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PERCEIVED RACISM AND NEGATIVE AFFECT: ANALYSES OF TRAIT AND STATE MEASURES OF AFFECT IN A COMMUNITY SAMPLE

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Abstract

Racism is a significant psychosocial stressor that is hypothesized to have negative psychological and physical health consequences. The Reserve Capacity Model (Gallo & Matthews, 2003) suggests that low socioeconomic status may influence health through its effects on negative affect. We extend this model to study the effects of racism, examining the association of lifetime perceived racism to trait and daily negative affect. A multiethnic sample of 362 American-born Black and Latino adults completed the Perceived Ethnic Discrimination Questionnaire–Community Version (PEDQ–CV). Trait negative affect was assessed with the Positive and Negative Affect Schedule (PANAS), and state negative affect was measured using ecological momentary assessments (EMA), in the form of an electronic diary. Analyses revealed a significant relationship of lifetime perceived racism to both daily negative affect and trait negative affect, even when controlling for trait hostility and socioeconomic status. The relationship of perceived racism to negative affect was moderated by education, such that the relationships were strongest for those with less than a high school education. The findings support aspects of the Reserve Capacity Model and identify pathways through which perceived racism may affect health status.

Racism has been defined as “the beliefs, attitudes, institutional arrangements, and acts that tend to denigrate individuals or groups because of phenotypic characteristics or ethnic group affiliation” (Clark, Anderson, Clark, & Williams, 1999, p. 805). In the current study we focus particularly on interpersonal racism defined as “directly perceived discriminatory interactions between individuals whether in their institutional roles or as public and private individuals” (Krieger, 1999, p. 301). Interpersonal racism may encompass different types of experiences ranging from social exclusion or workplace discrimination to physical threat and aggression (Brondolo, Kelly, Coakley, Gordon, Thompson, Levy, et al., 2005; Contrada,

Ashmore, Gary, Coups, Egeth, Sewell, et al., 2001). *Perceived* interpersonal racism refers to the individual's self-reports of exposure to racist interactions.

Racism has been hypothesized to act as a psychosocial stressor, potentially contributing to racial/ethnic disparities in health status and to variations in health within racial/ethnic groups. The mechanisms linking perceived racism to health outcomes are still unclear. Gallo and Matthews (2003) proposed a Reserve Capacity Model to describe potential pathways linking social stress to health. The original formulation of this model focused on the effects of socioeconomic status on health, but the model is also applicable to the study of perceived racism. Gallo and Matthews (2003) suggest that chronic social stressors, including racism, promote more intense and frequent exposure to harmful or potentially threatening events. Higher levels of stress exposure deplete the reserve capacity for coping by requiring greater use of tangible and psychological resources. This combination of greater stress exposure plus diminished coping resources culminates in chronically higher levels of negative affect. In turn, both acute and chronic experiences of negative affectivity have been demonstrated to increase risk for cardiovascular and other diseases through a variety of pathophysiological mechanisms (Rozanski, Blumenthal, & Kaplan, 1999; Suls & Bunde, 2005; Whiteman, Deary, & Fowkes, 2000).

The effects of perceived racism on negative affect may be multidimensional, influencing both trait negative affect and state negative affect. Trait negative affect refers to a broad and stable affective disposition that makes an individual more likely to experience negative emotions, whereas state affect refers to momentary experiences of emotion that may fluctuate as a result of daily events, situational characteristics, and other factors (Watson & Clark, 1984). Affective dispositions including trait negative affect may develop as a result of both genetic and environmental factors. Some of the environmental factors are a function of the individual's unique circumstances (e.g., attachment relationships), and some may be a function of social stressors that are shared across individuals (e.g., racism or neighborhood stress).

State affect is only partially driven by trait affect (Cohen et al., 1995; Kamarck, Schwartz, Shiffman, Muldoon, Sutton-Tyrrell, & Janicki, 2005). Lifetime perceived racism may directly influence state negative affect by increasing exposure to daily stressors. These may include negative interpersonal interactions, which may evoke negative emotions including anger, nervousness, and sadness (Broudy et al., 2007).

The available evidence consistently supports a relationship between lifetime perceived racism and a variety of manifestations of negative affect (Bennet, Merritt, Edwards, & Sollers, 2004; Bowen-Reid & Harrell, 2002; Broudy et al., 2007; Cassidy, O'Connor, Howe & Warden, 2004; Karlsen & Nazroo, 2002; Karlsen, Nazroo, McKenzie, Bhui, & Weich, 2005; Klonoff & Landrine, 1999; Landrine & Klonoff, 1996; Noh & Kaspar, 2003; Ren, Amick, & Williams, 1999; Swim, Hyers, Cohen, Fitzgerald, & Bylsma, 2003). Studies in the U.S. indicate that, for African Americans, racism is positively associated with symptoms of depression and anxiety, as well as dispositional hostility (Bowen-Reid & Harrell, 2002; Klonoff & Landrine, 1999; Landrine & Klonoff, 1996; Ren, Amick, & Williams, 1999). Other studies have focused on state emotional responses (e.g., anger) and have found a positive relationship of racism to both situation-specific (i.e., laboratory induced) and daily negative affect among minority group members (Bennet, Merritt, Edwards, & Sollers, 2004; Broudy et al., 2007; Swim et al., 2003; Taylor, Kamarck, & Schiffman, 2004).

