MINDFULLY PARENTING THE NEXT GENERATION: MATERNAL HISTORY OF CHILD MALTREATMENT, STRESS, AND INFANT ATTACHMENT

by

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DISSERTATION ABSTRACT

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Child maltreatment is associated with an enormous public health cost, and can be perpetuated intergenerationally via developmental effects of maltreatment (e.g., difficulties in stress regulation) that influence quality of caregiving. Mindfulness and mindful parenting have been associated with secure attachment, and may have therapeutic potential to enhance stress regulation and attachment security in parent-child dyads. The current study examined potential moderating effects of dispositional mindfulness and mindful parenting on the associations between maternal history of child maltreatment and mother/infant acute stress recovery as well as infant attachment classification. Mothers and infants participated in a stressful procedure designed to activate attachment behavior. Mothers and infants also provided cortisol samples after the procedure to provide information about physiological stress recovery. A significant interaction was found such that the infants of mothers with more severe histories of child maltreatment showed enhanced cortisol recovery when maternal dispositional mindfulness was high. Maternal mindfulness, however, was not otherwise associated with mother or infant cortisol recovery, nor did maternal history of child maltreatment or mindfulness significantly predict infant attachment classification. In contrast to

expectations, maternal history of child maltreatment was associated with enhanced maternal cortisol recovery. This study provides preliminary evidence that higher levels of maternal dispositional mindfulness may indirectly help infants of mothers with more severe histories of child maltreatment to recover more efficiently from attachment-related stress.

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Laurent, H. K., Hertz, R., Nelson, B., & Laurent, S. M. (2016). Mindfulness during romantic conflict moderates the impact of negative partner behaviors on cortisol responses. Hormones and Behavior, 79, 45-51.

Hertz, R., Laurent, H. K., & Laurent, S. M. (2014). Attachment mediates effects of trait mindfulness on stress responses to conflict. Mindfulness, 5, 483-489.

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TABLE OF CONTENTS

LIST OF FIGURES

Figure Page

LIST OF TABLES

Table Page

CHAPTER I

INTRODUCTION

Child maltreatment is a significant societal problem associated with an enormous public health cost. In 2015, approximately 3,358,000 cases of child abuse and neglect were investigated in the U.S., a nine percent increase since 2011 (U.S. Department of Health & Human Services, Administration on Children, Youth, and Families, Children's Bureau, 2017). Maltreated people have lifelong difficulties in regulation of physiological stress (Cicchetti, Rogosch, Gunner & Toth, 2010), and experience diminished cognitive and socio-emotional capacities based on deprivation, trauma, and high levels of stress (Bariola, Gullone, & Hughes, 2011; Cicchetti, 2013; Cloitre, Miranda, Stovall-McClough, & Han, 2005; Collishaw, Pickles, Messer, Rutter, Shearer, & Maughan, 2007; Kim & Cicchetti, 2009; McLaughlin, Peverill, Gold, Alves, & Sheridan, 2015; Powers, Etkin, Gyurak, Bradley, & Jovanovic, 2015; Parke, 1994; Sexton, Hamilton, McGinnis, Rosenblum, & Muzik, 2015; Shields, Ryan, & Cicchetti, 2001; Shipman, Zeman, Penza, & Champion, 2000). Consequently, child maltreatment is a major early life contributor to unhealthy lifestyles that result in staggering physical and mental healthcare costs. Analysis of statistics collected by the Centers for Disease Control (CDC) yielded an estimated total lifetime economic burden of maltreatment to be $585 billion per generation of maltreated children. Other sources estimate the lifetime public health cost per maltreated person to be greater than $210,000 per lifetime as of 2010 (Fang, Brown, Florence & Mercy, 2012). Child maltreatment, then, may be one of the most important prevention targets in addressing overall public health costs (Palaszynski & Nemeroff, 2009).

One of the risks associated with a history of child maltreatment is a heightened risk of maltreating one's own children in adulthood (e.g., Bailey, Moran, Pederson, & Bento, 2007; Ehrensaft, Knous-Westfall, Cohen, & Chen, 2015; George & Solomon, 2008; Hesse & Main, 2006). The intergenerational transmission of child maltreatment is undergirded by parental difficulties in emotional and behavioral regulation that arise from the developmental consequences of maltreatment (e.g., Collishaw et al., 2007; Sexton, Hamilton, McGinnis, Rosenblum, & Muzik, 2015; Siegel & Hartzell, 2014). These problematic developmental consequences are often replicated in the next generation in part through suboptimal parenting interactions that undermine the development of secure attachment, leading to problems in child development, such as chronic hyperarousal of the hypothalamic-pituitary-adrenal (HPA) system, and failure to develop a variety of socioemotional skills that are crucial to forming healthy, functional relationships (e.g., Bernier & Meins, 2008; Craig, 2002; Luke & Banerjee, 2013; Schore, 2003a/2003b; Siegel, 2007/2012; Stein, Lehtonen, Harvey, Nicol-Harper, & Craske, 2009).

Mindfulness, traditionally considered an intrapersonal process of paying attention to the present moment, on purpose, without judgment (Kabat-Zinn, 2006), has recently been expanded and applied to the interpersonal context of parenting. Duncan, Coatsworth, and Greenberg (2009) identified five interrelated dimensions of mindful parenting: (1) listening with undivided attention to the child, (2) nonjudgmental acceptance of self and child, (3) emotional awareness of self and child, (4) self-regulation in the context of the parenting relationships, and (5) compassion for the self and child. Such principles of parenting stand in stark contrast to the reality of child maltreatment.

The current study aims to better understand how a history of maltreatment in childhood influences parent-child dynamics in the next generation. Additionally, it aims to explore the potential of dispositional mindfulness and mindful parenting to help moderate the risk imposed by a history of maltreatment during childhood.

