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Research article

Temperamental sensitivity to early maltreatment and later family cohesion for externalizing behaviors in youth adopted from foster care

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ABSTRACT

Children in foster care frequently have histories of physical/sexual abuse and neglect, increasing their risk for externalizing behaviors (EB; e.g., aggression). According to the differential susceptibility theory, children with reactive temperaments (e.g., negative emotionality) may be particularly vulnerable to early maltreatment, but may also benefit the most from environmental enrichment such as family cohesion. In a high-risk longitudinal sample of 82 children adopted from foster care in Los Angeles County from 1996 and 2001, we examined predictions of EB from childhood to adolescence/young adulthood from temperament, preadoption maltreatment, and adoptive family cohesion. Overall, results from generalized linear models and generalized estimating equations (GEE) did not support differential susceptibility theory – specifically, youth with early reactive temperament did not exhibit heightened sensitivity to maltreatment nor to later adoptive family cohesion. Instead, reactive temperament was associated with higher EB at initial adoptive placement and escalating EB across childhood, controlling for age, gender, race-ethnicity, preadoption maltreatment, and adoptive family cohesion. Preadoption maltreatment history was unrelated to baseline EB, although sexual abuse history predicted escalating childhood EB post-adoption, whereas exposure to family violence (e.g., domestic violence) inversely predicted EB over time. By late adolescence/young adulthood 11–15 years post-adoption, rates of arrest and substance use in this sample were relatively comparable to normative populations of youth, although older age of adoption predicted more substance use in late adolescence/young adulthood. Findings highlight early reactive temperament and preadoption maltreatment as important risk factors to target for ameliorating patterns of EB growth in the first few years of adoption.

1. Introduction

Children with a history of foster care are at heightened risk for numerous socio-emotional and behavioral difficulties, especially youth externalizing behavior (EB) (e.g., aggression, delinquency) and related adult outcomes (e.g., substance problems) (Cutuli et al., 2016; Leve et al., 2012; Vidal et al., 2017). Compared to the general population, male and female former foster youth are 4 and 13 times more likely, respectively, to be arrested for EB by the age of 21 years (Courtney et al., 2007), an alarming pattern given that EB

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itself predicts chronic criminality, substance use disorders, academic failure, and job/economic instability (Edwards, Gardner, Hickman, & Kendler, 2016; Odgers et al., 2008). As a result, EB also contributes to substantial annual societal costs through law enforcement and juvenile justice systems, prisons, rehabilitation programs, and hospitalizations (Welsh et al., 2008).

Although foster youth face significantly higher risk for EB across multiple stages of development, the specific developmental pathways that lead to these long-term outcomes are not well understood. Efforts to identify targets for intervention are complicated by the fact that foster youth often have histories characterized by significant stress (e.g., maltreatment) that can have enduring effects on behavioral development. For example, adoption is conceptualized as a critical intervention for children in foster care, with meta-analytic evidence that adopted children can display significant plasticity in their behavioral outcomes and "catch up" to the general population (van IJzendoorn & Juffer, 2006). However, children also exhibit significant individual differences in responsiveness to these environmental changes (Palacios & Brodzinsky, 2010). Variations in the protective effects of adoption may be influenced by biologically-based traits, such as early temperament, that influence how children perceive and respond to their social environment, as well as by the quality of parenting and family environment in the adoptive home. Understanding the developmental course of EB in children adopted from foster care and identifying which pre- and post-adoption factors (including individual and environmental factors) predict these outcomes across development is critical to designing targeted prevention and intervention programs that are delivered during key developmental periods.

1.1. Maltreatment and EB development

Among the many risk factors foster children experience before adoption, one of the most pervasive is maltreatment, including prenatal substance exposure and postnatal maltreatment such as physical and sexual abuse and/or neglect (Oswald, Heil, & Goldbeck, 2010). There are relatively few longitudinal studies of foster care youth, but postnatal maltreatment is a key predictor of sustained EB over time (Simmel, 2007). Because maltreatment diverges sharply from the average expected environment, it is conceptualized as one of the most toxic and severe environmental conditions for development (Rogosch, Oshri, & Cicchetti, 2010). Childhood maltreatment initiates cascades of atypical development of neurobiological and physiological processes (e.g., HPA-axis functioning, amygdala functional connectivity), emotion regulation, and the formation of attachment and healthy relationships (Cicchetti & Banny, 2014; Rogosch et al., 2010). These effects can further differ based on subtypes of maltreatment (Kuhlman, Geiss, Vargas, & Lopez-Duran, 2015), ranging from physical and sexual abuse, to neglect and exposure to family violence (e.g., witnessing domestic violence between caregivers or sibling abuse). Together, childhood maltreatment and EB exert substantial individual, family, and societal consequences, and they contribute to the intergenerational continuity of psychopathology.

1.2. Temperamental sensitivity to the environment

Despite evidence that maltreatment disrupts development across multiple levels of functioning, not all children with maltreatment histories exhibit EB, highlighting the need to identify individual and environmental factors that promote resilience (Haskett, Nears, Ward, & McPherson, 2006). Although rarely examined in the foster care population per se, developmental psychopathology studies more broadly have identified several biologically-based "vulnerability factors," including temperament traits, that may differentiate children most sensitive versus "resistant" to adversity. Following a diathesis-stress conceptualization of psychopathology, children exposed to maltreatment or early harsh parenting who *also* had "difficult" or reactive temperaments (e.g., high negative emotionality, high sensitivity, low frustration tolerance, low inhibition) were particularly at risk for developing EB and other psychopathology (Kiff, Lengua, & Zalewski, 2011). That is, temperament acutely increased children's vulnerability to negative environments through Temperament x Environment interactions (Belsky, Hsieh, & Crnic, 1998).

Beyond sensitivity to early stress, emerging studies measuring a full range of caregiving environments have found that compared to children with easy temperaments, children with reactive early temperaments may also *benefit more* from positive parenting practices (Kochanska & Kim, 2013). That is, according to differential susceptibility theory, children with reactive temperaments may be more sensitive to the environment, for better *and* for worse (Ellis, Boyce, Belsky, Bakermans-Kranenburg, & van IJzendoorn, 2011). A growing literature consisting of cross-sectional, longitudinal, and emerging experimental studies support the plausibility that reactive temperament may confer general heightened sensitivity to the social environment (Belsky & Pluess, 2009). For example, a randomized controlled trial of infant-mother dyads found that highly irritable/reactive infants, who are traditionally considered at risk for later EB, benefited more from a brief intervention designed to increase secure attachments compared to less irritable infants (Cassidy, Woodhouse, Sherman, Stupica, & Lejuez, 2011). Although intervention studies examining patterns of temperamental sensitivity to the environment are only just emerging, these preliminary studies suggest that compared to children with easy temperaments, children with temperamental risk for EB may also show heightened environmental sensitivity to socially-based interventions.

1.3. Differential susceptibility and foster-adoptive youth

Although almost no studies of foster youth have investigated patterns of temperamental sensitivity to the environment in the context of differential susceptibility, the implications of this hypothesis for children in foster care are significant: there are over 400,000 children in foster care in the US alone (U.S. Department of Health and Human Services, 2011). Children with complex histories including maltreatment, who may present with more severe EB at initial placement, are particularly stigmatized and less likely to be adopted into nurturing permanent homes (Leathers, Spielfogel, Gleeson, & Rolock, 2012). However, differential