



Is sensitive caregiving in child care associated with children's effortful control skills? An exploration of linear and threshold effects



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ABSTRACT

This study examined associations between caregiver sensitivity and responsiveness in child care experienced at age 4 and children's effortful control skills at age 5, among 154 preschoolers who attended community-based child care settings. Sensitive caregiving was measured using a modified version of the Observational Ratings of the Caregiving Environment and children's effortful control skills were assessed using both a parent questionnaire and a laboratory assessment. Results suggest that effortful control is sensitive to thresholds of caregiver sensitivity. Specifically, positive associations between caregiver sensitivity and effortful control skills a year later were observed only for children in settings with relatively high-quality caregiver sensitivity. These findings suggest that supporting the development of children's effortful control skills may require exposure to child care that exceeds typical levels of caregiving quality experienced by young children in the United States.

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Introduction

In 2012, 60% of children under the age of five were in some type of non-parental child care (Mamedova & Redford, 2013). Given that preschoolers spend, on average, 33 h per week in child care (Laughlin, 2013), deepening our understanding of the role child care experiences play in shaping early cognitive and socio-emotional development is critical. A large body of research has addressed the basic question of whether child care experiences matter for children's development. Evidence has consistently demonstrated that the wide variation in quality that characterizes child care in the United States is associated with variation in a range of developmental outcomes (Helburn, 1995; Lamb & Ahnert, 2006; National Institute of Child Health and Human Development Early Child Care Research Network (NICHD ECCRN), 1998, 2000; Phillips, McCartney, & Sussman, 2006). Related research has addressed the need to identify policy levers that can enhance the child care experiences of young children, thereby increasing their odds of readiness for and success in school (Early et al., 2007; Johnson, Ryan, & Brooks-Gunn, 2012; Mashburn et al., 2008).

Child care research, as well as policy efforts to improve care quality, is now focused on the possibility that thresholds of child care quality exist above and below which the development of

children is more strongly impacted (Burchinal, Kainz, & Cai, 2011). Emerging developmental research aimed at identifying thresholds of child care quality suggests that benefits to children are most likely to accrue at higher levels of quality as it exists in the United States (Burchinal, Vandergrift, Pianta, & Mashburn, 2010; Vandell, Belsky, Burchinal, Vandergrift, & Steinberg, 2010; Weiland, Ulvestad, Sachs, & Yoshikawa, 2013). To the extent that positive benefits of child care are stronger above a certain quality threshold, policies aimed at ensuring young children are in child care and early education settings that promote school readiness should support programs in meeting or exceeding that quality level. Moreover, understanding what levels of child care quality are linked to children's positive development helps inform parents of all socio-economic backgrounds as they select the best care settings for their children.

Children's cognitive outcomes have received the most long-standing attention in examinations of both linear and threshold effects of child care quality on child development (Burchinal et al., 2010), although substantial research has also examined socioemotional outcomes (Crockenberg & Leerkes, 2005; Phillips et al., 2012; Pluess & Belsky, 2009, 2010). The domain of outcomes captured under the broad umbrella of regulatory skills, including effortful control, has only recently begun to receive attention in this literature. Self-regulation is a rich and active area of study, and thus the terminology is evolving as new work aims to connect the various lines of research that inform our understanding of the development of children's regulatory skills. The measures of *effortful control* used

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in this study capture children's abilities to intentionally manipulate their attention and behavior and tap their capacities for inhibitory control, attentional focusing, attentional shifting, and perceptual sensitivity (Liew, 2012; Rothbart & Bates, 2006).

Some studies have reported that regulatory skills are more strongly related to school performance than IQ, entry level math and reading skills, or student GPAs from the previous semester (Blair & Razza, 2007; Valiente, Lemery-Chalfant, & Reiser, 2007). As with other domains of development, higher-quality child care has been linked to improved capacities for focused attention (Peisner-Feinberg et al., 2001) and studies of relatively high-quality preschool environments have reported benefits to children's regulatory outcomes assessed with measures of attention, self-control, and compliance (Barnett et al., 2008; Diamond, Barnett, Thomas, & Munro, 2007; NICHD ECCRN, 1998; Weiland et al., 2013). Although this robust literature has linked child care quality to children's more general regulatory skills, to date no studies have attempted to link effortful control to variation in quality found in the wider range of community-based child care settings that serve households with 4-year-olds across the socioeconomic spectrum.

Our short-term, longitudinal study extends prior work on child care outcomes to children's effortful control skills, which encompass aspects of regulation that have been linked to later academic achievement and social competence (Blair & Razza, 2007; Liew, McTigue, Barrois, & Hughes, 2008; McClelland et al., 2007). Specifically, we bring evidence on the developmental importance of effortful control skills to bear on efforts to examine both linear and non-linear relationships between an aspect of child care quality, namely caregiver sensitivity and responsiveness, and later child outcomes in a sample of preschoolers attending a range of community-based child care arrangements.