Although these findings are consistent, there are some difficulties with their interpretation. It is unclear which aspects of racism are most closely associated with negative affect or psychiatric symptoms. For example, some studies used only two questions to measure racism: one to assess personal experiences of racism and a second to assess perception of racism in the

society (Karlsen & Nazroo, 2002; Karlsen, Nazroo, McKenzie, Bhui, & Weich, 2005). Other studies measured racism by inquiring about experiences of maltreatment due to race or ethnicity in several different situations (e.g., *in school, at work, getting housing*; Ren, Amick, & Williams, 1999). These measures of racism do not distinguish among the different types of interpersonal experiences including social exclusion versus physical threat, each of which may have different affective consequences (Brondolo, Kelly, et al., 2005; Contrada et al., 2001). Previously, we have demonstrated that the subtypes of perceived interpersonal racism are differentially associated with appraisals of threat and harm (Brondolo, Thompson, Brady, Appel, Cassells, Tobin et al., 2005).

In addition, in some studies the measures of racism contain items that assess exposure to racist interactions, as well as items that reflect affective and coping responses to racism (Bennett, Merritt, Edwards, & Sollers, 2004; Bowen-Reid & Harrell, 2002; Klonoff & Landrine, 1999). This inclusion of response-related items can confound the measurement of the stressor with the measurement of the stress response (i.e., negative affect).

The majority of studies have relied on self-report retrospective surveys to measure both racism and relatively stable indices of negative affect (e.g., measures of depressive symptoms or different indices of trait negative affect; Bowen-Reid & Harrell, 2002; Cassidy, O'Connor, Howe, & Warden, 2004; Karlsen & Nazroo, 2002; Karlsen, Nazroo, McKenzie, Bhui, & Weich, 2005; Klonoff & Landrine, 1999; Landrine & Klonoff, 1996; Noh & Kaspar, 2003; Ren, Amick, & Williams, 1999). The findings derived from these measures are limited by both common method variance and recall biases. The retrospective reports of experiences of racism and negative affect may have been influenced by participants' current physical and emotional state (Stone & Shiffman, 1994, 2002). Stable dispositions including trait hostility may influence the individual's recollections of his or her own general affective state, as well as his or her daily affective experiences (Brondolo, Rieppi, Erickson, Bagiella, Shapiro, McKinley, et al., 2003).

More recently, investigators have attempted to address these methodological concerns by employing ecological momentary assessment (EMA) methodologies, including diaries, to assess the effects of social stressors on daily experiences of affect. Diaries provide a highly reliable measure of state affect. Although situational factors may influence any single reading, they are less likely to affect all readings taken throughout the day. EMA provides information about affective experiences as they occur, making the information less subject to recall biases (Stone & Shiffman, 1994, 2002). In addition, the use of diaries permits us to evaluate the association of perceived racism to a range of negative affect states. Although previous reports have indicated that racism evokes anger (Bennett, Merritt, Edwards, & Sollers, 2004; Broudy et al., 2007; Swim et al., 2003), it is not unreasonable to speculate that episodes of race-related threat may also evoke sustained fear, whereas exclusion might evoke sadness. Two previous studies using small samples have successfully employed EMA methods to examine the relationship of perceived racism or everyday maltreatment to current negative affect (Broudy et al., 2007; Taylor, Kamarck, & Shiffman, 2004).

In the current study we include a measure of trait negative affect and ecological momentary assessments of state negative affect to assess the multidimensional influence of perceived racism. By including both state and trait measures of negative affect, it is possible to control for the effects of trait negative affect when we examine the effects of perceived racism on state affect. This permits statistical control for the tendency to view the world through a lens colored by negative emotion (i.e., individuals who may be chronically disposed to have negative affect, whether as a function of perceived racism or other factors). In addition, we can examine the degree to which EMA data capture elements of negative affect not assessed by trait measures.

Prior research has generally not controlled for other individual level characteristics that may account for any observed association of racism to negative affect, making it difficult to distinguish the specific effects of perceived racism. For example, recent research has suggested that attitudinal variables are also associated with perceived racism (Phinney, Madden, & Santos, 1998), as well as higher levels of negative affect (Brondolo et al., 2003; Jamner, Shapiro, Hui, Oakley, & Lovett, 1993). Including attitudinal variables (e.g., hostility, cynicism) in the analyses of the relationship of perceived racism to negative affect permits us to partly control for the contribution of the generalized tendency to perceive situations or individuals as harmful or threatening. In a previous study, we found that the relationship of perceived racism to state anger and to negative perceptions of social interactions remained significant when controlling for attitudinal variables such as hostility and defensiveness (Broudy et al., 2007).

An additional variable which may explain the relationship between perceived racism and negative affect is low socioeconomic status (SES). The literature on the relationship of SES to perceived racism is contradictory (Brondolo, Beatty, Cubbin, Weinstein, Saegert, Wellington et al., in press), but some research has suggested that individuals living in impoverished areas report higher levels of racism (Franzini, Caughy, Spears, & Esquer, 2005), and the psychological correlates of classism may overlap with those of racism (Myers & McClure, 1993). Low SES itself has been associated with negative affect (Brondolo, 2005; Gallo, Bogart, Vranceanu, & Matthews, 2005; Gallo & Matthews, 2003). Consequently, we control for the effects of SES when examining the psychological correlates of perceived racism. In addition, to test aspects of the Reserve Capacity Model which propose that psychosocial stressors deplete coping resources with resulting negative affect, we can examine the degree to which SES moderates the effects of racism on negative affect.

