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Depression And Perceived Stress as Mediators Between Racial Microaggressions and Somatic Symptoms in College Students of Color

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Abstract

The current study examined the ability of mental health indicators, namely depression and perceived stress, to mediate the relationship between racial microaggressions and health among a racially/ethnically diverse sample of 467 college students of color. Consistent with what was hypothesized, the main findings revealed that depression and perceived stress mediated the relationships between types of racial microaggressions, specifically low-achieving, invisibility, and

criminality, and somatic symptoms. The study results suggest that there may be multiple pathways by which specific racial microaggressions might be associated with psychological and somatic health indicators.

Racial microaggressions are racially related perceived slights, offenses, invalidations, or harmful messages that are communicated to people of color on a frequent basis (Pierce, Carew, Pierce-Gonzalez, & Wills, 1977; Sue et al., 2007). Racial microaggressions are stressful experiences that are encountered frequently by students of color (Solórzano, Ceja, & Yosso, 2000; Torres-Harding, Andrade, & Romero Diaz, 2012; Torres-Harding & Turner, 2015; Yosso, Smith, Ceja, & Solórzano, 2009). The relationships between these ambiguous racially related mistreatments and interpersonal experiences and the health and well-being of students of color is unclear. For instance, the empirical research has reported robust findings for the negative relationship between racial/ethnic discrimination and self-reported physical health (Brondolo, Brady ver Halen, Libby, & Pencille, 2011). However, minimal work has investigated racial microaggressions and physical health, let alone identified the underlying mechanisms connecting this link. Therefore, the current study will examine the association between racial microaggressions and physical health as well as the ability of depression and perceived stress to function as mediators in a racially and ethnically diverse sample of college students.

Racial Microaggressions

Initially, Pierce et al. (1977) described racial microaggressions as seemingly innocuous nonverbal interpersonal exchanges that were subtle, automatic, and offensive “putdowns” of African Americans. Elaborating on the work by Pierce and colleagues, Sue et al. (2007) defined *racial microaggressions* as “brief, everyday exchanges that send denigrating messages to people of color because they belong to a racial minority group (p. 273).” Sue and colleagues (2007) developed a taxonomy of microaggression types. They described three types of racial microaggressions: *microassaults*, overtly hostile or demeaning interpersonal interactions or attacks, such as racial name-calling; *microinsults*, rude or insensitive verbal or nonverbal behaviors toward a person of color or that denigrate that person’s culture or heritage; and *microinvalidations*, verbal or nonverbal communications that exclude, marginalize, ignore, or nullify the views, participation, perspectives, experiences, or realities of people of color.

Individuals who engage in racial microaggressions, especially microinsults and microinvalidations, toward people of color may not be fully aware that they are behaving in a racially unfair or biased manner, which makes identifying such racial microaggressions difficult (Sue et al., 2007). This lack of recognition fits with what is known in the psychological literature regarding the nature of contemporary racism, whereby individuals who hold implicit racial biases may largely be unaware of the extent to which such biases influence their behavior (Dovidio, 2001). Hence, detecting and coping with racial microaggressions may be quite challenging for people of color because of their ambiguous nature and because the perpetrators themselves may not exhibit an explicit intent to demean the person of color (Sue et al., 2007). These subtle and negative race-related experiences, because of their chronic nature, are thought to result in a cumulative effect on the health and well-being of people of color (Huynh, Devos, & Dunbar, 2012; O’Keefe, Wingate, Cole, Hollingsworth, & Tucker, 2015; Sue et al., 2007), and thus might contribute to observed mental and physical health disparities for people of color in the United States (Jackson, Knight, & Rafferty, 2013).

Racial microaggressions may negatively impact health because individuals must expend significant cognitive and emotional energy in order to make sense of, cope with, and address these ambiguous, stressful, and racially threatening situations (Huynh et al., 2012; Sue et al., 2007; Torres-Harding & Turner, 2015). Because racial microaggressions occur in response to one's visible racial group identity, these experiences may be particularly threatening to one's sense of self or one's relationships with others (Sue et al., 2007). These experiences might be more harmful or upsetting than other types of daily stressors because they can serve as painful reminders of long histories of racism, injustices and social exclusion, and that pejorative attitudes toward one's group still exist (Torres-Harding & Turner, 2015).

Racial Microaggressions and Health

An emerging literature has started to examine the relationship between experiencing racial microaggressions and the health and well-being of people of color. In a sample drawn from college and community settings, Nadal, Wong, Sriken, Griffen, and Fujii-Doe (2015) found that experiencing racial microaggressions in general, and experiencing microinvalidations in particular, were associated with generally poor mental health in 506 Asian Americans. Huynh (2012) found that, in 360 Latino and Asian adolescent high school students, negative treatment microaggressions (i.e., being treated as a second class citizen and being ignored in different settings) significantly predicted depressive and somatic symptoms.