Thresholds of child care quality

Child care research over the past few decades has focused nearly exclusively on detecting linear relationships between child care quality and child developmental outcomes. The heritage of this research is firm evidence that more positive, nurturing, and language-rich child care environments with ample early learning opportunities are associated with stronger cognitive, academic, and socioemotional outcomes (NICHD ECCRN & Duncan, 2003; Phillips et al., 2012; Vandell et al., 2010). However, the typically weak associations reported in this literature have recently led researchers to explore non-linear relations using analytic approaches that examine whether associations between quality and outcomes are stronger at certain ranges along the quality spectrum compared to others.

Evidence suggests that the relationship between care quality and child cognitive and social outcomes may indeed be better captured by non-linear patterns. Several studies have reported that positive associations between care quality and short- and long-term outcomes are stronger for children who experienced care in the moderate-to-high quality range as compared to those experiencing low-to-moderate quality care (Burchinal et al., 2010; Burchinal, Vernon-Feagans, Vitiello, & Greenberg, 2014; Howes, Phillips, & Whitebook, 1992; Vandell et al., 2010), although other efforts to detect thresholds have not found them (NICHD ECCRN & Duncan, 2003). There is virtually no evidence regarding such threshold effects on young children's effortful control capacities, beyond one recent evaluation of the Boston Public Schools pre-kindergarten program (Weiland et al., 2013). This study reported that children's scores on a Pencil Tapping task that assessed inhibitory control were more strongly affected in public school-based preschool classrooms characterized by higher classroom quality scores on the Classroom Assessment Scoring System (CLASS; Pianta, La Paro, & Hamre, 2008) subscales of instructional

and emotional support and classroom organization. Whether this pattern is replicated in a relatively more-advantaged sample using community-based child care arrangements that include, but are not restricted to, preschool settings and that reflect a broader range of caregiver sensitivity and responsiveness is an unanswered question addressed by the present study.

Effortful control

Effortful control is defined as the ability to suppress a dominant response to perform a subdominant response, to detect errors, and to engage in planning (Kochanska, Murray, & Harlan, 2000; Rothbart & Rueda, 2005). Effortful control has been used to describe both a set of self-regulatory mechanisms and the behaviors resulting from the self-regulatory aspect of temperament (Kochanska et al., 2000). It encompasses both inhibitory and excitatory response tendencies (i.e. suppressing a prepotent behavioral response as well as initiating and maintaining a subdominant response) across a broad range of domains of functioning including cognitive, social, emotional, motor, and behavioral performance (Kochanska et al., 2000). A child's capacity for effortful control is widely viewed as contributing to the early development of emotional regulation and executive functions (Kochanska, 1991; Kochanska, Murray, & Coy, 1997; Kochanska & Knaack, 2004), prosocial behavior (Eisenberg et al., 1995, 1997), and social competence (Ciairano, Visu-Petra, & Settanni, 2007; Eisenberg et al., 1995; Lengua, 2002, 2003). Further, effortful control has been found to promote resilience and adaptive functioning for children growing up in adversity (Buckner, Mezzacappa, & Beardslee, 2003; Cumberland, Eisenberg, & Reiser, 2004; Obradović, 2010). In the current study, we use measures of effortful control that capture children's inhibitory control, perceptual sensitivity, and planning skills.

Individual differences in effortful control appear early in life and exhibit both modest continuity over the lifespan (Martel, 2007; Murphy, Eisenberg, Fabes, Shepard, & Guthrie, 1999; Pedlow, Sanson, Prior, & Oberklaid, 1993), as well as change with age (Eisenberg et al., 2005; Nigg, 2006; Rothbart & Bates, 2006). Though effortful control is temperamentally based, it emerges in toddlerhood and develops significantly during the preschool years as the underlying brain networks demonstrate considerable age-related changes (Rothbart, Ellis, Rueda, & Posner, 2003; Rothbart, Sheese, & Posner, 2007). These skills show especially rapid development between 3 and 6 years of age (Carlson, 2005; Diamond, 2006) as children's prefrontal cortexes mature (Casey, Giedd, & Thomas, 2000; Gogtay et al., 2004), and are influenced by early rearing experiences (Eisenberg et al., 2005; NICHD ECCRN, 2005; Tarullo, Obradović, & Gunnar, 2009; Taylor, Eisenberg, Spinrad, & Widaman, 2013). Additionally, preschoolers' effortful control skills can improve with training (Dowsett & Livesy, 2000). Since effortful control skills are amenable to intervention, malleable to early experiences, and have not been a specific focus in child care research, the impact of child care experiences on these abilities is an important area of investigation.

The role of child care in the development of effortful control

A handful of studies have explored associations between child care experiences and children's early regulatory skills. However, these studies have been limited in one of three ways: they have considered early competencies related to children's self-regulation, but not effortful control per se (Burchinal et al., 2014; NICHD ECCRN, 2005), have examined preschool classrooms using specific curricula to promote children's regulatory skills (Barnett et al., 2008), or have focused on a specific type of child care setting, such as public school-based pre-kindergarten classrooms (Weiland et al., 2013).

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