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Immediate and delayed effects of everyday racial discrimination on mental health among Black college students: A mixed-methods approach

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Abstract

Experiences of racial discrimination significantly contribute to both mental and physical health outcomes. In this mixed-methods study, we examine both the immediate and delayed effect of discrimination experienced in daily life. Black students at a predominantly White university reported instances of racial discrimination, affect, anxiety, and depression several times per day over 4 weeks (N = 114); this was followed by qualitative focus groups (N = 25). Reporting an instance of discrimination corresponded with an acute decline in psychological wellbeing (higher negative affect, anxiety, and depression), consistent with previous work. However, this effect did not carry forward to later assessments during the same day or the following day as expected. Instead, positive affect temporarily increased in the hours following experiences of discrimination. Qualitative focus groups revealed social support, emotional reflection and processing, and feelings of taking action as important factors contributing to this bump in positive affect.

Keywords

racial discrimination, mental health, coping, intensive longitudinal methods, mixed methods

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Research on the effects of racial discrimination on individuals' wellbeing is not new. Decades of research have documented the psychological toll associated with experiences of racial discrimination (e.g., Clark et al., 1999; Williams et al., 2003). Generally, discrimination refers to the differential treatment of individuals on the basis of group or social category membership (Cuevas & Boen, 2021), and in the racial domain, serves to enforce and uphold structural racism. This differential

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treatment can manifest in different ways: explicit differential treatment based on race that limits access to resources or opportunities (e.g., redlining; Krieger et al., 2020; Nardone et al., 2020), differential treatment based on other factors (e.g., incarceration history, socioeconomic status, skin tone) that results in differential impacts (Landor & McNeil Smith, 2019), or racial microaggressions, which manifest in interpersonal interactions and convey (subtly or not) hostile or negative messages about racial minority groups (e.g., Sue et al., 2007; Wong et al., 2014). An increasing amount of research suggests that racial discrimination at all levels has an impact on health through a variety of mechanisms, although the majority of psychological research has focused on individuals' reports of experiences of discrimination within the interpersonal domain (e.g., receiving poorer service at restaurants, being stared at or harassed, or being called names or insulted; Essed, 1991; Williams et al., 2003). Self-reported experiences with interpersonal discrimination have been linked with increased anxiety, depression, cardiovascular risk factors, and higher mortality (Goosby et al., 2018; Pascoe & Richman, 2009; Pieterse et al., 2012; Schmitt et al., 2014).

The influential biopsychosocial model of racism and health (Clark et al., 1999) positions stress as an important factor in how experiences with discrimination affect health. Specifically, the biopsychosocial model builds on the general stress–coping model proposed by Lazarus and Folkman (1984), and suggests that environmental stimuli perceived by an individual as racist result in psychological and physiological stress responses. Over a lifetime, repeated stress responses contribute to the accumulation of allostatic load, which negatively affects the maintenance of psychological and physiological health systems to contribute to disease and mortality (Mays et al., 2007). Individual differences are theorized to moderate the relationship between racism and health in numerous ways, including through constitutional factors, psychological and behavioral factors, coping responses, and perceptions of environmental stimuli as racist (Clark et al., 1999). Although the biopsychosocial model theorizes that interactions or environmental stimuli perceived as racist have both an acute and a chronic effect, the acute and chronic effects of racial discrimination have primarily been examined separately. The current study expands the temporal domain and simultaneously examines the acute and lagged effects of discrimination experienced during daily life on mental health, which may shed light on how an acute effect may translate into a chronic effect.

Chronic and Acute Effects of Racial Discrimination on Health

Much of the existing work on racial discrimination and health has focused on population-level relationships, using cross-sectional samples and questionnaires (e.g., Paradies, 2006; Pieterse et al., 2012; Schmitt et al., 2014). Such work primarily identifies chronic or lifetime effects of racial discrimination on psychological and physical outcomes among African Americans and other racial/ethnic minority groups. For example, large cross-sectional studies have shown that lifetime prevalence or frequency of discrimination is positively associated with specific clinical outcomes, including generalized anxiety disorder (Soto et al., 2011) and major depressive disorder (Chou et al., 2012), physical health outcomes like cardiovascular disease and mortality rates (Busse et al., 2017; Mays et al., 2007), and sleep disturbance (Davenport et al., 2020; Slopen et al., 2016). These survey-based studies typically measure frequency of discrimination using items such as, "Within your lifetime, how often are you treated with less courtesy than others because of your race?" Although this method of measuring discrimination is often positioned as examining the frequency of interpersonal discrimination, it may also incorporate structural elements of racism since experiences of such events depend on structural positions within social systems and other systemic factors. This is consistent with the biopsychosocial model, which explicitly theorizes about the effect of both structural and interpersonal racism by emphasizing individuals' perceptions of whether something is racist (e.g., that

many Black Americans perceive substandard housing and lower wages to be a function of racism). However, the majority of psychological research frames these experiences as interpersonal discrimination that stems from an individual's attitudes or behaviors, unintentional or not (i.e., microaggressions), rather than representing systemic manifestations of structural racism (e.g., longer wait times at doctor's offices; Cuevas et al., 2016).

On the other side of the temporal scale, research focusing on the acute effect of discrimination has primarily used experimental lab studies, showing that experiencing or witnessing an interaction construed as discriminatory or racist prompts an acute physiological stress response, raising blood pressure and heart rate, increasing sympathetic nervous system activity, decreasing parasympathetic nervous system activity, and increasing cortisol (e.g., Huynh et al., 2017; Lockwood et al., 2018; Volpe et al., 2019). Related work has shown similar negative effects of experimentally induced discrimination on anxiety, depression, and negative affect (e.g., Bennett et al., 2004; Goodwin et al., 2010; Hoggard et al., 2017; Masten et al., 2010). These manipulations typically use examples of interpersonal discrimination or microaggressions, such as an experimenter saying to a Latino participant, "You speak English really well" (an example of a microinsult; García et al., 2020).

However, it is less clear how the acute effect of a single instance of interpersonal discrimination may translate into a chronic effect. To understand how one translates into the other, some research has examined the lagged effect of discrimination, using intensive longitudinal designs to measure both discrimination and outcomes in real life over the course of days or weeks (Potter et al., 2019). A number of these studies have shown both acute effects of experiencing racial discrimination (similar to those seen in experimental lab-based studies) and a sustained negative effect on both mental health (Douglass et al., 2016; Hoggard et al., 2015; Seaton & Douglass, 2014; Torres & Ong, 2010) and physical indicators of stress (Seaton & Zeiders, 2020; Zeiders et al., 2014, 2018) up to a week following an experience of discrimination. This prolonged negative effect suggests that the acute effects of interpersonally experienced discrimination as a stressor may have a longer effect than that measured in single-session lab studies, which may contribute to health disparities across the lifespan. Thus, it is important to examine how the within-person effects of discrimination may fluctuate over time, to examine how the acute effect of discrimination may translate into a chronic effect.