In addition to research with community samples, several researchers have specifically examined the relationship between racial microaggressions and health among college students of color. Qualitative investigations examining the experiences of African American and Latino students on campus have found that experiencing racial microaggressions contributed to a range of negative emotional and psychological reactions, an increased sense of discomfort, isolation and social exclusion, and contributed to an overall negative, hostile racial campus climate (Solórzano et al., 2000; Yosso et al., 2009). Several quantitative investigations have reported a link between experiencing racial microaggressions and negative mental and physical health outcomes in college students of color. Ong, Burrow, Fuller-Rowell, Ja, and Sue (2013) found that, within a sample of 152 Asian American college students, higher frequencies of daily racial microaggressions were associated with more self-reported negative affect and more somatic symptoms. Microinvalidation microaggressions were inversely associated with positive affect and more strongly contributed to negative affect and increased somatic symptoms (Ong et al., 2013). Similarly, Torres, Driscoll, and Burrow (2010) found that high achieving African American students enrolled in doctoral programs were subject to microaggressions which included having their abilities questioned, being socially isolated, marginalized and unfairly singled out, or being treated as if they were a criminal because of their race. Exposure to these racial microaggressions resulted in greater stress and depression symptoms 1 year later.

Nadal, Griffin, Wong, Hamit, and Rasmus (2012) found that, in a racially/ethnically diverse sample of 506 college students and community members, experiencing more microinvalidation microaggressions was associated with poorer overall mental health. Liao, Weng, and West (2016) found that, in a sample of 126 African American university students, perceived racial microaggressions were associated with more anxiety symptoms, after controlling for age. Similarly, in a racially/ethnically diverse sample of 405 college students, O'Keefe and colleagues (2015) found that the total number of racial

microaggressions was associated with suicidal ideation and, furthermore, depression mediated this link. Finally, among a sample of 178 participants of racially/ethnically diverse college students, Blume, Lovato, Thyken, and Denny (2012) found that experiencing racial microaggressions was associated with greater depression, decreased self-efficacy, and increased binge-drinking. As is evident from this review, the empirical research has focused on the negative psychological consequences associated with racial microaggressions with less work examining physical health outcomes (Huynh, 2012; Ong et al., 2013).

Mediational Model

The emerging research regarding the health consequences associated with racial microaggressions fits well with the literature examining the effects of racism on health. Research on racism has consistently found a negative association with mental and physical health (Carter, 2007; Paradies, 2006; Pascoe & Smart Richman, 2009), with stronger effects found for mental health outcomes when compared to physical health outcomes (Paradies et al., 2015). Given that the construct of racial microaggressions overlaps with other types of racism, such as discrimination (Pascoe & Smart Richman, 2009), racial battle fatigue (Smith, Allen, & Danley, 2007), race-related stress (Utsey & Ponterotto, 1996), or race-based traumatic stress (Carter, 2007), it is expected that racial microaggressions would have similar negative associations with physical and psychological symptoms. Given that there are less consistent associations with physical health outcomes (Paradies et al., 2015), it is possible that there may be important mediating or moderating variables that might affect the relationships between exposure to racism and physical symptomatology.

Researchers have proposed several pathways whereby racism-related experiences such as racial microaggressions may be associated with poorer physical health status. Brondolo, Hausmann, and colleagues (2011) proposed a model whereby race and ethnicity related mistreatment contributes to physical health status through both emotional (i.e., depression) and cognitive (i.e., perceived stress) pathways. In support of an emotional mediational pathway, they found that lifetime exposure to discrimination was related to depression, anxiety, and hostility, which in turn, was associated with negative physical health. As such, it is possible that depression and perceived stress might mediate the relationship between racial microaggressions and somatic or physical health symptoms.

Depression as a potential mediator between racial microaggressions and physical symptoms

Racism has been consistently linked to depression across ethnic minority groups (Lee & Ahn, 2011, 2013; Paradies et al., 2015). Racism-related experiences such as racial microaggressions may contribute to depressive symptoms because individuals experience social exclusion and devaluation due to their own racial or ethnic group identity (Brondolo, Brady ver Halen, et al., 2011). Racism can negatively impact an individual's self-identity and self-esteem which can contribute to a sustained negative mood (Brondolo, Brady ver Halen, et al., 2011). Further, racism is an uncontrollable stressor because individuals cannot change their group membership or phenotypic markers of race and ethnicity, and if racism-related maltreatment is pervasive or consistent, the person may experience a degree of helplessness which might also contribute to depressive symptoms (Brondolo, Brady ver Halen, et al., 2011).

In their model, Brondolo, Brady ver Halen, and colleagues (2011) proposed that depression, in conjunction with other variables, may in turn be associated with physical health status. The notion that

depression is associated with somatic symptoms has been supported in past empirical research (Haug, Mykletun, & Dahl, 2004). Additionally, other researcher has suggested that depression may function as a mediator between discrimination-related experiences and somatic symptoms. For example, in a sample of 4649 Asian Americans from diverse nationalities, Mereish, Liu, and Helms (2012) found that psychological distress, which included items assessing depression, mediated the relationship between everyday perceived discrimination and somatic symptoms. Additionally, in a sample of 680 Black women, Gibbons et al. (2014) found that internalizing symptoms, including depressive symptoms, were found to mediate the link between exposure to discrimination and general health status. Given that depression has been commonly reported after exposure to racism-related experiences, we wished to examine the ability of depressive symptoms to mediate the relationship between microaggression experiences and somatic symptoms.