The Impact of Child Maltreatment on Parenting Capacities

A healthy and responsive parent-child bond characterizes secure attachment, which supports the development of biopsychosocial capacities that later support healthy caregiving capacities, such as psychological adjustment, autonomy and self-reliance, regulation of levels of negative affect such as anger and anxiety, and the development of empathic capacities and interpersonal competence (e.g., Berlin, Cassidy, & Appleyard, 2008; Mikulincer & Shaver, 2008; Weinfield, Sroufe, Egeland, & Carlson, 2008). Secure attachment fosters pro-social qualities such as self-confidence, self-efficacy, self-esteem, and social skills that support competent exploration of social environments (Siegel & Hartzell, 2014). Thus, securely attached children are more likely to develop into adults with skills that support effective parenting, such as relational competence, desirable personality traits, stronger emotion regulation skills, better self-concept, more nuanced and functional social cognition, and greater emotional intelligence (Siegel, 2012; Thompson, 2008; Weinfield et al., 2008). Maltreatment exerts its deleterious effects on physical, emotional, and psychological development by disrupting the development of secure attachment between child and caregiver, compromising the foundational context within which many relational skills and competencies are fostered (Bailey et al., 2007; DeKlyen & Greenberg, 2008; Dozier, Stovall-McClough, & Albus, 2008; Kobak & Madsen, 2008). Maltreated children lack the early socioemotional experiences necessary

to develop pro-social capacities to the same extent that securely attached children do (Siegel, 2012).

Exposure to child maltreatment and other forms of early life adversity and trauma are associated with impairment in executive functions (Cowell, Cicchetti, Rogosch, & Toth, 2015; DePrince, Weinzierl, & Combs, 2009; Gould, Clarke, Helm, Harvey, Majer, Nemeroff, 2012; Kavanaugh & Holler, 2014; Nikulina & Widom, 2013; Nolin & Ethier, 2007; Skowron, Cipriano-Essel, Gatzke-Kopp, Teti, & Ammerman, 2014; Spann et al., 2012.) Deficits in executive functions, including working memory, cognitive flexibility, and inhibitory control, are associated with psychological dysfunction, which can manifest as depressive tendencies and psychophysiological dysregulation, such as that which characterizes posttraumatic stress disorder (PTSD; Aupperle, Melrose, Stein, & Paulus, 2012; Joormann, 2010; van Harmelen et al., 2014; Thomaes et al., 2010). Individuals who are maltreated as children tend to show negative biases in attention and memory, as well as difficulties in the regulation of attention, emotions, and behavioral impulses (e.g., Bremner et al., 1993; Fearon, Bakersmans-Kranenburg, Van Ijzendoorn, Lapsley, & Roisman, 2010; Noll-Hussong et al, 2010; Siegel, 2012). This can lead to tendencies that negatively impact parenting, such as excessive attention to negative thoughts and stimuli (Joormann, 2010), the inability to replace ineffective coping strategies with more effective strategies (Gilliom, Shaw, Beck, Schoenberg, & Lukon, 2002), and difficulty inhibiting automatic, inappropriate behavior (Goldin, McRae, Ramel, & Gross, 2008). Individuals who are maltreated as children also tend to experience consistently high negative affect while simultaneously having reduced impulse control and empathic capacities (Becker-Blease & Kerig, 2016; Cloitre, Stovall-McClough, Zorbas, &

Charuvastra, 2008; Hesse & Main, 2006; Paivio & Laurent, 2001). These traits in and of themselves, as well as problematic states of mind with respect to attachment (i.e., "unresolved" states of mind that lack integration into the broader personality structure), influence thoughts, beliefs, behavioral urges, and emotional states that impact the quality of caregiving.

Child maltreatment survivors struggle with interpersonal trust, negative biases in socioemotional information processing, impaired perspective taking, and a tendency to avoid intimacy, even in close relationships (Bailey, DeOliveira, Wolfe, Evans, & Hartwick, 2012; Briere, 1992, Cole & Putnam, 1992; Cicchetti & Valentino, 2006; Cook et al., 2005; Hildyard & Wolfe, 2002). These problems can lead to parents intentionally or inadvertently abdicating their caregiving responsibilities, negatively impacting the next generation (DeOliveira, Bailey, Moran & Pederson, 2004; Koren-Karie, Oppenheim, & Getzler-Yosef, 2004; Lyons-Ruth, Yellin, Melnick, & Atwood, 2005; Moran, Bailey, Gleason, DeOliveira, & Pederson, 2008). Various types of maltreatment have been differentially associated with numerous problems in observed parenting behavior. For example, a history of sexual abuse has been associated with parenting characterized by a lack of social-emotional involvement and blunted affective expression (Lyons-Ruth & Block, 1996), intrusive behaviors (Moehler, Biringen, & Poustka, 2007), and a negative, self-focused approach to communication (Burkett, 1991). Physical abuse has been associated with hostile, intrusive, and inconsistent parenting behavior (Driscoll & Easterbrooks, 2007; Lyons-Ruth & Block, 1996; Moehler et al., 2007). Emotional abuse and neglect, as well as vicarious trauma (e.g., witnessing family violence), has been linked to observed maternal hostility towards children (Bailey et al., 2012). These

problematic caregiving patterns can lead to the reproduction of disorganized attachment (i.e., an attachment style most commonly associated with traumatic child maltreatment; Cyr, Euser, Bakermans-Kranenburg, & Van Ijzendoorn, 2010) in the next generation, which, importantly, may be one of the earliest detectable risk factors for a problematic developmental trajectory (Bernier & Meins, 2008).

Mothers of children with disorganized attachment regularly fail to provide protection, care, and comfort to their children (George & Solomon, 2008). With a background of attachment trauma, and a caregiving context ripe with potential threats and posttraumatic cues, these women consciously or subconsciously have a tendency to attempt to segregate painful traumatic memories and associated emotions from their conscious approach to caregiving (George & Solomon, 2008). This results in part from an over-reliance on dissociative emotion regulation strategies, which help an individual regulate distress by reducing awareness of physiological cues in the body (Putnam, Helmers, Horowitz, & Trickett, 1995; Lanius et al., 2010; Simeon, Guralnik, Knutelska, Hollander, & Schmeidler, 2001; Stein et al., 2013; Steuwe, Lanius, & Frewen, 2012; Trickett, Noll, & Putnam, 2011). The lack of awareness of how difficult memories and related emotions might affect their current experience is problematic, because it prevents self-monitoring and regulation through executive control mechanisms (George & Solomon, 2008).

