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Temperament and Emotion Regulation: The Role of Autonomic Nervous System Reactivity

ABSTRACT: *The aim of the present study was to examine the moderating role of parasympathetic and sympathetic nervous system functioning on the relationship between child temperament and emotion regulation. Sixty-two 4.5-year olds (31 females) were rated by their parents on temperamental surgency. Respiratory sinus arrhythmia (RSA) and pre-ejection period (PEP) were measured at baseline and in reaction to an interaction with an unfamiliar person and a cognitive test. The preschoolers' ability to self-regulate emotion was assessed in response to a disappointment. Results revealed little or no PEP reactivity to the unfamiliar person to be related to poorer emotion regulation for children high in surgency, indicating that the lack of sympathetic activation may be a risk factor for behavioral maladjustment. Reciprocal sympathetic activation, or increases in sympathetic activity accompanied by decreases in parasympathetic activity, was associated with better regulation of emotion for all levels of temperamental surgency supporting previous work that reciprocal activation is an adaptive form of autonomic control.* © 2010 Wiley Periodicals, Inc. Dev Psychobiol 53: 266–279, 2011.

Keywords: *temperament; autonomic nervous system; parasympathetic reactivity; sympathetic reactivity; emotion regulation*

INTRODUCTION

Emotion regulation is a developmentally significant accomplishment. Learning to control one's emotions to frustrating or fear-inducing situations is essential to positive social adjustment and attenuates conditions related to poor developmental outcome. In young children, successful emotion regulation leads to better peer relations (Calkins, Gill, Johnson, & Smith, 1999), prosocial behavior (Eisenberg, Fabes, Guthrie, & Reiser, 2000), and fewer problem behaviors (Supplee, Skuban, Shaw, & Prout, 2009). Moreover, emotion regulation has an important role in school readiness, and moderates risks

associated with economic disadvantage (Raver, Garner, & Smith-Donald, 2007; Shields et al., 2001).

Children's ability to regulate emotions may vary depending upon their temperament. Variations in temperamental approach, for example, generate different emotions that may require regulation. Children who are characterized by high temperamental approach, referred to as surgent, exuberant, or uninhibited, exhibit more approach to novelty, intense pleasure, and impulsivity (Rothbart & Bates, 2006). Because of their approach motivations, these children may experience more frustration and anger to blocked goals, which in certain contexts would need to be regulated. Similarly, children who are low in temperamental approach, referred to as behaviorally inhibited or shy children, are characterized by their low tolerance for novelty and high levels of fearfulness and may also require skills to regulate their emotions—specifically their fear (Kagan, Reznick, & Snidman, 1987).

The importance of the self-regulation of emotion to children of varying approach tendencies may be best

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