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The relations of effortful control and impulsivity to children's sympathy: A longitudinal study

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Abstract

The relations of children's ($n = 214$ at Time 1; M age = 6 years at Time 1) dispositional sympathy to adult-reported and behavioral measures of effortful control (EC) and impulsivity were examined in a longitudinal study including five assessments, each two years apart. Especially for boys, relatively high levels of EC and growth in EC were related to high sympathy. Teacher-reported impulsivity was generally modestly negatively related to measures of teacher-reported sympathy for boys, and a decline in impulsivity was linked to boys' sympathy. Some findings suggested a positive association between impulsivity and children's self-reported sympathy. EC, especially when reported by teachers, was more often a unique predictor of sympathy than was impulsivity. Results generally support the argument that sympathetic individuals, especially boys, are high in EC and that EC is a more consistent predictor of sympathy than impulsivity.
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One of the core constructs in Rothbart's theory of temperament is effortful control (EC), defined as "the efficiency of executive attention—including the ability to inhibit a dominant response and/or to activate a subdominant response, to plan, and to detect errors" (Rothbart & Bates, 2006, p. 129). Executive attention, including the abilities to willfully shift or focus attention as required and to integrate incoming information, is central to EC and is believed to affect inhibitory control (the capacity to suppress approach tendencies as needed), activation control (the capacity to perform an action when there is a strong tendency to avoid it), planning, and integrating information. EC is a temperamentally based set of characteristics or skills that are involved in

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individual differences in the regulation of reactivity, including emotions and behavioral reactivity (e.g., Rothbart & Bates, 2006). Areas of the midfrontal lobe, including the anterior cingulate gyrus, in combination with lateral prefrontal areas, appear to underlie the executive attentional network and EC (Posner & Rothbart, 2007; Vogt, Finch, & Olson, 1992).

The construct of EC overlaps with that of executive functioning, especially executive attention (Eisenberg, Hofer, & Vaughan, 2007; Rueda, Posner, & Rothbart, 2005). Executive functioning, like EC, is a broad construct encompassing a number of attentional and cognitive processes that are integral to self-regulation and goal-directed activities (e.g., working memory, inhibition of prepotent responding, planning, and shifting and sustaining attention) (Blair, Zelazo, & Greenberg, 2005). Both EC and executive functioning are superordinate terms that refer to an array of overlapping and related skills, although executive functioning includes some skills (e.g., working memory) that are not emphasized in theory and research on EC.

The skills involved in EC have been operationalized in a variety of ways, some of them overlapping with typical assessments of executive control. The most common way of measuring EC has been with Rothbart's various adult-, adolescent-, or child-report temperament scales (e.g., Capaldi & Rothbart, 1992; Putnam, Gartstein, & Rothbart, 2006; Putnam & Rothbart, 2006; Rothbart, Ahadi, Hershey, & Fisher, 2001). Questionnaire items pertaining to EC tap (depending on the age of the person) the abilities to willfully shift attention, focus attention, inhibit behavior, and activate behavior. Sometimes indices of these aspects of EC group in factor analyses with perceptual sensitivity (detection of slight, low intensity stimuli from the external environment) and low intensity pleasure (i.e., the amount of pleasure or enjoyment related to situations involving low stimulus intensity, rate, complexity, novelty and incongruity), likely because of the role of attention in perceptual processes. In addition, researchers have increasingly designed or adapted behavioral measures to assess EC. Measures of EC used for school-aged children or adolescents include tasks that tap delay of gratification, persistence on boring tasks, and tasks that require voluntary inhibition or activation of behavior (Eisenberg et al., 2004; see Kochanska, Coy, & Murray, 2001; Kochanska, Murray, & Harlan, 2000, for a battery of such measures).

Control is usually defined as constraint, and it can be voluntary–based on EC–or less voluntary and effortful. Thus, Eisenberg and colleagues (Eisenberg & Morris, 2002; Eisenberg et al., 2007) have built on Rothbart's (e.g., Derryberry & Rothbart, 1997) distinction between effortful and reactive processes in an attempt to differentiate EC from other constructs that may seem effortfully self-regulated but are minimally so. Specifically, there are aspects of control, or the lack thereof, which seem to be involuntary or so automatic that they often are not under voluntary control; we label these reactive control. *Reactive control* processes pertain to relatively involuntary motivational approach and avoidance systems of response reactivity that, at extreme levels, result in impulsive undercontrol and rigid overcontrol. Measures typically tap, but are not confined to: (a) impulsivity: pertains to speed of response initiation and surgent approach behaviors, and (b) overcontrol–rigid, constrained behavior or behavioral inhibition (i.e., slow or inhibited approach in situations involving novelty or uncertainty; note that this is a different construct than inhibitory control) (Derryberry & Rothbart, 1997; Kagan & Fox, 2006). Pickering and Gray (1999) and others (Cacioppo, Gardner, & Berntson, 1999) have argued that motivational systems related to undercontrolled/impulsive and overly inhibited behaviors are associated with subcortical brain systems. One conceptualization of such systems includes Gray's (1987) Behavioral Inhibition System (BIS), which is activated in situations involving novelty and stimuli signaling punishment or frustrative nonreward, and Gray's Behavioral Activation System (BAS), which involves sensitivity to cues of reward or cessation of punishment. These systems are heuristic frameworks and there is some debate about the neurological bases of motivational systems.