Much of the research on the relationship of racism to affect has focused on a single ethnic group, such as African Americans (Bennet, Merritt, Edwards, & Sollers, 2004; Bowen-Reid & Harrell, 2002; Klonoff & Landrine, 1999; Landrine & Klonoff, 1996; Ren, Amick, & Williams, 1999; Swim et al., 2003), or Asians (Cassidy, O'Connor, Howe, & Warden, 2004; Noh & Kaspar, 2003). However, the psychological correlates of racism may vary depending on the sociocultural history of the group. To understand the degree to which perceived racism acts as a stressor whose effects on negative affect generalize across groups, it will be important to simultaneously examine the effects in more than one ethnic group. In the current study we limit our sample to two groups, Blacks and Latino(a)s, both of whom make up a significant proportion of the New York City metropolitan population. Our work and that of others has demonstrated that discrimination is a significant problem for Latino(a)s, as well as African Americans (Brondolo, Kelly, et al., 2005; Schneider, Hitlan, & Radhakrishnan, 2000).

The aim of this study was to testing several hypotheses pertaining to the Reserve Capacity Model by investigating the relationship of perceived racism to negative affect, a risk factor for impaired mental and physical health. Specifically, we hypothesized that perceived racism would be positively associated with both trait and state negative affect. We predicted that the specific effects of racism on negative mood would remain significant, even when controlling for personal characteristics, including attitudinal dispositions (i.e., trait hostility) and socioeconomic status that are known to be associated with racism and to independently contribute to negative affect.

In keeping with the Reserve Capacity Model, we further predicted that the effects of two psychosocial stressors, racism and low SES, might be additive. Consequently, we predicted that SES, in particular education level, would moderate the effects of racism on negative affect, with the strongest effects of racism seen in individuals with the lowest levels of education. Finally, as we are interested in understanding the generalizability of the model, we tested whether the association of racism to negative affect was comparable across at least two race/

ethnic groups, in this case American-born Blacks and Latino(a)s. We predicted that both Blacks and Latino(a)s would demonstrate a positive relationship of perceived racism to trait and state negative affect, although the levels of perceived racism and negative affect may vary across the two groups.

METHODS

PARTICIPANTS

Participants included patients, staff, and community members recruited from Community/Migrant Health Centers (C/MHCs), which are primary health-care practices located in low-income urban areas of New York City, affiliated with Clinical Directors Network (CDN). CDN and its member C/MHCs provide health care services and clinical research opportunities for poor, minority, and underserved populations and the clinicians who provide their primary care. The total sample was comprised of 362 American-born adults including 127 Black women, 91 Black men, 79 Latina women, and 65 Latino men.

The participants ranged in age from 24 to 65, with a mean age of 40.22 years ($SD = 9.64$). The majority were single, either having never been married (52%, $n = 188$), or having been separated, divorced, or widowed (16%, $n = 59$). Half (50%) of the participants were employed, with occupations ranging from food service worker to physician. Three-quarters of the sample (75%, $n = 269$) had completed at least a high school education, but overall the sample was poor, with a median gross household income (GHI) of approximately \$18,000.

MEASURES

Perceived Racism—The Perceived Ethnic Discrimination Questionnaire–Community Version (PEDQ–CV; Brondolo, Kelly, et al., 2005a) was used to measure perceived racism. The PEDQ–CV Lifetime Discrimination Scale (PEDQ–CV–Total) is a 34-item measure assessing lifetime experiences of ethnic discrimination within a social or interpersonal context. Each question on the scale begins with the phrase: “Because of your race or ethnicity ...” followed by an item describing exposure to some form of mistreatment or difficulty (e.g., “. . . a clerk or waiter ignored me”). Participants were asked to indicate how often they had ever “had these experiences during their lifetime,” and each item was rated on a 5-point Likert-type scale, with a response of 1 indicating that the event “never happened” and a response of 5 indicating the event “happened very often.” The scale contains four subscales assessing different dimensions of ethnic discrimination: social exclusion, discrimination at work, threat or harassment, and stigmatization. In this sample, the internal consistency (alpha) coefficient for the full scale was 0.95, and alpha coefficients for the subscales ranged from 0.74 to 0.87.

Trait Negative Affect—Trait negative affect was measured with the negative affect scale of Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988). The PANAS is a 10-item scale designed to measure characteristic experiences of negative affect. Using a 5-point scale, participants rate the extent to which they generally experience a particular mood state (e.g., distressed, upset, scared, irritable). The scale shows good internal consistency reliability, with an alpha coefficient of .90 in this sample.

State Negative Affect—State negative affect was measured with electronic diaries. The diary questions were displayed individually on a PDA screen, and participants were asked to rate their emotions every 20 minutes. The questions inquired about the individual's activities and emotions. Emotions (e.g., happy, relaxed, nervous, sad, and angry) were depicted using icons portraying different facial expressions next to the name of the emotion. Participants placed a mark along a 2-inch line displayed under the icon to indicate the degree (from 1 to 100) to which they were experiencing the emotion.