The current study extends previous daily diary studies by including a more fine-grained examination of the time course over which discrimination may have an effect. Prior studies have generally used a once-a-day reporting approach in which both discrimination and relevant outcomes are measured at the same time each day, usually in the evening. Instead, the current study used an ecological momentary assessment (EMA) approach where participants reported experiences of discrimination and mental health-related outcomes in near real-time several times per day. Using this approach, we examined how experiences with racial discrimination in daily life affect fluctuations in negative and positive affect, depression, and anxiety at several different delays, both within and across days, to better characterize the effect of discrimination over time. We expected to observe an acute negative effect of everyday discrimination on affect and mental health, as well as a delayed effect several hours later and into the next day, consistent with previous daily diary studies showing a lasting negative effect of experiencing discrimination a day or even a week later (e.g., Douglass et al., 2016; Torres & Ong, 2010).

Responding to Interpersonal Discrimination

Despite the negative impact of discrimination documented in previous work, other research highlights the resilience that members of marginalized groups show in navigating experiences of racism and discrimination (Brondolo et al., 2009; Brown & Tylka, 2011; Kubiliene et al., 2015). Coping or resilience can be conceptualized as both

an individual process, which is the dominant approach in psychological research (e.g., Brondolo et al., 2009), and as a group-related or social process, in that individuals have access to and learn repertoires for responding to discrimination from the groups they belong to (Lamont et al., 2013). Researchers have identified a number of coping strategies and individual differences that can buffer (or sometimes exacerbate) the negative effects of racial discrimination. These include coping strategies such as seeking social support, hypervigilance, confrontation, avoidance, and spiritual coping (Brondolo et al., 2009; Forsyth & Carter, 2014; Himmelstein et al., 2015; Utsey et al., 2008).

To understand how Black students in our sample respond to experiences of discrimination and how this may affect their mood and mental health, we incorporated a qualitative approach to more deeply probe how individuals respond to different experiences, how response strategies are influenced by elements of the situation and cultural context, and how these factors interact in a complex way (Bottrell, 2009; Kubiliene et al., 2015; Rutter, 2012). Specifically, we conducted semi-structured focus groups that served two complementary functions consistent with a community-based participatory research approach (CBPR; Wallerstein & Duran, 2006, 2010). Prior to the EMA study we convened focus groups of Black college students to get a more detailed understanding of the everyday instances of discrimination that they experience and the best ways to measure it. Second, following the EMA study we convened focus groups of EMA study participants to explore their responses to the instances of discrimination they had encountered, and how these responses may help to account for the pattern of results seen in the EMA data. The CBPR approach views participants as collaborators in the research endeavor through a co-learning and empowering process and encourages shifting involvement of the community that is directly impacted by the research to include participation at different stages, including experimental design, data analysis, and interpretation. Thus, focus group involvement shaped our quantitative approach as well as facilitating the interpretation of the results through a collaborative process.

Current Study

The current study examines the effect of interpersonally experienced everyday racial discrimination on mental health by taking an idiographic approach, asking the following questions: 1) How does each discrete exposure to everyday discrimination affect a person's immediate psychological functioning? 2) How does the acute impact of everyday discrimination change over the course of hours or days? and 3) How are coping responses engaged following a discriminatory experience, which may be important in understanding fluctuations in mental health following the experience? To do this, we used a mixed-methods approach, combining quantitative and qualitative elements. Quantitative measurement occurred within an EMA framework, in which participants used a smartphone app to repeatedly report instances of racial discrimination, affect, and anxiety/depression symptoms during daily life several times per day over the course of several weeks. We supplemented the quantitative measurement with qualitative focus groups both before and after the EMA study, to expand understanding of the types of discrimination Black students experience and to provide additional context for quantitative results.

Method

All procedures and materials were approved by the University of Missouri Institutional Review Board. Studies were not pre-registered.

Participants

Pre-study focus groups. Black undergraduate and graduate students were invited to participate in semi-structured focus groups discussing how race affects their lives as students at the University of Missouri. Participants were recruited through university newsletters, flyers shared by Black student organizations, and word of mouth. Sixteen

students (14 women, two men) participated in one of four focus groups (four people per group) that took place in September 2018. This data collection occurred after Michael Brown's death at the hands of police and subsequent swelling of the Black Lives Matter movement in Ferguson, Missouri, in August 2014. Identifying information was not collected. Each focus group lasted about an hour and was facilitated by the first author (the second author was additionally present for one focus group). Participants received $10 for taking part.

EMA study. A separate sample of individuals was recruited to participate in the EMA study. One-hundred and fourteen African American or Black individuals (88 women, 24 men, two transgender/non-binary people) participated in the EMA study. The sample size was determined using an a priori power analysis.[1] Participants were recruited using the same methods as the pre-study focus groups, as well as through SONA, which allows students in an introductory psychology class to receive credit for participating. Participants were all current undergraduate or graduate students and ranged in age from 18 to 45 years old (M = 20.6). Enrollment was staggered such that participants began their participation at various times throughout two semesters of data collection (fall 2018 and spring 2019). During the course of the EMA study, no major race-related events or protests occurred either locally or at the national level that may have affected participants' EMA responses. In exchange for their participation, participants received either credit toward a course requirement or monetary compensation ($100 possible in total [see details later]). Of the 114 enrolled in the study, three withdrew because of technological difficulties with the data collection app or because they were unable to commit the time to completing the prompts as the study progressed. Additionally, one participant did not properly comply with the sampling procedure.[2] Thus, 110 participants' EMA data were used in the analyses.

Post-study focus groups. Following the EMA study, all individuals who participated were invited to participate in follow-up focus groups. Twenty-five individuals (19 women, six men) participated in one of five focus groups (n = 4–7 participants per group) that took place in February 2020. All data collection was concluded by the time George Floyd was killed by police in Minneapolis, MN, and subsequent nationwide protests that occurred in May 2020. Identifying information was not collected. Each focus group lasted between an hour and an hour and a half and was facilitated by the first author (the second author was additionally present for one focus group). Focus group participants received $15 for taking part.

Procedure

Pre-study focus groups: Development of discrimination items. Although participants would be able to report discriminatory events during the EMA study in an open-ended manner, we first developed a list of possible discrimination events our sample might experience. We ran semi-structured focus groups in which students described how race affects their lives as students, including the forms of discrimination they have experienced while a student at the University of Missouri. These discussions were semi-structured, in that they were guided by broad, open-ended topic questions[3] that were asked in every focus group, often accompanied by follow-up why or how questions (Adams, 2015). The sequence that topic questions were asked in or level of subsequent probing varied according to participants' responses in order to explore unanticipated themes. Through analysis of these discussions (see Data Analysis section for more details), the authors developed a list of discrimination experiences that participants commonly described and added them to the experiences described in the Major and Everyday Discrimination Scales (Williams et al., 1997), a commonly used measure for racial discrimination (see Table 1). Participants in the EMA study were given this list as a prompt when reporting discrimination experiences, although participants were not limited to this list (see below for more details).

Table 1. List of discrimination experiences that participants could select from when completing a report in the EMA study.

