after task completion to determine whether there were state changes in PRD before/after the experimental task via a *visual analog scale* (Branscombe, Schmitt, & Harvey, 1999) examining unfair treatment attributed to race. After reading a hypothetical statement (e.g., boss tells you that you are not performing your job as well as others), participants rated the statement on a scale ranging from 0 (*due to factors other*

than racial prejudice/discrimination) to 100 (*completely due to racial prejudice/discrimination*).

VAS scales of PRD are correlated with longer measures of PRD among Black adults (Branscombe et al., 1999).

Follow-up. Consistent with prior work (Doumas & Hannah, 2008), participants were given a two-month period the month following completion of the baseline survey to complete the follow-up measures. At follow-up, variables of interest (one-month ISI [assessed sleep-related problem severity over a month period]; state craving and PRD VAS; state distress measure; willingness and intentions measures; and one-month TLFB [assesses the substance use frequency over the one-month period following the experimental task]) were assessed.

Experimental Conditions

Participants were randomly assigned via the randomization tool available on qualtrics.com to one of three conditions and randomization was consistent across the course of the study to control for potential high-risk substance use events (e.g., Mardi Gras) that may occur during participant completion of the study. Random assignment reduced the risk that potential differences between groups on baseline variables (e.g., baseline substance use frequency, pre-task distress) reflect true population differences (Miller & Chapman, 2001). In each condition, participants were asked to read a work-related scenario and to imagine themselves encountering the situation in real life. In all conditions, participants were asked to imagine how they might react to the scenario.

Pilot test. Additions were made to the Gibbons et al. (2010) task to standardize the level of social stress across PRD and non-PRD/stress conditions to isolate social stress from perceived racial discrimination-related stress and to include information that the account described in each

scenario occurred to a Black individual in the Baton Rouge Community. This version (described below) was pilot tested with a sample of 96 Black (84.3% women; $M_{age} = 21.02$, $SD = 3.15$; 83.0% reported past month substance use) substance-using adults. Participants were recruited via LSU psychology department's online survey sign-up system and were compensated with research participation credit for completion of the baseline survey and follow-up and entered into a chance to win a \$100 prize for completion of follow-up.

PRD condition. The procedure for this task was based on adaptations of the PRD induction task script (Gibbons et al., 2010) made by King (2005) and Yoo and Lee (2008). In the PRD condition, participants read a scenario that involves their manager using racial slurs and treating them unfairly at work because they are Black. This scenario included small changes throughout to identify that the script is about a Black adult in the Baton Rouge Community.

Non-PRD stress condition. In this condition, as in the PRD condition, participants read a scenario that involves experiencing slow work-productivity due to issues with work equipment (Gibbons et al., 2010). To isolate social stress from perceived racial discrimination-related stress, the scenarios utilized the same wording and the only difference between the two conditions was that the protagonist was treated unfairly at work due to their race in the PRD condition vs their work productivity in the non-PRD stress condition. Additionally, as in the PRD script, small changes were made throughout to identify that the script is about a Black adult in the Baton Rouge Community.

Non-PRD/non-stress control condition. In this condition, as in the PRD condition, participants were asked to read a scenario where they are working as a delivery person and are looking for the delivery address while on the job. This scenario utilized wording similar to the

original task script with small changes made throughout to identify that the script is about a Black adult in the Baton Rouge Community.

There were no significant differences between conditions on the substance use outcomes and both experimental conditions (i.e., the PRD condition and the non-PRD stress condition) resulted in significantly greater levels of post-task PRD than the control condition--PRD condition ($M = 47.81, SD = 5.45$) vs control ($M = 25.00, SD = 4.35$): $F(1, 62) = 14.03, p < .01, \eta^2 = .19$; non-PRD stress ($M = 44.85, SD = 5.37$) vs control ($M = 25.00, SD = 4.35$): $F(1, 62) = 8.67, p < .01, \eta^2 = .12$. However, there was no significant difference in levels of state PRD following the task when comparing the experimental conditions--PRD condition vs non-PRD stress: $F(1, 62) = 0.10, p = .751, \eta^2 = .00$. Further, we did not find that the modified PRD task resulted in significantly greater levels of post-task anger as found in the Gibbons et al. (2010) study--PRD condition ($M = 0.22, SD = 0.75$) vs control ($M = 0.16, SD = 0.45$): $F(1, 62) = 0.16, p = .687, \eta^2 = .00$; PRD condition ($M = 0.22, SD = 0.75$) vs non-PRD stress ($M = 0.41, SD = 1.04$): $F(1, 62) = 0.68, p = .412, \eta^2 = .00$. We did not find that the modified PRD task resulted in significantly greater levels of post-task depression as found in the Gibbons et al. (2010) study--PRD condition ($M = 0.97, SD = 1.26$) vs control ($M = 0.72, SD = 1.08$): $F(1, 63) = 0.73, p = .398, \eta^2 = .01$; PRD condition ($M = 0.97, SD = 1.26$) vs non-PRD stress ($M = 0.84, SD = 1.42$): $F(1, 62) = 0.14, p = .710, \eta^2 = .00$.

Additionally, we did not find that post-task anger significantly mediated the relation between the PRD condition and willingness to use substances as found in the Gibbons et al. (2010) study. When comparing the PRD condition vs the control, the total effects did not account for significant variance in post-task willingness: $R^2 = .005, df = 1, 62, F = 0.28, p = .598$. The indirect effects were estimated; the PRD condition (compared to the control) was not

indirectly related to greater willingness to use substances through post-task anger: $b = 0.16$, $SE = 0.43$, *Lower 95% CI* = -0.879, *Upper 95% CI* = 0.941. When comparing the PRD condition vs the non-PRD stress group, the total effects did not account for significant variance in post-task willingness: $R^2 = .043$, $df = 1, 62$, $F = 2.82$, $p = .098$. The indirect effects were estimated; the PRD condition (compared to the non-PRD stress group) was not indirectly related to greater willingness to use substances through post-task anger: $b = -0.10$, $SE = 0.29$, *Lower 95% CI* = -0.600, *Upper 95% CI* = 0.660.

Thus, we pilot tested the original Gibbons et al. (2010) study task script with a sample of 15 Black adults (93% female; $M_{age} = 21.57$, $SD = 2.73$; 81.8% reported past month substance use). Participants were recruited via LSU psychology department's online survey sign-up system and were compensated with research participation credit for completion of the baseline survey and follow-up and entered into a chance to win a \$100 prize for completion of follow-up. Following the second pilot test, we found that there were small effect sizes between conditions on post-task anger--PRD condition ($M = 0.40$, $SD = 0.89$) vs control ($M = 0.20$, $SD = 0.45$): $F(1, 8) = 0.23$, $p = .667$, $\eta^2 = .02$, $d = 0.12$; PRD condition ($M = 0.40$, $SD = 0.89$) vs non-PRD stress group ($M = 0.00$, $SD = 0.00$): $F(1, 8) = 1.00$, $p = .364$, $\eta^2 = .11$, $d = 0.38$. We also found that there were small effect sizes between conditions on post-task substance use willingness-- PRD condition ($M = 3.60$, $SD = 2.19$) vs control ($M = 2.60$, $SD = 1.94$): $F(1, 8) = 0.34$, $p = .575$, $\eta^2 = .04$, $d = 0.20$; PRD condition ($M = 3.60$, $SD = 2.19$) vs non-PRD stress group ($M = 1.80$, $SD = 1.79$): $F(1, 8) = 1.16$, $p = .313$, $\eta^2 = .13$, $d = 0.33$. Given that these findings were in line with the findings of Gibbons et al. (2010), the current study utilized the original task scripts with changes to indicate that the script was written about a person in the Baton Rouge community. We then began recruitment for the sample for the current

study.

Current Study Conditions

PRD condition. In the PRD condition, participants read a scenario that involved their manager using racial slurs and treating them unfairly at work because they are Black. This script has been successfully used to manipulate PRD in previous work (Gibbons et al., 2010; Stock et al., 2011).

Non-PRD stress condition. In this condition, participants read a scenario that involves experiencing slow work-productivity due to issues with work equipment. This script has been successfully used to manipulate general distress in previous work (Gibbons et al., 2010; Stock et al., 2011).

Non-PRD/non-stress control condition. In this condition, participants were asked to read a scenario where they are working as a delivery person and are looking for the delivery address while on the job. This script has been successfully used to produce less distress than the stress or PRD conditions in previous work (Gibbons et al., 2010; Stock et al., 2011).

A Priori Power Analysis and Sample Size

Previous work examining the relation between PRD and substance use report medium to large effect sizes (Clark et al., 2015; Gibbons et al., 2010; Pascoe & Smart Richman, 2009). As a result, the power analysis was conducted to detect medium effects. The sample size necessary to achieve the recommended power of .80 (Cohen, 1988) was determined using the guidelines discussed by Tabachnick and Fidell (2007), which specifies to include .80 power, alpha of .05, and the number of predictors. To test whether internalizing symptoms would mediate the relation between condition and each dependent variable [i.e., post-task craving, post-task willingness, post-task intention, follow-up substance use, follow-up sleep problem severity]),

the sample necessary to achieve .80 power with eight predictors (i.e., one covariate, four main effects, and three interactions) is 109 participants.

Data Analytic Strategy

Data were first inspected for outliers, skew, and kurtosis. Given that log transformations result in less skew, less leptokurtosis, and elimination of outliers greater than three standard deviations from the mean, data that present significant deviations from normality were log transformed

(Tabachnick & Fidell, 2007). To ensure conditions did not differ at baseline on demographic and other relevant variables, one- way analyses of variance (ANOVAs) were conducted for continuous variables (i.e., baseline substance use frequency, baseline sleep problems, pre-task PRD, pre-task craving, pre-task willingness, pre-task intentions, and pre-task anxiety/depression/anger) and a χ^2 analysis was performed for the dichotomous variable (i.e., gender). Post-hoc Tukey tests for multiple comparisons were used to test any pairwise differences between conditions following any significant results from ANOVAs. Any variables that were found to be significantly different between the three conditions were utilized as covariates in subsequent analyses. As there were no variables found to be significantly different between the three conditions (see Results Section), the remaining analyses did not include covariates. To evaluate the success of the experimental manipulation of PRD on inducing PRD, a 2 (Time: pre- and post-task) \times 3 (Condition: PRD, non-PRD Stress, and control) mixed model ANOVA was conducted. To examine the change in PRD over time for each condition, change scores (Post-task PRD – Pre-task PRD) were calculated and a one-way ANOVA was utilized to compare the mean differences for PRD group vs control, PRD group vs non- PRD stress group, and non-PRD stress group vs control. This

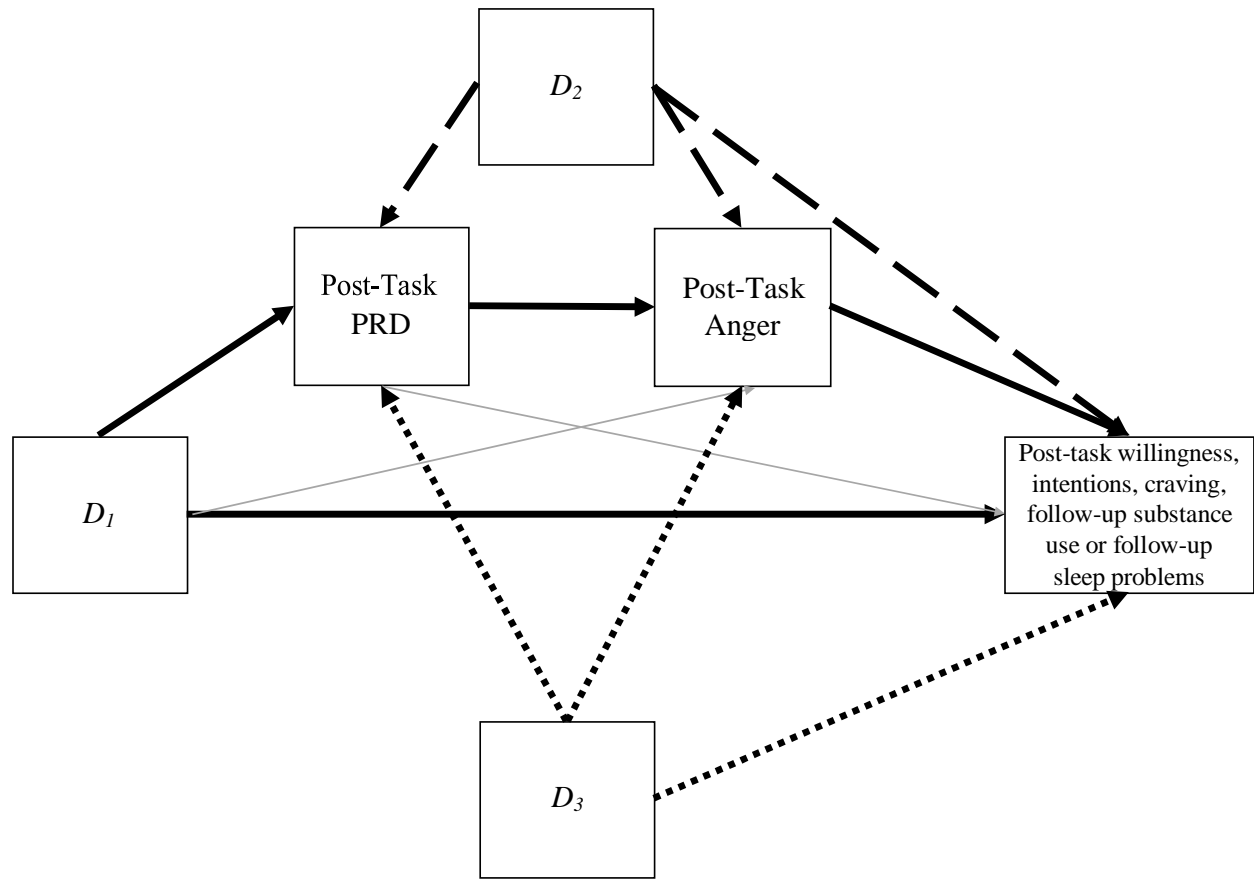
strategy for examining change over time has been used in prior work (Buckner, Zvolensky, Ecker, & Jeffries, 2016; Tabachnick & Fidell, 2007).

To evaluate the impact of the experimental manipulation of PRD on post-task outcomes (i.e., post-task substance use craving, post-task willingness, and post-task intention), three 2 (Time) \times 3 (Condition) mixed model ANOVA were conducted. To examine whether conditions differed on substance use frequency or sleep problems at follow-up, two ANOVAs were conducted.

Given that only anger was significantly different between conditions (see Results section), we examined anger as a mediator of the relationship between condition and substance use outcomes/sleep problems using the SPSS PROCESS macro, which uses an ordinary least squares-based path analysis (with bias-corrected bootstrap estimates) to test direct and indirect effects. Given that the current study utilized a multicategorical variable as the independent variable, each of the condition groups (k) must be represented in the model. To achieve this, dummy coding of these groups such that designation of a reference group for $k-1$ groups is necessary. Version 3 of the PROCESS macro allows for use of a multicategorical variable for the independent variable in all models (Hayes, 2017; Hayes & Preacher, 2014; Hayes, Preacher, & Myers, 2011). The multicategorical independent variable was dummy (D) coded (Cohen, Cohen, West, & Aiken, 2003) via the indicator coding scheme. As shown in Figure 1, $D1$ represents participants randomized to the PRD condition compared to the control condition and $D2$ represents participants who were randomized to the non-PRD stress condition compared to the control condition. Further, $D3$ represents participants who were randomized to the PRD condition compared to participants randomized to the non-PRD stress condition. The indicator coding scheme was utilized in the current study given the limitations of alternative strategies to

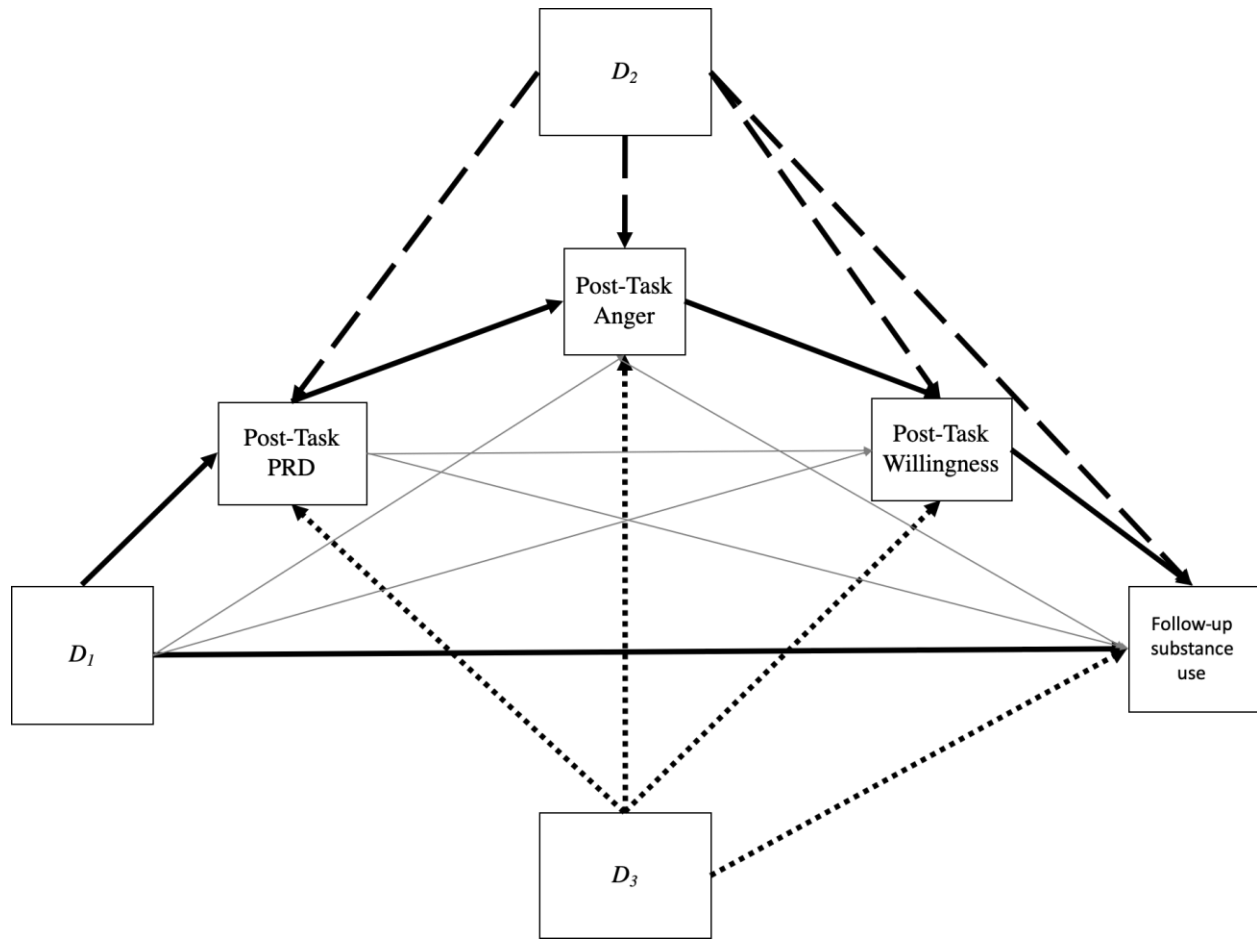
examine mediation when the independent variable is multicategorical. One such limited strategy is to remove all of the cases in the data of one group, while retaining the data of two groups to complete the mediation analysis. In this strategy, the mediation analysis is repeated, with the data from a different group being removed each time. Hayes (2017, pp. 188-189) describes that the one of the flaws when utilizing this approach is that it lowers statistical power, thereby increasing uncertainty in the estimation of the effects given that the mediation analyses conducted are completed with less data compared to if the full sample was analyzed in one analysis. The indicator coding scheme is unique in that it does not remove data while completing the mediation analysis, but instead the entire sample is analyzed simultaneously while not combining groups (e.g., PRD and non-PRD groups are not collapsed into one group) during the analysis and still retaining the multicategorical nature of the independent variable (Hayes, 2017, pp. 188-189). Further, this strategy retains information about how the groups differ (e.g., parameter estimates, model fit statistics such as R^2) during the analysis (Hayes & Preacher, 2014). This strategy was applied for all mediation analyses. Five separate models were tested; the independent variable was condition and the putative mediator was anger scores. Separate models were conducted for each dependent variable (post-task craving; post-task willingness; post-task intention; follow-up substance use; follow-up sleep problem severity). Continuous predictor variables (i.e., post-task PRD, post-task anger) were centered to reduce multicollinearity. An indirect effect was determined to be statistically significant if the 95% confidence interval did not contain zero. Additionally, we tested serial multiple mediator models to examine the impact of post-task PRD and post-task anger as mediators of the relation between condition and substance use outcomes/sleep problems. These conceptual models are presented in Figure 1. Hayes (2017) describes a serial multiple mediator model as one in which the

independent variable can affect the dependent variables through four pathways: directly and/or indirectly via post-task PRD, via post-task anger only, and/or via both sequentially, with post-task PRD affecting post-task anger. Five separate models were tested; the independent variable was condition and the putative mediators were post-task PRD and post-task anger.