Stress as a potential mediator between racial microaggressions and physical symptoms

Some research has provided support for perceived stress as a potential mediator linking discriminatory experiences to physical health. For instance, Huynh (2012) showed that perceived stress, along with anger, mediated the relationship between racial microaggressions and somatic symptoms among Latino and Asian American adolescents. Although conceptualized in a number of ways in the empirical literature, the traditional stress and coping model defines stress as a cognitive process that is in response to threatening stimuli, experiences, or situations (Folkman, Lazarus, Dunkel-Schetter, DeLongis, & Gruen, 1986). As such, perceived stress involves a cognitive appraisal that one's own resources are overwhelmed or exceeded in the face of demands, challenges, or threats (Cohen, Kamarck, & Mermelstein, 1983; Contrada, 2011; Smith & Kirby, 2011). Cognitive appraisals of stimuli as overwhelming and threatening to one's well-being may evoke coping responses to either regulate emotions or alter the potential threatening circumstance (Folkman et al., 1986) and may also contribute to a range of psychobiological consequences.

Researchers are increasingly conceptualizing racial microaggressions as a type of environmental or psychosocial stressor (Torres-Harding & Turner, 2015; Wong, Derthick, David, Saw, & Okazaki, 2014) that may evoke perceived stress and consequent psychobiological stress responses. Racial microaggressions may be particularly likely to contribute to one's general sense of perceived stress because the presence of racism in a given situation signals the possibility that an individual may be subject to future racial threats, restriction of rights or opportunities, racial discrimination or violence, or negative and unfair evaluations (such as poorer grades, poor performance evaluations, police harassment, etc.; Brondolo, Brady ver Halen et al., 2011).

In turn, perceived stress may be associated with somatic symptoms or physical health. Psychological functioning, including psychosocial stress and negative affect, is thought to contribute to physical symptomatology such as gastrointestinal difficulties, cardiovascular symptoms, and respiratory symptoms (Schat, Kelloway, & Desmarais, 2005). Some research has noted that perceived stress served a mediating role in the relationship between racism and health status (Paradies, 2006). Similarly, Patel, Tabb, Strambler, and Eltareb (2015) found that cognitive appraisal of severity of threat or harm mediated the link between exposure to ambiguous discrimination and both psychological health and academic outcomes. Thus, it is possible that perceived stress, whereby the individual perceived that

they are overwhelmed by or unable to meet environmental demands, can function to mediate the link between racial microaggressions and somatic or physical symptoms.

In summary, racial microaggressions have been associated with physical health yet the mechanisms underlying this phenomena are not well understood. Depression and perceived stress are two pathways that may help to explain the inimical effects of racial microaggressions. As an indicator of physical health status, somatic symptoms provide evidence that the individual is experiencing physical strain, perhaps after exposure to psychosocial stressors (Schat et al., 2005). Some researchers have suggested that the expression of psychological distress in some non-Western cultural groups is discouraged and highly stigmatized among groups, such as Asian Americans and Pacific Islanders (Mereish et al., 2012), which may lead individuals to underreport psychological symptoms in favor of somatic expressions of illness.

Purpose of the Current Study

Racial microaggressions have been linked to poor indicators of health in college students of color. Given past empirical research identifying differences across types of racial microaggressions (Huynh, 2012; Nadal et al., 2012; Nadal et al., 2015; Ong et al., 2013), it remains unclear how unique racial microaggression experiences are associated with somatic symptoms or physical health. Further, the connection between racial microaggressions and somatic symptoms may be mediated by depression and perceived stress. In other words, racial microaggressions could be associated with physical health concerns through increases in depressive symptoms and perceived stress. As such, the goals of the current study were to (1) examine different types of racial microaggressions in relation to indicators of physical health and (2) to test the ability of depressive symptoms and perceived stress to mediate the relationship between racial microaggressions and somatic symptoms among a racially diverse group of college students. Specifically, we hypothesized that experiencing different types of racial microaggressions would be associated with increased somatic symptomatology and psychological symptoms. Additionally, we hypothesized that, as consistent with the Brondolo, Hausmann, et al. (2011) model, the relationship between experiencing racial microaggressions and general somatic symptoms would be mediated by perceived stress and depressive symptoms.

Method

Procedure

All participants were recruited from a racially and ethnically diverse midsize private, secular university in a large Midwestern city. Students were recruited into the study using the psychological research online subject pool website, and via leaders of multicultural campus student groups. The questionnaire was administered via an online survey link. Students read an implied consent statement and then completed the study questionnaires. Completion of the survey took approximately 15 to 20 min. All the responses were anonymous. Although the focus of recruitment efforts was inviting students of color to participate in the study, any student, regardless of race, was allowed to participate. The results from students who identified as White, Caucasian, or European American were not included the study analyses. All study procedures were reviewed and approved by the Roosevelt University Institutional Review Board (Study: 2011–31; Title: *Impact of Racism on Health*).