Segregated, disorganized caregiving typically manifests in one of two forms, dysregulated and constricted, which in turn contribute to suboptimal parenting that can be characterized as frightening/intrusive or withdrawn/atypical (George & Solomon, 2008). Dysregulation occurs when segregation of distressing internal experience fails and a

parent is flooded and overwhelmed by negative affect related to the self and child that is likely based in implicit traumatic memories from childhood (Solomon & George, 1999; 2008). The dysregulated parent may avoid taking conscious, personal responsibility for such dysregulation, instead adopting a state of indifference or helplessness towards the possibility of increasing the effectiveness of their parenting. In these cases, the parent may instead blame others, the situation, or the child for their own dysregulated behavior. Additionally, when overwhelmed by distress, dysregulated caregivers are unable to accurately detect and interpret attachment cues from their children. Psychological dysregulation in caregiving is associated with frightening behavior that can lead to toxic stress in the child, since during such episodes the caregiver serves as both the source of distress as well as the default provider of the child's comfort and care (George & Solomon, 2008).

Constricted parenting behavior, on the other hand, occurs with rigid and effective segregation of unresolved or traumatic memories, and appears to impair appropriate parent-child differentiation (George & Solomon, 2008; Solomon, George, & De Jong, 1995). Constricted parents may withdraw from parenting situations to avoid dysregulation, or otherwise fail to respond appropriately because they inaccurately attribute precociously sophisticated capacities and abilities to the child, both resulting in child neglect. These parents may also demonstrate a tendency to think of the child as an extension of themselves, thus misunderstanding and invalidating the child's experience rather than providing appropriate care. Such behavior has been labeled by some researches as "atypical" (Abrams, Rifkin, & Hesse, 2006; Bernier & Meins, 2008; Goldberg, Benoit, Blokland, & Madigan, 2003; Lyons-Ruth, Bronfman, & Parsons, 1999;

Lyons-Ruth et al., 2005). These behaviors include withdrawn, intrusive, or otherwise misattuned behavior, such as "affective errors" or "miscues" (e.g., not comforting an obviously distressed child, or laughing at an embarrassed child; Bailey et al., 2007; Goldberg et al., 2003; Kobak & Madsen, 2008; Lyons-Ruth et al., 1999; MacDonald et al., 2008). In such cases, parents fundamentally misinterpret the child's emotional experience in a way that prevents the caregiver from conveying their willingness and ability to provide physical and psychological care, which the child depends upon for the development of secure and/or organized attachment and related socioemotional skills. Frightening and so-called atypical parenting styles have both demonstrated similar associations with maternal history of unresolved trauma in childhood and disorganized attachment in subsequent generations (Abrams et al., 2006; Bailey et al., 2007; Hesse & Main, 2006; Jacobvitz, Leon, & Hazen 2006; Schuengel, Bakermans-Kranenburg, & Van IJzendoorn, 1999). In sum, parents with disabled caregiving systems associated with a history of child maltreatment often abdicate their role as caregiver, view themselves as helpless in their role as parents, and are often influenced by strong, negative affective dysregulation (Solomon & George, 2008).

Chronic physiological dysregulation plays a major role in disorganized attachment and caregiving. The inability to effectively regulate stress not only results from receiving problematic parenting in childhood but also contributes to problematic caregiving behavior in adulthood (Del Giudice, Ellis, & Shirtcliff, 2011). Maltreatment leads to chronic over-excitation of the sympathetic nervous system and limbic system, creating toxic stress that fundamentally damages the ability to self-regulate emotions and behavior. This inability has been demonstrated, for example, in fMRI studies of adults

with unresolved states of mind with respect to attachment. When attachment was activated in these individuals, the prefrontal cortex failed to regulate limbic system activity (Buchheim et al., 2006; 2008; Buchheim & George, 2011). Attachment-related neurophysiological deficits may be a key underlying mechanism of the underdevelopment of socioemotional skills, perspective taking, and empathic capacities associated with child maltreatment (Anderson, Bechara, Damasio, Tranel, & Damasio, 1999; Baxter, Parker, Lindner, Izquierdo, & Murray, 2000; Becker-Blease & Kerig, 2016; Bigler, 2001; Cassidy & Mohr, 2006; Damasio, 2000; Elliott, 2000; Perry, Rosen, Kramer, Beer, Levenson, & Miller, 2001; Savage et al., 2001; Schore, 1994; Teicher, 2002; Teicher, Dumont, Ito, Vaituzis, Giedd, & Andersen, 2004). Even in the absence of overt maltreatment, a "second generation effect" of child maltreatment has been found. Second generation effects occur when problematic, but not maltreating, attachment interactions occur. For example, the parent may (intentionally or automatically) display dissociated, frightened, and/or threatening parental behavior (Hesse & Main, 1999; Van Ijzendoorn, Schuengel & Bakermans-Kranenburg, 1999). Even mothers with "earned security", or resolved early life loss or trauma, have been shown to engage in disorganized parenting (Hesse, 2008). This fundamental lack of effective stress regulatory capacities is of central importance in explaining the socioemotional difficulties that disable effective caregiving behavior in the ways described above (Pollak, 2008; Thompson, Hannan, & Miron, 2014).

Stress Physiology of Child Maltreatment

Repeated, prolonged interpersonal stress profoundly alters neurobiological development (Cross, Fani, Powers, & Bradley, 2017; Tarullo & Gunnar, 2006).

Deleterious effects are thought to result from reduced connectivity in key brain regions that are sensitive to stress, specifically the hippocampus, prefrontal cortex, and amygdala (Cerqueira, Mailliet, Almeida, Jay & Sousa, 2007; van Harmelen et al., 2014; Stevens et al., 2013; Tomoda, Suzuki, Rabi, Sheu, Polcari, & Teicher, 2009). Chronic stress disrupts connectivity between these regions (Tottenham & Sheridan, 2009; Cerqueira et al., 2007), and the lack of this connectivity is thought to drive the broad biopsychosocial dysregulation observed in child maltreatment survivors (Cross et al., 2017; Cerqueira et al, 2007; Opitz & Friederici, 2003; Stevens et al., 2013; Wendelken & Bunge, 2010).