Condition	D_1	D_2	D_3
Control	0	0	-
PRD condition	1	-	1
Non-PRD stress condition	-	1	0

Figure 1. Serial Mediation Models of the Conditional Indirect Effect of Condition on Substance Use/Sleep Outcomes via both Post-Task Perceived Racial Discrimination (PRD) and Post-Task Anger. D represents the dummy variables for condition. Subscripts represent the dummy coded comparisons between participants randomized to the PRD condition compared to the control condition (1) and the non-PRD stress condition compared to the control condition (2). Further, subscript (3) represents the dummy coded comparison between participants randomized to the PRD condition versus the non-PRD stress condition. Solid bolded lines represent the direct effects of the PRD condition (vs control condition) on substance use outcomes and the indirect effects via both post-task PRD and post-task anger. The dashed lines represent the direct effects of the non-PRD stress condition (vs control condition) on substance use outcomes and the indirect effects via both post-task PRD and post-task anger. The dotted lines represent the direct effects of the PRD condition (vs non-PRD stress condition) on substance use outcomes and the indirect effects via both post-task PRD and post-task anger.



Condition	D_1	D_2	D_3
Control	0	0	-
PRD condition	1	-	1
Non-PRD stress condition	-	1	0

Figure 2. Hypothesized Serial Mediation Models of the Conditional Indirect Effect of Condition on Follow-up Substance Use Frequency via Post-Task Perceived Racial Discrimination (PRD), Post-Task Anger, and Post-Task Willingness to Use Substances. D represents the dummy variables for condition. Subscripts represent the dummy coded comparisons between participants randomized to the PRD condition compared to the control condition (1) and the non-PRD stress condition compared to the control condition (2). Further, subscript (3) represents the dummy coded comparison between participants randomized to the PRD condition versus the non-PRD stress condition (second reference group). Solid bold lines represent the direct effects of the PRD condition (vs control condition) on substance use outcomes and the indirect effects via post-task PRD, post-task anger, and post-task willingness. The dashed lines represent the direct effects of the non-PRD stress condition (vs control condition) on substance use outcomes and the indirect effects via post-task PRD, post-task anger, and post-task willingness. The dotted lines represent the direct effects of the PRD condition (vs non-PRD stress condition) on substance use outcomes and the indirect effects via all three mediators.

Both direct and indirect effects were tested using the SPSS PROCESS macro. All specific and conditional effects were subjected to follow-up bootstrap analyses with 10,000 resamples from which a 95% confidence interval was estimated. All continuous predictor variables (i.e., post-task anger, post-task PRD) were centered to reduce multicollinearity.

Further, we tested an additional serial multiple mediator model to examine the impact of post-task PRD, post-task anger, and post-task willingness to use as mediators of the relation between condition and follow-up substance use frequency. This conceptual model is presented in Figure 2. Hayes (2017) describes a serial multiple mediator model as one in which the independent variable can affect the dependent variables through the following six pathways: directly and/or indirectly via post-task PRD, via post-task anger, via post-task willingness only; directly and/or indirectly via both post-task PRD and post-task willingness; directly and/or indirectly via both post-task anger and post-task willingness; and/or via all sequentially, with post-task PRD affecting both post-task anger and post-task willingness to use, which affects follow-up substance use frequency. One model was tested; the independent variable was condition and the putative mediators were post-task PRD, post-task anger, and post-task willingness to use. Both direct and indirect effects were tested using the SPSS PROCESS macro. All specific and conditional effects were subjected to follow-up bootstrap analyses with 10,000 resamples from which a 95% confidence interval was estimated. All continuous predictor variables (i.e., post-task anger, post-task PRD, post-task willingness to use) were centered to reduce multicollinearity.

We also tested the age X condition and lifetime PRD X condition interactions on substance use outcomes. Eight separate hierarchical linear regressions were conducted. The criterion variable was one of the following: post-task craving; post-task willingness; post-task

intention; follow-up substance use. For each model, the predictor variables were entered into two steps: Step 1: the main effects of condition and either age or lifetime PRD score scores; and Step 2: either the condition X age interaction or the condition X lifetime PRD interaction. Age and lifetime PRD scores were centered to reduce multicollinearity.

Finally, we tested the post-task PRD X condition interaction on substance use outcomes. Four separate hierarchical linear regressions were conducted. The criterion variable was one of the following: post-task craving; post-task willingness; post-task intention; follow-up substance use. For each model, the predictor variables were entered into two steps: Step 1: the main effects of condition and post-task PRD; and Step 2: the post-task PRD X condition interaction. Post-task PRD scores were centered to reduce multicollinearity.

RESULTS

Sample Characteristics

During the inspection of outliers, skew, and kurtosis, baseline and follow-up substance use presented significant deviations from normality (Table 1) and these data were log transformed (Tabachnick & Fidell, 2007). The log transformation resulted in the elimination of skew and leptokurtosis (Table 1).

Table 1. Test of Skew and Kurtosis Before and After Log Transformation for Mixed Model and One-way ANOVAs

Pre-Task/Baseline Variables	Skew before Log Transformation	Kurtosis before Log Transformation	Skew after Log Transformation	Kurtosis after Log Transformation
ISI	0.91	0.46	-	-
Past month Total Substance use	3.11	14.39	-0.27	-0.85
Craving	1.55	1.69	-	-
Dep Score	1.06	0.19	-	-
Anx Score	1.40	-1.21	-	-
Ang Score	2.58	6.63	-	-
Intentions to use/drink	-0.06	-1.61	-	-
Willingness to use/drink	0.60	-0.10	-	-
PRD VAS	1.50	2.67	-	-
Post-Task Variables	Skew	Kurtosis		
Craving	1.76	2.80	-	-
Dep Score	1.59	1.53	-	-
Anx Score	-0.07	-1.54	-	-
Ang Score	1.44	0.83	-	-
Intentions to use/drink	-0.01	-1.57	-	-
Willingness to use/drink	0.56	-0.16	-	-
PRD VAS	1.13	0.73	-	-
Follow-up Variables	Skew	Kurtosis		
ISI	0.72	0.11	-	-
Past month Total Substance use	3.88	19.41	0.64	-0.86
Craving	2.20	4.92	-	-
Dep Score	1.22	0.45	-	-
(Table 1 continued)				

Follow-up Variables	Skew	Kurtosis		
Anx Score	0.33	-1.12	-	-
Ang Score	2.71	7.92	-	-
Intentions to use/drink	-0.01	-1.66	-	-
Willingness to use/drink	0.57	-0.40	-	-
PRD VAS	1.25	0.96	-	-

Note. ISI = Insomnia Severity Scale; Dep score = Depression Score; Anx Score = Anxiety Score; Ang Score = Anger Score; PRD VAS = Perceived racial discrimination visual analog scale; * $p < .05$, ** $p < .01$; **Bold scores** indicate significantly elevated skew/kurtosis.

The retention rate was 71.7%. Condition was not related to attrition, $\chi^2(1, N = 152) = 3.88, p = .144, \phi = 0.16$. Completers did not significantly differ from non-completers in terms of gender (79.17% vs. 86.36% female), $\chi^2(1, N = 152) = 1.30, p = .254, \phi = 0.09$. Completers ($M = 19.47, SD = 2.93$) did not significantly differ from non-completers in terms of age ($M = 19.29, SD = 1.32$), $F(1, 149) = 0.17, p = .682, d = 0.08$. Completers also did not differ from non-completers on baseline substance use frequency ($M = 0.97, SD = 0.58$ vs. $M = 1.02, SD = 0.60$), $F(1, 149) = 0.25, p = .618, d = 0.08$; pre-task PRD ($M = 18.09, SD = 20.44$ vs. $M = 15.31, SD = 14.08$), $F(1, 149) = 0.73, p = .393, d = 0.16$; or lifetime PRD ($M = 45.85, SD = 17.14$ vs. $M = 40.79, SD = 14.28$), $F(1, 149) = 3.21, p = .075, d = 0.32$.

As presented in Table 2, pre-task substance use craving scores were positively related to pre-task substance use willingness, but not pre-task intentions, baseline past month substance use, or lifetime substance-related problems. Pre-task intentions were positively related to pre-task substance use willingness and baseline use, but not pre-task substance use craving, baseline other illicit substance use, or lifetime substance-related problems. Pre-task PRD was positively correlated with the lifetime PRD in the current study. Regarding the distress words used in the current study, each distress subscale achieved strong correlations with the respective distress words (e.g., the anxiety score demonstrates strong correlations with scores on the words tense, stressed, frustrated, worried). Further, lifetime PRD was significantly positively related to pre-

task anxiety, post-task depression/anxiety/anger, and follow-up anxiety. Conditions did not differ on baseline substance use frequency, baseline sleep problems, pre-task PRD, pre-task craving, pre-task willingness, pre-task intentions, pre-task depression, pre-task anxiety, and pre-task anger. There is no significant difference between conditions on gender (Table 3).

Table 2. Correlations among Study Variables at Pre-, Post-task, and Follow-up

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1. SRE score																				
2. Pre-task state PRD	.33**																			
3. Pre-task Substance use craving	.03	.04																		
4. Pre-task Substance use willingness	.05	-.07	.39**																	
5. Pre-task Substance use intentions	.09	-.11	.18*	.55**																
6. MAST-AD	-.04	-.04	.19*	.28**	.17*															
7. Baseline Substance use frequency	.08	-.03	.15	.50**	.52**	.30**														
8. Pre-Task Dep	.12	.04	.15	.05	.07	.13	.01													
9. Pre-Task Anx	.21**	-.02	.17*	.07	.11	.03	.15	.46**												
10. Pre-Task Ang	.13	.06	.23**	.14	-.05	.09	.02	.52**	.39**											

11. Post-Task Substance use craving	.04	.06	.91**	.41**	.19*	.19*	.19*	.18*	.14	.27*									
12. Post-Task Substance use willingness	.09	-.07	.38**	.95**	.55**	.27**	.51**	.07	.08	.13	.39**								
13. Post-Task Substance use intentions	.10	-.08	.20*	.53**	.92**	.18*	.50**	-.04	.12	-.04	.22**	.56**							
14. Post-Task Dep	.23**	.09	.07	.03	-.01	-.03	.04	.61**	.31**	.39**	.09	.02	.01						
15. Post-Task Anx	.19*	.13	.18*	.05	.07	.14	.06	.30**	.55**	.26**	.15	.09	.14	.40**					
16. Post-Task Ang	.21**	.16*	.11	.10	.08	.07	.02	.39**	.33**	.40**	.10	.11	.09	.41**	.47**				
17. FU Dep	.15	.04	.13	.06	.04	.06	.02	.59**	.37**	.41**	.14	.02	-.01	.57**	.28**	.34**			
18. FU Anx	.27**	.05	.07	.02	.11	-.04	.11	.33**	.40**	.28**	.04	.03	.06	.33**	.16	.16	.51**		
19. FU Ang	.07	.13	.08	.08	.03	-.02	-.01	.31**	.20*	.44**	.10	.07	.04	.28**	.05	.17	.48**	.49**	
20. FU Substance use frequency	.11	.02	.19*	.38**	.34**	.21**	.36**	-.08	-.08	.07	.19*	.35**	.33**	.02	.03	.07	.01	.01	-.01

Note. SRE = Schedule of Racist Events; PRD = Perceived racial discrimination; MAST-AD = Michigan Assessment Screening Test/Alcohol and Drug; Dep = Depression score, Anx = Anxiety score, Ang = Anger score; FU = Follow-up; * $p < .05$, ** $p < .01$.

Table 3. ANOVA Results for Condition Predicting Baseline/Pre-Task Variables

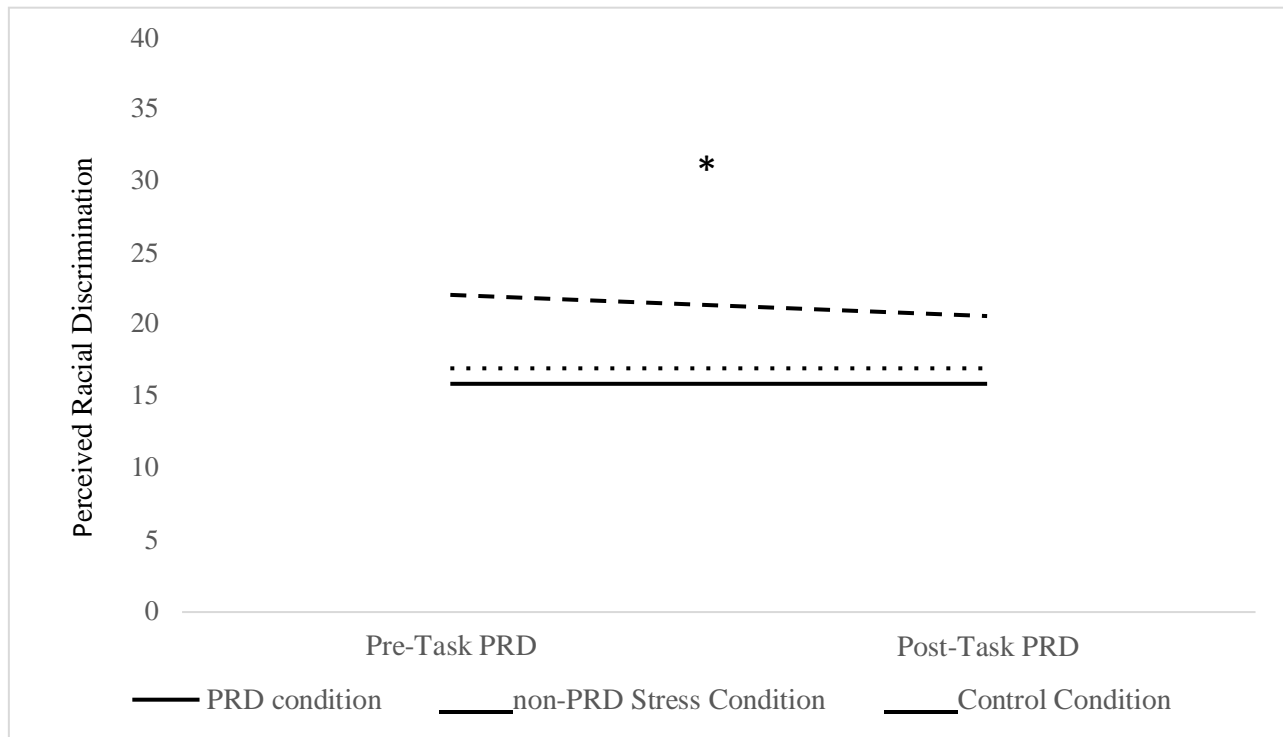
Dependent Variable	PRD Condition <i>N</i> = 51		Non-PRD Stress Condition <i>N</i> = 52		Non-Stress Control Condition <i>N</i> = 49				
	<i>M</i> or %	<i>SD</i>	<i>M</i> or %	<i>SD</i>	<i>M</i> or %	<i>SD</i>	<i>F</i> or χ^2	<i>p</i>	η^2 or φ
Baseline Substance use frequency	1.06 ^a	0.55	1.01 ^a	0.57	0.87 ^a	0.61	1.57	.211	0.02
Baseline Sleep Problems	1.24 ^a	0.59	1.15 ^a	0.36	1.18 ^a	0.49	0.12	.890	0.00
Pre-Task PRD	15.59 ^a	16.08	16.44 ^a	18.10	19.39 ^a	22.24	0.55	.577	0.01
Pre-Task Craving	1.33 ^a	1.93	1.58 ^a	2.50	1.53 ^a	2.26	0.17	.844	0.00
Pre-Task Willingness	12.33 ^a	8.14	12.21 ^a	8.31	11.35 ^a	7.19	0.23	.795	0.00
Pre-Task Intentions	2.65 ^a	1.25	2.67 ^a	1.20	2.57 ^a	1.24	0.09	.912	0.00
Pre-Task Depression	1.00 ^a	1.20	1.14 ^a	1.37	0.98 ^a	1.25	0.22	.801	0.00
Pre-Task Anxiety	1.78 ^a	1.42	1.79 ^a	1.39	1.90 ^a	1.36	0.11	.899	0.00
Pre-Task Anger	0.35 ^a	0.84	0.44 ^a	0.85	0.35 ^a	0.83	0.21	.814	0.00
Gender (% Female)	83.67 ^a		82.35 ^a		88.46 ^a		0.83	.661	0.07

Note. PRD = Perceived Racial Discrimination; Willingness = Willingness to use substances; Intentions = Intentions to use substances; **Bold scores** indicate significant differences at $*p < .05$. ^aMeans or percentages not significantly different from one another ($p < .05$).

Manipulation Check

The 2 (Time) X 3 (Condition) interaction was significant, $F(1, 149) = 12.59, p < .001, \eta_p^2 = .15$ (Figure 3). The condition variable was dummy coded to isolate the PRD condition (i.e., PRD condition = 1, non-PRD stress condition = 0; PRD condition = 1, control = 0) as described in previous work (Winer, 1991). Dummy coding revealed there were no pre-task PRD differences—compared to participants in the non-PRD stress condition ($M = 15.58; SD = 16.08$), participants in the PRD condition ($M = 16.44; SD = 18.10$) did not report significantly greater pre-task PRD,

Figure 3. The interaction of time and condition in the prediction of Perceived Racial Discrimination



Note. PRD = Perceived racial discrimination; Mean difference in PRD change score significantly different from zero * $p < .05$.

$F(1, 101) = 0.06, p = .801, \eta_p^2 = .47$; compared to participants in the control condition ($M = 19.39; SD = 22.23$), participants in the PRD condition did not report significantly greater pre-task PRD, $F(1, 100) = 0.96, p = .329, \eta_p^2 = .46$. Yet after the task, differences in PRD emerged--compared to participants in the non-PRD stress condition ($M = 20.19; SD = 19.53$), participants in the PRD condition ($M = 35.29; SD = 32.05$) reported significantly greater post-task PRD, $F(1, 101) = 8.38, p < .01, \eta_p^2 = .53$; compared to participants in the control condition ($M = 18.98; SD = 20.00$), participants in the PRD condition reported significantly greater post-task PRD, $F(1, 100) = 9.24, p < .01, \eta_p^2 = .51$. When examining each group separately, individuals in the PRD condition reported a significant difference in PRD, $F(1, 50) = 19.11, p <$

.001, $\eta_p^2 = .28$, as did the non-PRD stress condition, $F(1, 51) = 4.94, p = .031, \eta_p^2 = .09$, but the control condition did not report a significant difference in PRD, $F(1, 48) = 0.05, p = .826, \eta_p^2 = .00$.

Dummy coding the condition variable to isolate the non-PRD stress condition (i.e., non-PRD stress condition = 1, control condition = 0) revealed that compared to participants in the control condition, participants in the non-PRD stress group were not significantly different on PRD before the task, $F(1, 101) = 0.54, p = .466, \eta_p^2 = .45$, and there was no significant difference in PRD after the task, $F(1, 101) = 0.10, p = .100, \eta_p^2 = .00$. Inspection of the graph (Figure 3) suggests that the PRD condition was related with an increase in PRD. To test this hypothesis, change in PRD over time was examined by calculating change scores (Post-task PRD – Pre-Task PRD; Table 4). The PRD group (compared to the control and the non-PRD stress group) was significantly related to an increase in PRD over this time period (PRD at post-task subtracted from PRD at pre-task; Table 4). The non-PRD stress group and the control was not significantly related to an increase in PRD over this time period.