Participants

A total of 467 students who identified as being a member of a racial or ethnic minority background were included in the analyses. Ages ranged from 18 to 58, and the mean age of the entire sample was 24.16 years ($SD = 6.86$; with 53 participants not indicating age). Regarding gender, 367 (78.6%) were female, 96 (20.6%) were male (with four people not reporting gender). Regarding race/ethnicity, 176 (37.7%) were African American, 130 (27.8%) were Latino, 106 (22.7%) were Asian American, South Asian, Pacific Islander, or Middle Eastern, 8 (1.7%) were American Indian/Native American, and 47 (10.1%) were biracial or multiracial. Regarding generational level, 51 (10.9%) participants reported to be first-generation immigrants, 167 (35.8%) to be second-generation, 35 (7.5%) to be third-generation, 7 (1.5%) to be international students and/or foreign nationals, and 202 (43.3%) as none of the above (with five participants not indicating generational level). Regarding sexual orientation, 48 (10.3%) students indicated that they identified as either lesbian, gay, bisexual, transgender, queer, or questioning, and 404 (86.5%) identified as heterosexual (with 15 students not reporting sexual orientation). Sixteen (3.4%) individuals identified as having a physical or psychiatric disability.

Measures

Racial microaggressions

The Racial Microaggressions Scale (RMAS; Torres-Harding et al., 2012) contains 32 items that measure the frequency of specific racial microaggressions experiences. For each item, respondents were asked "How often does this happen to you?" with no specific time frame given. All responses were assessed using a four-point Likert-type ordered categorical scale, with 0 = *never*, 1 = *a little/rarely*, 2 = *sometimes or a moderate amount*, and 3 = *often/frequently*. The Foreigner subscale measured how often individuals reported being treated as a foreigner, as not American, or as if they did not belong. The Low-Achieving subscale measured how frequently individuals were treated as if their racial culture was dysfunctional, low achieving, or undesirable, and how frequently others viewed academic success as due to affirmative action or as an, "exception to the rule." The Sexualization subscale measured how frequently individuals reported that others treated them in an overly sexual manner or sexually stereotyped them because of their race. The Criminality subscale measured how frequently individuals reported others treating them as if they were aggressive or likely to engage in criminal behavior. The Invisibility subscale measured how frequently individuals reported that others overlooked, invalidated, or dismissed their views or contributions because of their racial heritage, and the extent to which they felt marginalized by others. The Environmental subscale measured how frequently individuals found themselves in settings in which they are the "only one," and to what extent they observed the absence of people from their own racial heritage in work settings, school settings, media, or positions of authority. Reliability of the frequency subscales, as measured by Cronbach's alpha analyses, was found to be adequate to excellent: Foreigner = .70; Low-Achieving = .87; Sexualization = .83; Criminality = .85; Invisibility = .89; Environmental = .81 (Torres-Harding et al., 2012).

Depression

The Depression Anxiety Stress Scale (DASS-21; Antony, Bieling, Cox, Enns, & Swinson, 1998; Lovibond & Lovibond, 1995) comprises 21 items measuring symptoms of depression, anxiety, and stress in three separate subscales. The 21-item is derived from a longer 42-item version of the scale. Previous research has found these three subscales to be conceptually distinct (McDowell, 2006). The Depression

subscale measures anhedonia, self-depreciation, dysphoric mood; the Anxiety subscale measures symptoms including anxious affect, muscular tension, and autonomic arousal associated with anxiety; and the Stress scale measures general tension and irritability in reaction to environmental stressors (Norton, 2007). The analyses in the current study used the Depression subscale, which, consistent with previous investigations, showed good internal reliability (Depression $\alpha = .94$). Further, the DASS has shown to consistently measure these constructs across four U.S. racial groups: African Americans, Whites, Latinos, and Asian Americans (Norton, 2007).

Perceived stress

The Perceived Stress Scale (PSS; Cohen et al., 1983) is a four-item short form of a 14-item scale assessing perceived stress. Items on this scale measure an individual's general subjective appraisal of whether they are overwhelmed by stressful demands or whether they feel unable to meet these demands. The Total Stress score was used in the present study to give a measure of global perceived stress. It has a range from 0 to 16, with higher scores indicating more global perceived stress. Previous investigations have found that this 4-item scale exhibits good internal consistency ($\alpha = .72$), and it also exhibits adequate test-retest reliability and convergent validity (Cohen et al., 1983).

