



Original article

Microaggressions and Diurnal Cortisol: Examining Within-Person Associations Among African-American and Latino Young Adults

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A B S T R A C T

Purpose: We examined the relations between African-American and Latino young adults' microaggressions and subsequent changes in weekly diurnal cortisol parameters (i.e., cortisol awakening responses, overall cortisol output (AUC), and diurnal slopes).

Methods: Young adults ($N = 53$, $M_{age} = 20$ years, $SD = .90$; 72% female) participated in a 4-week diary study in which they reported their weekly experiences of microaggressions and completed 2 days of saliva samples each week. Saliva samples were obtained at waking, 30-minutes after waking, and bedtime on each sampling day (six samples each week; 24 samples total). In line with an idiographic approach to stress, young adults' increases and decreases in microaggressions (relative to their own average) were linked to changes in cortisol parameters the following week.

Results: Increases in microaggressions predicted greater AUC the subsequent week, controlling for gender, race, parental education, prior week's AUC, and weekly behavioral controls. Follow-up analyses of specific types of microaggressions indicated that experiences centered around criminality and second-class citizenship also related to increases in young adults' cortisol awakening responses the subsequent week. Microaggressions were unrelated to changes in diurnal slopes.

Conclusions: Microaggressions were linked to subsequent changes in diurnal cortisol among African-American and Latino young adults. Given the rigorous within-person design, findings point to the importance and impact of subtle forms of discrimination on young adults' hypothalamic-pituitary-adrenal axis activity, which is theorized to underlie health and well-being.

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IMPLICATIONS AND
CONTRIBUTION

Microaggressions are common experiences for racial-ethnic minority young adults, although the health ramifications remain unclear. This study finds that microaggressions are linked to young adults' diurnal cortisol (greater overall cortisol output and cortisol awakening response [CAR]). Such findings are important given that diurnal cortisol is a correlate of individuals' physical and mental health.

The deleterious effects of discrimination experiences are well documented; discrimination is linked to poor mental and physical health, and academic difficulties [1,2]. Physiological processes are theorized to underlie the long-term consequences of discrimination and growing empirical evidence suggests that the hypothalamic-pituitary-adrenal (HPA) axis may, in part, be one of the stress-response systems at play [3]. Yet, notably missing from our

understanding of the effects of discrimination broadly, and the relation to the HPA axis specifically, is the examination of discrimination experiences that are considered more subtle [4]. Utilizing a within-person lagged design, the current study examined the relations between subtle experiences of mistreatment, also termed *microaggressions* [4], and ethnic-racial minority young adults' levels of cortisol, the main hormone of the HPA axis [5]. Cortisol levels, which follow a strong diurnal pattern—high at waking, peak 30–40 minutes after waking [e.g., CAR] and decline across the day [e.g., diurnal cortisol slope] [5]—have been linked to adults' and youths' physical and mental health [6]. Thus, we focused on young adults' diurnal patterns of cortisol and linked within-person

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weekly changes in microaggressions to individuals' subsequent diurnal cortisol patterns across a 4-week period. Such a design allowed us to test theoretical tenets of stress processes with statistical and methodological rigor. Further, it provided information about the physiological ramifications of microaggressions to help clarify questions about the overall nature of these experiences. Understanding whether microaggressions predict changes in young adults' diurnal cortisol provides insight into the physiological costs of mistreatment among ethnic-racial minority youth in the U.S.

Research has linked overt experiences of discrimination during adolescence and young adulthood to changes in diurnal functioning of the HPA axis [3]; discrimination has been related to greater overall cortisol output, flatter diurnal cortisol slopes, and greater CARs. Given that these diurnal components underlie health, such findings are theorized to reflect processes of allostatic load, or the biological toll of stress on individuals' long-term functioning [7]. There remains, however, questions about whether subtler experiences of discrimination, microaggressions, may be linked to diurnal cortisol in the same way. Indeed, microaggressions have been found to relate to health and behavioral outcomes that include greater depressive [8,9], anxiety [10], and somatic symptoms [8], lower levels of self-esteem [11], lower sleep quality and duration of sleep [12], and poorer physical health [13]. Additionally, in a recent experimental study with Asian American young adults, microaggressions by white perpetrators, but not Asian American perpetrators, were associated with increased blood pressure [14].