Table 4. ANOVA Results for Condition Predicting PRD change over time

Dependent Variable	PRD Condition <i>N</i> = 51		Non-PRD Stress Condition <i>N</i> = 52		Non-Stress Control Condition <i>N</i> = 49		<i>F</i>	<i>p</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
Change in PRD	19.71	32.19	3.75 ^a	12.16	-0.41 ^a	12.90	12.59	.000
Change in PRD Mean Difference (I – J)	<i>M (I-J)</i>	<i>SE</i>	<i>p</i>	Lower 95% CI	Upper 95% CI			
PRD vs Non-PRD Stress	15.96	4.19	.001	6.04	25.88	-	-	-
PRD vs Control	20.11	4.25	.000	10.05	30.18	-	-	-
Non-PRD Stress vs Control	4.16 ^a	4.23	.589	-5.86	14.18	-	-	-

Note. PRD = Perceived Racial Discrimination; Change in PRD = Post-task PRD – Pre-task PRD; CI = Confidence Interval; I – J = Condition A change in PRD mean – Condition B change in PRD mean; **Bold scores** indicate significant differences at $*p < .05$. ^aMeans or Mean differences not significantly different from one another ($p < .05$).

Effects of PRD on Post-Task Outcomes

The 2 (Time) X 3 (Condition) interaction on post-task substance use craving was not significant, $F(1, 149) = 0.05$, $p = .953$, $\eta_p^2 = .01$. The between-subjects effect was also not significant, $F(1, 149) = 0.16$, $p = .853$, $\eta_p^2 = .00$, and after the task the PRD condition ($M = 1.35$; $SD = 2.09$) did not differ on craving compared to the non-PRD stress group ($M = 1.56$; $SD = 2.36$) and control ($M = 1.57$; $SD = 2.57$). The 2 (Time) X 3 (Condition) interaction on post-task willingness was not significant, $F(1, 149) = 1.39$, $p = .254$, $\eta_p^2 = .02$. The between-subjects effect was also not significant, $F(1, 149) = 0.02$, $p = .635$, $\eta_p^2 = .01$, and after the task the PRD condition ($M = 12.35$; $SD = 8.51$) did not report significantly greater willingness to use compared to the non-PRD stress condition ($M = 12.44$; $SD = 8.24$) or the control condition ($M = 10.73$; $SD = 6.95$). The 2 (Time) X 3 (Condition) interaction on post-task intentions was not significant, $F(1, 149) = 0.01$, $p = .367$, $\eta_p^2 = .01$. The between-subjects effect was also not significant, $F(1, 149) = 0.18$, $p = .835$, $\eta_p^2 = .00$, and after the task the PRD condition ($M = 2.57$; $SD = 1.29$) did not report significantly greater intentions to use compared to the non-PRD stress condition ($M = 2.73$; $SD = 2.09$) or the control condition ($M = 2.55$; $SD = 1.24$). Notably, condition was related to post-task anger

such that the non-PRD stress condition reported significantly greater post-task anger (Table 5) than the control condition, although the size of the effect between post-task anger in the non-PRD stress condition vs PRD condition ($d = 0.16$, $p = .182$) was small and not significant. Condition was unrelated to any other post-task/follow-up distress score (i.e., post-task depression, post-task anxiety, follow-up depression, follow-up anxiety, and follow-up anger; Table 5).

Table 5. ANOVA results for Condition predicting Post-Task/Follow-up Distress and Follow-up Outcomes

Dependent variable	PRD Condition <i>N</i> = 51		Non-PRD Stress Condition <i>N</i> = 52		Non-Stress Control Condition <i>N</i> = 49		<i>F</i>	<i>p</i>	η^2
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
Post-Task Depression	0.67 ^a	1.03	0.98 ^a	1.34	0.49 ^a	0.99	2.45	.089	0.03
Post-Task Anxiety	1.67 ^a	1.62	2.40	1.51	1.92 ^a	1.55	2.97	.055	0.04
Post-Task Anger	0.76	1.19	1.19	1.48	0.41 ^a	0.91	5.21	.007	0.07
Follow-up Depression	0.53 ^a	0.90	0.98 ^a	1.21	1.18 ^a	1.40	2.64	.076	0.05
Follow-up Anxiety	1.74 ^a	1.42	1.56 ^a	1.30	1.68 ^a	1.39	0.16	.853	0.00
Follow-up Anger	0.38 ^a	0.74	0.29 ^a	0.64	0.41 ^a	1.02	0.23	.798	0.00
Follow up substance use	0.91 ^a	0.62	0.77 ^a	0.63	0.85 ^a	0.57	0.49	.617	0.01
Follow-up sleep problems	11.12 ^a	5.78	11.75 ^a	6.39	11.50 ^a	4.53	0.16	.849	0.00

Note. PRD = Perceived Racial Discrimination; **Bold scores** indicate significant differences at $*p < .05$.

^aMeans not significantly different from one another ($p < .05$).

Effect of PRD on Follow-up Outcomes

Condition was not significantly related to follow-up substance use frequency or follow-up sleep problem severity and was not significantly related to levels of follow-up substance use (Table 5). Further, participants in all conditions reported similar severity of sleep problems (Table 5).

Anger Mediating Condition and Post-Task Outcomes

As shown in Table 6, there was a significant effect of condition on one proposed mediator (i.e., post-task anger) but not the other proposed mediators (i.e., post-task depression, post-task anxiety) such that the non-PRD stress condition reported significantly greater post-task anger (Table 5) than the control condition, although the size of the effect on post-task anger in the non-PRD stress condition vs PRD condition ($d = 0.16, p = .182$) was small and not significant and the effect on post-task anger in the non- PRD stress condition vs control was moderate ($d = 0.63, p = .004$). We examined the total, direct, and indirect effects of condition via post-task anger on the post-task/follow-up outcomes (i.e., post-task craving, post-task willingness to use, post-task intentions to use, follow-up substance use, and follow-up sleep problems). The total effects models for the relations between the experimental conditions and each dependent variable did not account for significant variance in post-task craving ($R^2 = .002, df = 2, 149, F = 0.14, p = .871$), post-task willingness to use ($R^2 = .010, df = 2, 149, F = 0.73, p = .484$), post-task intentions to use ($R^2 = .005, df = 2, 149, F = 0.33, p = .717$), follow-up substance use ($R^2 = .007, df = 2, 149, F = 0.50, p = .607$), or follow-up sleep problems ($R^2 = .002, df = 2, 149, F = 0.11, p = .894$).

Table 6. Regression results for five mediation models examining effect of condition via post-task anger on substance use outcomes

<i>D₁</i>	Post-task Anger score					
Outcome variable	<i>b</i>	<i>t</i>	<i>p</i>	Lower 95% <i>CI</i>	Upper 95% <i>CI</i>	<i>se</i>
Post-Task substance use craving						
Condition → Ang score (a)	0.36	1.46	.147	-0.127	0.840	0.24
Ang score → Craving (b)	0.25	1.59	.115	-0.061	0.556	0.16
Condition → Craving (c')	-0.31	-0.65	.515	-1.235	0.622	0.47
Condition → Craving (c)	-0.22	-0.47	.652	-1.145	0.708	0.47
Post-Task substance use willingness						
Condition → Ang score (a)	0.36	1.46	.147	-0.127	0.840	0.24
Ang score → Willingness (b)	0.88	1.65	.100	-0.170	1.919	0.53
Condition → Willingness (c')	1.31	0.82	0.413	-1.837	4.450	1.59
Condition → Willingness (c)	1.62	1.02	.310	-1.521	4.758	1.59
Post-Task substance use intentions						
Condition → Ang score (a)	0.36	1.46	.147	-0.127	0.840	0.24
Ang score → Intentions (b)	0.11	1.39	.165	-0.048	0.276	0.08
Condition → Intentions (c')	-0.02	-0.09	.925	-0.511	0.464	0.25
Condition → Intentions (c)	0.18	0.25	.944	-0.468	0.503	0.25
Follow-up substance use						
Condition → Ang score (a)	0.36	1.46	.147	-0.127	0.840	0.24
Ang score → Sub use (b)	0.03	0.61	.543	-0.058	0.110	0.04
Condition → Sub use (c')	0.10	0.78	.438	-0.153	0.351	0.13
Condition → Sub use (c)	0.11	0.86	.393	-0.141	0.358	0.13
Follow-up sleep problems						
Condition → Ang score (a)	0.37	1.18	.241	-0.251	0.989	0.31
Ang score → sleep problems (b)	0.15	0.34	.741	-0.738	1.034	1.42
Condition → sleep problems (c')	0.43	0.30	.762	-2.387	3.246	1.42
Condition → sleep problems (c)	0.48	0.34	.731	-2.301	3.269	1.40

(Table 6 continued)

<i>D</i> ₂	Post-task Anger score					
Outcome variable	<i>b</i>	<i>t</i>	<i>p</i>	Lower 95% <i>CI</i>	Upper 95% <i>CI</i>	<i>se</i>
Post-Task substance use craving						
Condition → Ang score (a)	0.78	3.22	.002	.303	1.266	0.24
Ang score → Craving (b)	0.25	1.59	.115	-0.061	0.556	0.16
Condition → Craving (c')	-0.21	-0.43	.666	-1.157	0.741	0.48
Condition → Craving (c)	-0.01	-0.03	.977	-0.936	0.908	0.47
Post-Task substance use willingness						
Condition → Ang score (a)	0.78	3.22	.002	0.303	1.266	0.24
Ang score → Willingness (b)	0.88	1.65	.100	-0.170	1.919	0.53
Condition → Willingness (c')	1.02	0.63	.531	-2.19	4.235	1.59
Condition → Willingness (c)	1.71	1.08	.282	-1.417	4.832	1.58
Post-Task substance use intentions	<i>b</i>	<i>t</i>	<i>p</i>	Lower 95% <i>CI</i>	Upper 95% <i>CI</i>	<i>se</i>
Condition → Ang score (a)	0.78	3.22	.002	0.303	1.266	0.24
Ang score → Intentions (b)	0.11	1.39	.165	-0.048	0.276	0.11
Condition → Intentions (c')	0.09	0.36	.721	-0.408	0.588	0.25
Condition → Intentions (c)	0.18	0.73	.464	-0.304	0.663	0.25
Follow-up substance use						
Condition → Ang score (a)	0.78	3.22	.002	0.303	1.266	0.24
Ang score → Sub use (b)	0.03	0.61	.543	-0.058	0.110	0.04
Condition → Sub use (c')	0.09	0.70	.487	-0.167	0.348	0.13
Condition → Sub use (c)	0.11	0.88	.379	-0.137	0.360	0.13
Follow-up sleep problems	<i>b</i>	<i>t</i>	<i>p</i>	Lower 95% <i>CI</i>	Upper 95% <i>CI</i>	<i>se</i>
Condition → Ang score (a)	0.97	3.25	.002	0.380	1.569	0.30
Ang score → sleep problems (b)	0.15	0.33	.741	-0.738	1.034	0.45
Condition → sleep problems (c')	0.48	0.34	.737	-2.341	3.298	1.42
Condition → sleep problems (c)	0.62	0.46	.645	-2.049	3.294	1.35

(Table 6 continued)

<i>D</i> ₃	Post-task PRD					
Outcome variable	<i>b</i>	<i>t</i>	<i>p</i>	Lower 95% <i>CI</i>	Upper 95% <i>CI</i>	<i>se</i>
Post-Task substance use craving						
Condition → Ang score (a)	-0.43	-1.77	.078	-0.904	0.049	0.17
Ang score → Craving (b)	0.25	0.16	.115	-0.061	0.556	0.16
Condition → Craving (c')	-0.10	-0.21	.832	-1.017	0.819	0.46
Condition → Craving (c)	-0.20	-0.44	.658	-1.118	0.708	0.47
Post-Task substance use willingness						
Condition → Ang score (a)	-0.43	-1.77	.078	-0.904	0.049	0.24
Ang score → Willingness (b)	0.88	1.65	.100	-0.170	1.919	0.53
Condition → Willingness (c')	0.28	0.18	.857	-2.823	3.392	1.57
Condition → Willingness (c)	-0.09	1.08	.282	-3.183	3.004	1.57
Post-Task substance use intentions						
Condition → Ang score (a)	-0.43	-1.77	.078	-0.904	0.049	0.17
Ang score → Intentions (b)	0.11	1.39	.165	-0.048	0.276	0.11
Condition → Intentions (c')	-0.11	0.46	.643	-0.595	0.369	0.24
Condition → Intentions (c)	-0.16	0.73	.464	-0.641	0.316	0.24
Follow-up substance use						
Condition → Ang score (a)	-0.43	-1.77	.078	-0.904	0.049	0.17
Ang score → Sub use (b)	0.03	0.61	.543	-0.058	0.110	0.04
Condition → Sub use (c')	0.01	0.07	.947	-0.241	0.257	0.13
Condition → Sub use (c)	-0.00	-0.02	.983	-0.249	0.243	0.12
Follow-up sleep problems						
Condition → Ang score (a)	-0.61	-2.09	.039	-1.180	-0.032	0.29
Ang score → sleep problems (b)	0.15	0.33	.741	-0.738	1.034	0.45
Condition → sleep problems (c')	-0.05	-0.04	.971	-2.695	2.597	1.33
Condition → sleep problems (c)	-0.62	-0.11	.915	-2.717	2.441	1.30

Note. *D* represents the dummy variables for condition. Subscripts represent the dummy coded comparisons between participants randomized to the Perceived racial discrimination (PRD) condition compared to the control condition (1) and the non-PRD stress condition compared to the control condition (2). Further, subscript (3) represents the dummy coded comparison between participants randomized to the PRD condition versus the non-PRD stress condition; Ang Score = Anger Score; Willingness = Willingness to use substances; Intentions = Intentions to use substances; Sub use = Substance use; a = association of X with M; b = association of M with Y; c' = direct effect of X on Y, controlling for M; c = total effect of X on Y; **p* < .05.

The direct effects of the experimental conditions on each of the post-task/follow-up outcomes were not significant (Table 6). The indirect effects of the experimental conditions on each of the post- task/follow-up outcomes via post-task anger were not significant (Table 7).

Table 7. Bootstrap Estimates for the Standard Errors and 95% Confidence Intervals (CI) for the Indirect Effects via Post-Task Anger

<i>D₁</i>				
Outcome variable	<i>b</i>	<i>SE</i>	<i>Lower 95%CI</i>	<i>Upper 95% CI</i>
<u>Post-Task substance use craving</u>				
Condition → Ang score → Craving	0.02	0.06	-0.117	0.152
<u>Post-Task substance use willingness</u>				
Condition → Ang score → Willingness	0.10	0.26	-0.316	0.755
<u>Post-Task substance use intentions</u>				
Condition → Ang score → Intentions	0.01	0.03	-0.039	0.088
<u>Follow-up substance use</u>				
Condition → Ang score → Sub use	0.00	0.02	-0.015	0.039
<u>Follow-up sleep problems</u>				
Condition → Ang score → sleep problems	0.01	0.13	-0.241	0.323
<i>D₂</i>				
Outcome variable	<i>b</i>	<i>SE</i>	<i>Lower 95%CI</i>	<i>Upper 95% CI</i>
<u>Post-Task substance use craving</u>				
Condition → Ang score → Craving	0.21	0.16	-0.108	0.554
<u>Post-Task substance use willingness</u>				
Condition → Ang score → Willingness	0.69	0.55	-0.212	1.922
<u>Post-Task substance use intentions</u>				
Condition → Ang score → Intentions	0.10	0.07	-0.029	0.262
<u>Follow-up substance use</u>				
Condition → Ang score → Sub use	0.04	0.04	-0.028	0.122
<u>Follow-up sleep problems</u>				
Condition → Ang score → sleep problems	0.05	0.03	-0.854	1.024

(Table 7 continued)

<i>D</i> ₃				
Outcome variable	<i>b</i>	<i>SE</i>	<i>Lower</i> 95% <i>CI</i>	<i>Upper</i> 95% <i>CI</i>
<u>Post-Task substance use craving</u>				
Condition → Ang score → Craving	-0.11	0.11	-0.378	0.060
<u>Post-Task substance use willingness</u>				
Condition → Ang score → Willingness	-0.37	0.37	-1.259	0.197
<u>Post-Task substance use intentions</u>				
Condition → Ang score → Intentions	-0.05	0.05	-0.158	0.033
<u>Follow-up substance use</u>				
Condition → Ang score → Sub use	-0.01	0.02	-0.068	0.026
<u>Follow-up sleep problems</u>				
Condition → Ang score → sleep problems	-0.09	0.29	-0.709	0.499

Note. *D* represents the dummy variables for condition. Subscripts represent the dummy coded comparisons between participants randomized to the PRD condition compared to the control condition (1) and the non-PRD stress condition compared to the control condition (2). Further, subscript (3) represents the dummy coded comparison between participants randomized to the PRD condition versus the non- PRD stress condition; PRD = Perceived racial discrimination; Ang Score = Post-task Anger Score; Willingness = Willingness to use substances; Intentions = Post-task substance use intentions; Sub use = Substance use; **p* < .05.

PRD Mediating Condition and Post-task Outcomes

Given that post-task PRD was related to condition, we examined the total, direct, and indirect effects of condition via post-task PRD on the post-task/follow-up outcomes (i.e., post-task craving, post- task willingness to use, post-task intentions to use, follow-up substance use, and follow-up sleep problems). The total effects models for the relations between the experimental conditions and each dependent variable did not account for significant variance in post-task craving ($R^2 = .002$, $df = 2, 149$, $F = 0.14$, $p = .871$), post-task willingness to use ($R^2 = .010$, $df = 2, 149$, $F = 0.73$, $p = .484$), post-task intentions to use ($R^2 = .005$, $df = 2, 149$, $F = 0.33$, $p = .717$), follow-up substance use ($R^2 = .007$, $df = 2, 149$, $F = 0.50$, $p = .607$), or follow-up sleep problems ($R^2 = .002$, $df = 2, 149$, $F = 0.11$, $p = .894$). The PRD condition was related to greater post-task PRD than the control and the non-PRD stress conditions; yet, the direct effects of condition on each of the post-task/follow-up outcomes were not significant (Table 8).