Somatic symptoms

The Physical Health Questionnaire (PHQ; Schat et al., 2005) measures four dimensions of somatic health: gastrointestinal problems, headaches, sleep disturbances, and respiratory illness. This measure was developed to examine common somatic symptoms that might be potentially impacted by psychological symptoms or psychosocial stress/strain. Items assessed a range of somatic symptoms within these four domains, including difficulty falling or staying asleep, nausea, upset stomach, diarrhea, headache frequency, and the occurrence of colds, flus, and infections. In the current study, the total somatic health score, which is derived by summing the items, was used to measure total somatic symptoms. The internal reliability for the subscales and the total somatic score were very good and ranged between .70 and .90 (Schat et al., 2005). In the current study, total somatic score exhibited very good internal consistency ($\alpha = .84$).

Demographic information

Participants also completed a demographic questionnaire that assessed race/ethnicity, age, sexual orientation, gender, immigration status, work status, and disability status.

Results

Preliminary Analyses

Pearson correlation coefficients were computed to examine the relationships among the predictor variables (see Table 1). Correlations among the microaggression subscales ranged from .108 to .667, indicating that these were interrelated, yet distinct, constructs. Next, we wished to examine whether there may have been differences in reporting of somatic symptoms, perceived stress, and depression across the different racial groups, to determine whether racial group membership might need to be entered as a control variable in subsequent analyses. A series of one-way between-subjects analyses of variance were conducted to compare the differences in physical health, perceived stress, and depression among four of the racial/ethnic groups: African American, Latino/Hispanic, Asian American groups, and multiracial. No cross-racial group differences on any of the health scales were found; thus,

we did not control for racial group membership in subsequent analyses. As shown in Table 1, participant mean scores on the RMAS subscales were highest for Low-Achieving and Environmental, suggesting that these were the types of racial microaggressions most endorsed by the current sample of college students.

Table 1. Intercorrelations Among Racial Microaggression Subscales and Health Indicators

Study measures	1	2	3	4	5	6	7	8	9
1. RMAS Foreigner	—	.11*	.27***	.12**	.35***	.30***	.05	.12*	.13**
2. RMAS Criminality		—	.41***	.59***	.67***	.32***	.13**	.18***	.29***
3. RMAS Sexualization			—	.37***	.45***	.36***	.10 [†]	.10*	.23***
4. RMAS Low Achieving				—	.64***	.39***	.14**	.17***	.33***
5. RMAS Invisibility					—	.50***	.18***	.24***	.30***
6. RMAS Environment						—	.05	.06	.20***
7. Perceived Stress Scale							—	.58***	.35***
8. DASS–Depression								—	.39***
9. Somatic Symptoms–PHQ-9									—
M	.91	.81	.97	1.46	.73	1.43	6.79	6.72	43.34
SD	.86	.83	.94	.74	.69	.79	2.80	5.92	13.80

Note. RMAS = Racial Microaggressions Scale; DASS = Depression, Anxiety, Stress Scale; PHQ-9 = Physical Health Questionnaire.

[†] $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .001$.

Main Analyses

Examining racial microaggressions types and health indicators

In terms of the first study goal, Pearson correlation coefficients were computed to examine the relationships between the microaggression subscales and the health outcome scales (see Table 1). Pearson correlation coefficients indicated that somatic symptoms were strongly correlated with all racial microaggressions types, with Low-Achieving, Invisibility, and Criminality being particularly robust. For depression, all racial microaggressions types were significantly related except for Environmental microaggressions which was nonsignificant. Perceived stress was significantly associated with Criminality, Low-Achieving, and Invisibility but not Foreigner or Environmental microaggressions. The correlation between perceived stress and Sexualization was only marginally significant.

Examining perceived stress and depression symptoms are mediators

Next, mediator analyses were conducted to examine whether general perceived stress and depression symptoms mediate the relationship between racial microaggressions and somatic symptoms. Separate analyses were conducted for each RMAS subscale as the predictor variable while controlling for age and gender. Simple mediation analyses were conducted using Hayes (2013) PROCESS method of mediation analysis in SPSS (Version 25.0; IBM, 2017). The procedures outlined by Hayes (2013, 2015), and the PROCESS macro, were used to test for mediators. These analyses utilize bootstrapping which calculates the total direct and indirect effects by using a large number of samples, 10,000 in this case, to calculate the 95% confidence intervals (CI). Statistical significance ($p < .05$) is determined when CIs

do not contain the value of zero. Bootstrapping has been found to effective in controlling for Type I error rates while not imposing the assumptions of univariate and multivariate sampling distributions (Preacher & Hayes, 2008).

With the Low-Achieving subscale as the predictor variable, the multiple mediator analysis revealed that the overall model was significant $R^2 = .28$, $F(5, 320) = 25.45$, $p < .001$. A significant direct effect was observed by which the Low-Achieving subscale predicted somatic symptoms ($b = 4.97$, $t = 5.56$, $p < .001$; 95% CI [3.21, 6.73]). Table 2 shows that the total indirect effects along with the specific indirect effects of the proposed mediators were statistically significant. The total indirect effects suggest that a one-point increase in Low-Achieving subscale was associated with a 1.41 increase in physical health scores. Although both mediators were statistically significant, contrasts of specific indirect effects suggest that depression symptoms had a significantly greater effect than perceived stress.

