From Childhood Stress to Immune Response: Do Early Experiences Shape Reactions to Pathogen Threat?

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Background

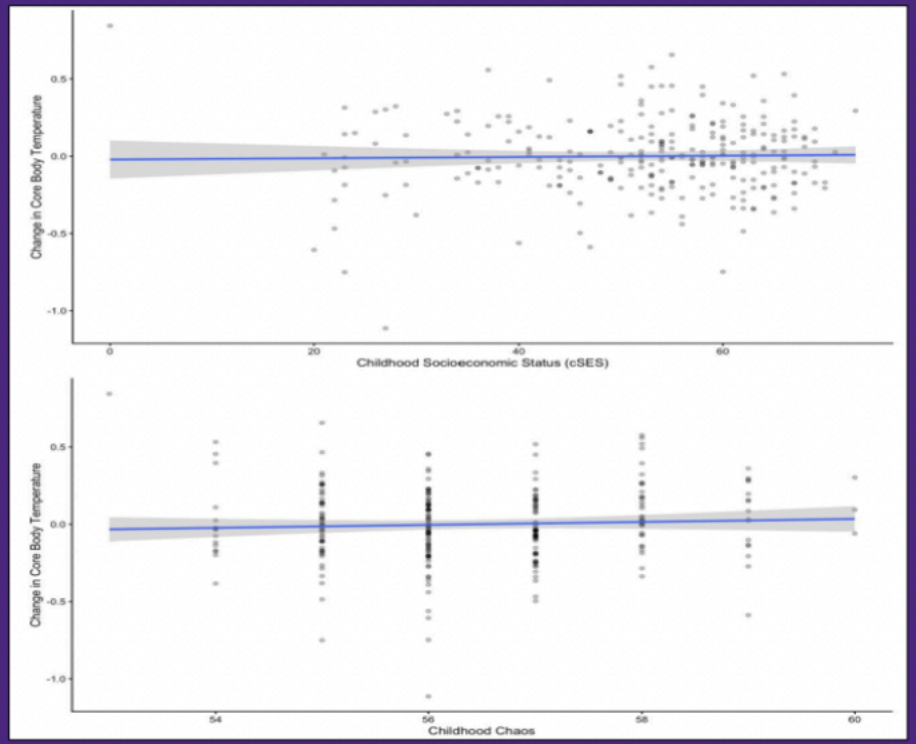
- Early life adversity (e.g., neglect, maltreatment, low SES) is linked to increased risk of long-term physical and mental health problems (Felitti et al., 1998).
- Childhood **is a sensitive developmental period**, where stress can become biologically embedded and shape long-term physiology (Shonkoff et al., 2012).
- Early stress is associated with increased **inflammation in adulthood,** suggesting long term changes in immune functioning (Danese et al., 2007; Miller et al., 2011).
- Disgust is part of the **behavioral immune system**, leading to avoidance of pathogen related threats and activating physiological responses to avoid infection (Schaller & Park, 2011).
- Thus, early life stress may lead to **heightened inflammatory and autonomic responses** to pathogen-related stimulation (Danese & McEwen, 2012).

Methods

- **Participants:** Adults (18+) screened to exclude illness, inflammatory conditions, and recent medication use.
- **Design:** Experimental manipulation with two conditions: **dirty room (pathogen/disgust)** vs. **clean room (control).**
- **Procedure:** Baseline finger prick blood sample, exposure to room condition, effort task (EEfRT), surveys, post exposure blood sample.
- **Measures (Physiological):** Core body temperature.
- **Measures (Self-report):** Early life stress (SES, adversity, CHAOS) and disgust ratings.

Research Question

- **Does greater exposure to early life stress predict stronger inflammatory and autonomic responses to pathogen-related stimuli?**



References

Felitti, V. J., et al. (1998). Relationship of childhood abuse and household dysfunction to many leading causes of death in adults.
Shonkoff, J. P., et al. (2012). The lifelong effects of early childhood adversity.
Danese, A., et al. (2007). Childhood maltreatment predicts adult inflammation.
Miller, G. E., Chen, E., & Parker, K. J. (2011). Psychological stress and inflammation.
Danese, A., & McEwen, B. S. (2012). Adverse childhood experiences and health.
Schaller, M., & Park, J. H. (2011). The behavioral immune system.

Results

- Participants in the dirty room reported more disgust (M = 3.32, SD = 2.07) than the clean room (M = 1.40, SD = 1.00), $t(221.45) = -9.99$, $p < .001$, $d = -1.19$.
- Room condition predicted increases in core body temperature (cSES: $b = 0.093$, $SE = 0.029$, $t = 3.18$, $p = .002$; CHAOS: $b = 0.088$, $SE = 0.029$, $t = 3.02$, $p = .003$).
- Neither cSES nor CHAOS, nor temperature, predicted desire to obtain rewards ($ps > .87$) or avoid costs ($ps > .13$).
- Indirect effects were nonsignificant across all levels of cSES and CHAOS (all 95% *CIs* included 0).
- Moderated mediation indices were nonsignificant (cSES: rewards = 0.024 [−0.503, 0.459], costs = −0.108 [−0.603, 0.232]; CHAOS: rewards = −0.057 [−3.67, 1.73], costs = 0.253 [−2.37, 2.80]).

Discussion

- Childhood SES and Chaos **did not** influence the relationship between room conditions or temperature and effort, with no effect of early life stress being observed.
- The disgust manipulation increased physiological response but was **not moderated by early adversity.**
- Early life stress may impact **baseline inflammation** rather than acute responses to short-term laboratory stimulation.
- The present study relied primarily on core body temp
- **Limited variability** in a college sample may have reduced the ability to detect meaningful effects.
- Individuals exposed to early adversity may develop **adaptive regulatory mechanisms**, masking differences in controlled settings.
- **Future research** should examine more diverse or high adversity populations and use stronger or real-world pathogen exposures to better capture these effects.