Table 8. Regression Results for Five Mediation Models Examining Effect of Condition via Post-Task PRD on Substance Use Outcomes

<i>D</i> ₁	Post-task PRD					
Outcome variable	<i>b</i>	<i>t</i>	<i>p</i>	Lower 95% <i>CI</i>	Upper 95% <i>CI</i>	<i>se</i>
Post-Task substance use craving						
Condition → Post-task PRD (a)	16.31	3.32	.001	6.599	26.030	4.92
Post-task PRD → Craving (b)	0.00	0.01	.991	-0.015	0.016	0.01
Condition → Craving (c')	-0.22	-0.45	.653	-1.183	0.744	0.49
Condition → Craving (c)	-0.22	-0.47	.642	-1.145	0.708	0.47
Post-Task substance use willingness						
Condition → Post-task PRD (a)	16.31	3.32	.001	6.599	26.030	4.92
Post-task PRD → Willingness (b)	-0.03	-1.08	.281	-0.081	0.024	0.03
Condition → Willingness (c')	2.09	1.27	.207	-1.166	5.337	1.65
Condition → Willingness (c)	1.62	1.02	.310	-1.521	4.758	1.59
Post-Task substance use intentions	<i>b</i>	<i>t</i>	<i>p</i>	Lower 95% 95%CI	Upper 95% CI	<i>se</i>
Condition → Post-task PRD (a)	16.31	3.32	.001	6.599	26.030	4.92
Post-task PRD → Intentions (b)	-0.00	-0.21	.833	-0.009	0.007	0.00
Condition → Intentions (c')	0.03	0.12	.901	-0.473	0.537	0.26
Condition → Intentions (c)	0.02	0.07	.943	-0.468	0.503	0.25
Follow-up substance use						
Condition → Post-task PRD (a)	16.31	3.32	.001	6.599	26.030	4.92
Post-task PRD → Sub use (b)	-0.00	-1.19	.237	-0.007	0.002	0.00
Condition → Sub use (c')	0.15	1.14	.256	-0.109	0.407	0.13
Condition → Sub use (c)	0.11	0.86	.393	-0.141	0.360	0.13
Follow-up sleep problems	<i>b</i>	<i>t</i>	<i>p</i>	Lower 95% 95%CI	Upper 95% CI	<i>se</i>
Condition → Post-task PRD (a)	15.80	2.51	.014	3.311	28.297	6.30
Post-task PRD → sleep problems (b)	0.02	0.90	.370	-0.024	0.064	0.02
Condition → sleep problems (c')	0.17	0.12	.907	-2.703	3.043	1.45
Condition → sleep problems (c)	0.48	0.34	.731	-2.301	3.269	1.40
<i>D</i> ₂	Post-task PRD					
Outcome variable (Table 8 continued)	<i>b</i>	<i>t</i>	<i>p</i>	Lower 95% <i>CI</i>	Upper 95% <i>CI</i>	<i>se</i>

Outcome variable	<i>b</i>	<i>t</i>	<i>p</i>	Lower 95% CI	Upper 95% CI	<i>se</i>
Post-Task substance use craving						
Condition → Post-task PRD (a)	1.21	0.25	.805	-8.457	10.883	4.89
Post-task PRD → Craving (b)	0.00	0.01	.991	-0.015	0.016	0.01
Condition → Craving (c')	-0.01	-0.03	.977	-0.939	0.912	0.47
Condition → Craving (c)	-0.01	-0.03	.977	-1.145	0.708	0.47
Post-Task substance use willingness						
Condition → Post-task PRD (a)	1.21	0.25	.805	-8.457	10.883	4.89
Post-task PRD → Willingness (b)	-0.03	-1.08	.281	-0.081	0.024	0.03
Condition → Willingness (c')	1.74	1.10	.272	-1.382	4.866	1.58
Condition → Willingness (c)	1.71	1.08	.282	-1.417	4.832	1.58
Post-Task substance use intentions	<i>b</i>	<i>t</i>	<i>p</i>	Lower 95%CI	Upper 95% CI	<i>se</i>
Condition → Post-task PRD (a)	1.21	0.25	.805	-8.457	10.883	4.89
Post-task PRD → Intentions (b)	-0.00	-0.21	.833	-0.009	0.007	0.00
Condition → Intentions (c')	0.18	0.74	.463	-0.304	0.666	0.25
Condition → Intentions (c)	0.18	0.73	.464	-0.304	0.663	0.24
Follow-up substance use						
Condition → Post-task PRD (a)	1.21	0.25	.805	-8.457	10.883	4.89
Post-task PRD → Sub use (b)	-0.00	-1.19	.237	-0.007	0.002	0.00
Condition → Sub use (c')	0.11	0.91	.365	-0.134	0.362	0.13
Condition → Sub use (c)	0.11	0.88	.379	-0.137	0.360	0.13
Follow-up sleep problems	<i>b</i>	<i>t</i>	<i>p</i>	Lower 95%CI	Upper 95% CI	<i>se</i>
Condition → Post-task PRD (a)	0.07	0.01	.991	-11.918	12.048	6.04
Post-task PRD → sleep problems (b)	0.02	0.90	.370	-0.024	0.064	0.02
Condition → sleep problems (c')	0.62	0.46	.646	-2.053	3.296	1.35
Condition → sleep problems (c)	0.62	0.46	.645	-2.049	3.294	1.35
<i>D</i> ₃	Post-task PRD					
Outcome variable	<i>b</i>	<i>t</i>	<i>p</i>	Lower 95% CI	Upper 95% CI	<i>se</i>
Post-Task substance use craving						

(Table 8 continued)

Outcome variable	<i>b</i>	<i>t</i>	<i>p</i>	Lower 95% CI	Upper 95% CI	<i>se</i>
Post-Task substance use craving						
Condition → Post-task PRD (a)	15.10	3.12	.002	5.530	24.674	4.84
Post-task PRD → Craving (b)	0.00	0.01	.991	-0.015	0.016	0.01
Condition → Craving (c')	-0.21	-0.43	.667	-1.151	0.739	0.48
Condition → Craving (c)	-0.20	-0.03	.977	-0.908	0.936	0.47
Post-Task substance use willingness						
Condition → Post-task PRD (a)	15.10	3.12	.002	5.530	24.674	4.84
Post-task PRD → Willingness (b)	-0.03	-1.08	.281	-0.081	0.024	0.03
Condition → Willingness (c')	0.34	0.21	.832	-2.848	3.534	1.61
Condition → Willingness (c)	-0.09	-0.06	.955	-3.183	3.004	1.57
Post-Task substance use intentions	<i>b</i>	<i>t</i>	<i>p</i>	Lower 95%CI	Upper 95% CI	<i>se</i>
Condition → Post-task PRD (a)	15.10	3.12	.002	5.530	24.674	4.84
Post-task PRD → Intentions (b)	-0.00	-0.21	.833	-0.009	0.007	0.00
Condition → Intentions (c')	-0.15	-0.59	.553	-0.644	0.346	0.25
Condition → Intentions (c)	-0.16	0.67	.504	-0.641	0.316	0.24
Follow-up substance use	<i>b</i>	<i>t</i>	<i>p</i>	Lower 95%CI	Upper 95% CI	<i>se</i>
Condition → Post-task PRD (a)	15.10	3.12	.002	5.530	24.674	4.84
Post-task PRD → Sub use (b)	-0.00	-1.19	.237	-0.007	0.002	0.00
Condition → Sub use (c')	0.03	0.27	.786	-0.219	0.288	0.13
Condition → Sub use (c)	-0.00	-0.02	.983	-0.249	0.243	0.12
Follow-up sleep problems						
Condition → Post-task PRD (a)	15.10	2.70	.008	4.160	27.308	5.83
Post-task PRD → sleep problems (b)	0.02	0.90	.370	-0.024	0.064	0.02
Condition → sleep problems (c')	-0.45	-0.34	.738	-3.124	2.221	1.35
Condition → sleep problems (c)	-0.14	-0.11	.915	-2.717	2.441	1.30

Note. *D* represents the dummy variables for condition. Subscripts represent the dummy coded comparisons between participants randomized to the PRD condition compared to the control condition (1) and the non-PRD stress condition compared to the control condition (2). Further, subscript (3) represents the dummy coded comparison between participants randomized to the PRD condition versus the non-PRD stress condition; PRD = Perceived Racial Discrimination; Willingness = Willingness to use substances; Intentions = Post-task substance use intentions; Sub use = Substance use; a = association of X with M; b = association of M with Y; c' = direct effect of X on Y, controlling for M; c = total effect of X on Y; **p* < .05.

Finally, the indirect effects of experimental condition on each of the post-task and follow-up outcomes via post-task PRD were not significant (Table 9).

Table 9. Bootstrap Estimates for the Standard Errors and 95% Confidence Intervals (CI) for the Indirect Effects via Post-Task PRD

<i>D₁</i>				
Outcome variable	<i>b</i>	<i>SE</i>	<i>Lower 95%CI</i>	<i>Upper 95% CI</i>
<u>Post-Task substance use craving</u>				
Condition → Post-task PRD → Craving	-0.07	0.14	-0.368	0.227
<u>Post-Task substance use willingness</u>				
Condition → Post-task PRD → Willingness	-0.79	0.50	-1.860	0.075
<u>Post-Task substance use intentions</u>				
Condition → Post-task PRD → Intentions	-0.05	0.07	-0.197	0.109
<u>Follow-up substance use</u>				
Condition → Post-task PRD → Sub use	-0.06	0.04	-0.157	0.015
<u>Follow-up sleep problems</u>				
Condition → Post-task PRD → sleep problems	0.30	0.44	-0.393	1.384
<i>D₂</i>				
Outcome variable	<i>b</i>	<i>SE</i>	<i>Lower 95%CI</i>	<i>Upper 95% CI</i>
<u>Post-Task substance use craving</u>				
Condition → Post-task PRD → Craving	-0.01	0.04	-0.096	0.074
<u>Post-Task substance use willingness</u>				
Condition → Post-task PRD → Willingness	-0.06	0.22	-0.522	0.394
<u>Post-Task substance use intentions</u>				
Condition → Post-task PRD → Intentions	-0.00	0.02	-0.051	0.045
<u>Follow-up substance use</u>				
Condition → Post-task PRD → Sub use	-0.00	0.02	-0.038	0.027
<u>Follow-up sleep problems</u>				
Condition → Post-task PRD → sleep problems	0.00	0.16	-0.304	0.393
<i>D₃</i>				
Outcome variable	<i>b</i>	<i>SE</i>	<i>Lower 95%CI</i>	<i>Upper 95% CI</i>
<u>Post-Task substance use craving</u>				
Condition → Post-task PRD → Craving	0.00	0.12	-0.225	0.251

(Table 9 continued)

Outcome variable	<i>b</i>	<i>SE</i>	<i>Lower 95%CI</i>	<i>Upper 95% CI</i>
<u>Post-Task substance use willingness</u>				
Condition → Post-task PRD → Willingness	-0.43	0.46	-1.418	0.419
<u>Post-Task substance use intentions</u>				
Condition → Post-task PRD → Intentions	-0.01	0.07	-0.144	0.129
<u>Follow-up substance use</u>				
Condition → Post-task PRD → Sub use	-0.04	0.04	-0.127	0.020
<u>Follow-up sleep problems</u>				
Condition → Post-task PRD → sleep problems	0.31	0.39	-0.318	1.202

Note. *D* represents the dummy variables for condition. Subscripts represent the dummy coded comparisons between participants randomized to the PRD condition compared to the control condition (1) and the non-PRD stress condition compared to the control condition (2). Further, subscript (3) represents the dummy coded comparison between participants randomized to the PRD condition versus the non- PRD stress condition; PRD = Perceived racial discrimination; Ang Score = Post-task Anger Score; Willingness = Willingness to use substances; Intentions = Post-task substance use intentions; Sub use = Substance use; * $p < .05$.

PRD and Anger Mediating Condition and Post-task Outcomes

In order to test the theory that greater PRD may impact greater distress, which would then impact substance use outcomes (Figure 1), we examined the total, direct, and indirect effects of condition via post-task PRD and post-task anger on the post-task/follow-up outcomes (i.e., post-task willingness to use, post-task intentions to use, follow-up substance use, and follow-up sleep problems). The total effects models for the relations between the experimental conditions and each dependent variable did not account for significant variance in post-task craving ($R^2 = .002$, $df = 2, 149$, $F = 0.14$, $p = .871$), post-task willingness to use ($R^2 = .010$, $df = 2, 149$, $F = 0.73$, $p = .484$), post-task intentions to use ($R^2 = .005$, $df = 2, 149$, $F = 0.33$, $p = .717$), follow-up substance use ($R^2 = .007$, $df = 2, 149$, $F = 0.50$, $p = .607$), or follow-up sleep problems ($R^2 = .002$, $df = 2, 149$, $F = 0.11$, $p = .894$). The direct effects of experimental condition on each of the post-task/follow-up outcomes were not significant (Table 10).

Table 10. Regression Results for Five Mediation Models Examining Effect of Condition via Post-Task PRD and Post-Task Anger on Substance Use Outcomes

<i>D₁</i>						
Outcome variable	<i>b</i>	<i>t</i>	<i>p</i>	<i>Lower 95% CI</i>	<i>Upper 95% CI</i>	<i>se</i>
Post-Task substance use craving						
Condition → Post-task PRD (a ₁)	16.31	3.32	.001	6.599	26.030	4.92
Post-task PRD → Craving (a ₂)	-0.00	-0.55	.584	-0.021	0.012	0.01
Post-Task PRD → Ang score (d ₂₁)	0.02	4.31	.000	0.009	0.024	0.00
Condition → Ang score (b ₁)	0.09	0.36	.723	-0.389	0.559	0.24
Ang score → Craving (b ₂)	0.28	1.67	.096	-0.050	0.606	0.17
Condition → Craving (c')	-0.24	-0.50	.616	-1.202	0.714	0.48
Condition → Craving (c)	-0.22	-0.47	.642	-1.145	0.708	0.47
Post-Task substance use willingness						
Condition → Post-task PRD (a ₁)	16.31	3.32	.001	6.599	26.030	4.92
Post-task PRD → Willingness (a ₂)	-0.05	-1.75	.082	-0.103	0.006	0.03
Post-Task PRD → Ang score (d ₂₁)	0.02	4.31	.000	0.009	0.024	0.00
Condition → Ang score (b ₁)	0.09	0.36	.722	-0.389	0.559	0.24
Ang score → Willingness (b ₂)	1.20	2.16	.033	0.100	2.302	0.56
Condition → Willingness (c')	1.98	1.22	.225	-1.231	5.197	1.63
Condition → Willingness (c)	1.62	1.02	.310	-1.521	4.758	1.59
Post-Task substance use intentions						
Condition → Post-task PRD (a ₁)	16.31	3.32	.001	6.599	26.030	4.92
Post-task PRD → Intentions (a ₂)	-0.00	0.72	.473	-0.012	0.006	0.00
Post-Task PRD → Ang score (d ₂₁)	0.02	4.31	.000	0.009	0.024	0.00
Condition → Ang score (b ₁)	0.09	0.24	.723	-0.389	0.559	0.23

(Table 10 continued)

Post-Task substance use intentions	<i>b</i>	<i>t</i>	<i>p</i>	<i>Lower 95% CI</i>	<i>Upper 95% CI</i>	<i>se</i>
Ang score → Intentions (b ₂)	0.14	1.55	.123	-0.037	0.307	0.09
Condition → Intentions (c')	0.02	0.08	.937	-0.482	0.523	0.25
Condition → Intentions (c)	0.02	0.07	.943	-0.468	0.503	0.25
Follow-up substance use						
Condition → Post-task PRD (a ₁)	16.31	3.32	.001	6.599	26.030	4.89
Post-task PRD → Sub use (a ₂)	-0.00	-1.48	.142	-0.008	0.001	0.00
Post-Task PRD → Ang score (d ₂₁)	0.02	4.31	.000	0.009	0.024	0.00
Condition → Ang score (b ₁)	0.09	0.36	.723	-0.389	0.559	0.24
Ang score → Sub use (b ₂)	0.05	1.07	.287	-0.041	0.136	0.05
Condition → Sub use (c')	0.15	1.11	.269	-0.113	0.403	0.13
Condition → Sub use (c)	0.11	0.86	.393	-0.141	0.358	0.13
Follow-up sleep problems						
Condition → Post-task PRD (a ₁)	15.80	2.51	.014	3.311	28.297	6.30
Post-task PRD → sleep problems (a ₂)	0.02	0.84	.403	-0.026	0.065	0.02
Post-Task PRD → Ang score (d ₂₁)	0.01	2.65	.009	0.003	0.022	0.00
Condition → Ang score (b ₁)	0.17	0.54	.591	-0.452	0.790	0.31
Ang score → sleep problems (b ₂)	0.05	0.11	.916	-0.869	0.967	0.46
Condition → sleep problems (c')	0.16	0.11	.912	-2.730	3.053	1.46
Condition → sleep problems (c)	0.48	0.34	.731	-2.301	3.269	1.40
<i>D₂</i>						
Outcome variable	<i>b</i>	<i>t</i>	<i>p</i>	<i>Lower 95% CI</i>	<i>Upper 95% CI</i>	<i>se</i>
Post-Task substance use craving						
Condition → Post-task PRD (a ₁)	1.21	0.25	.805	-8.457	10.883	4.89

(Table 10 continued)

Outcome variable	<i>b</i>	<i>t</i>	<i>p</i>	<i>Lower 95% CI</i>	<i>Upper 95% CI</i>	<i>se</i>
Post-Task substance use craving						
Post-task PRD → Craving (a ₂)	-0.00	-0.55	.584	-0.021	0.012	0.01
Post-Task PRD → Ang score (d ₂₁)	0.02	4.31	.000	0.009	0.024	0.00
Condition → Ang score (b ₁)	0.76	3.32	.001	0.309	1.219	0.23
Ang score → Craving (b ₂)	0.28	1.67	.096	-0.050	0.606	0.01
Condition → Craving (c')	-0.23	-0.47	.640	-1.180	0.727	0.48
Condition → Craving (c)	-0.01	-0.03	.977	-0.936	0.908	0.47
Post-Task substance use willingness						
Condition → Post-task PRD (a ₁)	1.21	0.25	.805	-8.457	10.883	4.89
Post-task PRD → Willingness (a ₂)	-0.05	-1.75	.082	-0.103	0.006	0.03
Post-Task PRD → Ang score (d ₂₁)	0.02	4.31	.000	0.009	0.024	0.00
Condition → Ang score (b ₁)	0.76	3.32	.001	0.309	1.219	0.23
Ang score → Willingness (b ₂)	1.20	2.16	.033	0.100	2.302	0.56
Condition → Willingness (c')	0.83	0.51	.611	-2.374	4.024	1.62
Condition → Willingness (c)	1.71	1.08	.282	-1.417	4.832	1.58
Post-Task substance use intentions	<i>b</i>	<i>t</i>	<i>p</i>	<i>Lower 95% CI</i>	<i>Upper 95% CI</i>	<i>se</i>
Condition → Post-task PRD (a ₁)	1.21	0.25	.805	-8.457	10.883	4.89
Post-task PRD → Intentions (a ₂)	-0.00	-0.72	.473	-0.012	0.006	0.00
Post-Task PRD → Ang score (d ₂₁)	0.02	4.31	.000	0.009	0.024	0.00
Condition → Ang score (b ₁)	0.76	3.32	.001	0.309	1.219	0.23
Ang score → Intentions (b ₂)	0.14	1.55	.123	-0.037	0.307	0.09
Condition → Intentions (c')	0.08	0.31	.760	-0.423	0.578	0.25
Condition → Intentions (c)	0.18	0.73	.464	-0.304	0.663	0.24

(Table 10 continued)

Outcome variable	<i>b</i>	<i>t</i>	<i>p</i>	<i>Lower 95% CI</i>	<i>Upper 95% CI</i>	<i>se</i>
Follow-up substance use						
Condition → Post-task PRD (a ₁)	1.21	0.25	.805	-8.457	10.883	4.89
Post-task PRD → Sub use (a ₂)	-0.00	-1.48	.142	-0.008	0.001	0.00
Post-Task PRD → Ang score (d ₂₁)	0.02	4.31	.000	0.009	0.024	0.00
Condition → Ang score (b ₁)	0.76	3.32	.001	0.309	1.219	0.23
Ang score → Sub use (b ₂)	0.05	1.07	.287	-0.041	0.136	0.05
Condition → Sub use (c ⁺)	0.08	0.13	.552	-0.180	0.335	0.13
Condition → Sub use (c)	0.11	0.88	.378	-0.137	0.360	0.13

Outcome variable	<i>b</i>	<i>t</i>	<i>p</i>	<i>Lower 95% CI</i>	<i>Upper 95% CI</i>	<i>se</i>
Follow-up sleep problems						
Condition → Post-task PRD (a ₁)	0.07	0.01	.991	-11.918	12.048	6.04
Post-task PRD → sleep problems (a ₂)	0.01	0.84	.403	-0.026	0.065	0.02
Post-Task PRD → Ang score (d ₂₁)	0.01	2.65	.009	0.003	0.022	0.00
Condition → Ang score (b ₁)	0.97	3.34	.001	0.396	1.552	0.29
Ang score → sleep problems (b ₂)	0.05	0.11	.916	-0.869	0.967	0.46
Condition → sleep problems (c ⁺)	0.57	0.40	.689	-2.259	3.406	1.43
Condition → sleep problems (c)	0.62	0.46	.645	-2.059	3.294	1.35

<i>D₃</i>						
Outcome variable	<i>b</i>	<i>t</i>	<i>p</i>	<i>Lower 95% CI</i>	<i>Upper 95% CI</i>	<i>se</i>
Post-Task substance use craving						
Condition → Post-task PRD (a ₁)	15.10	3.12	.002	5.530	24.674	4.84
Post-task PRD → Craving (a ₂)	-0.00	-0.55	.584	-0.021	0.012	0.01
Post-Task PRD → Ang score (d ₂₁)	0.02	4.31	.000	0.009	0.024	0.00

(Table 10 continued)

