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Predicting Difficulty with Learning in the Mathematics Classroom: The Usefulness of Heart Rate Variability

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Abstract

Mathematical thinking and learning are negatively affected by adverse childhood experiences (ACEs), which have been shown to impact school attendance, behavioral issues, and achievement of grade-level standards of a variety of academic subjects (Blodgett & Lanigan, 2018). ACEs are often linked to permanent physiological changes to the nervous system in a dose-response relationship (Dube, Felitti, Dong, Giles, & Anda, 2003). Laboratory studies have identified physiological indicators—such as heart rate variability—which can point to students who may have unique learning needs, but this has not yet been tested in a classroom setting, where students learning needs may be amplified (Smith, Thayer, Khalsa, & Lane, 2017). In this study we use sport watches to explore the value of measuring heart rate variability of students while they are in the classroom to predict those who may need support to optimize learning in math class.