Table 2. Test of Indirect Effects Between Microaggressions and Somatic Symptoms

Independent variables	Bootstrap estimate	SE	95% CL Lower Bound	Upper Bound
Predictor: RMAS low-Achieving				
Perceived stress	.30	.21	.74	2.26
DASS–Depression	1.12	.33	.56	1.90
Total	1.41	.38	.74	2.26
Contrasts of specific indirect effects Perceived stress vs. DASS–Depression	-.82	.40	-1.69	-.08
Predictor: RMAS Foreigner				
Perceived stress	.17	.15	-.03	.60
DASS–Depression	.58	.28	.13	1.25
Total	.74	.35	.11	1.49
Contrasts of specific indirect effects Perceived stress vs. DASS–Depression	-.41	.28	-1.09	.06
Predictor: RMAS Sexualization				
Perceived stress	.13	.12	-.03	.48
DASS–Depression	.44	.26	.01	1.03
Total	.57	.31	-.01	1.22
Contrasts of specific indirect effects Perceived stress vs. DASS–Depression	-.32	.25	-.93	.10
Predictor: RMAS Criminality				
Perceived stress	.31	.18	.05	.80
DASS–Depression	1.08	.33	.53	1.83
Total	1.39	.36	.75	2.17
Contrasts of specific indirect effects Perceived stress vs. DASS–Depression	-.77	.39	-1.64	-.09
Predictor: RMAS Invisibility				
Perceived stress	.46	.27	.05	1.12
DASS–Depression	1.46	.43	.75	2.48
Total	1.92	.48	1.12	3.03

Contrasts of specific indirect effects Perceived stress vs. DASS–Depression	-1.01	.54	-2.20	-.03
Predictor: RMAS Environmental				
Perceived stress	-.02	.15	-.37	.27
DASS–Depression	.17	.29	-.38	.76
Total	.15	.39	-.62	.92
Contrasts of specific indirect effects Perceived stress vs. DASS–Depression	-.19	.25	-.71	.30

Note. CI confidence interval; RMAS Racial Microaggressions Scale; DASS Depression, Anxiety, Stress Scale.

The analyses testing the ability of perceived stress and depression symptoms to mediate the relationship between the Foreigner subscale and somatic symptoms indicated that the overall model was significant, $R^2 = .21$, $F(5, 325) = 17.55$, $p < .001$, and a significant direct effect ($b = 1.52$, $t = 1.97$, $p = .049$; 95% CI [.01, 3.02]). The total indirect effects were statistically significant suggesting that a 1-point increase in the Foreigner subscale was associated with a .74-point increase in somatic symptom scores (see Table 3). The specific indirect effects suggest that depression symptoms was a statistically significant mediator, whereas perceived stress was not statistically significant.

With the Sexualization subscale as the predictor variable, the multiple mediator analyses revealed that the overall model was significant $R^2 = .25$, $F(5, 322) = 21.62$, $p < .001$. Although a statistically significant direct effect was observed ($b = 2.88$, $t = 4.10$, $p < .001$; 95% CI [1.48, 4.21]), the total indirect effects were not statistically significant (see Table 3). These analyses did not support the notion that perceived stress and depression symptoms mediate the relationship between Sexualization and somatic symptoms.

Analyses testing the mediational pathways linking Criminality subscale and somatic symptoms showed that the overall model was significant $R^2 = .27$, $F(5, 323) = 23.33$, $p < .001$. The direct effect was also statistically significant suggesting that Criminality microaggressions were predictive of physical health scores ($b = 3.54$, $t = 4.39$, $p < .001$; 95% CI [1.95, 5.13]). As shown in Table 3, the total indirect effects were statistically significant suggesting that 1-point increases in Criminality were associated with 1.39-point increases in somatic symptom scores via the proposed mediational pathways. The specific indirect effects indicated that both perceived stress and depression symptoms were significant mediational pathways. Contrasts of these specific indirect effects suggested that depression symptoms had a greater effect than perceived stress.

With the Invisibility score as the predictor, the multiple mediator analyses revealed a significant overall Model $R^2 = .24$, $F(5, 321) = 20.65$, $p < .001$. Invisibility significantly predicted somatic symptom scores via the direct effect ($b = 3.65$, $t = 3.69$, $p = .0003$; 95% CI [1.70, 5.59]). The total indirect effects were statistically significant in that a 1-point increase of Invisibility was associated with a 1.92-point increase in somatic symptom scores through the mediational pathways (see Table 3). The specific indirect effects for both mediators were statistically significant with contrasts showing that the depression symptoms pathway had a greater effect than perceived stress.

The final test of multiple mediators indicated that, with the Environmental subscale as the predictor, the overall model was significant $R^2 = .24$, $F(5, 321) = 19.81$, $p < .001$. The direct effect was statistically

significant ($b = 2.74$, $t = 3.38$, $p = .0008$; 95% CI [1.14, 4.33]) suggesting that the Environmental microaggressions predicted somatic symptom scores. However, the total indirect effects were not statistically significant (see Table 3) thus not supporting the hypothesis that perceived stress and depression symptoms mediated the relationship between environmental microaggressions and somatic symptom.

