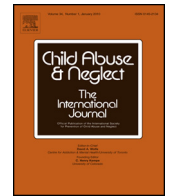




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Child maltreatment and emotion socialization: Associations with executive function in the preschool years

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ABSTRACT

This study examined executive function (EF) among preschoolers exposed to maltreatment, and tested whether caregiver practices related to emotion socialization (e.g., reactions to children's emotions; discussion of emotion) moderate the relationship between maltreatment and EF in this period. Participants were ($n = 107$) children aged 4–5 years ($M = 4.75$; $SD = 0.57$; 39% female), with various levels of exposure to maltreatment. Using the Maltreatment Classification System, substantiated reports of maltreatment were coded to produce an index of the multiplicity of abuse subtypes to which children had been exposed. EF was indexed using a composite of scores on three performance-based tests (Happy–Sad Stroop Task; Tapping Test; Dimensional Change Card Sort). Caregivers reported on their use of emotion related socialization behaviors (ERSBs) with the Coping with Children's Negative Emotions Scale. Exposure to maltreatment and ERSBs were both found to account for unique variance in EF, independent of developmental-ecological factors including children's receptive language and maternal depression. Significant interactions between maltreatment and ERSBs were also found to suggest that nonsupportive ERSBs (e.g., punitive reactions to negative child emotion) may amplify the risk for poor EF associated with maltreatment, whereas supportive ERPs (e.g., expressive encouragement) protect against it.

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1. Introduction

Executive function (EF) can be broadly conceptualized as a set of interrelated, higher-order cognitive processes that enable individuals to direct their attention, thoughts and actions for adaptive reasoning, problem-solving and planning, as indexed by tests of working memory, inhibitory control and cognitive flexibility (Diamond, 2013). Impairments in EF during early childhood have been associated with increased risk for a host of later problems pertaining to socioemotional competence and externalizing problems (Carlson, Zelazo, & Faja, 2013). With respect to cognitive outcomes, early childhood measures of EF predict school readiness, literacy, and mathematic abilities more consistently than IQ or early achievement scores (Clark, Sheffield, Wiebe, & Espy, 2013). Longitudinal research has likewise found early childhood deficits in self-control – a related aspect of EF – to predict social adjustment in adulthood (Moffitt et al., 2011). Such evidence points to EF as a high-priority target for early intervention and prevention, and has emphasized the need to identify risk and protective factors associated with its development (Ursache, Blair, & Raver, 2012).

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Due to the prolonged development of the prefrontal cortex system, its structure and function are shaped by environmental conditions and social experiences that can be both positive and enriching (e.g., stimulation, responsive caregiving) or negative and disruptive (e.g., maltreatment, poverty), particularly during periods of rapid neural growth or plasticity such as early childhood (Kolb et al., 2012). According to the neurobiological models of early stress, exposure to aggression, threat or neglect can produce dysregulated stress responses (e.g., allostatic load) leading to increased states of emotional over-arousal (e.g., hypervigilance, hyperactivity, numbing) and disruptions to volitional attention and EF (De Bellis, 2005; McCrory, De Brito, & Viding, 2010).

Research into the influences of family environment on emerging EF has focused largely on the periods of middle-to-late childhood, and on the extreme disturbances in caregiving characteristic of child maltreatment. Exposure to maltreatment in these periods has been associated with deficits in processing speed, inhibition, auditory and working memory, abstract thinking, and attention (Beers & De Bellis, 2002; DePrince, Weinzierl, & Combs, 2009; Mezzacappa, Kindlon, & Earls, 2001). It has likewise been associated with poor spatial working memory and everyday memory (Augusti & Melinder, 2013; Moradi, Doost, Taghavi, Yule, & Dalgleish, 1999).