Outcome variable	<i>b</i>	<i>t</i>	<i>p</i>	<i>Lower 95% CI</i>	<i>Upper 95% CI</i>	<i>se</i>
Post-Task substance use craving						
Condition → Ang score (b ₁)	-0.68	-3.32	.004	-1.309	-1.219	0.24
Ang score → Craving (b ₂)	0.28	1.67	.096	-0.050	0.606	0.01
Condition → Craving (c')	-0.02	-0.04	.972	-0.983	0.948	0.49
Condition → Craving (c)	-0.20	-0.44	.658	-1.118	0.708	0.46
Condition → Post-task PRD (a ₁)	15.10	3.12	.002	5.530	24.674	4.84
Post-task PRD → Willingness (a ₂)	-0.05	-1.75	.082	-0.103	0.006	0.03
Post-Task PRD → Ang score (d ₂₁)	0.02	4.31	.000	0.009	0.024	0.00
Condition → Ang score (b ₁)	-0.68	-2.88	.005	-1.144	-0.214	0.24
Ang score → Willingness (b ₂)	1.20	2.16	.033	0.100	2.302	0.56
Condition → Willingness (c')	1.16	0.71	.481	-2.082	4.398	1.64
Condition → Willingness (c)	-0.09	-0.06	.955	-3.183	3.004	1.57
Post-Task substance use intentions						
Condition → Post-task PRD (a ₁)	15.10	3.12	.002	5.530	24.674	4.84
Post-task PRD → Intentions (a ₂)	-0.00	-0.72	.473	-0.012	0.006	0.00
Post-Task PRD → Ang score (d ₂₁)	0.02	4.31	.000	0.009	0.024	0.00
Condition → Ang score (b ₁)	-0.68	-2.88	.005	-1.144	-0.214	0.24
Ang score → Intentions (b ₂)	-0.06	-0.22	.824	-0.564	0.450	0.26
Condition → Intentions (c')	-0.06	0.22	.824	-0.564	0.450	0.26
Condition → Intentions (c)	-0.16	-0.67	.504	-0.641	0.316	0.24
Follow-up substance use						
Condition → Post-task PRD (a ₁)	15.10	3.12	.002	5.530	24.674	4.84
Post-task PRD → Sub use (a ₂)	-0.00	-1.48	.142	-0.008	0.001	0.00

(Table 10 continued)

Follow-up substance use	<i>b</i>	<i>t</i>	<i>p</i>	<i>Lower 95% CI</i>	<i>Upper 95% CI</i>	<i>se</i>
Post-Task PRD → Ang score (d ₂₁)	0.02	4.31	.000	0.009	0.024	0.00
Condition → Ang score (b ₁)	-0.68	-2.88	.005	-1.144	-0.214	0.24
Ang score → Sub use (b ₂)	0.05	1.07	.287	-0.041	0.136	0.05
Condition → Sub use (c')	0.07	0.51	.610	-0.193	0.328	0.13
Condition → Sub use (c)	-0.00	-0.02	.983	-0.249	0.243	0.12
Follow-up sleep problems	<i>b</i>	<i>t</i>	<i>p</i>	<i>Lower 95% CI</i>	<i>Upper 95% CI</i>	<i>se</i>
Condition → Post-task PRD (a ₁)	15.10	3.12	.002	5.530	24.674	4.84
Post-task PRD → sleep problems (a ₂)	0.02	0.84	.403	-0.026	0.065	0.02
Post-Task PRD → Ang score (d ₂₁)	0.01	2.65	.009	0.003	0.022	0.00
Condition → Ang score (b ₁)	-0.97	3.34	.001	0.396	1.552	0.29
Ang score → sleep problems (b ₂)	0.05	0.11	.916	-0.869	0.967	0.46
Condition → sleep problems (c')	-0.41	-0.30	.770	-3.198	2.373	1.40
Condition → sleep problems (c)	-0.14	-0.11	.915	-2.717	2.441	1.30

Note. *D* represents the dummy variables for condition. Subscripts represent the dummy coded comparisons between participants randomized to the PRD condition compared to the control condition (1) and the non-PRD stress condition compared to the control condition (2). Further, subscript (3) represents the dummy coded comparison between participants randomized to the PRD condition versus the non-PRD stress condition; PRD = Perceived Racial Discrimination; Ang Score = Post-task Anger Score; Willingness = Willingness to use substances; Intentions = Post-task substance use intentions; Sub use = Substance use; a₁ = association of X with M₁; a₂ = association of M₁ with Y; b₁ = association of X with M₂; b₂ = association of M₂ with Y; d₂₁ = association of M₁ with M₂; c' = direct effect of X on Y, controlling for M₁ and M₂; c = total effect of X on Y; **p* < .05.

The indirect effects were estimated; the PRD condition (compared to the control and non-PRD stress conditions) was indirectly related to greater willingness to use substances through the serial effect of both post-task PRD and post-task anger (Table 11). The non-PRD stress condition (compared to the control group and the PRD condition) was not indirectly related to greater willingness to use substances through the serial effect of both post-task PRD

and post-task anger (Table 11).

There was also a significant indirect effect of condition (the non-PRD stress group compared to the control and the PRD conditions) on willingness via post-task anger (Table 11). The indirect effects of condition on each of the remaining post-task/follow-up outcomes via post-task PRD and post-task anger were not significant (Table 11).

Table 11. Bootstrap Estimates for the Standard Errors and 95% Confidence Intervals (CI) for the Indirect Effects via Post-task PRD and Post-task Anger

<i>D₁</i>				
Outcome variable	<i>b</i>	<i>SE</i>	<i>Lower 95%CI</i>	<i>Upper 95% CI</i>
Post-Task substance use craving				
Condition → Post-task PRD → Craving	-0.07	0.14	-0.368	0.227
Condition → Ang score → Craving	0.02	0.06	-0.117	0.152
Condition → Post-task PRD → Ang score → Craving	0.08	0.07	-0.033	0.241
Post-Task substance use willingness				
Condition → Post-task PRD → Willingness	-0.79	0.50	-1.860	0.075
Condition → Ang score → Willingness	0.10	0.26	-0.316	0.755
Condition → Post-task PRD → Ang score → Willingness	0.33	0.23	0.004	0.862
Post-Task substance use intentions				
Condition → Post-task PRD → Intentions	-0.05	0.07	-0.197	0.109
Condition → Ang score → Intentions	0.01	0.03	-0.039	0.088
Condition → Post-task PRD → Ang score → Intentions	0.04	0.03	-0.01	0.105
Follow-up substance use				
Condition → Post-task PRD → Sub use	-0.06	0.04	-0.157	0.015
Condition → Ang score → Sub use	0.00	0.02	-0.015	0.039
Condition → Post-task PRD → Ang score → Sub use	0.01	0.01	-0.010	0.047
Follow-up sleep problems				
Condition → Post-task PRD → sleep problems	0.30	0.44	-0.393	1.384
Condition → Ang score → sleep problems	0.01	0.13	-0.241	0.323
Condition → Post-task PRD → Ang score → sleep Problems	0.00	0.04	-0.094	0.054

(Table 11 continued)

<i>D₂</i>				
Outcome variable	<i>b</i>	<i>SE</i>	<i>Lower 95%CI</i>	<i>Upper 95% CI</i>
Post-Task substance use craving				
Condition → Post-task PRD → Craving	-0.01	0.04	-0.096	0.074
Condition → Ang score → Craving	0.21	0.16	-0.108	0.554
Condition → Post-task PRD → Ang score → Craving	0.01	0.03	-0.036	0.064
Post-Task substance use willingness				
Condition → Post-task PRD → Willingness	-0.06	0.22	-0.522	0.394
Outcome variable	<i>b</i>	<i>SE</i>	<i>Lower 95%CI</i>	<i>Upper 95% CI</i>
Post-Task substance use willingness				
Condition → Ang score → Willingness	0.92	0.55	0.024	2.171
Condition → Post-task PRD → Ang score → Willingness	0.02	0.09	-0.149	0.240
Outcome variable	<i>b</i>	<i>SE</i>	<i>Lower 95%CI</i>	<i>Upper 95% CI</i>
Post-Task substance use intentions				
Condition → Post-task PRD → Intentions	-0.00	0.02	-0.051	0.045
Condition → Ang score → Intentions	0.10	0.07	-0.029	0.262
Condition → Post-task PRD → Ang score → Intentions	0.00	0.01	-0.019	0.027
Follow-up substance use				
Condition → Post-task PRD → Sub use	-0.00	0.02	-0.038	0.027
Condition → Ang score → Sub use	0.04	0.04	-0.028	0.122
Condition → Post-task PRD → Ang score → Sub use	0.00	0.00	-0.009	0.012
Outcome variable	<i>b</i>	<i>SE</i>	<i>Lower 95%CI</i>	<i>Upper 95% CI</i>
Follow-up sleep problems				
Condition → Post-task PRD → sleep problems	0.00	0.16	-0.304	0.393
Condition → Ang score → sleep problems	0.05	0.03	-0.854	1.024
Condition → Post-task PRD → Ang score → sleep problems	0.00	0.04	-0.094	0.054
<i>D₃</i>				
Outcome variable	<i>b</i>	<i>SE</i>	<i>Lower 95%CI</i>	<i>Upper 95% CI</i>
Post-Task substance use craving				
Condition → Post-task PRD → Craving	-0.07	0.14	-0.349	0.211
Condition → Ang score → Craving	-0.19	0.16	-0.545	0.089
Condition → Post-task PRD → Ang score → Craving	0.07	0.06	-0.033	0.224

(Table 11 continued)

<i>D</i> ₃				
Outcome variable	<i>b</i>	<i>SE</i>	<i>Lower 95%CI</i>	<i>Upper 95% CI</i>
Post-Task substance use willingness				
Condition → Post-task PRD → Willingness	-0.73	0.47	-1.778	0.067
Condition → Ang score → Willingness	-0.82	0.47	-1.833	-0.010
Condition → Post-task PRD → Ang score → Willingness	0.30	0.21	0.002	0.794
Post-Task substance use intentions				
Condition → Post-task PRD → Intentions	-0.05	0.07	-0.196	0.101
Condition → Ang score → Intentions	-0.09	0.06	-0.225	0.025
Condition → Post-task PRD → Ang score → Intentions	0.03	0.03	-0.009	0.100
Follow-up substance use				
Condition → Post-task PRD → Sub use	-0.05	0.04	-0.148	0.014
Condition → Ang score → Sub use	-0.03	0.03	-0.105	0.025
Condition → Post-task PRD → Ang score → Sub use	0.01	0.01	-0.009	0.043
Follow-up sleep problems				
Condition → Post-task PRD → sleep problems	0.30	0.41	-0.417	1.237
Condition → Ang score → sleep problems	-0.04	0.38	-0.850	0.742
Condition → Post-task PRD → Ang score → sleep problems	0.00	0.03	-0.057	0.086

Note. *D* represents the dummy variables for condition. Subscripts represent the dummy coded comparisons between participants randomized to the PRD conditions compared to the control condition (1) and the non-PRD stress condition compared to the control condition (2). Further, subscript (3) represents the dummy coded comparison between participants randomized to the PRD condition versus the non-PRD stress condition; PRD = Perceived racial discrimination; Ang Score = Post-task Anger Score; Willingness = Willingness to use substances; Intentions = Post-task substance use intentions; Sub use = Substance use; **p* < .05.

A comparison of the unstandardized regression coefficients reveals that the effect of the non-PRD stress condition (compared to the PRD group) on willingness via post-task anger was stronger than the effect of the PRD condition on willingness via both post-task PRD and anger (Table 12).

Table 12. Mediation Effects of Post-Task PRD and Post-task Anger on Condition and Willingness to Use Substances

Outcome variable	<i>b</i>	<i>SE</i>	<i>Lower</i> 95% <i>CI</i>	<i>Upper</i> 95% <i>CI</i>
Willingness to use substances				
<i>D</i> ₃ : PRD Condition → PRD → Ang score → Willingness	0.30	0.21	0.002	0.794
<i>D</i> ₃ : Stress Condition → Ang score → Willingness	-0.82	0.47	-1.833	-0.010
	Contrast effect	<i>SE</i>	<i>Lower</i> 95% <i>CI</i>	<i>Upper</i> 95% <i>CI</i>
<i>D</i> ₃ : PRD vs Stress condition	-1.27	0.68	-2.703	-0.047

Note. *D* represents the dummy variables for condition. Subscript (3) represents the dummy coded comparison between participants randomized to the PRD condition versus the non-PRD stress condition; PRD = Perceived racial discrimination; Ang Score = Post-task Anger Score; Willingness = Willingness to use substances; Stress condition = non-PRD stress condition; **p* < .05.

In summary, condition (PRD vs control) was related to post-task PRD (*a*₁), PRD was related to anger (*d*₂₁), and anger was related to willingness to use (*b*₂). Condition (non-PRD stress vs control) was related to anger (*b*₁) and anger was related to willingness to use (*b*₂). However, condition was not related to PRD (*a*₁), thus the full serial model which included post-task PRD was not conducted with this comparison group.

PRD, Anger, and Willingness to use Mediating Condition and Follow-up Substance use

To test the theory that condition may impact PRD which may impact greater distress and greater willingness to use, which then impacts substance use frequency (Figure 2), we examined the total, direct, and indirect effects of condition on substance use frequency via post-task PRD, post-task anger, and post- task willingness to use. The total effects models for the relations between the experimental conditions and follow-up substance use did not account for significant variance in follow-up substance use frequency ($R^2 = .007$, $df = 2, 149$, $F = 0.50$, $p = .607$). The direct effect of condition on follow-up substance use frequency was not significant (Table 13).

Table 13. Regression Results for Mediation Model Examining Effect of Condition via Post-task PRD, Post-task Anger, and Post-task Willingness to Use on Follow-up Substance Use

<i>D₁</i>						
Outcome variable	<i>b</i>	<i>t</i>	<i>p</i>	<i>Lower 95% CI</i>	<i>Upper 95% CI</i>	<i>se</i>
Follow-up substance use						
Condition → Post-task PRD (<i>a</i> ₁)	16.31	3.32	.001	6.600	26.030	4.92
Condition → Ang score (<i>a</i> ₂)	0.09	0.36	.723	-0.389	0.559	0.24
Condition → Willingness (<i>a</i> ₃)	1.98	1.22	.225	-1.231	5.197	1.63
Post-Task PRD → Ang score (<i>d</i> ₂₁)	0.02	4.31	.000	0.009	0.024	0.00
Post-Task PRD → Willingness (<i>d</i> ₃₁)	-0.05	-1.75	.082	-0.103	0.006	0.03
Ang score → Willingness (<i>d</i> ₃₂)	1.20	2.16	.033	0.100	2.302	0.56
Post-task PRD → FU Sub use (<i>b</i> ₁)	-0.00	-0.93	.356	-0.006	0.002	0.00
Ang score → FU Sub use (<i>b</i> ₂)	0.02	0.36	.722	-0.070	0.100	0.04
Willingness → FU Sub use (<i>b</i> ₃)	0.03	4.33	.000	0.015	0.040	0.01
Condition → FU Sub use (<i>c</i> ['])	0.09	0.73	.464	-0.154	0.336	0.12
Condition → FU Sub use (<i>c</i>)	0.11	0.86	.393	-0.141	0.358	0.13
<i>D₂</i>						
Outcome variable	<i>b</i>	<i>t</i>	<i>p</i>	<i>Lower 95% CI</i>	<i>Upper 95% CI</i>	<i>se</i>
Follow-up substance use						
Condition → Post-task PRD (<i>a</i> ₁)	1.21	0.25	.805	-8.457	10.883	4.89
Condition → Ang score (<i>a</i> ₂)	0.76	3.32	.001	0.309	1.219	0.23
Condition → Willingness (<i>a</i> ₃)	0.83	0.51	.611	-2.374	4.024	1.62
Post-Task PRD → Ang score (<i>d</i> ₂₁)	0.02	4.31	.000	0.009	0.024	0.00
Post-Task PRD → Willingness (<i>d</i> ₃₁)	-0.05	-1.75	.082	-0.103	0.006	0.03
Ang score → Willingness (<i>d</i> ₃₂)	1.20	2.16	.033	0.100	2.302	0.56
Outcome variable	<i>b</i>	<i>t</i>	<i>p</i>	<i>Lower 95% CI</i>	<i>Upper 95% CI</i>	<i>se</i>
Follow-up substance use						
Post-task PRD → FU Sub use (<i>b</i> ₁)	-0.00	-0.93	.356	-0.006	0.002	0.00

(Table 13 continued)

Outcome variable	<i>b</i>	<i>t</i>	<i>p</i>	Lower 95% CI	Upper 95% CI	<i>se</i>
Follow-up substance use						
Ang score → FU Sub use (b ₂)	0.02	0.36	.722	-0.070	0.100	0.04
Willingness → FU Sub use (b ₃)	0.03	4.33	.000	0.015	0.040	0.01
Condition → FU Sub use (c')	0.06	0.73	.464	-0.154	0.336	0.12
Condition → FU Sub use (c)	0.11	0.88	.379	-0.137	0.360	0.13
<i>D₃</i>						
Outcome variable	<i>b</i>	<i>t</i>	<i>p</i>	Lower 95% CI	Upper 95% CI	<i>se</i>
Follow-up substance use						
Condition → Post-task PRD (a ₁)	15.10	3.41	.002	5.530	24.674	4.84
Condition → Ang score (a ₂)	-0.68	-2.88	.005	-1.144	-0.214	0.24
Condition → Willingness (a ₃)	1.16	0.71	.481	-2.082	4.398	1.64
Post-Task PRD → Ang score (d ₂₁)	0.02	4.31	.000	0.009	0.024	0.00
Post-Task PRD → Willingness (d ₃₁)	-0.05	-1.75	.082	-0.103	0.006	0.03
Ang score → Willingness (d ₃₂)	1.20	2.16	.033	0.100	2.302	0.56
Outcome variable	<i>b</i>	<i>t</i>	<i>p</i>	Lower 95% CI	Upper 95% CI	<i>se</i>
Post-task PRD → FU Sub use (b ₁)	-0.00	-0.93	.356	-0.006	0.002	0.00
Ang score → FU Sub use (b ₂)	0.02	0.36	.722	-0.070	0.100	0.04
Willingness → FU Sub use (b ₃)	0.03	4.33	.000	0.015	0.040	0.01
Condition → FU Sub use (c')	0.04	0.29	.773	-0.210	0.282	0.12
Condition → FU Sub use (c)	-0.00	-0.02	.983	-0.249	0.243	0.12

Note. *D* represents the dummy variables for condition. Subscripts represent the dummy coded comparisons between participants randomized to the PRD condition compared to the control condition (1) and the non-PRD stress condition compared to the control condition (2). Further, subscript (3) represents the dummy coded comparison between participants randomized to the PRD condition versus the non- PRD stress condition; PRD = Perceived Racial Discrimination; Ang Score = Post-task Anger Score; Willingness = Post-task willingness to use substances; FU Sub use = follow-up substance use; a₁ = association of X with M₁; a₂ = association of X with M₂; a₃ = association of X with M₃; d₂₁ = association of M₁ with M₂; d₃₁ = association of M₁ with M₃; d₃₂ = association of M₂ with M₃; b₁ = association of M₁ with Y; b₂ = association of M₂ with Y; b₃ = association of M₃ with Y; c' = direct effect of X on Y, controlling for M₁, M₂, and M₃; c = total effect of X on Y; **p* < .05.

The indirect effects were estimated; the PRD condition (compared to the control and non-PRD stress conditions) was indirectly related to greater follow-up substance use through the serial effect of post-task PRD, post-task anger, and post-task willingness (Table 14). The non-PRD condition was not indirectly related to greater follow-up substance use through the serial effect of post-task PRD, post-task anger, and post-task willingness (Table 14). The indirect effect of condition (the non-PRD condition compared to the control condition) on follow-up substance use frequency via both post-task anger and post-task willingness was also significant (Table 14). The indirect effects of condition (both experimental conditions compared to the control group and the PRD condition compared to the non-PRD condition) on follow-up substance use via both post-task PRD and post-task willingness was not significant (Table 14). A comparison of the unstandardized regression coefficients reveals that the effect of the non-PRD stress condition (compared to the PRD condition) on follow-up substance use frequency via post-task anger and post-task willingness to use was stronger than the effect of the PRD condition (compared to the non-PRD stress condition) on substance use frequency via all three mediators (Table 15).