You were unfairly fired or denied a promotion	You were called names or insulted
You were unfairly stopped, searched, or questioned by the police	You were threatened or harassed
You were treated with less courtesy than others	*Someone intentionally bumped into you without saying "Excuse me"
You received less respect than others	*Someone incorrectly assumed you were poor
You received poorer service than others in a restaurant or store	*Someone incorrectly assumed you grew up in a particular neighborhood
Someone assumed you were not intelligent	*Someone said you talk about race too much
Someone acted as if they were better than you	*Someone said racism doesn't exist
Someone acted as if they were afraid or threatened by you	*Someone mistook you for another Black person
Someone incorrectly assumed you were being dishonest	*Your opinion or contribution was ignored or overlooked

Note. Participants in the EMA study were not restricted to events on the list. *denotes items added as a result of pre-study focus groups.

EMA study. Participants first attended onboarding sessions wherein all details of the study were disclosed and participants had the opportunity to ask questions before giving their informed consent. Then, over the course of 28 days, participants completed event-based reports and random prompts using a mobile app called TigerAware (Morrison et al., 2018). Most participants used their own smartphones to complete the EMA prompts, but some participants used smartphones (iPhone SE) provided by the researchers because of technical issues with the app on their personal phone. During the EMA period, participants initiated an event-based report following an instance of racial discrimination, which was defined as any interpersonal interaction or event in which they felt they were treated differently because of their race. Participants were given the list developed through the initial focus groups (Table 1) as examples of discrimination they could report but were not limited to the experiences on the list in their reporting. Participants were encouraged to report events that they suspected may be race-related, even if they were not certain, due to the often-ambiguous nature of microaggressions in interpersonal interactions (e.g., Bennett et al., 2004; Tao et al., 2017). Additionally, since the emphasis of the current study was on interpersonal instances of discrimination, vicariously experienced discrimination (e.g., viewing news events or footage of racial injustices in the media) or other more structural forms of discrimination were not included in the scope of this study (see Discussion for more on this limitation). Upon initiating an event-based report, participants first completed the negative and positive affect scales from the PANAS-X (Watson & Clark, 1999), plus three additional items measuring anxiety-related symptoms (e.g., anxious, worried, restless) and three items measuring depression-related symptoms (e.g., depressed, sad, lonely). Participants reported the extent to which they felt each emotion on a scale from 1 (Very slightly or not at all) to 5 (Extremely).

Participants then responded to questions that were specific to the event. First, they reported what happened, either by selecting example items from the list developed through initial focus groups (Table 1) or by describing the event in a free-response box. After describing the interaction, participants answered the following questions: "To what extent do you think this happened because of race?" (response options: Definitely not because of my race; Probably not because of my race but could be interpreted that way; Probably because of my race but not certain; Definitely because of my race; I don't know); "What was the gender of the person who was primarily

responsible?" (response options: Male; Female; Trans/Non-Binary; I don't know); "What was their race?" (response options [select all that apply]: Non-Hispanic White/European American; Black/African American; Asian; Native American/Pacific Islander; Hispanic; I don't know); and "What category best describes your relationship with this person?" (response options: Classmate; Friend/Acquaintance; Roommate; Romantic partner; Family member; Professor or teaching assistant; Stranger).

Independently from the event-based reports, participants responded to random prompts sent via the TigerAware app three times per day between 9 a.m. and 10 p.m. The random prompts occurred on a semi-random schedule such that one prompt was sent randomly during each of three periods throughout the day (morning, afternoon, evening). Thus, several hours usually separated each random prompt. Each random prompt contained the same emotion items as the event-based reports. Participants were then asked whether any instances of discrimination had occurred since their last completed prompt that they had not reported; if participants responded, "Yes," they were given the event-related items, plus an item asking approximately what time the event had occurred.

This sampling procedure (three times per day plus the opportunity to initiate a report whenever an instance of discrimination occurred) was chosen to minimize participant burden while also sampling at a high enough rate to capture often-occurring events with limited retrospective bias. It is unclear how often racial discrimination truly occurs, as retrospective self-reports are likely to underestimate the true frequency of these experiences. Thus, we expected this sampling procedure to give a more accurate estimate of the frequency of racial discrimination within this particular population.

To encourage compliance, participants were compensated ($20/week) in person 2 weeks into the study, and again at the end of the EMA period, with a $5/week bonus if they completed at least 80% of the prompted reports (17 of 21 random prompts that week). As the bonus was not contingent on event-based reports, participants did not have an incentive to over-report discrimination events. Participants additionally had the ability to suspend random notifications during times they would be unable to respond, such as when they were driving or when they were taking a test. On average, compliance rates were acceptable (mean = 84%; min = 54%; max = 98%), which was calculated as the percentage of total prompted reports completed.

Individual differences in coping style. During the onboarding session, participants additionally completed a number of questionnaires assessing individual differences that may moderate the effect of experiencing discrimination on mental health. This included the Racism-Related Coping Scale (Forsyth & Carter, 2014), a 55-item questionnaire with subscales that assess the extent to which respondents engage in racially conscious action, empowered action, constrained resistance, confrontation, vigilance, bargaining, and spiritual coping in response to situations where they have been treated unfairly because of their race. Mean scores were created separately for each subscale and standardized. We additionally assessed self-esteem using the 10-item Rosenberg Self-Esteem Scale (Rosenberg, 1965) and ethnic identity using the 20-item Multigroup Ethnic Identity Measure (MEIM; Phinney, 1992). Items on the self-esteem scale were summed and standardized. Items on the MEIM were used to create separate mean scores for the Exploration (e.g., "I have spent time trying to find out more about my own ethnic group, such as its history, traditions, and customs") and Commitment (e.g., "I have a strong sense of belonging to my own ethnic group") subscales. These and other measured scales not investigated here are described with more detail in the Supplemental material.

Post-study focus groups. Following the conclusion of the EMA study, semi-structured focus groups were conducted to gain more information about participants' experiences in the EMA study, their interpretation of results, and how they respond to discrimination experienced in daily life in general.

In each group, the first author gave a presentation of the results from the EMA study, interspersed with topic questions to guide discussion.[4] As before, topic questions were followed up by probing questions to explore participants' responses.

Data Analysis

We used the R package lme4 (Bates et al., 2015) to fit multilevel models for quantitative data analysis. Satterthwaite approximations were used to estimate degrees of freedom and to obtain two-tailed *p*-values; in situations where degrees of freedom were >200, we report the results as z statistics. For each model, we used the most complex random structure that was supported by the data (i.e., we removed terms to avoid singular fit and terms that led to high correlations between random effects; Matuschek et al., 2017). All de-identified quantitative data and R code used for analysis can be found at https://github.com/hivolpertes/RacialDiscrimResiliance.

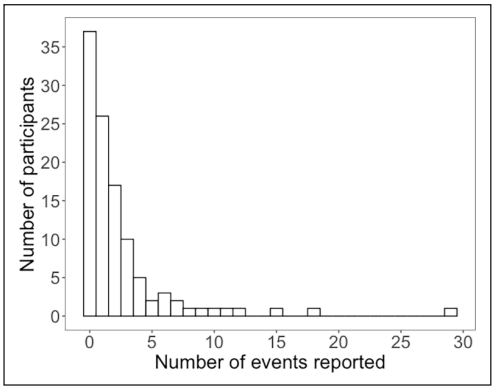
To analyze qualitative data, we used thematic analysis (Alhojailan, 2012; Creswell et al., 2006), which identifies classifications and themes in the data. Transcriptions of all focus groups were created and de-identified. Ideas or themes in participants' responses across groups were coded and tagged in the transcripts, which allows for identification of common themes (e.g., "Someone said you talk about race too much"). This process was done first to identify common forms of discrimination described in the pre-study focus groups, which contributed to the list used in the EMA study (Table 1). Then, thematic analysis was used to identify common responses to experiencing discrimination from the post-study focus groups (e.g., reaching out to friends and family). Thematic analysis for both the pre- and post-study focus groups was conducted primarily by the first author.