The hypothalamic-pituitary-adrenocortical (HPA) axis is a key mechanism implicated in the long-term health consequences associated with chronic stress, such as child maltreatment (Miller, Chen, & Zhou, 2007). Both psychological and physical stressors can activate the HPA system; child maltreatment often involves both. In the presence of threat or stress, limbic structures in the brain cue the hypothalamus to release corticotropin-realeasing hormone (CRH), which travels to the anterior pituitary gland and triggers the release of adrenocorticotropin hormone (ACTH). ACTH then circulates to the adrenal glands, resulting in the release of cortisol. Cortisol is involved in diurnal patterns of arousal, as well as the acute stress response, and prepares the organism to attempt to cope with the threat or stress largely by mobilizing energy resources throughout the body (Miller et al., 2007).

The organization of the HPA axis and related circuitry is subject to sensitive periods throughout development (Del Giudice et al., 2011). Infancy and adolescence are two such periods; thus the trauma of child maltreatment occurring in these early life periods can lead to lasting alterations of HPA axis functioning (Knudsen, 2004), resulting

in increased risk for persistent neurocognitive, behavioral, and psychological problems (Cowell et al., 2015; Dunn, Nishimi, Powers, & Bradley, 2017; Bosquet Enlow, Egeland, Blood, Wright, & Wright, 2012).

Recovery, or termination of an acute stress response, can be achieved by resolving the stressor or overcoming the perceived threat (Miller et al., 2007). However, when stressors are not readily overcome, such as in the case of child maltreatment, the perceived threat persists, resulting initially in hypercortisolism, or chronically high cortisol that fails to return to pre-stress levels within a relatively circumscribed time period. In such cases, the HPA axis is regulated via a negative feedback circuit, whereby elevated cortisol suppresses production of CRH and ACTH (Miller et al., 2007). This negative feedback loop is an important factor to consider when studying how chronic stress influences HPA functioning, especially recovery, or termination of an acute stress response. Cortisol levels may eventually decrease via this negative feedback loop with CRH and ACTH, resulting in hypocortisolism, or extremely low levels of cortisol that stay low even in the face of acute stressors (Miller et al., 2007). This hypocortisolism may last for months even after the termination of a stressor (Koob & Le Moal, 2008). The adaptive function of hypocortisolism may be to aid in recovery and resetting the system, offsetting the physiological and immunological damage associated with high cortisol (Fries et al., 2005; Miller et al., 2007). However, hypocortisolism may not be adaptive in terms of mental health or socioemotional functioning (e.g., Burke et al., 2005a/2005b; Mason et al., 2001; Miller et al., 2007; Miller, Cohen, & Ritchey, 2002; Seedat, Stein, Kennedy, & Hauger, 2003).

Chronic, uncontrollable stress in particular (e.g., child maltreatment) may result in diminished HPA activity, which may be bidirectionally related to avoidant coping (e.g., withdrawal, disengagement; Gold & Chrousos, 2002; Heim, Ehlert, & Hellhammer, 2000; Mason et al., 2001), or be understood as a physiological adaptation to the situation (Gunnar & Vazquez, 2001a). Thus, isolated incidences of child maltreatment may initially be associated with increased cortisol output; however, if child maltreatment occurs repeatedly over an extended period of time, as is often the case, it may eventually be associated with suppressed cortisol. Additionally, chronically low cortisol has been linked to problems commonly associated with child maltreatment, such as PTSD (Miller et al., 2007), domestic violence (Miller et al., 2002; Seedat et al., 2003), and the experience of shame (Mason et al., 2001). Recovery (i.e., termination of an acute stress response) in the context of hypocortisolism is difficult to assess, since hypocortisolism may supersede detectable acute stress responses. This may account for observations that maltreated populations fail to show responses to acute psychosocial stressors to the same extent as their non-maltreated peers (e.g., Harkness, Stewart, & Wynne-Edwards, 2011; Hostinar, Johnson, & Gunnar, 2015; Tarullo & Gunnar, 2006; discussed in more detail below).

Individuals vary in stress regulatory tendencies as a function of innate biophysiological tendencies and environmental characteristics, according to the Biological Sensitivity to Context theory (BSC; Boyce & Ellis, 2005), and its extension, the Adaptive Calibration Model (ACM Del Giudice et al., 2011). BSC theory states that children naturally vary in their level of susceptibility (i.e., sensitivity) to environmental influence. Whether this sensitivity is associated with positive or negative outcomes

depends on characteristics of the environment. Highly sensitive children may flourish in resource-rich, highly supportive environments, but languish in environments characterized by maltreatment and adversity. In contrast, children lower in BSC might show relative resilience across a wide variety of environmental contexts (Boyce & Ellis, 2005). The ACM extends this theory, stating that the functioning of the stress response system develops in a nonlinear, bidirectional fashion over time in response not only to characteristics of the individual, but also to characteristics of the environment, resulting in multiple possible stress response phenotypes that aim to maximize reproductive fitness (Del Giudice et al., 2011). Children in high quality environments are likely to experience infrequent, brief activations of the HPA system characterized by quick return to baseline. On the other hand, children developing in stressful contexts are more likely to show impaired HPA recovery and a tendency towards hypocortisolism (Del Guidice et al., 2011, Gunnar & Vasquez, 2001; Netter, 2004; Pruessner et al., 1997). One of the best metrics for evaluating the overall functionality of the HPA system may be to examine the extent to which a person is able to recover from an acute stressor, avoiding both prolonged elevations and flat, non-responsive cortisol profiles (e.g., Burke, Davis, Otte, & Mohr, 2005; Dienes, Hazel, & Hammen, 2013).