Table 14. Bootstrap Estimates for the Standard Errors and 95% Confidence Intervals (CI) for the Indirect Effects

<i>D_I</i>				
Outcome variable	<i>b</i>	<i>SE</i>	<i>Lower 95% CI</i>	<i>Upper 95% CI</i>
Follow-up substance use frequency				
Condition → PRD → FU Sub use	-0.03	0.04	-0.129	0.031
Condition → Ang score → FU Sub use	0.00	0.01	-0.014	0.024
Condition → Willingness → FU Sub use	0.05	0.05	-0.033	0.146
Condition → PRD → Ang score → FU Sub use	0.00	0.01	-0.018	0.032
Condition → PRD → Willingness → FU Sub use	-0.02	0.01	-0.052	0.001

(Table 14 continued)

Outcome variable	<i>b</i>	<i>SE</i>	<i>Lower 95% CI</i>	<i>Upper 95% CI</i>
Condition → Ang score → Willingness → FU Sub use	0.00	0.01	-0.009	0.022
Condition → PRD → Ang score → Willingness → FU Sub use	0.01	0.01	0.000	0.026
<i>D₂</i>				
Outcome variable	<i>b</i>	<i>SE</i>	<i>Lower 95% CI</i>	<i>Upper 95% CI</i>
Follow-up substance use frequency				
Condition → PRD → FU Sub use	-0.00	0.01	-0.028	0.020
Condition → Ang score → FU Sub use	0.01	0.03	-0.048	0.085
Condition → Willingness → FU Sub use	0.02	0.04	-0.062	0.116
Condition → PRD → Ang score → FU Sub use	0.00	0.00	-0.006	0.007
Condition → PRD → Willingness → FU Sub use	-0.00	0.01	-0.014	0.010
Condition → Ang score → Willingness → FU Sub use	0.02	0.02	0.001	0.064
Condition → PRD → Ang score → Willingness → FU Sub use	0.00	0.00	-0.004	0.007
<i>D₃</i>				
Outcome variable	<i>b</i>	<i>SE</i>	<i>Lower 95% CI</i>	<i>Upper 95% CI</i>
Follow-up substance use frequency				
Condition → PRD → FU Sub use	-0.03	0.04	-0.122	0.028
Condition → Ang score → FU Sub use	-0.01	0.03	-0.075	0.044
Condition → Willingness → FU Sub use	0.03	0.05	-0.070	0.126
Condition → PRD → Ang score → FU Sub use	0.00	0.01	-0.017	0.031
Condition → PRD → Willingness → FU Sub use	-0.02	0.01	-0.047	0.002
Condition → Ang score → Willingness → FU Sub use	-0.02	0.02	-0.056	-0.000
Condition → PRD → Ang score → Willingness → FU Sub use	0.01	0.01	0.000	0.023

Note. *D* represents the dummy variables for condition. Subscripts represent the dummy coded comparisons between participants randomized to the PRD condition compared to the control condition (1) and the non-PRD stress condition compared to the control condition (2). Further, subscript (3) represents the dummy coded comparison between participants randomized to the PRD condition versus the non-PRD stress condition; PRD = Post-task Perceived Racial Discrimination; FU Sub use = follow-up substance use; Ang Score = Post-task Anger Score; Willingness = Post-task willingness to use substances; **p* < .05.

Table 15. Mediation Effects of Post-Task PRD, Post-task Anger, and Willingness to Use Substances on Condition and Follow-up Substance Use

Outcome variable	<i>b</i>	<i>SE</i>	<i>Lower</i> 95% <i>CI</i>	<i>Upper</i> 95% <i>CI</i>
Follow-up substance use				
<i>D</i> ₃ : PRD Condition → PRD → Ang score → Willingness → FU Sub use	0.01	0.01	0.000	0.023
<i>D</i> ₃ : Stress Condition → Ang score → Willingness → FU Sub use	-0.02	0.02	-0.056	-0.000
	Contrast effect	<i>SE</i>	<i>Lower</i> 95% <i>CI</i>	<i>Upper</i> 95% <i>CI</i>
<i>D</i> ₃ : PRD vs Stress condition	-0.05	0.03	-0.135	-0.001

Note. *D* represents the dummy variables for condition. Subscript (3) represents the dummy coded comparison between participants randomized to the PRD condition versus the non-PRD stress condition; PRD = Perceived racial discrimination; Ang Score = Post-task Anger Score; Willingness = Willingness to use substances; Stress condition = non-PRD stress condition; FU Sub use = follow-up substance use; **p* < .05.

In summary, condition (PRD vs control) was related to post-task PRD (a1), post-task PRD was related anger (d21), anger was related to willingness to use (d23), and willingness to use was related to follow-up substance use (b3). Condition (non-PRD stress vs control) was related to anger (a2), anger was related to willingness to use (b2), and willingness to use was related to follow-up substance use (b3); however, condition was not related to PRD (a1), thus the full serial model including post-task PRD was not conducted in this comparison group.

Age and Lifetime PRD Moderating Condition-Post-task Outcomes

Contrary to prediction, neither age nor lifetime PRD moderated the condition-substance use outcomes relations (Tables 16 and 17).

Table 16. Interactions of Age with Condition to Predict Post-Task Substance Use Outcomes

<i>D₁</i>							
Dependent variable	ΔR^2	ΔF	f^2	β	t	p	sr^2
Post task substance use craving							
<u>Step 1: Main Effects</u>	.002	1.30	0.01			.275	
Age				-0.13	-1.62	.166	0.02
Condition				0.01	0.09	.925	0.00
<u>Step 2: Interaction Effect</u>	.003	0.39	0.02			.536	
Age X Condition				0.12	0.62	.536	0.00
Post task substance use willingness							
<u>Step 1: Main Effects</u>	.008	0.64	0.01			.531	
Age				0.03	0.36	.722	0.00
Condition				0.09	1.04	.299	0.01
<u>Step 2: Interaction Effect</u>	.003	0.51	0.01			.474	
Age X Condition				-0.14	-0.72	.474	0.00
Post task substance use intention							
<u>Step 1: Main Effects</u>	.004	0.29	0.00			.752	
Age				-0.01	-0.15	.879	0.00
Condition				0.06	0.75	.455	0.00
<u>Step 2: Interaction Effect</u>	.007	1.04	0.01			.310	
Age X Condition				0.20	1.02	.310	0.00
Follow up substance use							
<u>Step 1: Main Effects</u>	.001	0.20	0.01			.668	
Age				0.02	0.21	.834	0.00
Condition				0.07	0.86	.393	0.00
<u>Step 2: Interaction Effect</u>	.018	2.66	0.02			.105	
Age X Condition				0.32	1.63	.105	0.02
<i>D₂</i>							
Dependent variable	ΔR^2	ΔF	f^2	β	t	p	sr^2
Post task substance use craving							
<u>Step 1: Main Effects</u>	.020	1.30	0.01			.542	
Age				-0.20	-0.74	.459	0.00
Condition				0.07	0.15	.878	0.00
<u>Step 2: Interaction Effect</u>	.009	0.12	0.00			.771	
Age X Condition				-0.09	-0.29	.771	0.00

(Table 16 continued)

Dependent variable	ΔR^2	ΔF	f^2	β	t	p	sr^2
Post task substance use willingness							
<u>Step 1: Main Effects</u>	.008	0.64	0.01			.617	
Age				1.26	1.41	.161	0.01
Condition				1.10	0.67	.507	0.00
<u>Step 2: Interaction Effect</u>	.014	0.30	0.01			.297	
Age X Condition				-1.13	-1.05	.297	0.01
Post task substance use intention							
<u>Step 1: Main Effects</u>	.004	0.29	0.00			.469	
Age				0.08	0.60	.548	0.00
Condition				0.14	0.56	.573	0.00
<u>Step 2: Interaction Effect</u>	.026	1.04	0.02			.720	
Age X Condition				0.06	0.36	.720	0.00
Follow up substance use							
<u>Step 1: Main Effects</u>	.001	0.20	0.01			.495	
Age				-0.03	-0.48	.632	0.00
Condition				0.13	1.00	.321	0.01
<u>Step 2: Interaction Effect</u>	.022	0.80	0.02			.180	
Age X Condition				0.11	1.35	.180	0.02
<i>D₃</i>							
Dependent variable	ΔR^2	ΔF	f^2	β	t	p	sr^2
Post task substance use craving							
<u>Step 1: Main Effects</u>	.027	1.30	0.01			.542	
Age				-0.29	-1.64	.104	0.02
Condition				-0.17	-0.36	.721	0.00
<u>Step 2: Interaction Effect</u>	.009	0.12	0.00			.258	
Age X Condition				0.22	1.14	.258	0.00
Post task substance use willingness							
<u>Step 1: Main Effects</u>	.008	0.64	0.01			.617	
Age				0.13	0.22	.822	0.00
Condition				-0.06	-0.04	.971	0.00
<u>Step 2: Interaction Effect</u>	.014	0.30	0.01			.756	
Age X Condition				-0.21	-0.31	.756	0.00
Post task substance use intention							
<u>Step 1: Main Effects</u>	.004	0.29	0.00			.469	
Age				0.14	1.55	.124	0.01

(Table 16 continued)

Dependent variable	ΔR^2	ΔF	f^2	β	t	p	sr^2
Post task substance use intention							
Condition				-0.14	-0.58	.561	0.00
<u>Step 2: Interaction Effect</u>	.026	1.04	0.02			.064	
Age X Condition				-0.20	-1.87	.064	0.02
Follow up substance use							
<u>Step 1: Main Effects</u>	.001	0.20	0.01			.495	
Age				0.08	1.71	.090	0.02
Condition				0.00	0.01	.992	0.00
<u>Step 2: Interaction Effect</u>	.023	0.80	0.02			.081	
Age X Condition				-0.09	-1.76	.081	0.02

Note. D represents the dummy variables for condition. Subscripts represent the dummy coded comparisons between participants randomized to the PRD condition compared to the control condition (1) and the non-PRD stress condition compared to the control condition (2). Further, subscript (3) represents the dummy coded comparison between participants randomized to the PRD condition versus the non-PRD stress condition; SRE = Schedule of Racist Events; $*p < .05$.

Table 17. Interactions of Lifetime Perceived Discrimination with Condition to Predict Post-Task Substance Use Outcomes

D_I							
Dependent variable	ΔR^2	ΔF	f^2	β	t	p	sr^2
Post task substance use craving							
<u>Step 1: Main Effects</u>	.005	0.40	0.00			.831	
SRE score				0.05	0.64	.526	0.00
Condition				0.00	0.01	.991	0.00
<u>Step 2: Interaction Effect</u>	.000	0.02	0.01			.789	
SRE X Condition				0.02	0.13	.789	0.01
Post task substance use willingness							
<u>Step 1: Main Effects</u>	.021	1.59	0.02			.207	
SRE score				0.12	1.42	.157	0.01
Condition				0.09	1.15	.254	0.01
<u>Step 2: Interaction Effect</u>	.001	0.13	0.02			.725	
SRE X Condition				0.05	0.35	.725	0.00
Post task substance use intention	ΔR^2	ΔF	f^2	β	t	p	sr^2
<u>Step 1: Main Effects</u>	.011	0.84	0.01			.433	
SRE score				0.09	1.06	.289	0.01

(Table 17 continued)

Dependent variable	ΔR^2	ΔF	f^2	β	t	p	sr^2
Post task substance use intention							
Condition				0.07	0.80	.428	0.00
<u>Step 2: Interaction Effect</u>	.005	0.74	0.02			.393	
SRE X Condition				-0.13	-0.86	.393	0.01
Follow up substance use							
<u>Step 1: Main Effects</u>	.021	1.60	0.02			.206	
SRE score				0.13	1.56	.122	0.02
Condition				0.08	0.96	.340	0.01
<u>Step 2: Interaction Effect</u>	.023	0.24	0.03			.625	
SRE X Condition				-0.07	-0.49	.625	0.00
<i>D₂</i>							
Dependent variable	ΔR^2	ΔF	f^2	β	t	p	sr^2
Post task substance use craving							
<u>Step 1: Main Effects</u>	.005	0.40	0.00			.857	
SRE score				-0.01	-0.36	.722	0.00
Condition				-0.02	-0.04	.967	0.00
<u>Step 2: Interaction Effect</u>	.001	0.24	0.01			.728	
SRE X Condition				0.01	0.35	.728	0.00
Post task substance use willingness							
<u>Step 1: Main Effects</u>	.021	1.59	0.02			.321	
SRE score				-0.03	-0.33	.742	0.00
Condition				1.56	0.98	.327	0.01
<u>Step 2: Interaction Effect</u>	.016	0.03	0.01			.136	
SRE X Condition				0.16	1.50	.136	0.01
Post task substance use intention	ΔR^2	ΔF	f^2	β	t	p	sr^2
<u>Step 1: Main Effects</u>	.011	0.84	0.01			.582	
SRE score				0.01	0.56	.579	0.00
Condition				0.18	0.75	.456	0.00
<u>Step 2: Interaction Effect</u>	.013	0.24	0.01			.535	
SRE X Condition				-0.01	-0.62	.535	0.01
Follow up substance use							
<u>Step 1: Main Effects</u>	.021	1.60	0.02			.601	
SRE score				0.01	1.00	.320	0.01
Condition				0.12	0.95	.343	0.01
<u>Step 2: Interaction Effect</u>	.002	0.59	0.01			.647	
(Table 17 continued)							

<i>D₃</i>							
Dependent variable	ΔR^2	ΔF	f^2	β	t	p	sr^2
Post task substance use craving							
SRE X Condition				-0.00	-0.46	.647	0.00
<u>Step 1: Main Effects</u>	.005	0.40	0.00			.857	
SRE score				0.02	0.10	.917	0.00
Condition				-0.21	-0.46	.646	0.00
<u>Step 2: Interaction Effect</u>	.001	0.24	0.01			.405	
SRE X Condition				0.02	0.83	.405	0.00
Post task substance use willingness							
<u>Step 1: Main Effects</u>	.021	1.60	0.02			.321	
SRE score				0.04	0.58	.562	0.00
Condition				-1.72	-1.09	.276	0.01
<u>Step 2: Interaction Effect</u>	.016	0.03	0.01			.288	
SRE X Condition				0.09	1.07	.288	0.01
Post task substance use intention							
<u>Step 1: Main Effects</u>	.011	0.84	0.01			.582	
SRE score				-0.00	-0.29	.769	0.00
Condition				-0.16	-0.68	.500	0.00
<u>Step 2: Interaction Effect</u>	.013	0.24	0.02			.161	
SRE X Condition				0.02	1.41	.161	0.01
Follow up substance use							
<u>Step 1: Main Effects</u>	.021	1.60	0.02			.601	
SRE score				0.00	0.58	.562	0.02
Condition				-0.01	-0.06	.952	0.00
<u>Step 2: Interaction Effect</u>	.002	0.59	0.00			.657	
SRE X Condition				0.00	0.45	.657	0.00

Note. *D* represents the dummy variables for condition. Subscripts represent the dummy coded comparisons between participants randomized to the PRD condition compared to the control condition (1) and the non-PRD stress condition compared to the control condition (2). Further, subscript (3) represents the dummy coded comparison between participants randomized to the PRD condition versus the non- PRD stress condition; SRE = Schedule of Racist Events; * $p < .05$.

Post-task PRD Moderating Condition-Post-task Outcomes

Contrary to prediction, post-task PRD did not moderate the condition-substance use outcomes relations (Table 18).

Table 18. Interactions of Post-task PRD with Condition to Predict Post-Task Substance Use Outcomes

<i>D₁</i>							
Dependent variable	ΔR^2	ΔF	f^2	β	t	p	sr^2
Post task substance use craving							
<u>Step 1: Main Effects</u>	.000	0.01	0.00			.990	
Post-task PRD				-0.01	-0.14	.887	0.00
Condition				-0.00	-0.02	.985	0.00
<u>Step 2: Interaction Effect</u>	.010	1.56	0.01			.214	
Post-task PRD X Condition				0.19	1.25	.214	0.01
Post task substance use willingness							
<u>Step 1: Main Effects</u>	.013	0.96	0.01			.387	
Post-task PRD				-0.07	-0.87	.384	0.01
Condition				0.09	1.08	.280	0.01
<u>Step 2: Interaction Effect</u>	.000	0.00	0.01			.979	
Post-task PRD X Condition				0.00	0.03	.979	0.00
Post task substance use intention							
	ΔR^2	ΔF	f^2	β	t	p	sr^2
<u>Step 1: Main Effects</u>	.004	0.32	0.00			.726	
Post-task PRD				-0.03	-0.30	.762	0.00
Condition				0.06	0.75	.457	0.00
<u>Step 2: Interaction Effect</u>	.001	0.17	0.00			.685	
Post-task PRD X Condition				-0.06	-0.41	.685	0.00
Follow up substance use							
<u>Step 1: Main Effects</u>	.012	0.88	0.01			.418	
Post-task PRD				-0.08	-0.99	.322	0.01
Condition				0.07	0.89	.374	0.01
<u>Step 2: Interaction Effect</u>	.007	0.99	0.02			.321	
Post-task PRD X Condition				-0.15	-0.10	.321	0.01
<i>D₂</i>							
Dependent variable	ΔR^2	ΔF	f^2	β	t	p	sr^2
Post task substance use craving							
<u>Step 1: Main Effects</u>	.000	0.01	0.00			.990	
Post-task PRD				-0.02	-1.29	.198	0.01
Condition				0.15	0.31	.755	0.00
<u>Step 2: Interaction Effect</u>	.010	1.56	0.01			.217	
Post-task PRD X Condition				0.03	1.24	.217	0.01

(Table 18 continued)

Dependent variable	ΔR^2	ΔF	f^2	β	t	p	sr^2
Post task substance use willingness							
<u>Step 1: Main Effects</u>	.023	0.96	0.01			.627	
Post-task PRD				-0.06	-1.03	.306	0.01
Condition				1.80	1.09	.276	0.01
<u>Step 2: Interaction Effect</u>	.000	0.00	0.01			.963	
Post-task PRD X Condition				0.00	0.05	.963	0.00
Post task substance use intention							
	ΔR^2	ΔF	f^2	β	t	p	sr^2
<u>Step 1: Main Effects</u>	.013	0.96	0.01			.526	
Post-task PRD				-0.01	-0.78	.437	0.01
Condition				0.16	0.65	.517	0.00
<u>Step 2: Interaction Effect</u>	.001	0.17	0.00			.687	
Post-task PRD X Condition				-0.01	-0.40	.687	0.00
Follow up substance use							
<u>Step 1: Main Effects</u>	.023	0.88	0.01			.645	
Post-task PRD				-0.00	-1.19	.236	0.01
Condition				0.05	0.39	.699	0.00
<u>Step 2: Interaction Effect</u>	.007	0.99	0.02			.619	
Post-task PRD X Condition				0.00	0.51	.619	0.00
D_3							
Dependent variable	ΔR^2	ΔF	f^2	β	t	p	sr^2
Post task substance use craving							
<u>Step 1: Main Effects</u>	.016	0.47	0.00			.786	
Post-task PRD				0.01	0.46	.649	0.00
Condition				-0.30	-0.62	.538	0.00
<u>Step 2: Interaction Effect</u>	.015	1.08	0.01			.910	
Post-task PRD X Condition				-0.00	-0.11	.910	0.00
Post task substance use willingness							
<u>Step 1: Main Effects</u>	.023	0.96	0.01			.627	
Post-task PRD				-0.06	-0.97	.335	0.01
Condition				0.24	0.15	.882	0.00
<u>Step 2: Interaction Effect</u>	.010	0.26	0.01			.475	
Post-task PRD X Condition				0.05	0.72	.475	0.00
(Table 18 continued)							

Dependent variable	ΔR^2	ΔF	f^2	β	t	p	sr^2
Post task substance use intentions							
<u>Step 1: Main Effects</u>	.013	0.96	0.01			.526	
Post-task PRD				-0.01	-1.36	.177	0.01
Condition				-0.16	-0.65	.514	0.00
<u>Step 2: Interaction Effect</u>	.023	0.90	0.01			.092	
Post-task PRD X Condition				0.02	1.70	.092	0.01
Follow up substance use							
<u>Step 1: Main Effects</u>	.023	0.88	0.01			.645	
Post-task PRD				0.00	0.20	.845	0.00
Condition				0.13	0.99	.326	0.01
<u>Step 2: Interaction Effect</u>	.007	0.00	0.00			.507	
Post-task PRD X Condition				-0.00	-0.66	.507	0.00

Note. *D* represents the dummy variables for condition. Subscripts represent the dummy coded comparisons between participants randomized to the PRD condition compared to the control condition (1) and the non-PRD stress condition compared to the control condition (2). Further, subscript (3) represents the dummy coded comparison between participants randomized to the PRD condition versus the non- PRD stress condition. PRD = Perceived Racial Discrimination; * $p < .05$.

DISCUSSION

The current study is the first to examine the impact of an experimental paradigm designed to induce perceived discrimination on substance use willingness, intentions, and behavioral outcomes among Black adults. Importantly, compared to the control, the PRD condition was indirectly associated with greater follow-up substance use frequency via the serial effects of post-task PRD, post-task anger, and post-task willingness to use; condition was related to post-task PRD, post-task PRD was related anger, anger was related to willingness to use, and willingness to us was related to follow-up substance use.