Despite preliminary evidence that microaggressions carry a psychological and physiological toll, the existing research is limited because of its almost exclusive focus on cross-sectional, between-person associations (for exception see [15,16]). Between-person approaches provide information about the relations between microaggressions and well-being from a *nomothetic approach* [17,18]. They investigate relations across a set of individuals and examine the effects of experiencing high levels of microaggressions relative to the other individuals in the sample. This approach is limited because observed and unobserved stable characteristics of individuals, such as personality, can bias (and partially explain) the association [19,20]. Using intensive diary or longitudinal data, however, allows for the examination of the association from an *idiographic approach*, an approach that focuses on within-person fluctuations and examines the effects of experiencing high levels of microaggressions in comparison to one's own average level. Such an approach is a more rigorous test because it aligns with theoretical tenets of stress processes and controls for stable between-person characteristics (e.g., personality) that may be theorized to explain the association.

Extended to our understanding of microaggressions, an idiographic approach appears particularly needed given the ambiguous nature of experiences. Indeed, researchers have noted that cross-sectional research is unable to disentangle the effects of personality-related factors in linking microaggressions to outcomes, and called for work to take a more rigorous within-person design [15]. Additionally, such designs allow for *lagged effects*, which may be particularly relevant when ambiguity is experienced—individuals who are uncertain about the meaning of experiences may be more likely to have a delayed response, not captured in contemporaneous associations.

Heeding this call, the current study examined the link between microaggressions and diurnal cortisol using an idiographic approach. Specifically, we utilized young adults' reports of microaggressions across 4 weeks, and linked weekly fluctuations in these events to subsequent weekly changes in diurnal cortisol

parameters. We focused on three commonly discussed classifications of microaggressions: assumptions of inferiority (e.g., experiences in which others assume that you are less intelligent or less deserving), second-class citizen/assumptions of criminality (experiences that relate to substandard service or stereotypes as deviant/criminal), and microinvalidations (experiences in which others do not acknowledge race/ethnicity or ascribe to color-blind ideology), and examined their overall relation (average score) to three parameters of diurnal cortisol: the CAR, the area under the curve (AUC; overall cortisol output across the day), and the diurnal slope (the rate of decline from waking to bedtime cortisol). Consistent with prior work linking discrimination to cortisol [3], we hypothesized that microaggressions would relate to greater CARs and AUCs, and flatter diurnal slopes. We also explored the distinct associations of the three microaggressions to diurnal cortisol parameters, given that some evidence suggests differential relations between types of microaggressions and young adults' mental health [21]. Understanding whether or not microaggressions physiologically affect young adults is an important preliminary step in the ongoing debate of whether subtle experiences of discrimination can get under the skin.

Method

Participants and procedures

Data from the current study come from a larger weekly diary project focused on understanding stress, health, and relationships among 145 African-American and Latino young adults attending a Midwestern University. The study was approved by University Institutional Review Board (IRB #2002764). Young adults who self-identified as Black/African-American or Hispanic/Latino or Hispanic/Latino and white and between the ages of 18–25 years old were invited to participate in the study. Upon informed consent, participants completed an initial online assessment (approximately 1.5 hours) and weekly diary assessments for the 4 subsequent weeks (approximately 15 minutes each week). Weekly diary assessments were emailed to participants on each Friday. Upon completion of the weekly diaries, participants completed an end assessment (approximately 1 hour).

For the current study, we utilized a subsample of 53 participants (16 Latino, 37 African-American) from the larger project that participated in an additional weekly salivary sampling protocol. This subsample provided salivary samples three times per day, for 2 consecutive days (Thursdays and Fridays), across the 4 weeks (total of 24 samples). On each of the sampling days, participants provided a waking, 30-minute postwaking, and bedtime sample. Participants were primarily female (72%), reflecting gender differences in rates of participation for the overall larger study and, in part, gender differences observed in survey research among young adults [22]. Young adults were, on average, 20.00 years old ($SD = .90$) and a majority were born in the U.S. (98%). Participants were compensated \$75 for participation. A majority of participants (72%) completed all 4 weeks of self-reported diaries; 15.1% completed 3 weeks; 13% completed 2 or less weeks. We examined differences on demographic variables between participant who completed 3–4 weeks of nightly surveys to those who completed less than 3 weeks. No differences emerged on participant race, $\chi^2(1) = 2.78, p = .10$, gender, $\chi^2(1) = .28, p = .60$, living arrangement (i.e., living on-campus vs. off-campus), $\chi^2(1) = .21, p = .65$, age, $t(51) = 1.25, p = .22$, or income, $t(50) = -.82, p = .41$. As for saliva samples, a majority of participants provided 20–24 samples (76%);

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