

# **Respiratory sinus arrhythmia, parenting, and externalizing behavior in children with autism spectrum disorder**

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Children with autism spectrum disorder (ASD) display more challenging behavior (e.g., non-compliance, aggression) than do children with neurotypical development. This may stem, in part, from difficulties managing, or regulating, emotions. Respiratory sinus arrhythmia (RSA), which refers to variability in heart rate across the breathing cycle, is a physiological measure related to emotion regulation. Increases in RSA reflect calming and reductions in RSA reflect arousal. Reductions in RSA in response to frustration may be helpful (supporting engagement with the challenge) or problematic (if the arousal is excessive or mismatched with environmental demands and supports). Indeed, the effects of higher RSA reduction may depend in part upon aspects of the social environment that support or undermine successful management of emotion. In this research, we tested whether associations between RSA reduction (in response to a frustrating laboratory task) and children's challenging behavior depended upon levels of positive parenting (warmth, scaffolding) or negative parenting (criticism, harsh discipline). Positive parenting, negative parenting, and children's challenging behavior were measured through multiple methods, including observation, interview, and questionnaires. We found that the association between RSA reduction in response to frustration and child behavior depended upon the parenting environment. Specifically, greater RSA reduction was associated with less challenging behavior in the context of less negative parenting. In contrast, greater RSA reduction was associated with more challenging behavior in the context of more negative parenting. Associations between RSA reduction and child behavior did not depend upon levels of positive parenting. Together, findings suggest that some children with ASD are more sensitive to certain types of negative parenting than others. That is, greater RSA reduction (i.e., increased arousal) when frustrated may facilitate effective engagement and problem-solving in the context of less negative parenting environments, but foster dysregulation or challenging behavior in critical or harsh parenting environments. Implications for understanding how biopsychological factors (such as RSA reduction in response to frustration) and social factors (such as parenting) combine to influence challenging behavior in children with ASD and potential avenues for intervention are discussed.