Early Childhood Research Quarterly 28 (2013) 784–793

Contents lists available at ScienceDirect

Early Childhood Research Quarterly

Income and the development of effortful control as predictors of teacher reports of preschool adjustment☆

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ARTICLE INFO

Article history:
Received 22 March 2012
Received in revised form 4 July 2013
Accepted 20 July 2013

Keywords:
Effortful control
Executive control
Delay ability
Income
Social competence
Adjustment problems

ABSTRACT

This study examined the relations of income and children's effortful control to teacher reports of preschoolers' social competence and adjustment problems. This study tested whether changes in effortful control accounted for the effects of income on children's adjustment. A community sample ($N = 306$) of preschool-age children (36–40 mos.) and their mothers, representing the full range of income (29% at or near poverty, 28% at or below the local median income), was used. Path analyses were used to test the prospective effects of income on rank-order changes in two aspects of effortful control, executive control and delay ability, which in turn, predicted teacher-reported adjustment problems and social competence. Lower income predicted smaller rank-order change in executive control, but did not predict changes in delay ability. Smaller rank-order change in delay ability predicted greater adjustment problems above the effect of income. Larger rank-order change in executive control predicted greater social competence and fewer adjustment problems above the effect of income. These findings provided some support for the hypothesis that disruptions in the development of effortful control related to low income might account for the effects of low income on young children's adjustment. Effortful control is potentially a fruitful target for intervention, particularly among children living in low income and poverty.

Children living in poverty are at elevated risk for problems in social, emotional, and behavioral adjustment. Such children have a greater likelihood of learning and academic problems, school dropout, emotional and behavior problems (Barbain et al., 2006; Brooks-Gunn & Duncan, 1997; Evans, 2003; Kim, Conger, Elder, & Lorenz, 2003; McLoyd, 1998; Mistry, Vandewater, Huston, & McLoyd, 2002; Petterson & Albers, 2001). In addition, children living in low-income environments tend to demonstrate lower self-regulation, a core aspect of which is effortful control. Effortful control develops early in childhood, underlies a wide range of children's socioemotional outcomes, and has both immediate and long-term effects on adjustment (Raver, 2004). Children living in low-income environments tend to demonstrate lower levels of effortful control when compared to children living in higher-income environments (Eisenberg, Cumberland, et al., 2001; Eisenberg, Gershoff, et al., 2001; Howse, Lange, Farran, & Boyles, 2003; Lengua, 2002; Mezzacappa, 2004). Further, young children living in low-income environments tend to develop their self-regulatory capacities at a slower rate than their more privileged peers (Lengua, Honorado, & Bush, 2007; Li-Grining, 2007). Disruptions to the development of effortful control might represent a pathway of the effect of low income on children's adjustment (Meich, Essex, & Goldsmith, 2001) and account for the marked and enduring implication of early experiences of poverty (Brooks-Gunn & Duncan, 1997; Duncan, Ziol-Guest, & Kalil, 2010). This study builds upon existing research on the impact of income on children's self-regulatory capacities and adjustment by testing whether changes in effortful control account for the effects of low income on preschool-age children's social competence and adjustment problems in the classroom.

1. Effortful control

Effortful control is defined as the ability to inhibit a dominant response for a preferred non-dominant response in conflict situations (Kochanska, Murray, & Harlan, 2000). Effortful control, originally referred to as the anterior attention network, refers to the ability to shift attention from irrelevant or distracting stimuli and focus on relevant stimuli (Kochanska et al., 2000; Rothbart, Ahadi, & Evans, 2000). Effortful control is also related to planning tasks, as it facilitates self-monitoring, flexibility, response inhibition, and resistance to interference (Kochanska, Murray, Jacques, Koenig, & Vandegeest, 1996). Taken together, effortful control can

☆ This research was supported by a grant to the 2nd author from the National Institutes of Child Health and Human Development (R01HD054465). The authors wish to thank the families who participated in this research.

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0885-2006/$ – see front matter © 2013 Elsevier Inc. All rights reserved.
http://dx.doi.org/10.1016/j.ecresq.2013.07.006

be thought of as a central aspect of self-regulation and includes dimensions of executive attention, inhibitory control, and ability to delay. As the name suggests, effortful control is a self-regulatory mechanism involving the voluntary, self-guided regulation of one's attention and behavior (Rothbart et al., 2000).

Measures of effortful control often combine the executive attention and inhibitory control dimensions with reward delay dimensions. However, from a biological perspective, the attention and inhibitory control aspects of effortful control may stem from different brain regions than the ability to delay in reward contexts. Imaging studies have begun to illustrate separateness in brain activation between a cognitive or an emotional attention task (Bush, Luu, & Posner, 2000). Whereas the attention and inhibitory control dimensions may point to activity in areas of the prefrontal cortex, the reward delay dimension may also call upon motivational systems embodied in mesolimbic dopaminergic pathway. The interaction of these brain regions (prefrontal and mesolimbic) may be key to successful delay of gratification (Dixon, 2010). Beyond differences in underlying brain regions, emerging research has also illustrates differences in developmental course (Carlson, 2005; Li-Grining, 2007), correlations with dimensions of temperament (Hongwanishkul, Happaney, Lee, & Zelazo, 2005) and relations to adjustment and academic outcomes (Brock, Rimm-Kaufman, Nathanson, & Grimm, 2009; Gusdorf, Karreman, van Aken, Dekovic, & van Tuijl, 2011; Nigg, 2000) with regard to these dimensions of effortful control. Therefore, in this study, we examined the reward delay component of effortful control separately from the executive attention and inhibitory control components (which we refer to as "executive control") to assess the possibility of differential vulnerability to the effects of income, as well as differential relations to preschool social competence and adjustment problems.