Control Variables—We controlled for trait hostility by administering the cynicism and hostile attributions subscales of the Cook Medley Hostility Scale as specified by Barefoot (Barefoot, Dodge, Peterson, & Dahlstrom, 1989). The hostile attributions score reflects the tendency of an individual to interpret the behavior of others as intentionally harmful or hostile. The cynicism subscale assesses the degree to which the individual perceives the world and people as unfair, deceitful, or selfish. In this sample the combined cynicism and hostility scale had an alpha coefficient of 0.75.

We also controlled for individual level socioeconomic status by including indices of employment, gross household income (GHI), and education level. For education, individuals were assigned to one of three degree-based groups: (a) less than a high school diploma (< H.S. Diploma); (b) high school diploma/GED—which includes those with technical school or some college (H.S. Diploma/GED); and (c) at least a college degree ($\geq$ College Degree). Income measurement for the individual participant and her or his spouse covered the following categories: wages, commissions or bonuses, self-employment income, interest, social security disability or supplemental income, retirement income or alimony, and investments. If other individuals were contributing to the household, we asked the participant to include their income in an estimate of gross household income (GHI). For occupation, we coded whether or not the individual was currently employed.

PROCEDURE

Data were collected from participants who had volunteered for a larger study of racism, coping, and ambulatory blood pressure (BP). Participants were excluded if they were not American-born, were not between the ages of 25 and 65, or were taking any medication that affected BP. The larger study required three separate visits. At Visit 1, measures of demographic variables and perceived racism were collected. At Visit 2, participants completed the PANAS and the hostility questionnaires. All questionnaire items were presented individually via computer, with each item presented visually on the screen and orally through the headphones.

After completing questionnaires, participants were equipped with an ambulatory blood pressure monitor and were given an electronic diary or PDA. The research staff trained the participants in diary completion and observed as each participant completed several practice diary entries. The participants were asked to complete the diary questions every 20 minutes, coinciding with the completion of a blood pressure reading. In this way, the blood pressure monitor served as an alarm to complete the diary. Diaries were returned at Visit 3. Participants were compensated \$150.

ANALYTIC PLAN

Preliminary analyses examined gender, race, and age differences in the independent variables (i.e., perceived racism) and dependent variables (i.e., trait and state negative affect). Additional preliminary analyses examined relations first among independent variables and then among dependent variables. Third, hierarchical multiple regression (HMR) analyses were employed to assess the relationship between the PEDQ-CV and trait affect, following control for the designated covariates. Fourth, a series of mixed models regression analyses estimated using PROC Mixed, a procedure developed by the SAS Institute (Littell, Milliken, Stroup, & Wolfinger, 1996), were employed to evaluate the association of perceived racism to each of the state affect measures. In comparison to standard repeated measures or regression analyses, these mixed models offer a more efficient and potentially more powerful strategy for significance testing when using EMA (Bagiella, Sloan, & Heitjan, 2000; Brondolo, Rosen, Kostis, & Schwartz, 1999; Schwartz & Stone, 1998). Given that we performed three mixed regression analyses to assess the relationship of perceived racism to state affect, one for each of the three state affect measures, the nominal *p*-values are compared to the Bonferroni-

corrected alpha-level of .017 ($= 0.05/3$). To determine which aspect of perceived racism contributes to negative affect, additional analyses were performed with the four subscales of PEDQ-CV entered into the model as a set, allowing the various aspects of perceived racism to compete for accountability for variance in affect.

Diary data were available for 331 of the 362 participants because of technical problems with the electronic diaries. Only one individual in the sample of 331 had three or fewer diary readings. Eighty-eight percent of the sample had 10 or more diary readings and 25% had more than 38 diary readings over the course of the weekday. The median number of readings for the entire sample was 31.

All analyses were performed twice. In the initial set of analyses, demographic covariates (age, gender, and race) were forced into the equation prior to inclusion of the PEDQ-CV–Total scores or the PEDQ-CV subscale scores. The next set of analyses provided opportunities to control for the effects of cynical hostility and individual SES. For diary data, analyses were repeated with the trait measure of negative affect entered as an additional covariate.

We categorized individuals into poverty level groups because the individual income (GHI) variable was not normally distributed. Participants were divided into income level groups based on the ratio of their GHI to the poverty level income for households with equivalent numbers of members, senior citizens, and children (18 and under). Four income level groups were constructed: (a) group 1 ($\leq$ poverty level), income at or below poverty level for households of their size and composition; (b) group 2 ($\leq 2\times$ poverty level), income more than the poverty level, but less than twice the poverty level; (c) group 3 ($\leq 3\times$ poverty level), income more than twice the poverty level, but less than three times the poverty level; and (d) group 4 ($> 3\times$ poverty level), income more than three times the poverty level.

RESULTS

Tables 1a and 1b display mean scores and standard deviations for all study variables by demographic characteristics.

Gender, Race and Age Effects—There were no differences between ethnic groups in the proportions of women and men, but Blacks (mean age = 41.2 years) were older than Latino(a)s (mean age = 38.8), years, $F(1,360) = 5.21, p < .05$.