Cortisol recovery among infants and children. Within the context of parenting, the mother's stress regulation becomes an input that shapes the developing infant's patterns of stress regulation (Bowlby, 1969, 1973; Del Giudice et al., 2011). Social buffering occurs when the presence of an attachment figure reduces the infant's reactivity to the perceived threat, or hastens their recovery to baseline stress levels following exposure to a stressor (Ahnert, Gunnar, Lamb, & Barthel, 2004; Gunnar, 2017). Effective

social buffering serves as the scaffolding that promotes cortico-limbic interconnectivity and stress regulation until the brain matures to the extent that the child can independently enact executive psychobiological regulation of stress (Gunnar, 2017). Secure attachment appears to provide a stress buffering effect, even among temperamentally fearful infants (Gunnar, Brodersen, Nachmias, Buss, & Rigatuso, 1996; Nachmias, Gunnar, Mangelsdorf, Parritz, & Buss, 1996). Compared to research on stress reactivity, research focusing on the termination of the stress response (i.e., recovery) among maltreated children is sparse. Regarding HPA recovery, sensitive maternal behavior may influence quicker return to baseline following acute stressors (Albers, Riksen-Walraven, Sweep, & de Weerth, 2008; Blair, Granger, Willoughby, & Kivlighan, 2006). On the other hand, impaired social stress buffering has been linked to the disrupted attachment relationship (Hostinar, Sullivan, & Gunnar, 2014). The presence of insecure attachment figures may actually interfere with a child's attempts to regulate distress (Nachmias et al., 1996). Impaired stress regulation/recovery in infants and children in the context of problematic parenting may involve either slower return to baseline following an acute stressor (i.e., a "flat and high" cortisol recovery trajectory), or be characterized by blunted cortisol profiles (i.e., a "flat and low" cortisol recovery trajectory), indicating hypocortisolism. Which pattern emerges may relate to the type, onset, and chronicity of stress (e.g., brief episodes of parental insensitivity vs. prolonged episodes of severe neglect; Del Giudice et al., 2011; Miller et al., 2007), as well as innate variations in BSC (Boyce & Ellis, 2005),

The flat and high pattern of impaired stress recovery is typified by HPA hyperreactivity and slower return to baseline. In a sample of high-risk mothers and their infants, maternal insensitivity was linked to higher total levels of cortisol output

following a dyadic stressor, indicative of hyperreactivity and slower return to baseline (Bosquet Enlow, King, Schreier, Howard, Rosenfield, & Wright, 2014b). Additional work with depressed adolescents with a history of early life adversity found greater cortisol reactivity coupled with failure to recover from a social stress task. Greater early life adversity predicted higher cortisol levels (Rao, Hammen, Ortiz, Chen, & Poland, 2008).

The flat and low pattern of impaired stress recovery is characterized by hypocortisolism. In such cases, individuals fail to show expected increases in cortisol in response to acute stressors, instead maintaining low cortisol levels throughout the task. Although cortisol levels remain low, it is not accurate to say that recovery occurred since there was no detectable acute stress response from which to recover. For example, one large study of low-SES mothers and infants found that, compared to infants of mothers high in maternal sensitivity, infants of mothers low in maternal sensitivity demonstrated steady declines in cortisol in response to consecutively presented emotion challenge procedures, which included toy reach, mask presentation, barrier, and arm restraint tasks (Blair et al., 2006). Maternal sensitivity was assessed separately during a semi-structured free play interaction. Results indicated that infants of mothers lower in sensitivity finished the emotion challenge tasks with lower absolute cortisol levels relative to their peers who received sensitive mothering, who showed a more typical response of reactivity followed by recovery once the stressor was removed (Blair et al., 2006). This study exemplifies the flat and low pattern of stress regulation among infants characteristic of hypocortisolism. Additionally, flat and low cortisol recovery trajectories have been observed in response to social stress among post-institutionalized (i.e., orphaned) youth,

whereas their peers from intact biological families demonstrated a more typical acute tress response coupled with significant reductions in cortisol over the recovery period (Hostinar, Johnson, & Gunnar, 2015). Other work has also demonstrated flat and low cortisol response profiles to acute social stress among adolescents (e.g., Elzinga, Roelofs, Tollenaar, Bakvis, van Pelt, & Spinhoven, 2008; MacMillan et al., 2009) and children (Gunnar, Grenn, Wewerka, and Van Ryzin, 2009) with a history of child maltreatment. Lack of cortisol response to psychosocial stress has been associated with social and behavioral problems (Ouellet-Morin et al., 2011), posttraumatic stress disorder (Elzinga, Spinhoven, Berretty, de Jong, & Roelofs, 2010), depression (Harkness, Stewart, & Wynne-Edwards, 2011), and negative family relationships (Luecken, Kraft, & Hagan, 2009).

Cortisol recovery among adult survivors of child maltreatment: Adult outcomes associated with the experience of child maltreatment are diverse, existing along a continuum from high resilience and healthy adaptation to severe comorbid mental and physical pathology (Ehlert, 2013). Dysregulated HPA activity contributes to a variety of adult mental and physical health problems associated with child maltreatment (Palaszynski & Nemeroff, 2009). Similar to the literature on HPA regulation among children, much work on this topic in adult survivors of child maltreatment has focused on reactivity, rather than recovery (e.g., Heim, Newport, Wagner, Wilcox, Miller, & Nemeroff, 2002; Voellmin et al., 2015). However, most studies that focus on cortisol reactivity also report on recovery trajectories, providing insight into this process. A recent meta-analysis of 30 studies of the effects of early life adversity on acute HPA response to social stress in adulthood found a moderate effect size indicating flat and low cortisol

recovery trajectories in people with a history of early life adversity (Bunea, Szentágotai-Tatar, & Miu, 2017). The majority of studies focused on history of child maltreatment (N=21) while nine studies concerned other forms of adverse childhood events (Bunea, Szentágotai-Tatar, & Miu, 2017).

Hypocortisolism associated with child maltreatment has been associated with problematic long-term outcomes. For example, flat and low cortisol recovery profiles have been associated with history of sexual or physical abuse among women, but only among women without psychiatric diagnoses (Girdler et al., 2003). Flat and low cortisol recovery trajectories, indicative of hypocortisolism, have been observed in depressed women in response to acute psychosocial stressors (e.g., Burke et al., 2005; Burke, Fernald, Gertler, & Adler, 2005). In contrast, Bremner and colleagues (2003) found evidence of increased reactivity and no impairment in recovery among adults with PTSD related to childhood maltreatment; however, they utilized a cognitive challenge task, rather than a social stressor, which may have influenced cortisol outcomes. This suggests that hypocortisolism associated with child maltreatment may be uniquely related to psychosocial functioning.