1.1. Effortful control predicts social competence and adjustment problems

Effortful control is consistently and robustly related to children's social competence and adjustment problems (Kochanska et al., 1996; Lengua, 2003), supporting the Posner and Rothbart (2000) assertion that effortful control is crucial to understanding both adaptive functioning and psychopathology. Within the realm of social and emotional competence, executive control may facilitate the inhibition of a dominant response in favor of a more socially acceptable, albeit non-dominant behavior. Self-monitoring, an important component of executive attention, may foster self-monitoring of one's impact on others, as well as alerting a child to social norms in early school settings. Indeed, inhibition and attention focusing are related to more concurrent social competence (Ciairano, Visu-Petra, & Settanni, 2007; NICHD Early Child Care Research Network, 2003; Rudasill & Konold, 2008). This link between attention and more social competence has also been demonstrated in a sample of low-income preschool children (Raver, Blackburn, Bancroft, & Torp, 1999). Executive attention has also been shown to prospectively predict greater social skills and fewer social problems in school-age children (Gewirtz, Stanton-Chapman, & Reeve, 2009; Mintz, Hamre, & Hatfield, 2011; Nigg, Quamma, Greenberg, & Kusche, 1999). Effortful control is related to greater empathy (Rothbart, Ahadi, & Hersey, 1994), restraint (Kochanska et al., 2000), internalization of rules (Kochanska, 1997), and more socially appropriate behavior and popularity (Eisenberg, Fabes, Guthrie, & Reiser, 2000; Eisenberg et al., 2003; Spinrad et al., 2006).

Executive attention and ability to delay gratification also predict adjustment problems. Executive attention may afford the capacity to direct one's attention to attenuate distress, inhibit antisocial behaviors, and modulate anger and acting out behaviors, while delay of gratification may promote the space in which children consider the consequences of their actions before acting (Kochanska, 1997; Posner & Rothbart, 2000; Rothbart et al., 2000). Executive dysfunction (Hughes & Ensor, 2009) and lack of attention and impulsivity (NICHD Early Child Care Research Network, 2003; Zahn-Waxler, Schmitz, Fulker, Robinson, & Emde, 1996) have predicted more externalizing problems. Further, the inability to regulate attention has been shown to predict greater conduct problems (Eisenberg et al., 1995; Lengua, 2003; Pope, Bierman, & Mumma, 1989). Poor inhibitory control has also been consistently related to more externalizing problems (Gusdorf et al., 2011; Hughes, White, Sharpen, & Dunn, 2000; Nigg et al., 1999; Riggs, Greenberg, Kusche, & Pentz, 2006) as well as ADHD behaviors (Gewirtz et al., 2009; Gusdorf et al., 2011). Finally, poor delay of gratification has been consistently linked to greater behavior problems such as aggression and conduct problems (Ayduk, Rodriguez, Mischel, Shoda, & Wright, 2007; Gusdorf et al., 2011).

Components of executive attention have also been found to predict internalizing problems (Eisenberg, Cumberland, et al., 2001; Eisenberg, Gershoff, et al., 2001). The attention regulation aspect of effortful control has been identified as important in regulating internal emotional states (Eisenberg et al., 2000) and both the attention regulation and shifting components of effortful control are negatively related to negative affectivity. Given that individuals better at directing their attention can attenuate their distress (Posner & Rothbart, 2000), individuals higher in effortful control may be less prone to developing internalizing problems (de Boo & Kolk, 2007; Eisenberg, Cumberland, et al., 2001; Eisenberg, Gershoff, et al., 2001; Kiff, Lengua, & Bush, 2011; Lengua, 2003, 2006; Muris, van der Pennen, Sigmond, & Mayer, 2008).

Taken together, there is some evidence to support specificity in the relations of executive control and delay of gratification to social competence and adjustment problems, with executive control relating to both social competence and adjustment problems (Nigg et al., 1999), and delay of gratification relating to adjustment problems. Unfortunately, there is a widespread tendency to examine either executive attention or delay of gratification, but not both components simultaneously when examining the relation of these aspects of effortful control to social competence and adjustment problems. For example, Eisenberg, Gershoff, and colleagues (2001) found that greater child self-regulation predicted both greater externalizing behavior problems and social competence. However, their measure of self-regulation tapped executive function (attention focusing, shifting, and inhibitory control) but not delay of gratification ability. Relatedly, one study found a measure of effortful control that combined executive attention and delay dimensions to be related to greater externalizing behaviors, but did not test for potential specificity of executive function and delay in predicting adjustment (Kochanska & Knaack, 2003). Further, few studies have tested whether developmental changes in effortful control account for children's adjustment. It is conceivable that children who develop effortful control at a faster rate can navigate their increasing autonomy and the greater demands of their contexts more effectively. Thus, not only a higher level of effortful control, but also a greater increase in effortful control may be relevant to children's social-emotional and behavioral adjustment, as has been found in older children (King, Lengua & Monahan, 2013). The present study seeks to clarify potential specificity in the effects of executive control and delay of gratification on social competence and adjustment problems in preschool-age children. Based on extant research on the unique predictive values components of effortful control (Gusdorf et al., 2011) and the relations of executive control and delay of gratification to adjustment, we predict that greater relative changes in executive control will predict higher levels of preschool social competence and lower levels of adjustment problems, whereas smaller relative changes in delay ability will predict higher levels of preschool adjustment problems.