Results

Ecological Momentary Assessment Study

First, we describe the type and frequency of the discrimination events reported during the EMA study. Second, we test the effect of reporting an event on affect, anxiety, and depression at three different delays: the immediate effect on the same prompt, the delayed effect on the next prompt several hours later, and the delayed effect on the following day.

Figure 1. Distribution of the number of discrimination events reported by each person over the course of the EMA study.



Type and frequency of events reported. Across the entire sample, 264 discrimination events were reported over the course of the 4-week EMA period, which corresponds to an average of 2.4 discrimination events per participant. However, the distribution of reported events was heavily skewed across individuals (min = 0; max = 29; see Figure 1). Of the sample, 37 participants (33.6%) did not report any discrimination event and 26 (23.6%) reported only one discrimination event. Examples of six common themes are included in Table 2 for illustrative purposes, although no formal thematic analysis or coding was done. Examples have been edited for clarity.

Effect of reported events on affect, anxiety, and depression. For each outcome, we tested the effect of reporting a discrimination event at three different delays: 1) the immediate effect of a reported event (i.e., both event and outcome on prompt P); 2) the delayed effect of a reported event on the next prompt several hours later (i.e., event on prompt P and outcome on prompt P+1); and 3) the delayed effect of a reported event on the following day (i.e., event on day D and outcome on

Table 2. Common forms of discrimination reported in the EMA study and examples.

Type	Description	Examples
Interpersonal slights or overt harassment	Interactions that communicated hostile derogatory, or negative racial slights, sometimes (but not always) without the awareness or intention of the perpetrator (e.g., Sue et al., 2007); Being treated with less courtesy or respect	"I went to this mostly White party and it was just horrible. I felt like White boys felt they could touch me unnecessarily, one girl kept apologizing only to me like she was scared I would do something, I felt scared that anything could happen"
Assumption of inferiority	Interactions in which others acted superior, ignored or overlooked the participant, or assumed the participant was unintelligent or incompetent	"My usual Chemistry lab partner was sick today, so I worked with someone else in today's lab whose partner was also sick. Throughout the whole lab, he would tell me what to do next, what equipment I should keep out, and what I can go ahead and wash. One time he even took the pipet from my hand to measure a solution himself, even though I was measuring all the other solutions that we needed"
Being perceived as a threat	Interactions or situations in which participants were treated as threatening or suspicious, including being accused of lying or theft	"I was volunteering at a Black event for the Big 12 conference. Me and maybe five to seven other Black people were in a room and literally seven White cops were there on alert. It made us wonder why there were so many and two of them were standing up, in position staring while we were setting up chairs"; "I asked a friend to come sit with me but as she went to grab her stuff she said she didn't trust me with her phone"
Mistaken identity	Interactions in which the participant was mistaken for another Black person or the perpetrator interacted with the participant as if they were interchangeable with any other Black person	"There are three Black girls in my French class and the instructor refers to all of us as Dee. Dee is the name of the Black girl that rarely comes to class"
Spotlighting	Interactions in which the participant felt put on the spot to represent all Black people, or viewed with heightened fascination in a way that made the participant feel uncomfortable	"In class we discussed race and social justice. [I'm the only Black person in class]. One girl talked about her situation between her and her AA neighbors in her dorm room . . . She then asked if White people can join African American organizations on campus? But turned to me and asked, expecting me to be the 'spokesperson' for Black people"
Derogatory jokes or comments	Interactions or situations in which people made comments or jokes at the expense of Black people	"Someone made an insensitive joke about using people of color as guinea pigs in experiments because they are a cheap and inexpensive source of research participants"

Table 3. Model results for same prompt (P) outcomes.

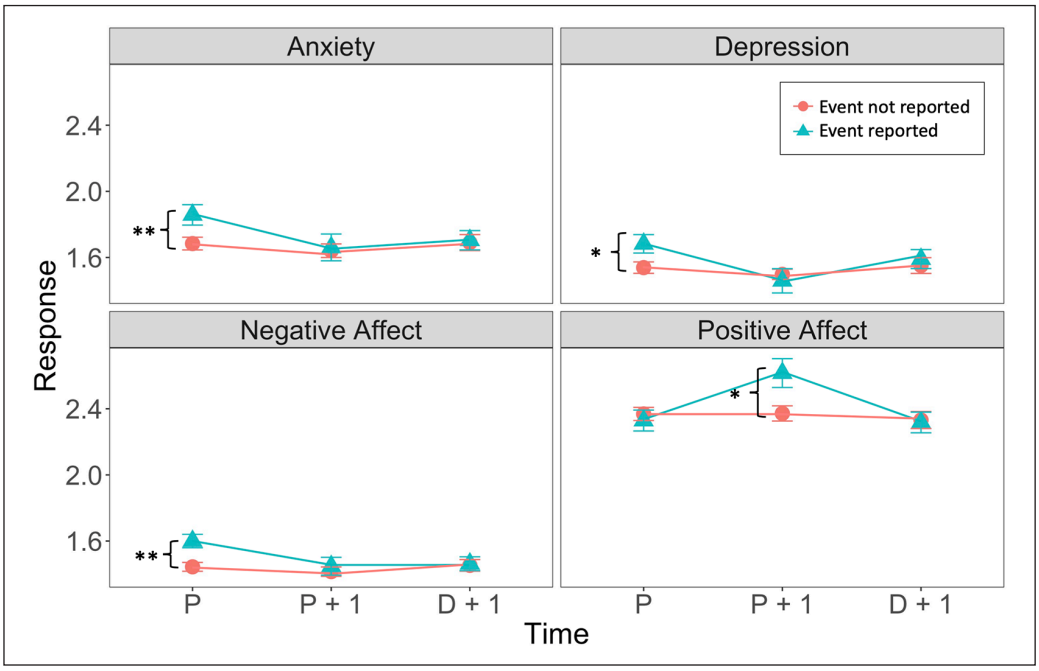
	Positive affect		Negative affect		Depression		Anxiety	
Unconditional intraclass correlation coefficient								
Participant	.57		.61		.59		.52	
Day within Participant	.17		.15		.15		.14	
Model fit	*Marg.*	*Cond.*	*Marg.*	*Cond.*	*Marg.*	*Cond.*	*Marg.*	*Cond.*
R^2	.31	.53	.27	.54	.27	.51	.14	.43
Random Effects	*Var.*	*SD*	*Var.*	*SD*	*Var.*	*SD*	*Var.*	*SD*
Participant	.15	.39	.08	.28	.12	.35	.16	.40
Day within Participant	.00	.00	.00	.00	.00	.00	.00	.00
Residual	.33	.58	.13	.36	.26	.51	.31	.56
Fixed effects	*Est.*	*p*	*Est.*	*p*	*Est.*	*p*	*Est.*	*p*
Intercept	**1.35**	**<.001**	**0.83**	**<.001**	**0.87**	**<.001**	**1.16**	**<.001**
Event (prompt P)	−0.04	.477	**0.16**	**<.001**	**0.15**	**.001**	**0.18**	**<.001**
Outcome (prompt P–1)	**0.46**	**<.001**	**0.43**	**<.001**	**0.43**	**<.001**	**0.32**	**<.001**
Gender	**0.12**	**.021**	0.01	.710	0.00	.985	0.02	.711
Age	0.01	.631	0.01	.193	0.02	.073	0.00	.905
Tuesday	0.02	.502	0.00	.881	0.00	.880	0.03	.422
Wednesday	0.05	.114	0.01	.509	0.02	.520	0.04	.200
Thursday	0.01	.785	−0.01	.799	−0.01	.866	−0.01	.733
Friday	0.01	.783	−0.03	.188	0.00	.871	−0.02	.494
Saturday	0.01	.853	**−0.04**	**.049**	−0.03	.319	−0.05	.174
Sunday	−0.02	.645	−0.02	.441	0.01	.842	−0.04	.293