Contrary to prediction, the indirect effect of the non-PRD stress group on follow-up substance use via post-task anger and post-task willingness was stronger than the effect of the PRD group on follow-up substance use via all three mediators. Further, neither of the experimental conditions were found to be directly related to substance use frequency and we did not observe significant correlations between lifetime PRD and substance use frequency, sleep problems, willingness to use, intentions to use, or substance use cravings. Importantly, these findings were observed even after condition was shown to be significantly related to post-task PRD such that individuals in the PRD condition reported greater levels of PRD than those in the non-PRD stress condition and control condition. This suggests that after experiencing elevated PRD and elevated anger, there was a subsequent change in willingness to use substances, which then impacts substance use frequency among Black adults. These findings are in line with prior work suggesting that individual differences in negative affectivity does not fully explain the relation between experiencing racism and psychopathology and that distress is related with only some experiences of discrimination (e.g., being perceived as part of undesirable culture; Williams, Kanter, & Ching, 2018).

Further it is notable that compared to the control and PRD groups, anger mediated the relation between the non-PRD stress condition and willingness to use substances when PRD was not accounted for in the model. Given that when examined separately, the non-PRD stress condition reported a significant difference in PRD and post-task PRD was related to post-task anger in the non-PRD stress condition, it is possible that this difference in PRD may have influenced the results of the current study. Although the task script for the non-PRD condition represented a general work-related stressful situation, it is plausible that some participants may have evaluated the script as an example of the myth of meritocracy, a type of microaggression (i.e., brief daily verbal, behavioral, or environmental indignities, either intentional or unintentional, that communicate prejudicial slights or insults towards a marginalized group) in which it is implied that people of color are lazy and/or incompetent and need to work harder (Sue et al., 2007) given that the script described an individual who needed to complete the work of two individuals while also managing computer related difficulties in order to avoid negative evaluation from their boss. These findings are in line with previous studies suggesting that experiencing microaggressions is associated with greater levels of negative affect above and beyond overt discrimination among Black young adult women (e.g., Donovan, Galban, Grace, Bennett, & Felicié, 2013) and a theory suggesting that discrimination experiences that are uncontrollable and ambiguous may contribute to greater levels of stress than overt discriminatory experiences (Williams & Mohammed, 2009).

The current findings extend the extant literature in several key ways. First, the findings from the current study expand prior work by examining the interplay between key variables (state anger, state PRD, and willingness to use) that help to further identify the order of mechanisms of the positive relation between lifetime PRD and substance use and related problems identified in previous cross-sectional studies. Although it has been posited that Black

adults self-medicate with substances to reduce distress following PRD (e.g., Clark, 2014; Gibbons et al., 2004), the current study extends the literature by determining that state PRD and state anger serially effect the relation between an instance of discrimination and willingness to use substances. Notably, the current study is the first experimental study to observe that state PRD, state anger, and willingness to use substances serially effect the relation between an instance of discrimination and follow-up substance use frequency. Given that the PRD condition did not report significantly greater levels of distress following the experimental task, the findings of the current study provide weak evidence for the Self-Medication Hypothesis and suggest that there are key mechanisms underlying the relations between experiencing PRD, distress, and substance use. As such, in future research it is important to consider how culturally informed models (e.g., Minority Stress Model, Integrative Model for Racial Discrimination; Coll et al., 1996; Meyer, 2003) examine the relationship between discrimination and distress to better understand the complex associations between these two constructs and how they impact substance use frequency and related variables.

Additionally, neither of the experimental conditions were found to be directly related to substance use frequency, the PRD condition was not related to a significant increase in distress, and we did not observe significant correlations between lifetime PRD and substance use frequency, sleep problems, willingness to use, intentions to use, or substance use cravings. These findings are somewhat inconsistent with the results found in the Gibbons et al. (2010) manuscript. The current study differs from the Gibbons et al. (2010) in a variety of ways including the sampling strategy that may have impacted the composition of the final sample—for example, Gibbons et al. (2010) included only participants from the Iowa area whose parents also were able to provide data, thus limiting their sample to those who were motivated to participate and were also able to gather their parent’s information. Additionally, the final sample of the

current study is composed of young adults and the current sample also contains some who identify as non-traditional aged college students (i.e., older than 25; Spitzer, 2000), whereas Gibbons et al. (2010) was comprised of older adolescents and some young adults. These differences in sample characteristics may have had a significant impact on the outcome of these two studies. Finally, Gibbons et al. (2010) utilized a data analytic strategy that collapsed the stress and control groups to be used as a single comparison group contrasted with the PRD condition. Such a strategy is at risk of violating important assumptions (e.g., homoscedasticity; Hayes, 2017) and may have had an impact on the overall findings in Gibbons et al. (2010).

The non-significant findings of the current study may have been impacted by a variety of factors. Firstly, participants in the current study may have varied on pre-task levels of internalized racism, a construct defined as the extent to which a person of color accepts and perpetuates the impact of racial oppression (e.g., including acceptance of discriminatory action; Harper, 2007; Pyke & Dang, 2003; Speight, 2007). Given that in the current study participants' perception of racial discrimination in the PRD condition varied widely from zero to 100, it is plausible that individuals who report high levels of internalized racism may have a desensitized reaction to perceiving discrimination, and thus experience little emotional impact after experiencing a discriminatory situation. Further, the degree of racial socialization (i.e., messages parents communicate to their children about how to cope with racial discrimination; Stevenson, Reed, Bodison, & Bishop, 1997) may have also impacted findings given that racial socialization messages regarding how to prepare for discrimination have been negatively associated with negative affect among Black young adults (Bynum, Burton, & Best, 2007). Examining the impact of both variables on perceptions of discrimination and subsequent substance use is an important next step in this line of research.

Second, the current sample may have differed in the types of coping resources participants were equipped with prior to completing the study as compared to the participants in the Gibbons et al. (2010) study. Participants in the Gibbons et al. (2010) study included individuals from the Midwest, whereas the current study included individuals who lived in the Southern U.S. Given that regions across the U.S. vary in the history of discrimination and racial composition (Perez & Hirschman, 2009), it is possible that participants living in the South may have engaged in more preparatory conversations at earlier ages about overt discrimination. Further, regional differences in reports of racial socialization regarding how to cope with discrimination have been identified within the U.S. (Thornton, 1997; Thornton, Chatters, Taylor, & Allen, 1990) and these regional differences in racial socialization may have had a substantial impact on the observed findings.

Additionally, the current sample was predominantly female (% female = 84.2%) compared to the Gibbons et al. (2010) study (% female = 64.7%). A recent meta-analysis indicates that samples containing more male participants demonstrated larger effect sizes in the positive relation between instances of everyday discrimination and adjustment-related outcomes (e.g., depression, anxiety, physical health) than samples containing more female participants (Lui & Quezada, 2018). Further, gender also differentially impacts substance use given that Black young adult men reported higher rates of substance use as compared to Black young adult women (McCabe et al., 2007). Due to the observed impact of gender on both the relation between experiences of discrimination and mental health as well as substance use, it is plausible that the overrepresentation of women in the current sample may have a substantial impact on the observed results. Research efforts targeted towards examining the interplay of gender and the variables in the current study is needed to further understand the relations among discrimination, distress, and substance use and to further contextualize the current findings.

Third, the recent cultural climate of the area where this study took place is an important factor to consider as well—given the historic change in national attention on police shootings of unarmed Black adults throughout the U.S. during the mid-2010s, including the high profile case of a police shooting of an unarmed Black man that occurred in Baton Rouge two years prior to the data collection of the current study, it is possible that these events may have had a desensitization effect on the perception of discrimination during the experimental task. Given that the original Gibbons et al. (2010) study utilized this task prior to this change in national attention, this is the first study that has utilized this task in the aftermath of this culture shift. It is plausible that individuals in the Baton Rouge community may have developed additional coping resources to manage affect associated with discrimination given the vicarious exposure to racially charged violence in their own community and across the U.S. and given that the task script represented a situation that produced lower than expected levels of PRD among the current sample. Indeed, only 33.3% of the participants in the PRD condition reported moderate levels of PRD (i.e., 50 on a scale of 100) or above following the task.

Fourth, the results of the current study may represent an example of a common avoidant coping strategy among Black individuals when faced with racial discrimination. A daily diary study examined common types of coping strategies used by Black young adults and revealed that participants were more likely to engage in more avoidant coping strategies (e.g., pretending the event did not occur) when faced with racial discrimination versus a general stress event (Hoggard, Byrd, & Sellers, 2012). Further, there is a positive association between cognitive avoidance coping strategies in response to racial discrimination and avoidance symptoms (e.g., emotional numbing, behavioral inhibition) among Black individuals (Sanders Thompson, 2006). This is of concern given that avoidant strategies to cope with discrimination have been associated with poorer overall wellbeing among Black young adults (Utsey, Ponterotto,

Reynolds, & Cancelli, 2000) and is theorized to significantly impact the relation between PRD and a heightened stress response (Pascoe & Smart Richman, 2009). The findings of the current study may provide preliminary evidence for the theorized impact of emotional numbing (Pascoe & Smart Richman, 2009) given that the findings suggest that although individuals in the PRD condition did not report greater levels of distress following the task, a significant indirect effect of the PRD condition on substance use frequency via post-task PRD, post-task anger, and post-task willingness was observed.

Findings also have important clinical implications. Given that the data suggest that substance using Black adults who experience increased PRD experience an increase in anger and an increase in substance use willingness, which impacts greater substance use frequency, clinicians may consider discussing experiences of PRD and anger to promote validation of this emotion with Black clients with SUDs before explicitly discussing more adaptive skills to manage their negative affect to reduce the potential for coping motivated use. Interventions that specifically target the experience of PRD and the negative health impacts of racism and discriminatory treatment are in their infancy, yet a protocol which has been utilized exclusively among Black veterans that integrates evidence based cognitive behavioral skills and emotion focused empowerment techniques has shown preliminary positive outcomes, including increased use of adaptive coping strategies and increased sense of self efficacy at coping with discrimination (Carlson, Endlsey, Motley, Shawahin, & Williams, 2018).

Further, the present study should be considered in light of limitations that suggest future directions for work in this area. First, although the PRD condition reported significantly greater levels of PRD following the experimental task than the other two conditions, it is possible that the experimental task utilized in previous studies (e.g., Gibbons et al., 2010) was not a strong

enough induction of PRD to result in state level changes in distress and thus no changes in sleep outcomes. Relatedly, lifetime PRD was not related with any of the post-task/follow-up outcomes, suggesting that there may be a smaller than expected effect of PRD on these outcomes among the current sample of Black adults. In light of this, future studies may benefit from the use of in person induction techniques or multimedia (e.g., videos) to help improve the performance of the experimental task. Second, similar to the majority of studies of this topic, data were collected via self-report and future studies may benefit from study designs that utilize a variety of data collection methods (e.g., psychophysiological data), particularly given that the experience of discrimination often results in physiological reactions (e.g., sleep problems, memory/concentration problems, elevated blood pressure; e.g., Ryan, Gee, & Laflamme, 2006) that are hypothesized to impact health disparities in this population.

Third, although the current study targeted the substance use behaviors and PRD of Black adults, the current sample did not include older adults and the average estimated family income was relatively high. Future work is necessary to determine whether findings generalize to a sample of Black older adults or Black adults currently living below the poverty line. Additionally, a major limitation of the study design was in not assessing the participant's pre-task levels of internalized racism, racial socialization for preparation for discrimination, or coping strategies when facing discrimination. It is plausible that individuals who report high levels of these constructs or more adaptive coping strategies may have a desensitized reaction to perceiving discrimination. Future studies examining the impact of induced perceived discrimination should consider examining these variables prior to the experimental task to determine whether they impact findings.

Fourth, it is possible that the increase in media attention surrounding police shootings of

unarmed Black men may have had a desensitization effect on the perception of discrimination during the experimental task. Future studies should consider assessing the impact of vicarious experiences of discrimination on the effect of the experimental task. Fifth, findings of the current study identified poor internal consistency among the MAST-AD items, which assesses substance use related problems, within the current sample. There may have been several reasons that contributed to the inconsistency of responses—participants in the current sample were considerably younger and had higher estimated family incomes than Black individuals in the original sample used to validate the MAST-AD. As such, it is possible that there are within group cultural differences influenced by socioeconomic status in the perception of substance use related problems among Black adults. Further it may be that the current sample was less consistent in their reports of substance use problems as many participants may not have first-hand experiences of significant substance use related problems at this stage of development.

This is the first known study to test the impact of an experimental manipulation of a PRD paradigm on behavioral substance use outcomes among Black adults. Results from the current study suggest that PRD has immediate impacts on behavioral substance use outcomes via state PRD, state anger, and willingness to use, which may significantly impact substance use behaviors over an individual's lifetime. The findings of the proposed study inform treatment recommendations for examining the impact of PRD on substance use frequency among substance using Black individuals and provide further information regarding the scope of the PRD-substance use relation among Black adults. Future research is needed to test whether an intervention aimed at mindfully identifying emotions generated from PRD and adaptive skill usage to help manage PRD-related anger (Carlson et al., 2018) would impact the relation of PRD and willingness to use and the PRD-substance use frequency relation over time. Such research could have important implications for intervention efforts for a population at risk for

experiencing institutional racism and discrimination.

APPENDIX A.

SCRIPTS USED DURING FIRST PILOT TEST

PRD condition:

Now we would like you to think about how you might react in a particular situation. Please first think about the situation, and then think about how you would react if it actually happened to you.

Sometimes people have difficulty on their jobs....

Sometimes African Americans in Baton Rouge (and elsewhere) experience discrimination because they are African American.

Suppose you have a job that you really like. Most of the people you work with are OK, but there are a couple of co-workers that have treated you poorly—ignored you sometimes, said some nasty things to you—because you’re African American.

In addition, you have a boss that you know doesn’t like you because of your race. He hasn’t given you full credit for many of the things you have done well, he makes you do things over when you shouldn’t have to, and one time he called you a name in front of other people.

Non-PRD stress condition:

Now we would like you to think about how you might react in a particular situation. Please first think about the situation, and then think about how you would react if it actually happened to you.

Sometimes people have difficulty on their jobs....

Suppose you have a job that you really like. Most of the people you work with are OK, but there are a couple of co-workers that have treated you poorly—ignored you sometimes, said some nasty things to you—because over the past couple of weeks, some things have gone wrong. A co-worker has been out sick and you have been doing his work as well as your own.

In addition, you have a boss that you know doesn’t like you. He hasn’t given you full credit for many of the things you have done well, he makes you do things over when you shouldn’t have to, and one time he called you a name in front of other people.

Control condition:

Now we would like you to think about how you might react in a particular situation. Please first think about the situation, and then think about how you would react if it actually happened to you.

Sometimes people have difficulty on their jobs....

Suppose you have a job that you really like. Most of the people you work with are OK, and you enjoy the work you do on a daily basis.

In addition, your boss seems to like you. He gives you full credit for many of the things you have done well, and one time even praised your work in front of your coworkers.

APPENDIX B.

SCRIPTS USED DURING FINAL STUDY

PRD condition:

Now we would like you to think about how you might react in a particular situation. Please first think about the situation, and then think about how you would react if it actually happened to you.

Sometimes people have difficulty on their jobs. Sometimes African Americans in Baton Rouge (and elsewhere) experience discrimination because they are African American.

Suppose you have a job that you really like. Most of the people you work with are OK, but there are a couple of co-workers that have treated you poorly—ignored you sometimes, said some nasty things to you—because you're African American.

In addition, you have a boss that you know doesn't like you because of your race. He hasn't given you full credit for many of the things you have done well, he makes you do things over when you shouldn't have to, and one time he called you a name in front of other people.

Non-PRD stress condition:

Now we would like you to think about how you might react in a particular situation. Please first think about the situation, and then think about how you would react if it actually happened to you.

Sometimes people have difficulty on their jobs....

Suppose you have a job that you really like. However, over the past couple of weeks, some things have gone wrong. A co-worker has been out sick and you have been doing his work as well as your own.

Also, some equipment has broken down and you've had to do extra work to make up for it. Now you're concerned that the current work order you have won't get done on time and could mean a bad evaluation from your boss.

Non-stress condition:

Now we would like you to think about how you might react in a particular situation. Please first think about the situation, and then think about how you would react if it actually happened to you.

Sometimes people have difficulty on their jobs....

Suppose you have a job that you really like. You're a delivery person for a large company. An order comes in and you have to deliver it.

You head out to the car and start to drive and then realize that you're not sure where the address is. Fortunately, you have plenty of time to get there.

APPENDIX C. IRB APPROVAL FORM

ACTION ON PROTOCOL APPROV



Institutional Review Board
Dr. Dennis Landin, Chair
130 David Boyd Hall
Baton Rouge, LA 70803
P: 225.578.8692
F: 225.578.5983
irb@lsu.edu
lsu.edu/research

TO: Julia Buckner
Psychology

FROM: Dennis Landin
Chair, Institutional Review Board

DATE: December 20, 2017

RE: IRB# 3989

TITLE: The Impact of Stress on Alcohol/Drug Use within the Black Community

New Protocol/Modification/Continuation: New Protocol

Review type: Full ☐ Expedited ☒ **Review date:** 12/19/2017

Risk Factor: Minimal ☒ Uncertain ☐ Greater Than Minimal ☐

Approved ☒ **Disapproved** ☐

Approval Date: 12/20/2017 **Approval Expiration Date:** 12/19/2018

Re-review frequency: (annual unless otherwise stated)

Number of subjects approved: 109

Protocol Matches Scope of Work in Grant proposal: (if applicable)

By: Dennis Landin, Chairman 

PRINCIPAL INVESTIGATOR: PLEASE READ THE FOLLOWING –
Continuing approval is CONDITIONAL on:

1. Adherence to the approved protocol, familiarity with, and adherence to the ethical standards of the Belmont Report, and LSU's Assurance of Compliance with DHHS regulations for the protection of human subjects*
2. Prior approval of a change in protocol, including revision of the consent documents or an increase in the number of subjects over that approved.
3. Obtaining renewed approval (or submittal of a termination report), prior to the approval expiration date, upon request by the IRB office (irrespective of when the project actually begins); notification of project termination.
4. Retention of documentation of informed consent and study records for at least 3 years after the study ends.
5. Continuing attention to the physical and psychological well-being and informed consent of the individual participants, including notification of new information that might affect consent.
6. A prompt report to the IRB of any adverse event affecting a participant potentially arising from the study.
7. Notification of the IRB of a serious compliance failure.
8. **SPECIAL NOTE: When emailing more than one recipient, make sure you use bcc.**

**All investigators and support staff have access to copies of the Belmont Report, LSU's Assurance with DHHS, DHHS (45 CFR 46) and FDA regulations governing use of human subjects, and other relevant documents in print in this office or on our World Wide Web site at <http://www.lsu.edu/irb>*

REFERENCES

- Bastien, C. H., Vallières, A., & Morin, C. M. (2001). Validation of the Insomnia Severity Index as an outcome measure for insomnia research. *Sleep medicine*, 2(4), 297-307.
- Benkert, R., Peters, R. M., Clark, R., & Keves-Foster, K. (2006). Effects of perceived racism, cultural mistrust and trust in providers on satisfaction with care. *Journal of the National Medical Association*, 98, 1532-1540.
- Boynton, M. H., O'Hara, R. E., Covault, J., Scott, D., & Tennen, H. (2014). A mediational model of racial discrimination and alcohol-related problems among African American college students. *Journal of Studies on Alcohol and Drugs*, 75(2), 228-234.
- Branscombe, N. R., Schmitt, M. T., & Harvey, R. D. (1999). Perceiving pervasive discrimination among African Americans: Implications for group identification and well-being. *Journal of personality and social psychology*, 77(1), 135.
- Brody, G. H., Kogan, S. M., & Chen, Y.-F. (2012). Perceived discrimination and longitudinal increases in adolescent substance use: Gender differences and mediational pathways. *American Journal Of Public Health*, 102(5), 1006-1011. doi: 10.2105/AJPH.2011.300588
- Brown, S. C., Geiselman, P. J., Copeland, A. L., Gordon, C., & Richard-Eaglin, A. (2008). Reliability and validity of the Personal Wellness Profile (PWP) Questionnaire in African American college women. *Journal of Cultural Diversity*, 15(4), 163-167.
- Buckner, J. D., Ecker, A. H., & Dean, K. E. (2016). Solitary cannabis use frequency mediates the relationship between social anxiety and cannabis use and related problems. *The American Journal on Addictions*. doi: 10.1111/ajad.12339
- Buckner, J. D., Silgado, J., & Schmidt, N. B. (2011). Marijuana craving during a public speaking challenge: Understanding marijuana use vulnerability among women and those with social anxiety disorder. *Journal of Behavior Therapy and Experimental Psychiatry*, 42, 104-110. doi: 10.1016/j.jbtep.2010.07.005
- Buckner, J. D., Zvolensky, M. J., Crosby, R. D., Wonderlich, S. A., Ecker, A. H., & Richter, A. (2015). Antecedents and consequences of cannabis use among racially diverse cannabis users: An analysis from ecological momentary assessment. *Drug and Alcohol Dependence*, 147, 20-25.
- Buckner, J. D., Zvolensky, M. J., Ecker, A. H., & Jeffries, E. R. (2016). Cannabis craving in response to laboratory-induced social stress among racially diverse cannabis users: The impact of social anxiety disorder. *Journal of Psychopharmacology*, 30(4), 363-369.
- Bynum, M. S., Burton, E. T., & Best, C. (2007). Racism experiences and psychological functioning in African American college freshmen: Is racial socialization a buffer? *Cultural Diversity and Ethnic Minority Psychology*, 13(1), 64.