There were significant gender, $F(1,360) = 3.78, p = .05$, and race, $F(1,360) = 4.53, p < .05$, differences in perceived racism. Blacks reported more lifetime perceived racism, and in particular more social exclusion, than did Latino(a)s, and men reported more lifetime perceived racism than did women. There was no relationship between age and perceived racism.

There were race/ethnicity, but not gender or age differences in trait negative affect. Latinos reported more trait negative affect than did Blacks, $F(1, 349) = 7.37, p < .01$. There were no significant age, gender, or race differences in daily anger, nervousness, or sadness. Given gender and race differences in perceived racism, and age differences between ethnic groups, in all subsequent analyses, gender, age and race serve as covariates.

Relations Among Independent Variables and Among Dependent Variables—The PEDQ-CV subscales were significantly intercorrelated (all $r_s > .46, p_s < .0001$). A series of PROC Mixed analyses, examining the relations of trait negative affect to state negative affects indicated that trait negative affect (PANAS–Negative) was positively associated with daily anger ($B = 4.65, SE = .88, t = 5.27, p < .0001$), nervousness ($B = 5.72, SE = 0.92, t = 6.20, p < .0001$), and sadness ($B = 4.75, SE = .94, t = 5.07, p < .0001$), after controlling for age, gender, and race.

Perceived Racism and Trait Negative Affect—Hierarchical multiple regression analyses were performed to examine the relationship of perceived racism to trait negative affect within both groups. With PEDQ–CV–Total score included as the predictor, and age, gender, and race entered first as covariates, the overall equation was significant ($R^2 = .14$, Adj. $R^2 = .13$, $p < .0001$) and perceived racism accounted for 12% of the variance in trait negative affect.

Race/ethnicity Effects—Interactions of race $\times$ perceived racism on trait negative affect were not significant. Perceived racism (PEDQ–CV–Total) was significantly positively correlated with trait negative affect after controlling for age and gender in both Latino(a)s, $r(144) = .41$, $p < .001$) and in Blacks, $r(218) = .30$, $p < .001$).

Perceived Racism and State Negative Affect—PROC Mixed models were used in three separate analyses to predict daily anger, nervousness, and sadness. With age, gender, and race serving as covariates, perceived racism was positively associated with daily anger ($B = 4.49$, $SE = 1.06$, $t = 4.23$, $p < .001$), daily nervousness ($B = 4.45$, $SE = 1.11$, $t = 4.01$, $p < .001$), and daily sadness ($B = 3.92$, $SE = 1.14$, $t = 3.44$, $p < .01$). All effects exceed the Bonferroni criterion for significance ($p < .017$).

Race/ethnicity Effects—Tests of the interaction of race $\times$ perceived racism on state negative affect were not significant, and the association of perceived racism to state affect was seen in both groups. Perceived racism (PEDQ–CV–Total) was positively associated with daily anger ($B = 4.81$, $SE = 1.38$, $p < .01$), daily nervousness ($B = 4.29$, $SE = 1.48$, $p < .01$), and daily sadness ($B = 4.77$, $SE = 1.41$, $p < .01$) for Blacks, and daily anger ($B = 3.87$, $SE = 1.67$, $p < .03$) and daily nervousness ($B = 4.37$, $SE = 1.69$, $p < .01$), although not daily sadness ($B = 2.51$, $SE = 1.91$, $p < .19$) for Latino(a)s.

Effects on State Negative Affect, Controlling for Trait Negative Affect—These analyses permitted the evaluation of the degree to which perceived racism predicts daily experiences of mood independent of the contributions of affective dispositions. Controlling for age, gender, and race, as well as trait negative affect, the association of perceived racism (PEDQ–CV–Total) to daily anger ($B = 2.96$, $SE = 1.10$, $t = 2.69$, $p < .01$) remained significant. Effects for nervousness and sadness remain positive, but do not reach significance once Bonferroni corrections are applied.

Controlling for Other Personal Characteristics (i.e., Hostility and SES). We first examined the relationship of cynical hostility and individual SES to perceived racism and negative affect. Next, we reevaluated the effects of racism to negative affect controlling for cynical hostility and SES. Cynical hostility was positively related to perceived racism (lifetime PEDQ–CV–Total) scores ($r = .23$, $p < .001$), and positively related to trait negative affect ($r = .27$, $p < .001$), but was not related to diary measures of negative affect.

There was no significant relationship of lifetime perceived racism (PEDQ–CV–Total) to any measure of individual SES, although there were SES effects on PEDQ subscales as seen in Tables 1a and 1b, and as we have documented elsewhere (Brondolo et al., in press). Poverty group was not significantly associated with trait negative affect, but both education level, $F(2, 359) = 5.68$, $p < .01$, and employment status, $F(1, 360) = 5.57$, $p < .02$, were significantly related to trait negative affect.

Education level was significantly associated with daily diary measures of anger, $F(2, 327) = 3.70$, $p < 0.03$. There were also significant effects of education level, $F(2, 327) = 3.95$, $p < 0.02$, poverty group, $F(3, 326) = 2.95$, $p < 0.04$, and employment status, $F(1, 328) = 8.61$, $p < 0.01$, on diary measures of nervousness. Education level, $F(2, 327) = 4.53$, $p < 0.02$, poverty group, $F(3, 326) = 2.93$, $p < 0.04$, and employment status, $F(1, 328) = 6.39$, $p < 0.02$, were all

significantly related to diary measures of sadness. In general, those with lower levels of SES had higher levels of daily negative affect. Details are presented in Table 1b.