Discussion

The current study sought to examine racial microaggressions in relation to general somatic and psychological symptoms among a racially diversity group of college students. Results showed a complex pattern of relationships, with the types of racial microaggressions showing differential associations to physical health. The analyses found significant positive relationships between experiencing Criminality, Foreigner, Sexualization, Low-Achieving, Invisibility, and Environmental microaggressions with the total somatic symptoms. Further, all of the microaggression types except Environmental microaggressions were associated with depression while only Criminality, Low-Achieving, and Invisibility microaggressions were associated with more perceived stress.

Interestingly, all of the microaggression types were significantly associated with total self-reported somatic or physical symptoms, and less strongly associated with psychological reactions of perceived stress and depression. This is in contrast to meta-analytic findings by Paradies et al. (2015), which found stronger effect sizes for mental health symptoms when compared to physical health outcomes. However, Paradies and colleagues' literature review and meta-analysis predominantly included objective health indicators such as the presence of hypertension or body-mass index, and not self-reported physical or somatic symptoms. It is important to note that self-reported somatic symptoms can be indicators of underlying physiological system dysfunction in the immune, endocrine, or autonomic symptoms, as well as psychological conditions, such as depression or anxiety. Future research should examine whether racial microaggressions might also be specifically associated with more objective health indicators or physical health status.

Consistent with previous findings on racism and health, the current associations between racial microaggressions and somatic symptoms showed effect sizes in the small to medium range (Paradies et al., 2015; Pascoe & Smart Richman, 2009). This suggests that Criminality, Foreigner, Sexualization, Low-Achieving, and Invisibility racial microaggressions may have similar associations with psychological symptoms and physical health when compared to more general types of racism-related experiences. In contrast, Environmental and Foreigner microaggressions were less consistently associated with negative somatic health symptoms. They both exhibited smaller effect sizes or were not associated with perceived stress. It is possible that the university context may have influenced these small or nonsignificant findings. That is, the sample was drawn from a racially/ethnically diversity university setting located in a large urban area including many immigrant communities. It is possible, therefore, that being perceived as a foreigner or seeing that one is one of the few within a racially diverse setting, may have been less salient or less frequently encountered within the current sample. Experiencing Environmental and Foreigner microaggressions in settings where few immigrants live or where only one racial or ethnic majority group predominates may be problematic for individuals. For instance, being one of the few of your own racial group in a predominantly White affluent student community may be perceived as more threatening or harmful when compared to being in a setting where no one

racial group predominates. Future research should examine the potential role that the sociocultural context may play in individuals' perceptions of racial microaggressions.

Additionally, the current findings indicated that experiencing Low-Achieving, Criminality, and Invisibility microaggressions were associated with psychological outcomes, namely depression and perceived stress, which were, in turn, associated with somatic symptoms. These mediational findings further our understanding of how different racial microaggressions are associated with both psychological and somatic symptoms. For instance, Low-Achieving microaggressions may be particularly detrimental for the psychological well-being of college students of color because academic and intellectual achievement is the primary focus within a university setting (Torres, Driscoll, & Burrow, 2010). Thus, being treated as if one's intellectual capacities and cultural functioning is inherently poorer may be particularly threatening to one's academic and career goals, and thus, be linked to perceived stress and depression, which would then be associated with increased somatic symptoms.

Similarly, Criminality microaggressions may be associated with poorer outcomes because they might involve being reminded of the possibility of highly threatening situations or encounters with authority figures or police (Smith et al., 2007). Being treated as a criminal, as aggressive, or as an illegitimate member of a college community has been reported to provoke a range of emotional reactions akin to experiencing 'battle fatigue' in African American men (Smith et al., 2007), and this might be associated with depression symptoms and perceived stress, which, as supported with the current findings, are related to somatic or physical health difficulties.

Finally, Invisibility microaggressions might lead to negative psychological reactions and ultimately somatic symptoms because they involve being treated as a second-class citizen, being ignored, excluded, or not acknowledged. Invisibility microaggression experiences may overlap with the concept of social exclusion, which has been proposed to be associated with poorer mental health and more severe psychiatric symptomatology (Mezey et al., 2013).

Thus, the major findings of the current study revealed that different types of racial microaggressions were associated with health indicators through diverse pathways. The mediational analyses indicated that depression showed a stronger indirect effect when compared to perceived stress, which suggests that individuals who experience sadness, guilt, self-blame, or other related symptoms might be particularly vulnerable to also experiencing more physical symptoms. Given that depression symptoms, as measured in the current study, are indicators of a potentially severe or impairing clinical condition, it makes sense that this variable showed a robust indirect effect. As mentioned earlier, Low-Achieving and Invisibility microaggressions may be particularly salient for university students of color which, when experienced, can contribute to lower self-esteem, decreased self-efficacy, and negative mood.