- Carlson, M., Endlsey, M., Motley, D., Shawahin, L. N., & Williams, M. T. (2018). Addressing the impact of racism on veterans of color: A race-based stress and trauma intervention. *Psychology of Violence*, 8(6), 748.
- Chapman, L. J., & Chapman, J. P. (1983). *Infrequency Scale*. Unpublished test. Madison, WI.
- Chavez, A. F., & Guido-DiBrito, F. (1999). Racial and ethnic identity and development. *New Directions for Adult & Continuing Education*, 84, 39- 47. doi: 10.1002/ace.8405
- Choi, Y., Harachi, T. W., Gillmore, M. R., & Catalano, R. F. (2006). Are multiracial adolescents at greater risk? Comparisons of rates, patterns, and correlates of substance use and violence between monoracial and multiracial adolescents. *American Journal of Orthopsychiatry*, 76(1), 86-97. doi: 10.1037/0002-9432.76.1.86
- Clark, R., Anderson, N. B., Clark, V. R., & Williams, D. R. (1999). Racism as a stressor for African Americans: A biopsychosocial model. *American Psychologist*, 54(10), 805-816. doi: 10.1037/0003-066X.54.10.805
- Clark, T. T. (2014). Perceived discrimination, depressive symptoms, and substance use in young adulthood. *Addictive behaviors*, 39(6), 1021-1025.
- Clark, T. T., Salas-Wright, C. P., Vaughn, M. G., & Whitfield, K. E. (2015). Everyday discrimination and mood and substance use disorders: A latent profile analysis with African Americans and Caribbean Blacks. *Addictive Behaviors*, 40, 119-125. doi: 10.1016/j.addbeh.2014.08.006
- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences (2nd ed.)*. New York: Academic Press.
- Cohen, J., Cohen, P., West, S. G., & Aiken, L. S. (2003). *Applied multiple regression/correlation analysis for the behavioral sciences*: Psychology Press.
- Coll, C. G., Crnic, K., Lamberty, G., Wasik, B. H., Jenkins, R., Garcia, H. V., & McAdoo, H. P. (1996). An integrative model for the study of developmental competencies in minority children. *Child development*, 67(5), 1891-1914.
- Compton, W. M., Thomas, Y. F., Stinson, F. S., & Grant, B. F. (2007). Prevalence, correlates, disability, and comorbidity of DSM-IV drug abuse and dependence in the united states: Results from the national epidemiologic survey on alcohol and related conditions. *Archives of General Psychiatry*, 64(5), 566-576. doi: 10.1001/archpsyc.64.5.566
- Curran, V. H., Brignell, C., Fletcher, S., Middleton, P., & Henry, J. (2002). Cognitive and subjective dose-response effects of acute oral Δ^9 -tetrahydrocannabinol (THC) in infrequent cannabis users. *Psychopharmacology*, 164(1), 61-70.

- DeJong, W., & Langford, L. M. (2002). A typology for campus-based alcohol prevention: Moving toward environmental management strategies. *Journal of Studies on Alcohol, Supplement*(14), 140-147.
- Dillon, F. R., Turner, C. W., Robbins, M. S., & Szapocznik, J. (2005). Concordance among biological, interview, and self-report measures of drug use among African American and Hispanic adolescents referred for drug abuse treatment. *Psychology of Addictive Behaviors, 19*(4), 404- 413. doi: 10.1037/0893-164X.19.4.404
- Donovan, R. A., Galban, D. J., Grace, R. K., Bennett, J. K., & Felicié, S. Z. (2013). Impact of racial macro-and microaggressions in Black women's lives: A preliminary analysis. *Journal of Black Psychology, 39*(2), 185-196.
- Doumas, D. M., & Hannah, E. (2008). Preventing high-risk drinking in youth in the workplace: A web- based normative feedback program. *Journal of Substance Abuse Treatment, 34*(3), 263-271. doi: 10.1016/j.jsat.2007.04.006
- Garber, J., & Hollon, S. D. (1991). What can specificity designs say about causality in psychopathology research? *Psychological Bulletin, 110*(1), 129-136.
- Gerrard, M., Gibbons, F. X., Stock, M. L., Lune, L. S. V., & Cleveland, M. J. (2005). Images of smokers and willingness to smoke among African American pre-adolescents: An application of the prototype/willingness model of adolescent health risk behavior to smoking initiation. *Journal of Pediatric Psychology, 30*(4), 305-318.
- Gerrard, M., Stock, M. L., Roberts, M. E., Gibbons, F. X., O'hara, R. E., Weng, C. Y., & Wills, T. A. (2012). Coping with racial discrimination: The role of substance use. *Psychology of Addictive Behaviors, 26*(3), 550.
- Gibbons, F. X., Etcheverry, P. E., Stock, M. L., Gerrard, M., Weng, C. Y., Kiviniemi, M., & O'Hara, R.E. (2010). Exploring the link between racial discrimination and substance use: What mediates? What buffers? *Journal of Personality and Social Psychology, 99*, 785-801. doi: 10.1037/a0019880
- Gibbons, F. X., Gerrard, M., Cleveland, M. J., Wills, T. A., & Brody, G. (2004). Perceived discrimination and substance use in African American parents and their children: A panel study. *Journal of Personality and Social Psychology, 86*(4), 517.
- Gibbons, F. X., Kingsbury, J. H., Weng, C.-Y., Gerrard, M., Cutrona, C., Wills, T. A., & Stock, M. (2014). Effects of perceived racial discrimination on health status and health behavior: A differential mediation hypothesis. *Health Psychology, 33*(1), 11.
- Gil, A. G., Wagner, E. F., & Tubman, J. G. (2004). Culturally sensitive substance abuse intervention for Hispanic and African American adolescents: Empirical examples from the alcohol treatment targeting tdolescents in need (ATTAIN) project. *Addiction (Abingdon, England), 99 Suppl 2*, 140- 150.

- Harper, S. R. (2007). Peer support for African American male college achievement: Beyond internalized racism and the burden of “acting White”. *The Journal of Men’s Studies*, 14(3), 337-358.
- Hartz, D. T., Frederick-Osborne, S. L., & Galloway, G. P. (2001). Craving predicts use during treatment for methamphetamine dependence: A prospective, repeated-measures, within-subject analysis. *Drug and Alcohol Dependence*, 63(3), 269-276.
- Hayes, A. F. (2017). *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach*: Guilford Publications.
- Hayes, A. F., & Preacher, K. J. (2014). Statistical mediation analysis with a multicategorical independent variable. *British Journal of Mathematical and Statistical Psychology*, 67(3), 451-470.
- Hayes, A. F., Preacher, K. J., & Myers, T. A. (2011). Mediation and the estimation of indirect effects in political communication research. *Sourcebook for political communication research: Methods, measures, and analytical techniques*, 23, 434-465.
- Hayes, M. (1921). Experimental development of the graphics rating method. *Psychological Bulletin*, 18, 98-99.
- Hoggard, L. S., Byrd, C. M., & Sellers, R. M. (2012). Comparison of African American college students' coping with racially and nonracially stressful events. *Cultural Diversity and Ethnic Minority Psychology*, 18(4), 329.
- Hunte, H. E. R., & Barry, A. E. (2012). Perceived discrimination and DSM-IV-based alcohol and illicit drug use disorders. *American Journal of Public Health*, 102(12), 111.
- Hunter, L. R., & Schmidt, N. B. (2010). Anxiety psychopathology in African American adults: Literature review and development of an empirically informed sociocultural model. *Psychological Bulletin*, 136, 211-235. doi: 10.1037/a0018133
- Huntley, E. D., Brown, T. S. H., Kobayashi, I., & Mellman, T. A. (2014). Validation of the Fear of Sleep Inventory (FOSI) in an urban young adult African American sample. *Journal of Traumatic Stress*, 27(1), 103-107. doi: 10.1002/jts.21882
- Kendzor, D. E., Businelle, M. S., Reitzel, L. R., Rios, D. M., Scheuermann, T. S., Pulvers, K., & Ahluwalia, J. S. (2014). Everyday discrimination is associated with nicotine dependence among African American, Latino, and White smokers. *Nicotine & Tobacco Research: Official Journal of the Society for Research on Nicotine and Tobacco*, 16(6), 633-640. doi: 10.1093/ntr/ntt198
- Khantzian, E. (2003). Understanding addictive vulnerability: An evolving psychodynamic perspective. *Neuropsychanalysis*, 5(1), 5-21.

- King, K. R. (2005). Why is discrimination stressful? The mediating role of cognitive appraisal. *Cultural Diversity & Ethnic Minority Psychology, 11*(3), 202-212.
- Kulis, S., Marsiglia, F. F., & Nieri, T. (2009). Perceived ethnic discrimination versus acculturation stress: Influences on substance use among latino youth in the southwest. *Journal of Health and Social Behavior, 50*(4), 443-459.
- Landrine, H., & Klonoff, E. A. (1996). The Schedule of Racist Events: A Measure of Racial Discrimination and a Study of Its Negative Physical and Mental Health Consequences (Vol. 22, pp. 144-168): *Journal of Black Psychology*.
- Lievaart, M., Erciyas, F., van der Veen, F. M., van de Wetering, B. J. M., Muris, P., & Franken, I. H. A. (2015). Validation of the cocaine versions of the Obsessive Compulsive Drug Use Scale and the Desires for Drug Questionnaire. *American Journal of Drug & Alcohol Abuse, 41*(4), 358-365. doi: 10.3109/00952990.2015.1043210
- Lui, P. P., & Quezada, L. (2018). Associations between microaggression and adjustment outcomes: A meta-analytic and narrative review.
- Marsh, J. C., Cao, D., Guerrero, E., & Shin, H.-C. (2009). Need-service matching in substance abuse treatment: Racial/ethnic differences. *Evaluation and Program Planning, 32*(1), 43-51.
- Martin, Tuch, & Roman. (2003). Problem drinking patterns among African Americans: the impacts of reports of discrimination, perceptions of prejudice, and "risky" coping strategies. *Journal of Health and Social Behavior, 44*(3). doi: 10.2307/1519787
- McCabe, S. E., Morales, M., Cranford, J. A., Delva, J., McPherson, M. D., & Boyd, C. J. (2007). Race/ethnicity and gender differences in drug use and abuse among college students. *Journal of ethnicity in substance abuse, 6*(2), 75-95.
- McCaul, M. E., Svikis, D. S., & Moore, R. D. (2001). Predictors of outpatient treatment retention: Patient versus substance use characteristics. *Drug and Alcohol Dependence, 62*(1), 9-17.
- McLaughlin, K. A., Hatzenbuehler, M. L., & Keyes, K. M. (2010). Responses to discrimination and psychiatric disorders among Black, Hispanic, female, and lesbian, gay, and bisexual individuals. *American Journal of Public Health, 100*(8), 1477-1484.
- Meyer, I. H. (2003). Prejudice, social stress, and mental health in lesbian, gay, and bisexual populations: conceptual issues and research evidence. *Psychological bulletin, 129*(5), 674.
- Miller, G. A., & Chapman, J. P. (2001). Misunderstanding analysis of covariance. *Journal of Abnormal Psychology, 110*(1), 40.

- Monti, P. M., Abrams, D. B., Binkoff, J. A., Zwick, W. R., Liepman, M. R., Nirenberg, T. D., & Rohsenow, D. J. (1990). Communication skills training, communication skills training with family and cognitive behavioral mood management training for alcoholics. *Journal of Studies on Alcohol*, 51(3), 263-270. doi: 10.15288/jsa.1990.51.263
- Nasim, A., Fernander, A., Townsend, T. G., Corona, R., & Belgrave, F. Z. (2011). Cultural protective factors for community risks and substance use among rural African American adolescents. *Journal of Ethnicity in Substance Abuse*, 10(4), 316-336. doi: 10.1080/15332640.2011.623510
- Nasim, A., Utsey, S. O., Corona, R., & Belgrave, F. Z. (2006). Religiosity, refusal efficacy, and substance use among African-American adolescents and young adults. *Journal of Ethnicity in Substance Abuse*, 5(3), 29-49. doi: 10.1300/J233v05n03_02
- Neighbors, C., Lee, C. M., Lewis, M. A., Fossos, N., & Walter, T. (2009). Internet-based personalized feedback to reduce 21st-birthday drinking: A randomized controlled trial of an event-specific prevention intervention. *Journal of Consulting and Clinical Psychology*, 77(1), 51.
- Okamoto, J., Ritt-Olson, A., Soto, D., Baezconde-Garbanati, L., & Unger, J. B. (2009). Perceived discrimination and substance use among Latino adolescents. *American Journal of Health Behavior*, 33(6), 718-727.
- Pascoe, E. A., & Smart Richman, L. (2009). Perceived discrimination and health: A meta-analytic review. *Psychological Bulletin*, 135, 531-554. doi: 10.1037/a0016059
- Perez, A. D., & Hirschman, C. (2009). The changing racial and ethnic composition of the US population: Emerging American identities. *Population and Development Review*, 35(1), 1-51.
- Pomery, E. A., Gibbons, F. X., Reis-Bergan, M., & Gerrard, M. (2009). From willingness to intention: Experience moderates the shift from reactive to reasoned behavior. *Personality & Social Psychology Bulletin*(7), 894.
- Pyke, K., & Dang, T. (2003). "FOB" and "whitewashed": Identity and internalized racism among second generation Asian Americans. *Qualitative Sociology*, 26(2), 147-172.
- Rohsenow, D. J., & Monti, P. M. (1999). Does urge to drink predict relapse after treatment? *Alcohol Research and Health*, 23(3), 225-232.
- Ryan, A. M., Gee, G. C., & Laflamme, D. F. (2006). The association between self-reported discrimination, physical health and blood pressure: findings from African Americans, Black immigrants, and Latino immigrants in New Hampshire. *Journal of health care for the poor and underserved*, 17(2), 116-132.

- SAMHSA. (2003). *Overview of findings from the 2002 national survey on drug use and health. [microform]*. Rockville, MD: Center for Behavioral Health Statistics and Quality
- SAMHSA. (2015). *Results from the 2015 national survey on drug use and health: Detailed tables*. Rockville, MD: Center for Behavioral Health Statistics and Quality
- Sanders Thompson, V. L. (2006). Coping Responses and the Experience of Discrimination 1. *Journal of Applied Social Psychology*, 36(5), 1198-1214.
- Schuckit, M. A. (1994). Low level of response to alcohol as a predictor of future alcoholism. *The American Journal of Psychiatry*, 151(2), 184-189.
- Sellers, R. M., Smith, M. A., Shelton, J. N., Rowley, S. A., & Chavous, T. M. (1998). Multidimensional model of racial identity: A reconceptualization of African American racial identity. *Personality And Social Psychology Review: An Official Journal Of The Society For Personality And Social Psychology, Inc*, 2(1), 18-39. doi: 10.1207/s15327957pspr0201_2
- Sigelman, L., & Welch, S. (1994). Black Americans' views of racial inequality: The dream deferred. *American Political Science Review*(1), 238.
- Sobell, L. C., Brown, J., Leo, G. I., & Sobell, M. B. (1996). The reliability of the Alcohol Timeline Followback when administered by telephone and by computer. *Drug and Alcohol Dependence*, 42(1), 49-54.
- Speight, S. L. (2007). Internalized racism: One more piece of the puzzle. *The Counseling Psychologist*, 35(1), 126-134.
- Spitzer, T. M. (2000). Predictors of college success: A comparison of traditional and nontraditional age students. *NASPA Journal*, 38(1), 82-98.
- Stevenson, H. C., Reed, J., Bodison, P., & Bishop, A. (1997). Racism stress management: Racial socialization beliefs and the experience of depression and anger in African American youth. *Youth & Society*, 29(2), 197-222.
- Stock, M. L., Gibbons, F. X., Walsh, L. A., & Gerrard, M. (2011). Racial identification, racial discrimination, and substance use vulnerability among African American young adults. *Personality and Social Psychology Bulletin*, 37(10), 1349-1361.
- Sue, D. W., Capodilupo, C. M., Torino, G. C., Bucceri, J. M., Holder, A., Nadal, K. L., & Esquilin, M. (2007). Racial microaggressions in everyday life: implications for clinical practice. *American psychologist*, 62(4), 271.
- Tabachnick, B. G., & Fidell, L. S. (2007). *Using multivariate statistics*, Boston, MC: Pearson Education. Inc.

- Thornton, M. C. (1997). Strategies of racial socialization among Black parents: Mainstream, minority, and cultural messages.
- Thornton, M. C., Chatters, L. M., Taylor, R. J., & Allen, W. R. (1990). Sociodemographic and environmental correlates of racial socialization by Black parents. *Child development*, 61(2), 401- 409.
- Utsey, S. O., Ponterotto, J. G., Reynolds, A. L., & Cancelli, A. A. (2000). Racial discrimination, coping, life satisfaction, and self-esteem among African Americans. *Journal of Counseling & Development*, 78(1), 72-80.
- Wells, K., Klap, R., Koike, A., & Sherbourne, C. (2001). Ethnic disparities in unmet need for alcoholism, drug abuse, and mental health care. *The American Journal of Psychiatry*, 158(12).
- Westermeyer, J., Yargic, I., & Thuras, P. (2004). Michigan Assessment-Screening Test for Alcohol and Drugs (MAST/AD): Evaluation in a clinical sample. *The American Journal on Addictions*, 13, 151-162.
- Williams, D. R., & Mohammed, S. A. (2009). Discrimination and racial disparities in health: evidence and needed research. *Journal of behavioral medicine*, 32(1), 20-47.
- Williams, M. T., Kanter, J. W., & Ching, T. H. (2018). Anxiety, stress, and trauma symptoms in African Americans: Negative affectivity does not explain the relationship between microaggressions and psychopathology. *Journal of racial and ethnic health disparities*, 5(5), 919-927.
- Winer, B. J. (1991). *Statistical principles in experimental design*.
- Witkiewitz, K., & Marlatt, G. A. (2004). Relapse prevention for alcohol and drug problems: That was zen, this is tao. *The American Psychologist*, 59(4), 224-235.
- Yen, I. H., Ragland, D. R., Greiner, B. A., & Fisher, J. M. (1999a). Racial discrimination and alcohol- related behavior in urban transit operators: Findings from the san francisco muni health and safety study. *Public Health Reports*, 114(5), 448.
- Yen, I. H., Ragland, D. R., Greiner, B. A., & Fisher, J. M. (1999b). Workplace discrimination and alcohol consumption: Findings from the san francisco muni health and safety study. *Ethnicity & Disease*, 9(1), 70-80.
- Yoo, H. C., & Lee, R. M. (2008). Does ethnic identity buffer or exacerbate the effects of frequent racial discrimination on situational well-being of Asian Americans? *Journal of Counseling Psychology*, 55(1), 63.

VITA

Kimberlye Dean, a native of Lithonia, Georgia, received her Bachelor's of Science from the University of Georgia and a Master of Arts in clinical psychology from Louisiana State University in 2017. Ms. Dean's doctoral work in clinical psychology at Louisiana State University has been under the mentorship of Dr. Julia Buckner. Ms. Dean is currently on clinical research fellowship at the Massachusetts General Hospital in Boston, Massachusetts. She will continue to research anxiety and sociocultural factors upon receiving her Doctoral Degree in Clinical Psychology in December 2019.