Relations of Perceived Racism to Trait Negative Affect Controlling for Cynical Hostility and SES—After controlling for age, race, and gender, the individual level covariates of hostility, and SES (i.e., employment status, poverty group and education level) were entered into the analyses. The overall equation remained significant ($R^2 = .19$, Adj. $R^2 = .17$, $p < .0001$). Perceived racism (PEDQ–CV–Total) accounted for 9% of the variance in trait negative affect, an effect that is somewhat smaller than when controlling only for age, race, and gender, but is still highly significant ($p < .0001$).

Relations of Perceived Racism to State Negative Affect Controlling for Cynical Hostility and SES—When the mixed model regression analyses were repeated controlling for both cynical hostility and individual level SES measures, the effects of perceived racism (PEDQ–CV–Total) on anger ($B = 3.64$, $SE = 1.02$, $t = 3.57$, $p < .0004$, nervousness ($B = 3.97$, $SE = 1.09$, $t = 3.66$, $p < .0003$), and sadness ($B = 3.13$, $SE = 1.11$, $t = 2.82$, $p < .006$) remained significant, even with Bonferroni correction.

Dimensions of Perceived Racism and Negative Affect—To determine which aspects of perceived racism were associated with trait negative affect, we repeated the analysis with the 4 subscales of the PEDQ–CV entered as a set (instead of the lifetime PEDQ–CV–Total score). As displayed in Table 2, ethnicity–related stigmatization and threat/harassment were significantly associated with trait negative affect.

The analyses for each measure of state affect were repeated with the four subscale scores substituted for the PEDQ–CV–Total score. Covariates included demographics, cynical hostility, and individual level SES. Summary results are displayed in Table 3 and indicated that stigmatization was associated with higher levels of anger and sadness, and threat/harassment was associated with higher levels of all three negative emotions.

The Moderating Effects of Education—In HMR analyses with perceived racism and education level and their interaction entered as predictors, and age, sex, race, cynical hostility, poverty group, and employment status forced in initially as covariates, the interaction of education level and perceived racism (PEDQ–CV–Total) was highly significant for trait negative affect ($B = -0.31$, $SE = 0.09$, $t = -3.52$, $p < .001$). In follow-up analyses the relationship of PEDQ–CV–Total to trait negative affect was highly significant for those with less than a high school diploma ($p < .001$, $n = 92$), with perceived racism accounting for 33% of the variance in negative affect. For those with a high school diploma ($n = 213$), PEDQ–CV–Total scores accounted for 3% of the variance in negative affect ($p < .01$). For those with at least a college degree ($n = 57$) there was no significant relationship between PEDQ–CV–Total scores and trait negative affect.

We repeated the analyses 4 times, substituting one of the PEDQ subscale scores for the PEDQ–CV–Total score. The interaction of Education $\times$ Subscale was significant for the social exclusion, stigmatization, and workplace discrimination subscales (all $ps < .0125$, as required with Bonferroni correction, .05/4 comparisons). In each case the association of the subscale score to trait negative affect was large and significant for those with less than a high school education, moderate and significant for those with a high school education, and nonsignificant for those with a college degree.

When PROC Mixed Analyses were employed to examine the interactions of education and PEDQ–CV–Total on state negative affect, the interaction effects for daily sadness, $F(1, 318) = 4.76$, $p < .03$, show a trend toward significance, but do not reach significance with Bonferroni

corrections applied. It is worth noting that follow-up analyses revealed a trend toward an association of PEDQ-CV to daily sadness only for those with less than a high school diploma ($B = 7.52$, $SE = 2.95$, $t = 2.55$, $p < .02$).

DISCUSSION

Racism is a significant psychosocial stressor that is hypothesized to have negative mental and physical health consequences. To understand the mechanisms through which racism affects health, researchers have examined the association of racism to measures of psychological distress, including measures of negative affect. In the current study perceived racism was positively associated with a trait measure of negative affect and with daily diary measures of anger, nervousness, and sadness over the course of a day. The study provides evidence that perceived racism has effects on several different dimensions of negative affect, each of which may lead to more enduring effects on mental and physical health. The relationship of perceived racism to both trait and state negative affect remained significant after controlling for other individual characteristics, including hostility and socioeconomic status that are known to be associated with racism and to contribute independently to negative affect. This supports the notion that perceived racism is a distinct stressor, specifically adding to the daily load of negative affect.

African Americans reported greater lifetime perceived racism than did Latinos. Although the level of perceived exposure may vary across these groups, tests of moderation did not reveal significant differences in the psychological correlates of perceived racism. The findings suggest that perceived racism is a noxious stressor, regardless of the ethnicity of the targeted group.

The methodology permitted us to address several limitations in the existing literature. The use of the PEDQ-CV allowed examination of the ways in which different aspects of perceived interpersonal racism were associated with negative affect. Discriminatory events perceived to be threatening or stigmatizing appear to be more closely related to trait and state negative affect than those events which were perceived as exclusionary or as workplace discrimination. Items on the threat subscale assess actual or threatened physical harm to the target or his or her property. Experiencing physical harassment and being treated in a stigmatizing and potentially humiliating manner are events with high levels of emotional salience. These are very disturbing (and potentially harmful) experiences, and may be the types of experiences that are the most likely to shape one's on-going perceptions of the world.

