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Stressing the Hormone: Biological and Psychosocial Factors associated with Chronic Stress

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Stressing the Hormone: Biological and Psychosocial Factors associated with Chronic Stress

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Introduction

Over two studies from the diverse UMB campus and neighboring communities, we examined linkages between biological, psychosocial, and cognitive factors related to acute and chronic stress.

Biological indicators of chronic stress were collected, including hair cortisol (measuring approximately 3 months retrospective cortisol secretion), waist-to-hip ratio, and resting systolic, diastolic blood pressure, and cardiovascular parameters.

These measures were tested for associations with subjective measures of stress including chaos in the home, city stress (i.e., frequency of violence, assessments of neighborhood safety), perceived daily and lifetime discrimination, and perceived personal stress.

In study 2, we also included indices of social identity as potential moderators of the relationship between stress and health, affective, and cognitive outcomes.

Method

Participants

Study 1: 134 adults (ages 18-67; M = 29.49, SD = 12.48)
Study 2: 180 adults (ages 18-30, M = 22.56, SD = 3.54)

T1 Measures: Biological measures of stress.

• Hair Cortisol
• Resting Blood Pressure
• Waist-to-hip ratio

Self-Reported Stress.

Perceived Stress Scale (Cohen & Williamson, 1988)
City Stress Index (Ewart & Sachday, 2002)
Chaos in the home (Matheny, et al., 1995)
Well being

Total Stress. Stress scales were z-transformed and a Total subjective stress score was calculated with mean scale items.

T2 Additional Measures:

• Daily Discrimination (Williams, 1999)
• Lifetime Discrimination (Williams, 1999)
• Social Identity (Schaafma, 2001)
• Vigilance task. A modified Stroop (1935) task assessed affective vigilance by producing social devaluation cues. Dependent variables included latencies (ms) and physiological reactivity during the negative cues (e.g., loss, projects) as compared to the neural cues block (e.g., house, book).

Results

Study 1: Hair Cortisol and Subjective Stress: Hair cortisol was significantly and positively associated with Total subjective stress (5%), p < 0.05.

Study 2: Total Subjective Stress: Somewhat replicating T1, the Race x SES interaction showed that Whites in higher SES had greater TSS, and a non-significant decrease in stress with higher SES (right panel, Figure 5). The figure illustrates that African-Americans reported the highest frequency of perceived discrimination in high SES, and the Asian group had mid-SES whereas White and Latins/o showed little change by SES.

Study 3: Daily Discrimination: Race x SES interaction on Daily Discrimination (Figure 6) showed that at any level of SES, minorities report the greatest benefit of decreases in stress with higher SES (Figure 4).

Summary

• Race x Cort: is positively and moderated associated with a composite of total subjective stress (Figure 1).

• Race x SES: Figure 2 shows that at any level of SES, minorities have little change in Total subjective stress, compared to non-minorities, who show the expected decrease in stress with higher SES.

• Race x SES: Figure 3 illustrates that both low and high SES minorities show higher Cort, similar to the mid-SES non-minorities.

• What are the potential mechanisms?

• Evidence exists that minorities in higher SES may have greater daily experiences of discrimination, or social interactions where race becomes more salient (e.g., Schaafma, 2011; Brody, et al., 2017).

• Evidence also suggests that the extent to which an individual identifies with their ethnic/heritage group may moderate experiences of discrimination, such that group stereotypes have less negative impact (e.g., Schaafma, 2011; Nol, 1999).

• The unexpected findings of higher stress for minorities led us to the further investigations in study 2.

STUDY 2:

• Race x Social Identity: Figure 7 shows that strong social identity was positively and moderated associated with Total subjective stress in high SES.

• The present research illuminates psychosocial mechanisms that may be both beneficial and costly, such as a strong social identity with ones heritage group, particularly for those who experience high stress and more frequent discriminations. Future work could add related measures, including self-esteem, self-esteem, and other biological measures of allostatic load to further understand these complex findings.

References