In summary, regarding recovery, or termination of an acute stress response, individuals may show a flat and high cortisol trajectory (i.e., extended elevations), or may show a flat and low trajectory indicative of persistently low levels of cortisol that are nonresponsive to stressors. Either response may be problematic. Extended elevations, in addition to having high physiological and immunological costs, may reflect a lack of effective coping skills and emotional and behavioral dysregulation. Persistently low cortisol, on the other hand, may reflect disengagement or withdrawal, and a lack of a

response to the stressor where active coping may be optimal. While these dynamics apply to both children and adults, these difficulties in stress regulation are particularly problematic for mothers, who are responsible not only for their own self-regulation, but also for maintaining sufficient self-regulation in order to provide effective parenting to facilitate the development of effective self-regulation in their children.

Intergenerational Transmission of Child Maltreatment

An intergenerational cycle of child abuse and neglect has been well documented (Child Welfare Information Gateway, 2013; McCloskey & Bailey, 2000; Schuetze & Eiden, 2005; Seng, Sperlich, Low, Ronis, Muzik, & Liberzon, 2013; Spieker, Bensely, McMahon, Fung & Ossiander, 1996). Childhood maltreatment increases the risk of psychophysiological dysregulation and depressive tendencies, which in turn negatively impact offspring (Field, 2010; Forcada-Guex, Borghini, Pierrehumbert, Ansermet, & Muller-Nix, 2011; Muzik et al., 2013; Leigh & Milgrom, 2008). The intergenerational transmission of traumatization refers to the adverse outcomes experienced by the offspring of traumatized parents (Bowers & Yehuda, 2016). Parental PTSD symptoms, such as those related to child maltreatment, are linked to dysfunction in offspring (Boričević, Maršanić, Aukst Margetić, Jukić, Matko, & Grgić, 2014; Tees, Harville, Xiong, Buekens, Pridjian, & Elkins-Hirsch, 2010; Zerach, Kanat-Maymon, Aloni, & Solomon, 2016). Problematic next-generation outcomes include infant internalizing and externalizing symptoms, as well as emotional and behavioral dysregulation (Bosquet Enlow, Kitts, Blood, Bizarro, Hofmeister, & Wright, 2011), greater reactivity to novel situations, and poor coping and stress regulation among infants (Bosquet Enlow et al., 2011; Brand, Engel, Canfield, & Yahuda, 2006; Enlow et al., 2009). These difficulties

have been found to persist into childhood, where they contribute to the development of socioemotional problems (Ahlfs-Dunn & Huth-Bocks, 2014).

The Perinatal Interactional Model of Intergenerational Transmission of Trauma (Lang & Gartstein, 2018) suggests that in addition to biological influences, social learning and poor quality caregiving help explain the disrupted parent-child relationships characteristic of the intergenerational transmission of trauma. One mechanism through which this transmission is thought to occur is via in utero exposure to stress hormones as the child is carried to term within a mother experiencing psychophysiological and emotional dysregulation (Babenko, Kovalchuk, & Metz, 2015). Dysfunction of the next generation may also be due, in part, to epigenetic neuroendocrine and neuroanatomical effects in the mother, associated with the original trauma, that are subsequently passed to offspring. Socioemotional learning also plays a role, as infants in particular have been shown to closely mirror their mothers' stress responses (Waters, West, & Mendes, 2014), which can be problematic when the mother experiences chronic psychophysiological dysregulation. For example, women with PTSD and/or depression have been observed to have poorer quality interactions with their children, which were in turn associated with impaired bonding and insecure attachment (Seng et al., 2013; Bosquet Enlow, Egeland, Carlson, Blood, & Wright, 2014). Social learning plays a role in that children of parents who have been negatively impacted by experiences of child maltreatment are more likely to be exposed to intense levels of negative affect (e.g., sadness, anger, fear), and may also observe problematic coping practices such as numbing, withdrawal, or intrusive and aggressive behavior (Bandura, 1963; Carver & Vaccaro, 2007; Elwood, Williams, Olatunji, & Lohr, 2007; Lang & Gartstein, 2018).

Mothers with PTSD report more hostility, aggression, and overall conflict in their parenting (Chemtob, Gudino, & Laraque, 2013; Davies, Slade, Wright, & Stewart, 2008; Westerink & Giarratano, 1999). Parents with PTSD symptoms are also more likely to maltreat their children (Cohen, Hien, & Batchelder, 2008) and are more likely to use psychological and/or physical aggression and punitive measures in an attempt to control their children's behavior (Cohen et al., 2008). Even when not overtly maltreating, maternal experiences of anger, fear, or dissociative tendencies implicitly hurt the ability of the mother to respond appropriately to the child who is in need of connection and care (de Wolff & Van Ijzendorn, 1997; Gartstein, Crawford, & Robertson, 2008; Lang & Gartstein, 2018). For example, the negative alterations in cognition and mood typical of PTSD may contribute to the observation that these traumatized mothers are more likely to make negative attributions about their infants (Davies et al., 2008) as well as to hold unrealistic expectations of their children (Schechter et al., 2005). These influences culminate in low quality caregiving interactions that interfere with the developing child's ability to effectively regulate stress (Zalewski, Lengua, Kiff, & Fisher, 2012). Although not all survivors of child maltreatment go on to develop PTSD, PTSD symptoms can be conceptualized as existing on a continuum that may characterize a broader proportion of adult survivors of child maltreatment.