Note. Unconditional ICCs were calculated using a random-effects-only model (i.e., no fixed effects). Marginal and conditional R^2 were calculated with the MuMIn package in R and represent the variance explained by the fixed effects alone and the fixed and random effects together, respectively (Bartón, 2020). Bolded values in the fixed effects are significant at $p < .05$.

day D+1). At each delay, the effect of reporting an event was tested on each unique outcome (positive affect, negative affect, anxiety symptoms, and depression symptoms) in separate models.[5] For the immediate effect,[6] models included a categorical predictor, coding whether or not an event had been reported on a particular prompt, P (*No event* = 0; *Event* = 1), along with the following covariates: 1) the day of the week to account for weekend effects; 2) participant gender; 3) participant age; and 4) the relevant outcome (positive affect, negative affect, depression, anxiety) on the preceding prompt (prompt P–1) to account for stability in mood/affect. The dependent variable was the outcome on prompt P. For the delayed effect on the subsequent prompt,[7] all of the same predictors were included, along with whether or not an event was reported on prompt P+1 (*No event* = 0; *Event* = 1). Additionally, the dependent variable was the outcome on prompt P+1 instead of on prompt P. All models included a random intercept by participant, as well as a random intercept by day in the study nested within participant. For the delayed effect on the subsequent day,[8] responses for each outcome were aggregated for each day. Outcomes on Day D+1 were predicted by whether or not an event was reported on Day D, day of the week, participant age and gender, whether or not an event was reported on Day D+1, and the relevant outcome on Day D–1. In these models, since only one observation was included per day, only a random intercept by participant was included.

When looking at the immediate effect of a reported event, the best predictor of each outcome on prompt P was the respective outcome (positive affect, negative affect, depression, or anxiety) on the previous prompt (prompt P–1; see Table 3), suggesting affect and mental health were relatively

Figure 2. Model predicted means and SEs showing each outcome on prompt P, prompt P+1, and day D+1 as a function of whether an event was reported on prompt P or day D.



Note. $^{**}p < .001$; $^{*}p < .05$.

stable. However, even when accounting for stability in affect and mental health outcomes across prompts, reporting a discriminatory event did have a unique effect on immediate negative affect, $b = 0.16$, 95% confidence intervals (CIs) [0.09, 0.22], $z = 4.88$, $p < .001$, $f^2 = .006$, depression, $b = 0.15$, 95% CIs [0.06, .024], $z = 3.22$, $p = .001$, $f^2 = .002$, and anxiety, $b = 0.18$, 95% CIs [0.08, 0.27], $z = 3.49$, $p < .001$, $f^2 = .004$, such that these outcomes were all higher on prompts when an event was reported compared with prompts with no reported event (see Figure 2). Immediate positive affect did not differ as a function of reporting an event, $b = -0.04$, 95% CIs [−0.14, 0.06], $z = -0.711$, $p = .477$, $f^2 = .000$. Of the covariates, the only significant effects were of day of week on negative affect, such that lower negative affect was reported on Saturday relative to Monday, and the effect of gender on positive affect, such that men reported higher positive affect than women overall (see Table 3).[9]

Next, we examined the effect of reporting an event at prompt P on outcomes measured on the following prompt (prompt P+1). As when examining outcomes on prompt P, the best predictor of outcomes on prompt P+1 was affect or anxiety/depression symptoms on prompt P–1 (see Table 4). In contrast to the immediate effect, reporting an event on prompt P did not have a significant effect on negative affect, depression, or anxiety on the following prompt (prompt P+1; see Figure 2, Table 4). Instead, reporting an event on prompt P had a significant positive effect on positive affect at prompt P+1, $b = 0.25$, 95% CIs [0.10, 0.41], $z = 3.25$, $p = .001$, $f^2 = .045$, such that positive affect was more positive on prompts following a reported event than prompts following no reported event, even when controlling for positive affect prior to the event and events reported on prompt P+1. Additionally, events reported on prompt P+1 corresponded with a significant increase in outcomes at P+1

Table 4. Model results for next prompt (P+1) outcomes.

	Positive affect		Negative affect		Depression		Anxiety	
Unconditional intraclass correlation coefficient								
Participant	.57		.61		.58		.51	
Day within Participant	.19		.15		.15		.16	
Model fit	*Marg.*	*Cond.*	*Marg.*	*Cond.*	*Marg.*	*Cond.*	*Marg.*	*Cond.*
R^2	.28	.71	.20	.50	.27	.61	.10	.42
Random effects	*Var.*	*SD*	*Var.*	*SD*	*Var.*	*SD*	*Var.*	*SD*
Participant	.19	.44	.08	.28	.09	.29	.16	.41
Day within Participant	.14	.38	.00	.00	.08	.29	.00	.00
Residual	.22	.47	.13	.36	.20	.44	.30	.54
Fixed effects	*Est.*	*p*	*Est.*	*p*	*Est.*	*p*	*Est.*	*p*
Intercept	**1.47**	**<.001**	**0.89**	**<.001**	**0.82**	**<.001**	**1.15**	**<.001**
Event (prompt P)	**0.25**	**.001**	0.03	.552	−0.04	.607	0.01	.874
Event (prompt P+1)	−0.03	.686	**0.16**	**.003**	0.09	.249	**0.20**	**.011**
Outcome (prompt P–1)	**0.42**	**<.001**	**0.38**	**<.001**	**0.44**	**<.001**	**0.28**	**<.001**
Gender	**0.14**	**.021**	0.02	.534	0.01	.872	0.02	.672
Age	0.00	.905	0.01	.219	0.02	.098	0.00	.743
Tuesday	−0.03	.627	−0.03	.439	−0.02	.692	0.03	.587
Wednesday	0.08	.152	0.02	.527	−0.01	.814	0.06	.274
Thursday	−0.07	.227	0.00	.918	0.00	.927	0.02	.682
Friday	−0.03	.562	−0.02	.583	0.00	.984	0.03	.523
Saturday	0.01	.932	−0.02	.602	−0.01	.817	0.03	.593
Sunday	−0.10	.098	−0.02	.609	0.04	.464	0.01	.796

Note. Unconditional ICCs were calculated using a random-effects-only model (i.e., no fixed effects). Marginal and conditional R^2 were calculated with the MuMIn package in R and represent the variance explained by the fixed effects alone and the fixed and random effects together, respectively (Bartón, 2020). Bolded values in the fixed effects are significant at $p < .05$.

for negative affect, $b = 0.16$, 95% CIs [0.05, 0.26], $z = 3.00$, $p = .003$, $f^2 = .004$, and anxiety, $b = 0.20$, 95% CIs [0.05, 0.35], $z = 2.53$, $p = .011$, $f^2 = .004$.

