



# Multilevel and multimodal biobehavioral methods in the study of stress, trauma, and resilience: a systems approach

Sharon Y. Lee<sup>1,2,3</sup> · Shaquanna Brown<sup>1,2,3</sup> · Chrystal Vergara-Lopez<sup>1,2,3</sup> · Karen Jennings Mathis<sup>1,2,3</sup> · Beth C. Bock<sup>1,2,3</sup> · Nicole R. Nugent<sup>1,3,4,5</sup> · Stephanie H. Parade<sup>1,3,6</sup> · Audrey R. Tyrka<sup>1,3,7</sup> · Laura R. Stroud<sup>1,2,3</sup>

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## Abstract

In recent years, there has been a proliferation of methodological and technological advances in stress, trauma, and resilience research. We present an approach to studying the structural transmission of stress, trauma, and resilience across multiple socio-ecological systems. Specifically, we highlight methodologies that are: (1) Multilevel in capturing the compounding of traumas and stressors across multiple socio-ecological systems over time, (2) multimodal in integrating data from different sources and across different settings, and (3) biobehavioral in assessing how stress, trauma, and resilience affect biology and behavior. We identify opportunities for expanding settings where stress, trauma, and resilience research is conducted. Next, we review promising methodological and technological approaches for multisystem measurement, assessment, and analysis. We explore considerations for developing new self-report measures, employing ecological methods (e.g., ecological momentary assessment, wearable devices, social interactions), leveraging biomarkers, and using qualitative methods. Finally, we discuss ways to advance our measurement and methodologies through collaboration, implementation, and future research.

## Key Terms

- **Stress:** An umbrella construct referring to both stressors and stress responses.
- **Stressor:** An event or situation that poses actual or perceived threat or harm.
- **Stress Response:** Cognitive, affective, and physiological changes due to internal or external events or situations.
- **Trauma:** Direct or indirect exposure to an experience that threatens life or safety including, but not limited to, death, injury, or violence.
- **Resilience:** Adaptation to threat or harm by a system, community, group, or individual.

**Keywords** Structural resilience · Methodology · Multimodal · Biobehavioral · Multilevel

✉ Sharon Y. Lee  
sharon\_y\_lee@brown.edu

<sup>1</sup> COBRE Center for Stress, Trauma, and Resilience (STAR), The Miriam Hospital, Providence, USA

<sup>2</sup> Center for Behavioral and Preventive Medicine, The Miriam Hospital, Providence, USA

<sup>3</sup> Department of Psychiatry and Human Behavior, Warren Alpert Medical School, Brown University, Providence, USA

<sup>4</sup> Department of Pediatrics, Warren Alpert Medical School, Brown University, Providence, USA

<sup>5</sup> Department of Emergency Medicine, Warren Alpert Medical School, Brown University, Providence, USA

<sup>6</sup> Bradley/Hasbro Children's Research Center, E. P. Bradley Hospital, East Providence, USA

<sup>7</sup> Mood Disorders Research Program and Laboratory for Clinical and Translational Neuroscience, Butler Hospital, Providence, USA

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