Considerably less is known about the influences of maltreatment on EF during early childhood. Two studies of young children in foster care have found them to perform worse on tests of inhibitory control than non-foster children (Lewis, Dozier, Ackerman, & Sepulveda-Kozakowski, 2007; Pears et al., 2010), whereas one found them comparable (Pears & Fisher, 2005). Findings regarding children under the care of their biological parents have also been mixed. Physical abuse has been associated with poor parent-reported EF among children (aged 4–7 years) known to child protection services (Kim-Spoon, Haskett, Longo, & Nice, 2012). However, other research has found no differences between maltreated and non-maltreated preschoolers on measures of inhibitory control (Cipriano-Essel, Skowron, Stifter, & Teti, 2013). Such findings highlight the need for ongoing research into the influences of maltreatment on EF in early childhood, and raise questions regarding other family-level processes that may amplify or protect against such influences during this period. Importantly, there is growing evidence to indicate that not only extreme environmental insults such as maltreatment, but quality of caregiving in common parenting domains, accounts for individual differences in emerging EF.

As identified in a recent systematic review, the parenting variables that have been researched most extensively in this regard are those related to sensitivity (Fay-Stammbach, Hawes, & Meredith, 2014). As conceptualized in attachment theory, sensitive caregiving (e.g., positive affect, warmth, absence of hostility) is assumed to promote the internalization of regulatory strategies. Findings from longitudinal research across infancy and early childhood have been largely consistent in demonstrating associations between high levels of sensitivity (and low levels of hostility) and emerging EF in early childhood (e.g., Blair et al., 2001; Cuevas et al., 2014; Kraybill & Bell, 2013; Rhoades, Greenberg, Lanza, & Blair, 2011). Likewise, a randomized controlled trial of an attachment-based parenting program found it to enhance EF (cognitive flexibility) in maltreated foster children (Lewis-Morrarty, Dozier, Bernard, Terracciano, & Moore, 2012).

Traditionally, developmental research into sensitive caregiving has focused largely on the period of infancy, during which time it has often been operationalized broadly in terms of frequency and appropriateness of mothers' responses to infants' emotional displays (e.g., Cohn & Tronick, 1983; Field, 1981). In recent years researchers have focused increasingly on developmental periods beyond infancy, and have conceptualized sensitive caregiving in terms of specific emotion socialization practices comprising supportive versus nonsupportive parental reactions to children's emotional reactions. According to Eisenberg, Cumberland, and Spinrad (1998), these emotion-related socialization behaviors (ERSBs) largely fall into four domains: 1) parents' reactions to children's emotions; 2) parents' discussion of emotion; 3) parents' expression of emotion; and 4) parents' selection or modification of the child's situation. The potential to precisely operationalize and target these ERSBs in skill-based parenting interventions can be seen as an important advantage over more global conceptualizations of caregiver sensitivity.

Research to date has associated ERSBs with behavioral and self-regulatory competencies in a range of populations, including typically developing children (e.g., Cole, Dennis, Smith-Simon, & Cohen, 2009) and those with clinic-referred difficulties (e.g., Pasalich, Waschbusch, Dadds, Hawes, 2014). Such research with families characterized by maltreatment has been particularly limited, yet has nonetheless indicated that ERSBs may be important to regulatory outcomes among such children. Most notably, such research has found that among physically maltreating mothers, use of ERSBs mediate the relationship between maltreatment and regulation of emotional expression and parent/child-reports of emotional arousal and regulation in children aged 6-to-12 years (Shipman & Zeman, 2001; Shipman et al., 2007). This evidence of interplay between maltreatment status and ERSBs raises the question of whether ERSBs may likewise protect against the adverse effects that maltreatment appears to have on emerging EF (i.e., cognitive control) in early childhood. Interestingly, these studies indicate that associations between maltreatment status and ERSBs (e.g., emotion coaching) may be only moderate in size (Shipman et al., 2007). As such, while parents at risk for maltreatment are by definition characterized by negative parenting practices, considerable variability in levels of positive and negative ERSBs may nonetheless be seen among such parents.

1.1. Aims and hypotheses

The major aim of this study was to examine the relationship between maltreatment and EF in preschool-aged children. Although a range of parameters can be used to index magnitude of maltreatment, there is growing evidence to indicate that most victims of childhood maltreatment experience multiple forms of victimization, and that this multiplicity may be particularly influential in conferring risk for negative biopsychosocial outcomes (Chartier, Walker, & Naimark, 2010;

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