Perceived racism may influence daily experiences of affect both directly and indirectly. For example, our findings and those of others suggest that perceived racism may contribute to both cognitive schemas about the potentially threatening nature of the world (i.e., trait cynical hostility) and shape dispositional tendencies to experience negative affect (i.e., trait negative affect). These enduring dispositions may potentiate the likelihood of perceiving experiences as distressing. However, the effects of perceived racism on daily affective experiences are not limited only to changes in these more stable personal characteristics. Our findings demonstrate that despite controlling for cynical hostility, perceived racism was positively associated with daily anger, nervousness, and sadness. Even when controlling for affective dispositions, perceived racism displayed an association with daily anger. Although additional research is needed to identify the personal and environmental factors that contribute to these state affective experiences, the data support the notion that ecological momentary assessments yield data about psychological experiences that are not tapped by more conventional questionnaire methods. The EMA findings highlight the potential daily burdens associated with perceived racism.

The association of perceived racism to negative affect persists despite controlling for individual SES, again suggesting that the psychological effects of racism are not simply a by-product of personal privation. However, we also find a moderating effect of education on the relationship of perceived racism to negative affect. Specifically for those with less than a high school education, perceived racism predicts 33% of the variance in trait negative affect. Similarly, the effects of perceived racism on daily sadness were strongest for those with the least education. This suggests that the effects of psychosocial stressors may be additive, with both perceived racism and low SES taxing coping resources resulting in more intense experiences of negative affect. These findings are supportive of the Reserve Capacity Model proposed by Gallo and Matthews (2003), suggesting that negative affect is elicited and potentially sustained when the stress burden is greater than the available coping resources.

LIMITATIONS

This was a correlational, cross-sectional study, and therefore we cannot determine the direction of the relationship of perceived racism to negative affect, which is actually likely to be bidirectional. Our sample was a sample of convenience, and it would be important to replicate these findings in a population-based sample to demonstrate the generalizability of these effects. In this sample we clearly see the psychosocial costs of perceived racism in a group with very low levels of education in comparison to those with a high school diploma. It may be the case that there are different negative outcomes associated with perceived racism when it is experienced by more highly educated individuals. It would be beneficial to test this hypothesis in a larger sample of college educated individuals. Finally, this study took place in the New York City area. There may be regional differences in the experiences and psychosocial correlates of perceived racism. Despite these limitations, the study provides strong evidence of the negative psychological correlates of perceived racism in a community sample, and the findings suggest a plausible pathway through which this social stressor can lead to negative health outcomes.

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TABLE 1a
Means and SDs for PEDQ Total, Subscales, Cynical Hostility and Trait Affect Across Demographic Variables

	Full Score Means N = 362	Blacks N = 218	Latinos N = 144	Men N = 156	Women N = 206	Less than High School N = 92	High School N = 213	College N = 57	Working N = 182	Not Working N = 180	Poverty Group #1 N = 151	Poverty Group #2 N = 84	Poverty Group #3 N = 44	Poverty Group #4 N = 83
PEDQ Total	2.15 (.67)	2.21 [*] (.66)	2.06 (.67)	2.23 [*] (.65)	2.09 (.68)	2.18 (.74)	2.14 (.67)	2.13 (.56)	2.13 (.64)	2.16 (.70)	2.14 (.72)	2.17 (.73)	2.10 (.57)	2.15 (.56)
PEDQ— Excl.	2.53 (.78)	2.61 [*] (.76)	2.41 (.79)	2.57 (.77)	2.50 (.79)	2.52 (.85)	2.53 (.77)	2.53 (.68)	2.52 (.73)	2.54 (.82)	2.51 (.83)	2.57 (.83)	2.48 (.72)	2.56 (.67)
PEDQ— Work	2.19 (.81)	2.26 (.79)	2.09 (.82)	2.19 (.76)	2.19 (.84)	2.07 (.74)	2.22 (.84)	2.28 (.78)	2.29 [*] (.84)	2.10 (.77)	2.08 (.79)	2.22 (.84)	2.24 (.69)	2.35 (.84)
PEDQ— Stigma	1.96 (.83)	2.01 (.83)	1.88 (.82)	2.10 ^{**} (.87)	1.85 (.78)	2.04 (.90)	1.93 (.79)	1.94 (.82)	1.89 (.78)	2.02 (.87)	1.99 (.88)	2.00 (.86)	1.83 (.57)	1.93 (.81)
PEDQ— Threat	1.68 (.76)	1.71 (.81)	1.62 (.69)	1.75 (.74)	1.62 (.77)	1.91 ^{**a} (.88)	1.64 (.72)	1.45 (.59)	1.59 (.69)	1.77 [*] (.82)	1.77 ^{ab} (.82)	1.70 (.81)	1.65 (.68)	1.49 (.60)
CYN	.53 (.20)	.52 (.20)	.54 (.19)	.53 (.20)	.52 (.20)	.59 ^{**a} (.19)	.52 (.20)	.46 (.19)	.50 (.19)	.55 [*] (.20)	.56 ^{ab} (.20)	.52 (.18)	.51 (.20)	.48 (.19)
PANAS	2.04 (.76)	1.96 (.73)	2.18 [*] (.82)	2.00 (.73)	2.07 (.78)	2.26 ^{**a} (.82)	1.97 (.74)	1.94 (.63)	1.95 (.64)	2.13 [*] (.85)	2.16 (.84)	1.98 (.72)	1.92 (.65)	1.94 (.67)
NEG														

Note.