Lastly, we examined the effect of reporting an event on outcomes measured the following day. As before, the best predictor of anxiety, depression, negative affect, and positive affect on Day D+1 was each outcome reported on the previous day, Day D–1 (see Table 5). When accounting for the previous day's outcome and all other covariates, the effect of a reported discrimination event on next day outcomes was not significant for any of the four outcomes.

Individual coping responses. In an exploratory way, we examined whether quantitative self-reported individual differences in coping style, self-esteem, and ethnic identity moderated the effect of experiencing discrimination on the following prompt. Each moderator was included in separate models predicting each outcome on prompt P+1 and allowed to interact with the dummy coded variable describing whether an event had been reported on prompt P.[10] No significant interactions were found for any moderators or any outcomes (all ps $> .153$; see Table S1 in Supplemental material), suggesting none of the individual differences moderated the effect of a discrimination event on the subsequent prompt.

Follow-Up Focus Groups

Since a quantitative approach did not uncover successful approaches to coping following instances of discrimination, we supplemented

Table 5. Model results for next day (D+1) outcomes.

	Positive affect		Negative affect		Depression		Anxiety	
Unconditional intraclass correlation coefficient								
Participant	.68		.71		.70		.65	
Model fit	*Marg.*	*Cond.*	*Marg.*	*Cond.*	*Marg.*	*Cond.*	*Marg.*	*Cond.*
R^2	.16	.62	.12	.65	.12	.63	.05	.59
Random effects	*Var.*	*SD*	*Var.*	*SD*	*Var.*	*SD*	*Var.*	*SD*
Participant	.27	.52	.13	.36	.24	.49	.25	.50
Residual	.22	.47	.09	.30	.18	.42	.19	.43
Fixed effects	*Est.*	*p*	*Est.*	*p*	*Est.*	*p*	*Est.*	*p*
Intercept	**1.76**	**<.001**	**1.10**	**<.001**	**1.15**	**<.001**	**1.46**	**<.001**
Event (day D)	−0.02	.629	0.01	.600	0.04	.278	0.01	.692
Event (day D+1)	0.01	.866	0.04	.138	−0.01	.827	0.03	.447
Outcome (day D–1)	**0.30**	**<.001**	**0.28**	**<.001**	**0.27**	**<.001**	**0.18**	**<.001**
Gender	0.12	.069	0.02	.658	0.00	.954	0.03	.602
Age	0.01	.482	0.01	.269	0.02	.082	0.00	.905
Tuesday	**−0.07**	**.043**	−0.04	.061	−0.02	.444	−0.03	.438
Wednesday	**−0.07**	**.054**	−0.03	.142	−0.02	.445	−0.05	.144
Thursday	**−0.07**	**.049**	**−0.07**	**.003**	−0.05	.140	**−0.10**	**.003**
Friday	−0.06	.096	**−0.10**	**<.001**	−0.04	.171	**−0.14**	**<.001**
Saturday	**−0.11**	**.003**	**−0.07**	**.002**	−0.03	.395	**−0.13**	**<.001**
Sunday	−0.03	.382	−0.02	.469	0.01	.641	−0.01	.724

Note. Unconditional ICCs were calculated using a random-effects-only model (i.e., no fixed effects). Marginal and conditional R^2 were calculated with the MuMIn package in R and represent the variance explained by the fixed effects alone and the fixed and random effects together, respectively (Bartón, 2020). Bolded values in the fixed effects are significant at $p < .05$.

the quantitative data with qualitative data from semi-structured focus groups to better understand the return to baseline for negative outcomes and the increase in positive affect in the several hours following a reported event. Using a mixed-methods approach in this way provides a greater depth of information, contextualizes the results, and helps strengthen inferences, especially when examining a new or unexpected pattern of results (Almalki, 2016; Doyle et al., 2009; Fetters et al., 2013). To accomplish this, a subset of participants from the EMA study participated in post-study focus groups that discussed participants' experiences in the EMA study and their interpretation of the study results. Although focus group discussion covered a range of topics that were explored through probing questions, thematic analysis focused on the kinds of activities participants tend to engage in immediately after experiencing discrimination, which may contribute to an increase in positive affect.

Several common themes emerged across the post-study focus groups in terms of what participants did after experiencing and reporting an instance of discrimination. One common theme was that participants reached out to friends and family, which is consistent with quantitative research showing the positive benefit of social support-seeking among marginalized groups that buffers the negative effect of discrimination on health (Odom & Vernon-Feagans, 2010; Utsey et al., 2008). In this study, social support following discrimination had a positive effect on mood and mental health in several different ways. One positive effect was that friends with similar experiences were able to validate participants' feelings and understand their experience, which is especially important in ambiguous situations and provides participants with reassurance that their own

emotional reactions were appropriate. Second, spending time with friends provided a positive distraction, along with other activities participants engaged in with the purpose of lifting their mood, like listening to music, watching videos online, taking a nap, or going to the gym. Most importantly, conversations with friends and family provided an opportunity for participants to process what had happened and to vent, confronting their negative emotions and providing closure. One participant said, "You feel happier about it because you spoke to somebody that relates to your issues and you guys got over it and moved on."

Reflecting on an interaction and processing it, including one's emotional reaction to it, was not limited to conversations with friends and family. Several participants described that even just the act of reporting the event using the TigerAware app as part of the study had a positive benefit. One participant said,

> When I was [participating in the study], I thought about how good you feel to let that stressor go. . .[you] feel light and airy about it versus if you're holding it in and you're kind of just like, 'Ok, this is my thing to carry.' So that's just something that I experienced when I did report [a discrimination event]. You know, I felt better, I got it off my chest.

Another participant explained the positive bump in affect as,

> It's a reflecting on it versus it happened and you don't think about it . . . because there is an app asking you questions about it and so you sort of look through it and you get to kind of analyze how you're feeling in that moment vs suppressing those emotions.

This act of reflection, processing, and reporting seemed to be similar to the benefit of journaling or writing about an event, in that it allowed participants to confront their experience and gain closure rather than attempting to suppress the event and letting the negative emotion build (Pennebaker, 1997; Pennebaker & Seagal, 1999).

Last, in addition to the benefits of processing the interaction, participants described reporting a discrimination event in the app as a form of taking action. One participant said, "Because I'm reporting it, I feel like I'm doing something about it." Another explained that by reporting something in the study,

> I feel as though there's actually probably going to be something done about it, or somebody's going to bring it to somebody's attention . . . even though I didn't go to Title 9 or anybody like that, I went and I said something about it on a report.

