

A biopsychosocial perspective on maternal psychopathology and the development of child emotion regulation

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Abstract:

In this commentary, the authors note that Gratz and colleagues (2014) have made an important step in understanding the effect of maternal borderline personality (BP) pathology on children's developing emotion regulation. The emphasis on mechanisms of transmission in their article has implications for our understanding of the relationships between parental mental health and child functioning more generally. The authors of the commentary argue that using a biopsychosocial framework to understand the multiple levels that characterize the developmental system will push this kind of focus on behavioral mechanisms a step further. A biopsychosocial framework implies that a set of hierarchically organized, but reciprocally interacting, processes, from the genetic to the environmental, provide the essential elements of development (Gottlieb, 2007). Thus, in studying the effects of maternal BP pathology on child outcomes, consideration may also be given to the role of underlying biological processes that are influenced by maternal functioning and may alter child outcomes. Challenges to using this general approach in studying the effects of parental psychopathology are discussed.

Keywords: emotion regulation | child development | borderline personality pathology | mother-child relationship

Article:

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EMOTION: COMMENTARY

A BIOPSYCHOSOCIAL PERSPECTIVE ON MATERNAL PSYCHOPATHOLOGY AND THE DEVELOPMENT OF CHILD EMOTION REGULATION

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In this commentary, the authors note that Gratz and colleagues (2014) have made an important step in understanding the effect of maternal borderline personality (BP) pathology on children's developing emotion regulation. The emphasis on mechanisms of transmission in their article has implications for our understanding of the relationships between parental mental health and child functioning more generally. The authors of the commentary argue that using a biopsychosocial framework to understand the multiple levels that characterize the developmental system will push this kind of focus on behavioral mechanisms a step further. A biopsychosocial framework implies that a set of hierarchically organized, but reciprocally interacting, processes, from the genetic to the environmental, provide the essential elements of development (Gottlieb, 2007). Thus, in studying the effects of maternal BP pathology on child outcomes, consideration may also be given to the role of underlying biological processes that are influenced by maternal functioning and may alter child outcomes. Challenges to using this general approach in studying the effects of parental psychopathology are discussed.

Research conducted with at-risk samples has demonstrated that maternal psychiatric disorders can have detrimental effects on the mother-child relationship and child outcomes (Cummings & Cicchetti, 1990; Field, Healy, Goldstein, & Guthertz, 1990; Hobson, Patrick, Crandell, García-Pérez, & Lee, 2005; Kiel, Gratz, Moore, Latzman, & Tull, 2011), although the developmental pathways by which maternal pathology may affect child adjustment are still largely unknown. In their contribution to this special issue, Gratz and colleagues (2014) examine the proposition that one particular psychiatric disorder, maternal borderline personality (BP) pathology, influences children's behavior and mental health outcomes via the child's devel-

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oping emotion regulation. They attempt to understand how this developmental process occurs by focusing on possible emotional processes that serve as mediators between maternal BP pathology and infant emotion regulation.

From a normative developmental perspective, there is an extensive literature examining how primary caregivers socialize infant emotion regulation (Calkins & Fox, 2002; Calkins & Leerkes, 2011; Thompson, 1994). Gratz and colleagues extend some of these ideas to their work with families with maternal BP pathology, and they posit a credible mechanism for this effect: maternal emotional functioning. Specifically, they examined the role of two dimensions of maternal emotional functioning, maternal emotion regulation difficulties and maternal intensity/reactivity, as possible factors that mediate the effects of maternal BP pathology on infant emotion regulation. They also examined attachment as a possible moderator of the relations between maternal BP pathology and related emotional dysfunction and infant emotion regulation. The results from this study demonstrated that although there was not a direct relation between maternal BP pathology and infant emotion regulation, there was an indirect association between the two that occurred via maternal emotional dysfunction. For example, on the basis of their results, the authors suggest that one pathway by which maternal BP pathology predicts infants' lower use of self-focused emotion regulation strategies is through maternal emotional intensity/reactivity when there is an insecure-resistant attachment relationship between the mother and the infant. In addition, emotion regulation difficulties in mothers with BP pathology were related to blunted fear expressivity and higher anger expressivity in their infants.