^aThe main effects of education were significant for PEDQ threat, cynical hostility and trait negative affect. Post hoc comparisons (with Tukey's adjustment) indicate significant differences between those with less than a high school education and those with a college education.

^bThe main effects of Poverty Group on PEDQ threat and cynical hostility were significant ($ps < .05$). For both variables post hoc comparisons (with Tukey's adjustment) indicate marginally significant differences between those in poverty group 1 vs. 4.

* $p < .05$

** $p < .01$

*** $p < .001$.

TABLE 1b
Means and SDs for State Affect Across Demographic Variables

	Full Score Means N = 331	Blacks N = 199	Latinos N = 132	Men N = 146	Women N = 185	Less than High School N = 87	High School N = 192	College N = 52	Working N = 168	Not Working N = 163	Poverty Group #1 N = 137	Poverty Group #2 N = 82	Poverty Group #3 N = 40	Poverty Group #4 N = 72
Anger	8.54 (.72)	8.64 (.92)	8.37 (1.15)	7.82 (1.08)	9.10 (.96)	10.79 ^a (1.40)	6.89 (.93)	10.85 (1.77)	7.46 (1.00)	9.68 (1.03)	10.11 (1.13)	7.65 (1.44)	7.72 (2.05)	7.16 (1.50)
Nervous	8.97 (.75)	9.07 (.96)	8.83 (1.20)	8.43 (1.13)	9.41 (1.00)	11.96 (1.46)	7.24 (.97)	10.38 (1.85)	6.86 (1.03)	11.22 [*] (1.06)	11.51 ^{ab} (1.17)	8.42 (1.49)	6.02 (2.13)	6.69 (1.55)
Sadness	7.61 (.76)	7.16 (.98)	8.31 (1.22)	7.23 (1.15)	7.92 (1.02)	11.35 ^a (1.49)	5.96 (.99)	7.56 (1.89)	5.76 (1.06)	9.59 ^{**} (1.09)	9.96 ^{ab} (1.20)	7.68 (1.52)	3.87 (2.17)	5.41 (1.59)

Note.

^aThe main effects of education were significant for anger ($p < .05$) and sadness ($p < .03$). Post hoc comparisons (with Tukey's adjustment) indicate significant differences between those with less than a high school education and those with a high school education.

^bThe main effects of Poverty Group on sadness and nervousness were significant ($ps < .05$). For nervousness, post hoc comparisons (with Tukey's adjustment) indicate marginally significant differences between those in poverty group 1 vs. 4 ($p < .07$). For sadness, post hoc comparisons (with Tukey's adjustment) indicate marginally significant differences between those in poverty group 1 vs. 3 ($p < .07$).

*
 $p < .05$

**
 $p < .01$.

TABLE 2

Hierarchical Multiple Regression: PEDQ—CV Subscales Predicting Trait Negative Affect

	B	SE	T	B
Age	-0.00	0.00	-0.78	-0.04
Gender	-0.13	0.08	-1.76	-0.09
Race	0.21	0.08	2.66 [*]	0.13
Cyn/Hos	0.70	0.20	3.52 ^{***}	0.18
Income	0.03	0.03	1.01	0.06
Education	-0.07	0.07	-1.10	-0.06
Work Status	-0.13	0.08	-1/49	-0.08
Exclusion	0.08	0.08	1.00	0.08
Stigmatization	0.14	0.07	2.19 [*]	0.16
Work Discr	-0.02	0.07	-0.29	-0.02
Threat	0.14	0.06	2.21 [*]	0.14

Note. $R^2 = .15$, Adj. $R^2 = 0.13$, ($F(7, 354) = 8.59$, $p < .0001$) Subscales partial $R^2 = .12$.

*
 $p < .05$

**
 $p < .01$

 $p < .001$.

Summary Table of 3 Separate Mixed Models Analyses Examining Relations of PEDQ—CV Subscales to State Affect, Controlling for Demographics, Cynical Hostility, and Individual Level SES ($n = 344$).

	Anger			Nervousness			Sadness		
	<i>B</i>	<i>SE</i>	<i>t</i>	<i>B</i>	<i>SE</i>	<i>T</i>	<i>B</i>	<i>SE</i>	<i>T</i>
Exclusion	−1.94	1.47	−1.32	.14	1.58	−.09	−3.12	1.59	−1.96 [*]
Workplace Discrimination	.26	1.21	.22	−.68	1.30	−.52	−.41	1.31	−.31
Stigmatization	3.54	1.17	3.03 ^{**}	2.24	1.26	1.79	3.99	1.27	3.15 ^{**}
Threat and harassment	2.57	1.10	2.33 [*]	3.23	1.19	2.73 ^{**}	3.78	1.20	3.16 ^{**}

Note.
^{*} $p < .05$
^{**} $p < .01$.