Thus, even though this act of reporting in a research study was unlikely to result in any punitive action against the perpetrator of the discrimination, participants felt they were taking direct action simply by reporting their experience and contributing to the scientific understanding of discrimination.

All of these factors, including receiving validation from friends and family, engaging in positive distractions, reflecting on and processing the event, and feelings of taking action, may have contributed to participants' increases in positive affect after reporting a discrimination event during the course of the study.

Discussion

Experiencing racial discrimination is substantially related to both mental and physical health, as demonstrated by three decades of research and several large meta-analyses (Mays et al., 2007; Pascoe & Richman, 2009; Schmitt et al., 2014). The biopsychosocial model of racism and health (Clark et al., 1999) suggests that events perceived as racist have both acute and chronic effects on psychological and physiological stress. To date, much of the research examining the effect of discrimination on health has examined acute and chronic effects separately. In this study, we used a mixed-method approach combining EMA (Trull & Ebner-Priemer, 2013) and semi-structured focus groups to examine

how discrimination affects fluctuations in mental health at various delays, and how responses to discrimination events may contribute to this relationship.

During the EMA study, we quantitatively examined the effect of reports of racial discrimination on both immediate and delayed outcomes relevant to mental health by repeatedly measuring both reports of discrimination and participants' affect, anxiety, and depression over the course of several weeks. Because of the nature of the repeated assessment, we could test the effect of reporting an instance of discrimination at several different delays and examined the immediate effect, the delayed effect at the subsequent prompt several hours later, and the delayed effect on the subsequent day. The temporal pattern that emerged was quite complex. Reporting an instance of discrimination had an immediate negative effect, resulting in higher levels of negative affect, depression, and anxiety on prompts when an event was reported, relative to prompts where no event was reported. This is consistent with laboratory studies that have shown an acute effect of experiencing or witnessing discrimination on mental stress responses (Bennett et al., 2004) and physical stress responses (for a review, see Lockwood et al., 2018). However, rather than seeing this negative effect persist until the next prompt or the next day, as has been shown in other intensive longitudinal studies (Ong et al., 2013; Torres & Ong, 2010), there were no differences in negative affect, depression, and anxiety on the subsequent prompt (prompt P+1) as a function of whether discrimination was reported on prompt P. Instead, positive affect actually increased, which, to our knowledge, has not been reported in previous literature.

Because of the number of statistical tests conducted in this research and because this bump in positive affect within several hours of reporting an instance of discrimination has not previously been found in other daily diary studies, it is possible that this is a spurious result and should therefore be investigated in future research. However, it is consistent with the idea of resilience and coping written about in other literature (Bottrell, 2009; Brondolo et al., 2009; Brown & Tylka, 2011; Forsyth & Carter, 2014; Kubiliene et al., 2015; Rutter, 2012). To assist with the interpretation of these novel results, we used a CBPR-inspired approach to discuss and interpret the results with participants. In post-study focus groups, a subset of the individuals who participated in the EMA study described different types of responses or coping that they engaged in following an instance of discrimination, which contributed to a lifting of affect. Themes in participants' responses included seeking social support from friends and family, engaging in mood-lifting or distracting activities, and using the act of reporting as a way to process an interaction, take action, and/or gain closure. Thus, both individual-focused and social-group or community-focused responses were reported as effective.

It is important to consider that for at least some of the participants, the methodology itself (i.e., reporting and reflecting on instances of discrimination) may have contributed to the observed bump in positive affect following reports of discrimination. Although this reactivity was unintended, it is consistent with other research on the benefits for emotion regulation of writing about stressful experiences (Lepore et al., 2002; Pennebaker, 1997; Pennebaker et al., 1990). Future research should consider how the daily act of reporting, especially prevalent in EMA or daily diary designs, may alter participants' typical responses to discrimination and thus its impact on health. Additionally, although the positive benefit of reporting in this study specifically is unlikely to have led to any follow-up or punitive actions being taken to hold the perpetrators accountable, universities and institutions should consider how complaint and rights processing mechanisms at a structural level encourage or discourage reporting. Efforts should be made to improve the environment surrounding the reporting of daily race-based hassles, not just to improve the racial environment by holding perpetrators accountable and making Black students feel heard and supported by the institution, but for the

possible positive benefits for Black students who report such events.

Lastly, we examined the effect of reporting a discriminatory event on next day affect and mental health and found no continued effect, either positive or negative. This contrasts with studies showing a continuing negative effect of discrimination on both mental health (Douglass et al., 2016; Hoggard et al., 2015; Ong et al., 2013; Seaton & Douglass, 2014; Torres & Ong, 2010) and physical stress outcomes, including cortisol (e.g., Zeiders et al., 2018). It is unclear why we did not replicate previous studies' findings on the negative spillover of discriminatory events into the next day or week; this may have had something to do with differences in the sample (e.g., age, education level, racial/ethnic group), methodology (e.g., once-a-day assessment, how discrimination is measured), or outcome (e.g., depression, social anxiety, cortisol). See more discussion of issues related to sample generalizability below.

Although these results may seem encouraging, in that participants within our sample who had access to a supportive social networks or other coping strategies mentioned in the focus groups seemed able to regulate their mood/affect quite quickly, we encourage readers to exercise caution in overinterpreting these results. Chronic lifetime effects of discrimination have been clearly and well-documented in other studies, as have the acute stress effects of a single instance of discrimination on both physical and mental health, the latter of which we have replicated in our study. That the discrimination reported in daily life over the course of a month did not seem to have a lagged effect in our study suggests merely that lagged effects may not be a mechanism by which acute effects translate into chronic effects. Future research should consider other possibilities, including structural and systemic forces that give rise to both long-term effects and increase exposure to interpersonal discrimination, accumulation of stress through repeated exposure to discrimination over the lifetime, specific emotional responses such as anger (e.g., Pittman, 2011; Terrell et al., 2006), rumination about discrimination (Brosschot et al., 2006; Hoggard et al., 2012; Miranda et al., 2013; Williams et al., 2019), and vigilance-related processes (Himmelstein et al., 2015; Hines et al., 2018; LaVeist et al., 2014; Powell et al., 2016; Watson-Singleton et al., 2019), all of which may expand our understanding of how the acute effects of discrimination contribute to chronic effects. Additionally, because of the relatively short duration of the EMA study (1 month), very few of the reported events were instances of "major" racial discrimination (e.g., "You were unfairly stopped, searched, or questioned by the police or campus security"; Williams et al., 1997), which happen less frequently during one's lifetime but have a much longer-lasting impact. Future research should examine the impact of these more intense and disruptive forms of discrimination. Last, the existence of racial discrimination should be concerning, regardless of its health consequences, because of its implications for racial justice and equity.

Limitations in Estimating Frequency of Discrimination

Although the number of discrimination events reported on average in this study (2.4 events over the 4-week period, or 0.6 events per week) is consistent with some previous reports (e.g., Ong et al., 2009; Swim et al., 2003), this may be an underestimation of the frequency of these kinds of interactions, as other studies have recently documented higher frequencies of reporting discrimination among Black participants (e.g., discrimination occurring several times per day; English et al., 2020; Joseph et al., 2020; Seaton & Douglass, 2014).