Further, in contrast to previous studies (Nadal et al., 2012), microinsult racial microaggressions (Criminality, Low-Achieving, Invisibility, Sexualization) were more consistently associated with negative psychological and somatic symptoms. Also, Sexualization and Environmental microaggressions were associated with negative physical symptoms directly, and the relationships between these two microaggression types and somatic symptoms were not mediated by either perceived stress or depression. This suggests these two racial microaggression types may be associated with other indicators of health that were not assessed in the current study. These findings highlight the need to

look at these individual types of racial microaggressions separately when examining associations with health outcomes. Microaggression experiences may be qualitatively different and activate different cognitive and emotional responses from an individual. How a person responds to these experiences may depend upon the content and the presumed type of threat represented by the specific microaggression itself. Future researchers should take care to carefully consider, not only the context of the microaggression experiences themselves, but also the specific microaggression types, as the current study found differential patterns of results depending upon the specific microaggression type.

The current study suggests that examining the type of racial microaggressions and the context in which they occur are important to address when unpacking related health consequences. That is, previous investigations have generally viewed racial microaggressions as monolithic experiences often measured via a total scale score. The differential associations of microaggressions with indicators of health indicate that these negative experiences may influence well-being in unique ways. Recent work employing an intersectionality framework has encouraged scholars to examine microaggressions by considering an individual's unique and overlapping identities (Lewis, Williams, Peppers, & Gadson, 2017). Furthermore, the major findings support the idea that racial microaggressions are a type of stressful demand that are associated with a range of psychological and physical responses. As such, the results provide further evidence for the consequences associated with experiencing racial microaggressions and advance the empirical research by identifying potential underlying mechanisms. Future research should explore the potential pathways whereby experiencing microaggressions might be associated with these negative psychological and physical symptoms or contribute to one's overall disease burden.

It is important to address the correlational nature of these findings, and thus, it is not possible with the current results to determine the causality of the relationships observed in this study. It is possible, for example, that experiencing somatic or psychological symptomatology may in some way sensitize individuals to interpret these ambiguous situations as being racially related or to label these interpersonal situations as stressful or threatening. Likewise, there may be important, unmeasured variables serving as confounds that might be contributed to relationships among experiencing microaggressions and physical and psychological health indicators. These variables might include personality factors, coping strategies, racial or ethnic identity, social connectedness, self-regulation resources, uncertainty intolerance, interpersonal sensitivity, or physiological activation, and these constructs would be expected to also serve mediating or moderating roles between experiencing racial microaggressions and somatic or physical symptoms (Brondolo, Hausmann, et al., 2011; Liao et al., 2016; Liu & Suyemoto, 2016; Lilienfeld, 2017; Sellers & Shelton, 2003; Torres et al., 2010). Additionally, other researchers have found that generational status may impact the relationship between racism-related stress and health outcomes (Liu & Suyemoto, 2016), and future research might investigate whether generational status may also play a mediating or moderating role.

Thus, these findings should be viewed as exploratory and interpreted with caution. Cross-sectional studies appear to be more commonly conducted in this area (Wong et al., 2014), which makes finding evidence for proposed causal pathways difficult. However, there is also evidence from experimental studies that suggest that exposure to discrimination may indeed cause negative impacts on health (Paradies et al., 2015). For example, Huynh, Huynh, and Stein (2017), using an experimental design,

found that Latino college students who were exposed to indirect racial microaggressions (overhearing racially disparaging and insulting remarks about Latinos that could be examples of foreigner microaggressions) experienced longer lasting physiological stress reactivity responses when compared with Latinos in a control condition overhearing insulting but nonracial remarks. More research is needed to examine whether racial microaggressions might be serving as unique racial psychological stressors that negatively impact physical health symptoms, and the use of causal/experimental and longitudinal designs may aid clarification of the presumed contributors to and impacts of experiencing racial microaggressions (Lilienfeld, 2017; Wong et al., 2014).

In addition to the cross-sectional nature of the study, limitations include the fact that the study was exploratory in nature and was conducted in only one university setting, which might have impacted the generalizability of results. Specifically, it is unclear whether these results might generalize to predominantly White-serving institutions or institutions that serve students in mono-cultural settings (i.e., Hispanic Serving Institutions or Historically Black Colleges and Universities). Future research should examine whether contextual variables might also potentially influence the associations between experiencing microaggression and health status. Finally, the sample was predominantly female and this might have affected the prevalence of the different types of racial microaggressions experienced as well as the prevalence of depression and perceived stress, and this in turn might have impacted study results.

In sum, this study found that racial microaggressions may be associated with the physical and psychological functioning of college students of color. Study results suggest that the relationships with health status might vary depending on the type of microaggression experienced and according to the context in which these racial microaggressions are experienced. Future research should continue to examine the processes and outcomes of recognizing and responding to such experiences, and to examine the physiological and cognitive processes that occur when a person experiences these subtle and racially related interpersonal events.

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