The findings presented by Gratz and colleagues suggest that there are multiple pathways through which maternal functioning affects child outcomes, and their work represents a good first step in the important process of providing empirical evidence for the mechanisms through which parental psychopathology affects children's development more generally. In this commentary, we reflect on this work and the general direction of the field of developmental psychopathology as it seeks to extend the empirical work on normative developmental processes, such as the development of emotion regulation, to more high-risk rearing conditions, such as those observed in the relationships between children and parents coping with mental health issues. We provide a brief review of this work, emphasizing the role of early attachment processes, but we note that the behavioral processes observed in typical interactions between caregivers and children, and within children as they cope with daily challenges, may mask an important level of analysis that helps us to understand the complex mechanisms through which parenting affects children. Thus, we invoke our biopsychosocial model of the development of emotion regulation that integrates biological, relational, and behavioral functioning as a framework for understanding the specific ways in which caregivers affect children's behavior (Calkins, 2011; Calkins, Propper, & Mills-Koonce, in press). We use this model as a reference for understanding the findings of Gratz and colleagues and for directing future work in this area.

CAREGIVING EFFECTS ON THE DEVELOPMENT OF EMOTION REGULATION

Considerable theoretical and empirical work has addressed the notion that caregiving practices contribute to children's development of emotion regulation abilities. In infancy, the ability to successfully regulate emotions is largely dependent on the appropriate responding, sensitivity, and support of the caregiver (Calkins & Fox, 2002; Calkins & Leerkes, 2011; Kopp, 1982; Sroufe, 2000). Over time, children learn that some specific strategies are more useful in regulating emotional arousal than other strategies, within the context of a caregiver's ability to appropriately read child cues and respond in a manner that reduces distress (Sroufe, 1996). Although the caregiving environment is broadly accepted as an important contributor in the development of children's emotion regulation, the specific mechanisms by which this development occurs are often left undetermined (Calkins, 2011; Fox & Calkins, 2003).

One hypothesis about the way in which caregiving practices affect children's development of emotion regulation is through the emerging attachment relationship. Indeed, because attachment processes are frequently generated in emotionally evocative situations and serve emotion regulatory functions, it is likely that the attachment relationship contributes to the development of emotion regulation skills in infancy and early childhood. Current theory and research about attachment and its role in emotional development have roots in the pioneering work of John Bowlby (1969, 1988). Bowlby emphasized the survival function of infants' ability to attach to a caregiver and recognized that the quality of the caregiving environment was associated with the quality of the infant-caregiver attachment. Specifically, sensitive caregiving was proposed to lead to a secure infant-caregiver attachment and expectations that emotional needs would either be met by the caregiver or be managed with skills developed through interactions with the caregiver. Mary Ainsworth conducted innovative empirical work testing Bowlby's theory in a longitudinal study of infants and mothers (Ainsworth, Blehar, Waters, & Wall, 1978). On the basis of infants' behavior in the "Strange Situation" procedure, Ainsworth characterized infants as securely attached or insecurely attached with either resistant or avoidant profiles. Importantly, this research showed that maternal sensitivity to infant cues and signals was a predictor of secure infant-mother attachment. Ainsworth proposed that consistent sensitive and responsive caregiver behavior allows the infant to have appropriate expectations regarding the caregiver (Ainsworth et al., 1978). Over time, an infant's use of supported and independent regulatory strategies is reinforced by the mother and accompanying reduction in arousal. More recently, others have also addressed the importance of attachment processes in the development of emotion regulation. Sroufe (1996, 2000) proposed that an infant's ability to self-regulate arousal is rooted in infant-caregiver interactions. In these interactions, infants experience positive interactions with their caregivers, increases and decreases in emotional arousal with the assistance of the caregiver, and reductions in distress through the caregiver's actions (Sroufe, 1996).

