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### **Brief Report**

# Impact of attention biases to threat and effortful control on individual variations in negative affect and social withdrawal in very young children



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#### ABSTRACT

Early temperamental sensitivity may form the basis for the later development of socioemotional maladjustment. In particular, temperamental negative affect places children at risk for the development of anxiety. However, not all children who show negative affect go on to develop anxiety or extreme social withdrawal. Recent research indicates that reactive control, in the form of attention to threat, may serve as a bridge between early temperament and the development of later social difficulties. In addition, variation in effortful control may also modulate this trajectory. Children (mean age = 5.57 years) were assessed for attention bias to threatening and pleasant faces using a dot-probe paradigm. Attention bias to threatening (but not happy) faces moderated the direct positive relation between negative affect and social withdrawal. Children with threat biases showed a significant link between negative affect and social withdrawal, whereas children who avoided threat did not. In contrast, effortful control did not moderate the relation between negative affect and social withdrawal. Rather, there was a direct negative relation between effortful control and social withdrawal. The findings from this short report indicate that the relations among temperament, attention bias, and social withdrawal appears early in life and point to early emerging specificity in reactive and regulatory functioning.

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#### Introduction

Early temperamental sensitivity may lay the foundation for the later development of social anxiety (Biederman et al., 2001; Chronis-Tuscano et al., 2009; Rosenbaum et al., 1993; Rubin & Burgess, 2001), particularly for children who display negative affect. The antecedents of social anxiety are marked by high levels of social withdrawal prior to the emergence of the disorder (Rapee & Spence, 2004). However, not all children who show increased negative affect go on to develop anxiety or extreme social withdrawal (Degnan & Fox, 2007). Recent research indicates that attention may act as a developmental tether linking early temperamental risk to the later emergence of social difficulties (Pérez-Edgar, Taber-Thomas, Auday, & Morales, 2014; Pérez-Edgar et al., 2010). Attention to threat may reflect individual differences in reactive control (Rueda, 2012), which can take on a regulatory function (Todd, Cunningham, Anderson, & Thompson, 2012). In addition, strong effortful control skills may also impact this developmental link (Lonigan & Vasey, 2009). This study aimed to examine the association among early temperament (negative affect), attention bias to salient stimuli (reactive control), effortful control, and levels of social withdrawal in a normative sample of young children. These data provide insight into varied regulatory mechanisms involved in typically observed patterns of socioemotional functioning that may also subserve maladaptive patterns of anxious behavior (Fox & Pine, 2012).

Rothbart and Derryberry (1981) characterized temperament as a set of stable, biologically based individual differences in reactivity and regulation. In this model, emotional reactivity works in concert with regulation processes to provide the basis of observed behavior in children (Goldsmith et al., 1987). These two components of temperament, along with environmental factors and individualized experiences, shape the child's personality (Rothbart, 2012). Much of the literature investigating the development of psychopathology has focused on negative reactivity—negative emotional and motoric responses produced when a person is exposed to novel environmental stimuli (Derryberry & Reed, 2002). These can include feelings of anger, distress, agitation, sadness, and fear and associated behaviors (Davidson, Putnam, & Larson, 2000; Rothbart, Ahadi, Hershey, & Fisher, 2001). Observed patterns of negative reactivity are supported by specific patterns of functioning in both the central nervous system and the limbic system, often marked by a hyperactive amygdala response (Pérez-Edgar et al., 2007; Thomas et al., 2001).

Although negative affect has been directly linked to the development of anxiety, this trait does not work alone to shape observed patterns of behavior. Rather, individual differences in initial reactivity are coupled with individual differences in regulatory skills, which can serve as variably effective or robust checks on reactivity. Regulation processes emerge relatively slowly over the course of childhood (Cole, Michel, & Teti, 1994). As children grow, they shift from using external sources to provide regulation of their emotions (e.g., parents, pacifiers) to employing internal regulatory mechanisms (e.g., attention shifting, thought suppression) to control their immediate emotional responses (Rueda, 2012).

Functionally, one can parse regulatory behavior into reactive and effortful control mechanisms. Reactive control is motivated by immediate incentives and is sufficiently spontaneous to not be considered deliberate (Martel & Nigg, 2006). This implicit evaluation then triggers relatively automatic or reflexive response strategies that can indicate approach or withdrawal behavior (Rueda, 2012). Todd et al. (2012) suggested that affect-biased attention can act as a reactive form of emotion regulation. This bias may be particularly acute for social (vs. nonsocial) threats (LoBue & Pérez-Edgar, 2014). Negatively reactive individuals are also slower to disengage their attention from these stimuli relative to less reactive individuals (Fox, Russo, Bowles, & Dutton, 2001). Negative affect, coupled with reactive threat bias, may place individuals at even greater risk for anxiety and social withdrawal (Pérez-Edgar & Fox, 2005; Pérez-Edgar et al., 2014).

Emerging data suggest that threat avoidance, marked by attention bias *away* from threat, is also associated with the development of anxiety (Shechner et al., 2012). Direction may reflect diagnostic boundaries; distress disorders have shown a significant bias toward threat, whereas children with fear disorders show an attention bias away from threat (Waters, Bradley, & Mogg, 2014). Patterns of

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