PO52

Effects of stress on bodily freezing in adolescents

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Freezing is a major defensive stress-response, characterized by reduced body-sway and heart rate. Exacerbated freezing in threatening situations has been associated with increased basal and stress-induced glucocorticoid levels and with long-lasting stress-related symptoms in animals. However, the effects of stress-induced changes on human freezing are unknown. A new measure has been developed to quantify freezing-like behavior in humans using a stabilometric force-platform such that shifts in body-sway can be assessed with high temporal and spatial accuracy. Previous research has shown that exposure to angry (vs. neutral) faces can induce reductions in body-sway and heart rate in humans. In our study, we used this method to assess the effects of stress and stress-induced cortisol on human freezing responses to angry versus happy and neutral faces. Participants were 90 adolescents (age 17) who were tested at three time points: prior to, immediately after, and 55 min after the Maastricht Acute Stress Test. To ascertain stress-induction, self-reported, physiological, and hormonal measures were collected prior to, immediately after, and 20, 30, 40, and 55 min after stress-onset. Preliminary analyses of the self-report and blood pressure measures indicated a successful stress-induction. Additionally, we predicted that stress-induced cortisol levels are associated with increased freezing. Finally, we will explore the association between stress-induced freezing and affective symptoms (e.g., anxiety) to gain a better understanding why adolescence is a phase of increased vulnerability for stress-related symptoms. We will discuss our results in terms of the translation between animal and human models of stress and defensive responses to threat.

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PO53

Acute mortality salience interacts with early-life adversity to predict adrenocortical reactivity to stress

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Background: Early-life adversity (ELA) alters stress reactivity. From an evolutionary perspective, these alterations may be adaptive in unsafe environments where early mortality is likely. Biological-sensitivity-to-context theory argues that humans evolved to detect mortality cues in their environment and this information calibrates stress responsivity. While evidence suggests that stress responsivity depends on exposure to mortality indicators during childhood, we do not know how acute mortality salience affects stress responsivity during adulthood.

Hypothesis: Acute mortality salience interacts with early-life adversity to predict physiological responsivity to stress.

Method: Forty-six healthy young men were categorized as either high or low on ELA based on retrospective self-reported levels of maternal care. Participants were randomly assigned to one of two conditions. In the experimental condition, we primed mortality salience by asking participants to write about death. The control group wrote an essay about sleep. After completing the essay, participants performed the Trier Social Stress Test. Through out the procedure, salivary cortisol was measured repeatedly to ascertain physiological reactivity to stress.

Results: Mortality salience significantly reduced cortisol reactivity to the TSST but only among low ELA individuals.

Discussion: Our results confirm the notion that mortality salience modulates sensitivity to stress. We extend this notion in two ways: (1) by showing that susceptibility of stress responsivity to mortality cues persists into adulthood, (2) the persistence of this plasticity depends on maternal care. Consistent with biological-sensitivity-to-context theory, we argue that protective environments not only entrain greater stress reactivity, but greater sensitivity to future environmental cues that modulate stress responsivity.

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PO54

The influence of stress exposure on physiological stress responses and body composition in preschool children

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Background: Stress exposure (stressful major life events, daily hassles, and conflicts within families) has been found to have an impact on physiological stress regulation and has been related to childhood obesity in older children. However, its impact in young children remains unclear. The purpose of this study was to determine the effect of stress exposure on physiological stress responses and body composition in 2–6-year old children.

Method: 477 preschool children (Mean age 3.88 yrs/SD 0.68; m/f: 252/225) participated in a national cohort study. All children were tested at their child care centers by using an age-adapted socio-evaluative stress paradigm. Salivary cortisol and salivary alpha amylase were assessed during the stress paradigm and on