One contributor to the lower rate of reporting in the current study was the restriction to events of interpersonal discrimination, which ignores the contribution of vicarious discrimination (Douglass et al., 2016; English et al., 2020). Vicariously experienced discrimination is facilitated by the Internet and social media, which has made it much more common and feasible for individuals to both share their experiences and

see footage of racial injustices that others experience. Recent research has begun to show the significant impact of vicarious discrimination on health, as witnessing instances of discrimination, even if one is not the target, elicits a physiological stress response (Morris-Prather et al., 1996; Ozier et al., 2019) and impacts mental health (Holloway & Varner, in press; Louie & Upenieks, 2022).

Another contributor to underreporting was a tendency among participants to "brush off" often-occurring but minor events because they did not seem significant enough to report. In the follow-up focus groups, a number of participants were surprised that interpersonal slights or harassment composed almost 50% of the reported events. Several participants said that they experienced other forms of discrimination much more often, including spotlighting and assumption of inferiority, which may have been underreported because of how frequently they occur. In other words, when a particular type of interaction occurs repeatedly, participants become desensitized to it and the interaction is normalized, even if upon reflection, participants believe the event to be race-related and thus discriminatory (also see Basford et al., 2014). One participant in the focus groups spoke to this, saying, "I honestly didn't report every single incidence just because I am so accustomed to it. It is almost normal at this point, I expect it." This may also be a result of the cognitive dilemma described by Sue and colleagues (2007), where ambiguous events can either be attributed to discrimination or not, which has implications for how the person should respond. Given the psychological or otherwise instrumental cost to attributing ambiguous events to discrimination—including the time cost of reporting an instance of discrimination in this study—participants may choose to discount or overlook subtle or ambiguous instances of discrimination.

Limitations to Generalization

Because of our methods of recruiting there are two important issues that should be considered when interpreting these results. First, our sample consisted of university students, who on average, come from higher socioeconomic backgrounds and may have different coping strategies than their non-university Black peers, as shaped by their groups and institutional or structural forces. For example, confrontation was not identified in our study as a common response, but has been reported as an often-used response among working- and middle-class African Americans (Fleming et al., 2012). Additionally, the university setting is likely to affect both the type and frequency of discrimination the participants in our sample experienced. For these reasons, we should not generalize our estimates of the frequency or type of discrimination to other racial minority groups or even to what Black individuals may experience outside the university setting. Other research suggests, for example, that Black high schoolers aged 13 to 17 (English et al., 2020) and members of a community sample (Joseph et al., 2020) may experience and report discrimination at higher rates.

Additionally, our sample was predominantly women, which is an important consideration when interpreting the results. As highlighted by research on intersectionality (Crenshaw, 1989), Black women and men often experience different forms of discrimination (Bowleg et al., 2016; Harnois & Ifatunji, 2011), experience different consequences of discrimination (Assari et al., 2017; Seaton et al., 2010), and cope with discrimination in different ways (Ortiz, 2019; Thomas et al., 2015; Williams & Lewis, 2019). Future research should consider how temporal fluctuations in daily mental health may respond to discrimination differently among Black men, especially in response to gendered forms of discrimination, and how different forms of coping are instrumental.

Conclusion

A mixed-method approach combining EMA and follow-up focus groups allowed for the investigation of complex temporal dynamics in the relationship between discrimination and mental health. Repeated measurement of real-life experiences of discrimination, affect, anxiety, and depression revealed a complex temporal

relationship, such that discrimination had an immediate negative effect, but after a few hours, this negative effect faded and instead increases in positive affect were evident. Neither positive nor negative effects of discrimination persisted until the next day. Qualitative focus groups probed the ways in which the participants responded to instances of discrimination in their daily lives, including seeking social support, engaging in positive affect-lifting activities, and reflecting on and processing the interaction, which contributed to an increase in positive affect following an instance of discrimination. Although we did not find lagged effects of discrimination, research should examine other mechanisms by which the acute negative effect of discrimination translates into a long-term effect.

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Supplemental material

Supplemental material for this article is available online.

Notes

1. A simplified model was used to conduct a power simulation to reduce the number of parameters needed to be assumed, as power in multilevel models depends on a number of parameters (Arend and Schäfer, 2019). Our power simulation used the following assumed parameters: 1) a 90% completion rate resulting in at least 75 measurements per individual; 2) that the effect size of racial discrimination on outcomes would be .24, as calculated in Pieterse et al. (2012); 3) that the standard deviation in all random effects is 0.7 (Gelman & Hill, 2007); and 4) that the intercepts and slopes associated with each subject do not correlate (Gelman & Hill, 2007). According to the power curve produced by the simulations, 80% power was achieved at approximately 60 individuals under these assumptions. Thus, we exceeded the planned sample size.
2. Rather than completing random prompts sent by the TigerAware app at random times throughout the day, this participant instead initiated event-based reports at their own convenience, even when no discrimination had occurred. Because affect and mood were non-randomly sampled throughout the day as a result, this participant's data were excluded.
3. Examples of questions asked in every focus group: How has your experience as a Mizzou student been affected by your race, in both positive and negative ways? How often do you experience an ambiguous interaction that may be the result of discrimination but you're not sure? How long do you think about those kinds of experiences after they occur? Are there certain situations or environments where you feel particularly on edge or vigilant? What is the impact of hearing about other instances of discrimination either inside or outside of Mizzou?
4. Examples of questions asked in every focus group: Is [the types of discrimination described by participants in the study] consistent with your experience? Are you surprised by the prevalence of any of these categories [of discrimination] or feel any category is missing? What factors contribute to reporting something as "discriminatory" or "race-related"? Why do you think we see a bump in positive affect by the next prompt? What do you do immediately after experiencing discrimination?
5. An aggregate was created for each outcome using the following items: Positive affect: active, alert, attentive, determined, excited, inspired, proud, strong; Negative affect: afraid, scared, nervous, jittery, irritable, hostile, guilty, ashamed, upset, distressed; Depression: depressed, sad, lonely; Anxiety: anxious, worried, restless.
6. Wilkinson notation for model: Outcome_promptP ~ Event_promptP + DayWeek + Gender + Age + Outcome_promptP-1 + (1|Participant) + (1|Participant:DayStudy)

7. Wilkinson notation for models: Outcome_promptP+1 ~ Event_promptP + DayWeek + Gender + Age + Outcome_promptP-1 + Event_promptP+1 + (1|Participant) + (1|Participant:DayStudy)
8. Wilkinson notation for models: Outcome_dayD+1 ~ Event_dayD + DayWeek + Gender + Age + Outcome_dayD-1 + Event_dayD+1 + (1|Participant)
9. Approximate Cohen's f^2 values were calculated using conditional R^2 as described in Nakagawa et al. (2017). Conditional R^2 was calculated using the MuMIn package in R (Bartón, 2020).
10. Wilkinson notation for models: Outcome_promptP+1 ~ Event_promptP*Moderator + DayWeek + Gender + Age + Outcome_promptP-1 + Event_promptP+1 + (1|Participant) + (1|Participant:DayStudy)

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