Fortunately, interventions aimed at improving problematic parenting, for example, by challenging parents' negative attributions about their children, have been shown to lead to improved parenting interactions (e.g., Bugental, Ellerson, Lin, Rainey, Kokotovic, & O'Hara, 2002; Wilson & White, 2006), demonstrating that interrupting the intergenerational cycle of trauma is possible. However, timing of these interventions may

be critical for maximum impact given biological effects of the mothers' physiological dysregulation on the fetus. It may be especially important to intervene prior to or early in pregnancy (Yehuda et al., 2013) to curtail biological impacts and improve mothers' psychophysiological functioning before socioemotional patterns of interaction have been established with their infants. Given mindfulness' associations with improved executive functioning and emotion regulation, as well as its focus on increasing interoceptive awareness and reducing dissociation, mindfulness may represent a prime intervention principle when working with survivors of childhood maltreatment (Cross et al., 2017). The current study explores the potential of dispositional mindfulness and mindful parenting as protective factors in the associations between maternal history of child maltreatment and problematic outcomes in the next generation. The following sections provide a rationale, based on empirical findings, for further exploring the role of mindfulness as it relates to parenting, the development of attachment, and mother-infant stress regulation.

Mindfulness, Mindful Parenting, and Reducing the Risk of Problematic Outcomes Associated with Child Maltreatment

Mindfulness, a quality of attention characterized by intentional, nonjudgmental receptivity to experience, has been associated with improved physical and psychological health, and healthier relationships (e.g., Chambers, Gullone, & Allen, 2009; Gu, Strauss, Bond, & Cavanagh, 2016; Pepping, Duvenage, Cronin, & Lyons, 2016). Mindfulness can be conceptualized as a relatively stable trait (i.e., dispositional mindfulness), or a temporary state that can be intentionally cultivated through mindfulness-based interventions. Mindfulness may help ameliorate many of the harmful impacts of child

maltreatment in adult survivors (e.g., Hanley, Garland, & Tedeschi, 2016; McDonald, Sherman, Petocz, Kangas, Grant, & Kasparian, 2016; Siegel & Hartzell, 2014). For example, evidence suggests dispositional, or trait, mindfulness may be associated with less dysfunction among child maltreatment survivors (e.g., Frewen, Dozois, Neufel, & Lanius, 2016; Whitaker et al., 2014). Preliminary studies of mindfulness-based interventions for child maltreatment survivors have yielded promising outcomes, such as reductions in symptoms of PTSD, depression, and anxiety, increases in mindfulness, and lowered risk of further victimization (e.g., Earley et al., 2016; Hill, Vernig, Lee Brown, & Orsillo, 2011; Kimbrough, Magyari, Langenberg, Chesney, & Berman, 2009). Mindfulness-based interventions have shown promise in the treatment of trauma-related disorders like posttraumatic stress disorder (PTSD), anxiety, substance use, and depression (Hilton et al., 2016; Zemestani & Ottaviani). These studies highlight the potential protective benefits of mindfulness for individuals affected by experiences of child maltreatment.

Mindfulness may be a particularly important treatment target for survivors of child maltreatment who become parents, because mindfulness has been shown to support important qualities related to parenting, like effective emotion regulation (e.g., Chambers, Gullone, & Allen, 2009), and secure attachment (e.g., Goodall, Trejnowska, & Darling, 20120; Pepping, Davis, & O'Donovan, 2013; Walsh, Balint, Smolira, Frederickson, & Madsen, 2009). The cultivation of mindfulness has even been suggested as a promising pathway towards earned security among adults with histories of insecure attachment (Siegel, 2007; Siegel & Hartzell, 2014). Some scientists have already begun to

investigate ways in which the cultivation of mindfulness may be particularly useful for promoting positive parenting (e.g., Duncan et al., 2009).

Mindful parenting refers to mindfulness applied to the interpersonal context of parenting. Specifically, Duncan and colleagues (2009) define mindful parenting as: (1) listening with undivided attention to the child, (2) nonjudgmental acceptance of self and child, (3) emotional awareness of self and child, (4) self-regulation in the context of the parenting relationships, and (5) compassion for the self and child. Mindful parenting interventions have been shown to improve maternal wellbeing and enhance the quality of parenting interactions in non-maltreated populations (e.g., Bögels, Hellemans, van Deursen, Römer, & van der Meulen, 2014; Coatsworth, Duncan, Greenberg, & Nix, 2010; Perez-Blasco, Viguer, & Rodrigo, 2013; Van der Oord, Bögels, & Peijnenburg, 2012). It may be that mindful parenting promotes children's wellbeing by enhancing attachment security in parent-child relationships (Medeiros, Gouveia, Canavarro, & Moreira, 2016; Siu, Ma, & Chui, 2016). Moreover, dispositional mindfulness and mindful parenting appear to be positively related to one another. Previous work found that parent dispositional mindfulness was positively associated with mindful parenting, which in turn predicted more positive parenting behavior and less negative parenting behavior (Parent, McKee, Anton, Gonzalez, Jones, Forehand, 2016). Thus, both maternal dispositional mindfulness and mindful parenting may be related to better parenting and enhanced attachment security, making it a promising intervention target for adult survivors of child maltreatment who may be at risk for compromised caregiving. The current study aims to further explore the potential benefits of mindfulness and mindful parenting in parent-child dynamics among adult survivors of child maltreatment.

Mindfulness, mindful parenting, and stress regulation. As discussed previously in this manuscript (pp. 9-17), child maltreatment is linked to impaired stress regulation, which is in turn associated with problematic outcomes, like symptoms of psychopathology (e.g., Miller et al., 2007). Given the current study is concerned with exploring mindfulness' potential as a protective factor in the regulation of stress among adult survivors of child maltreatment and their offspring, empirical findings related to mindfulness, mindful parenting, and stress regulation are explored next.

A recent meta-analysis of meditation programs for stress and wellbeing found that mindfulness interventions are associated with small to moderate improvements in multiple components of psychological wellbeing, including reduction of self-reported stress (Goyal et al. 2014). Mindful parenting has also been associated with reduced subjective stress, including parenting stress (Bazzano et al., 2015; Bögels et al., 2014; Haydicky, Shecter, Wiener, & Ducharme, 2015). While an abundance of studies support the association between mindfulness and reduction of subjective stress and symptoms of psychopathology (e.g., Hofmann, Sawyer, Witt & Oh, 2010; Keng, Smoski & Robins, 2011), evidence for the impact of mindfulness on physiological stress (i.e., HPA functioning) is sparse and results have been mixed. For example, several studies have found that participation in Mindfulness-Based Stress Reduction (MBSR) was associated with decreases in diurnal cortisol production, along with other improvements in physiological indicators of stress (Carlson, Speca, Faris, & Patel, 2007; Matchim, Armer, & Stewart, 2011). Yet other studies have found no effect of mindfulness practice on cortisol responses (Galantino, Baime, Maguire, Szapary & Farrar, 2005; Gex-Fabry et al., 2012; O'Leary, O'Neill, & Dockray, 2016).

