

# Preschool children's heart rate variability across contexts of low and high emotional challenge correlates with their self-regulation performance

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## Abstract

Heart rate variability (HRV) theoretically provides a biomarker for self-regulation, although studies with young children offer mixed findings regarding the relevance of emotional demands in this link. We aimed to describe variation in children's HRV during tasks with relatively high and low emotional load, and to determine the relation of HRV during these tasks to different behavioral measures of children's self-regulation. Electrocardiograms were recorded in 80 3 - 5-year-olds (M = 57 months; 54% male, 47% female) while they completed a Go/No-go task with low emotional load and an emotionally challenging Delay Frustration task. Mean HRV was similar across these tasks, although it increased during a between-task rest interval. Accounting for age, gender, and caregiver education, higher HRV during both tasks, but not during rest, correlated with children's executive function task performance. HRV during Delay Frustration correlated with caregiver-reported self-regulation, whereas greater HRV withdrawal during tasks correlated with children's task-related negative frustration. Children's maintenance of HRV during emotional and cognitive challenge may support their effective self-regulation.

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