Existing research generally supports these views of the importance of early attachment relationships in the development of emotion expression and regulation. Infants and toddlers in secure attachment relationships are more likely to use strategies emphasizing social orientation and maternal help-seeking than children classified as insecure-avoidant or disorganized (Diener, Mangelsdorf, McHale, & Frosch, 2002; Schieche & Spangler, 2005). A secure attachment relationship in infancy has also been found to predict greater attentional distraction strategies in toddlerhood, which is frequently linked to better emotion regulation (Gilliom, Shaw, Beck, Schonberg, & Lukon, 2002). Consistent with these findings, research has shown that secure infants use strategies to regulate emotions that include social referencing and expressing a need for maternal intervention, whereas insecure-avoidant infants are more likely to use self-soothing and solitary exploration with toys (Braungart & Stifter, 1991; Nachmias, Gunnar, Mangelsdorf, Parritz, & Buss, 1996). These findings suggest that the strategies infants use to regulate their emotions reflect their expectations regarding the caregiver as a source of emotion regulation.

Parent-child attachment relationships have also been implicated in the development of emotional functioning and development, important aspects of emotion regulation. For example, Kochanska (2001) found that when compared to securely attached children, insecurely attached children showed higher levels of fear and/or anger and lower levels of joy in laboratory tasks over time. Specifically, whereas secure infants showed a decline over time in the display of negative affect, insecure infants displayed an increase in negative affect, as well as a decline in positive affect. Of note, avoidant infants over time displayed an increase in fear, providing support for the argument that avoidant infants' minimizing of emotional reactions in the short term may lead to long-term challenges (Cassidy, 1994).

Finally, the relationship between children's emotion regulation and aspects of parenting believed to be linked to attachment has been examined in multiple studies. For example, in our own research, we have found that maternal negative and controlling behavior was negatively associated with distraction techniques to regulate frustration and positively associated with less successful regulation techniques in a frustrating situation (i.e., children's use of orienting to or manipulating the object of frustration, a barrier box containing an attractive toy) (Calkins, Smith, Gill, & Johnson, 1998). Indeed, considerable work has focused on different dimensions of parenting behavior (cf. Calkins & Leerkes, 2011, for a review), but relatively little of this work has taken the approach of Gratz and colleagues examining the emotional functioning and behavior of the caregiver. Such work represents an important step in understanding the mechanisms linking parent behavior to child functioning. Moreover, we suggest that this work be linked, both conceptually and empirically, to recent work that we and others have been conducting examining the role of biological processes and parenting behavior. That is, although much of the normative developmental research focuses on the effects of parenting and attachment on behavioral manifestations of emotion regulation, our conceptualization of parenting effects acknowledges that family and child factors are embedded in a dynamic biological and so-

cial context. This biopsychosocial approach has its roots in psychobiological theory and research, much of which emphasizes that a range of biological mechanisms are implicated in behavioral functioning across a number of levels of developmental influence (cf. Gottlieb, 1991, 2007). Such an approach may be useful in further elaborating the mechanisms of transmission that Gratz and colleagues address in their work.

BIOPSYCHOSOCIAL APPROACHES TO THE STUDY OF EARLY PARENTING

Current theory and research examining parenting from a biopsychosocial framework draw on the psychobiological literature that uses animal models as a basis for positing multiple ways in which parents influence offspring. These models offer evidence for caregiver effects on the development and functioning of the offspring's central nervous system. Moreover, advances in human neuroscience research have provided opportunities to begin to examine associations between caregiving experiences and neuroanatomical structure and function in early development (Calkins et al., in press). Thus, biopsychosocial theory and research are well suited to provide directions for future research on parent psychological functioning and child outcomes.

