Title: Associations between stressful life events and perceptions of stress and their interactive effects on cardiovascular responses to acute psychological stress

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BACKGROUND: The stage model of stress combines epidemiological, psychological, and biological traditions to explain individual differences between stress and increased disease risk. Exposure to stressful life events (SLE), perceptions of stress (PS), and stressor-evoked cardiovascular reactivity (CVR) represent different processes of the stage model of stress: SLE are events that happen to individuals, PS are how individuals perceive events, and CVR represents biological responses to stressors. Studies have analyzed independent effects of the relationship between SLE, PS, and CVR with disease outcomes. Few studies have evaluated how the three traditions of stress may interact and/or relate to each other during the same acute psychological stress exposure.

AIM: To examine the association between SLE, PS, and their interactive effects on CVR to a standardized acute psychological stress task.

METHODS: Participants (N = 118) completed questionnaires about levels of PS (Perceived Stress Scale) in their life and recent SLE (Undergraduate Stress Questionnaire) followed by a 10-minute baseline period and 4-minute standardized mental arithmetic stress task. Heart rate (HR) was measured throughout the baseline period and stress task. Reactivity was the difference between average stress and average baseline values.

RESULTS: Bivariate correlations indicated a significant negative relationship between SLE and HR reactivity, \( r(116) = -.249, p = .007 \). PS was not significantly related to HR reactivity \( (p = .162) \). In regression analyses controlling for gender, race, and main effects of each variable, the PS x SLE interaction was a significant predictor of HR reactivity, \( \beta = .192, p = .034, 95\% \text{ CI} [.001 - .020] \). Individuals with low PS and high SLE exposure showed the most blunted HR responses to the stressor. Individuals with high amounts of PS, regardless of SLE exposure, reacted similarly with HR responses to the task stressor.

CONCLUSION: SLE may desensitize how individuals’ biological systems respond to acute stress. However, the current study suggests the relationship is dependent on individuals’ PS of these events. This demonstrates the importance of measuring both PS and SLE as suggested by the stage model of stress. Future research should evaluate how these unique stress traditions interact to predict future disease outcomes.