Evidence from animal models has suggested that the environment the caregiver provides is the mechanism by which caregiving affects infants' biological and behavioral regulatory abilities, rather than through shared inherited traits. For example, Meeney and colleagues, in work with rats, have found that high maternal licking/grooming and arched back nursing influence the neurological systems associated with stress response, a process that has a long-term influence on stress-related illness, certain cognitive functions, and physiological functions (Caldji et al., 1998; Champagne & Meaney, 2001; Francis, Caldji, Champagne, Plotsky, & Meaney, 1999). Evidence that these maternal behaviors are transmitted behaviorally through the nursing mother and not through the biological mother was demonstrated in cross-fostering studies. This finding highlights the crucial role of early caregiving in early development and that the impact of caregiving may affect the organism's emotional reactivity across the life span (Calatayud, Coubard, & Belzung, 2004; Champagne & Meaney, 2001).

Beyond animal models, there is emerging evidence to support the notion that caregivers affect infant and child physiological indices of emotion regulation, including measures of heart rate, cortisol, and brain electrical activity in the Strange Situation paradigm. For example, insecurely attached and disorganized infants are more stressed during the Strange Situation than secure infants, as evidenced by elevated cortisol levels (Fox & Hane, 2008). Researchers have also examined multiple indices of physiological regulation across the Strange Situation (Hill-Soderlund et al., 2008). When compared to secure infants, avoidant infants showed greater increases in vagal withdrawal, a measure of physiological regulation (Porges, 2007), and consistently high salivary alpha-amylase, a measure of autonomic reactivity (Granger et al., 2006), suggesting greater sympathetic arousal and more internal efforts

to self-regulate. These findings suggest hyperactivation of the coping system, thereby promoting burnout and leading to the underarousal of the physiological coping systems and less well-controlled behavior over time.

Additional empirical support comes from examinations of two dopamine receptor genes (DRD2 and DRD4 long), which are associated with difficulties in emotional and behavioral undercontrol (see Propper et al., 2008, for a review) and attachment-related caregiver behavior and children's physiological emotion regulation. Maternal sensitivity during the first year buffered infants with the DRD2 risk allele from negative effects on vagal withdrawal during a distressing task (Propper et al., 2008). Thus, to the extent that caregivers provide the support for physiological regulation early in development, children should be more successful at using strategies to regulate emotion and behavior. They should also be better prepared to engage in interactions with caregivers, facilitating the transactional relationship that reinforces sensitive and responsive caregiving.

The theoretical and empirical approaches that have roots in psychobiology, and have been adapted to more general models of biopsychosocial functioning (cf. Calkins, 2011), make clear that researchers studying the mechanisms of transmission in psychopathology cannot ignore that a host of dynamic intervening processes lie between the gene and the behavioral phenomenon of interest, whether that phenomenon is parenting behavior or child adjustment outcomes. Moreover, it is also necessary, in light of the extant research findings, to abandon direct effects models of family influence. Co-action, transaction, and interaction characterize development in a biologically informed model of parenting and child functioning (Sameroff, 2010).

The empirical challenges in using such an approach are clear. First, longitudinal research is needed to assess these biological processes and the direction of effects across time. Second, parenting behaviors must be considered as regulatory and regulated. That is, as the findings from Gratz and colleagues imply, caregivers must regulate their own behaviors and biological processes even as they are attempting to regulate their children's behavior (Calkins, 2011). Such a theoretical proposition may be difficult to test empirically because the direction of effects may be hard to untangle. Finally, studies of the development of particular behavioral and biological phenomena are not easy to conduct. Measuring change across time at different levels of functioning poses significant challenges, both methodologically and analytically. Selection of child outcomes measures, for example, depends on an appreciation of developmentally appropriate expectations for functioning, which may be known from a behavioral perspective, but are less known for biological indicators. Despite these challenges, adoption of a biopsychosocial framework that emphasizes the dynamic and transactional nature of the developmental system is key to isolating mechanisms of transmission in a host of challenging parenting environments. Such an approach may also offer guidance as to the important points of entry for intervention and prevention work with at-risk families.

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