Effects of mindfulness on acute stress reactivity have likewise been mixed. Some studies have shown a negative association between mindfulness and acute stress reactivity (i.e., lower mindfulness predicting greater cortisol reactivity and less recovery; e.g., Brown, Weinstein, & Creswell, 2012). Other work replicated this pattern in male partners in a romantic dyad, but showed the opposite effect for women partners, who demonstrated a positive association of greater mindfulness predicting elevated stress reactivity (Laurent, Laurent, Hertz, Egan-Wright, & Granger, 2013). As discussed previously, the functionality of cortisol dynamics varies according to environmental context and innate factors (Del Giudice et al., 2011), which may explain some of the variability in these findings.

Other studies provide indirect evidence on possible links between mindfulness and acute stress regulation, linking qualities that are incompatible with mindfulness with HPA functioning among adult survivors of child maltreatment. For example, emotional non-acceptance of one's own emotions seems to confer a blunting effect on HPA response to social threat (i.e., a flat and low cortisol recovery trajectory) among women with a high degree of early life stress including child maltreatment (Cărnuţă, Crişan, Vulturar, Opre, & Miu, 2015). Another study found that difficulties with emotion regulation moderated associations between maternal history of child maltreatment and HPA regulation in response to the emotional Stroop task in a population of maltreated postpartum women (England-Mason, Kimber, Khoury, Atkinson, MacMillan, & Gonzalez, 2017). Specifically, women with more child maltreatment in their histories and greater difficulties in emotion regulation showed flat and low cortisol recovery trajectories. In both these cases, qualities incompatible with mindfulness (i.e., emotional

non-acceptance, difficulties in emotion regulation) seem to predict patterns of cortisol regulation consistent with hypocortisolism in populations reporting higher levels of early life stress and child maltreatment.

Currently, little is known about how mindfulness or mindful parenting relates to physiological stress reactivity within the mother-infant dyad. One of the first studies of this kind, based on a different subset of data from the current study, showed that mothers' mindful parenting predicted steeper maternal cortisol recovery slopes, indicating enhanced recovery following an acute, dyadic lab stressor (Laurent, Duncan, Lightcap, & Khan, 2017). Maternal mindful parenting also moderated the impact of life stress on physiological stress reactivity of both mother and infant following an acute stressor. Specifically, when life stress was high, greater mindful parenting was associated with lower average infant cortisol levels but extended elevations of cortisol (i.e., flat and high trajectories) in the mother (Laurent et al., 2017). These elevations may be adaptive for women dealing with current stressors insofar as the stress response enables active coping.

Regarding the mother-infant dyad, the ability of mothers to respond effectively to their child's needs is especially important, since a lack of effective parenting tends to promote infant HPA hyperactivation and subsequent emotional and behavioral difficulties (Bosquet Enlow et al., 2014b; Dawson, Hessl, & Frey, 1994; Essex, Klein, Cho, & Kalin, 2002; Hostinar et al., 2014). Thus, among infants, less pronounced cortisol elevations could reflect more effective stress co-regulation within the mother-infant dyad. Yet when it comes to mothers' own cortisol reactivity, flat and low cortisol trajectories could reflect the use of avoidant coping strategies, such as a lack of emotional engagement with the child, where a stress-response and approach-oriented actions would

be necessary for optimal parenting (Crockett, Holmes, Granger, & Lyons-Ruth, 2013; Miller et al., 2007). Given mindfulness' and mindful parenting's associations with more dynamic (i.e., less flat) acute cortisol regulation (e.g., Cărnuţă et al., 2015; England-Mason et al., 2017; Laurent et al., 2013; Laurent et al., 2017), better parenting, and enhanced attachment security (Bazzano et al., 2015; Bögels et al., 2014; Coatsworth et al., 2010; Haydicky et al., 2015; Medeiros et al., 2016; Parent et al., 2016; Perez-Blasco et al., 2013; Siu et al., 2016; Van der Oord et al., 2012), further exploration of the potentially protective role of mindfulness in associations between maternal history of child maltreatment and problematic outcomes in the next generation is warranted.

Summary

In summary, child maltreatment exerts deleterious effects on development in ways that make parents more prone to problematic parenting behavior, thus potentially interrupting the development of secure attachment with their own children (Abrams et al., 2006; Bailey et al., 2007; Ehrensaft et al., 2015; Hesse & Main, 2006; Jacobvitz et al., 2006). One potential pathway of influence in this process is the parents' ability to regulate their own and their child's stress during challenging interactions (e.g., Laurent et al., 2017). Importantly, a lack of effective parenting behavior and/or stress regulation may contribute to the development of insecure or disorganized attachment (Filey et al., 2001; Gaensbauer & Siegel, 1995; Lyons-Ruth & Jacobvitz, 1999).

In the context of a history of child maltreatment, dysregulation of acute stress recovery is associated with flatter trajectories from peak stress across the recovery period. This flat trajectory may be the result of (1) a failure to return to pre-stress baseline following an acute stress response (i.e., a flat and high recovery trajectory) or (2) blunted

cortisol trajectories indicative of hypocortisolism, reflecting a lack of a stress response where one might be expected; (i.e., a flat and low recovery trajectory). While stress associated with child maltreatment may initially be associated with flat and high recovery trajectories (e.g., Bosquet Enlow et al., 2014b; Miller et al., 2007), chronic child maltreatment seems to be more frequently associated with hypocortisolism and flat and low cortisol recovery trajectories (e.g., Blair et al., 2006; Miller et al., 2007; Hostinar et al., 2015b). These flat and low cortisol trajectories, rather than indicating hyper-effective stress regulation or buffering, are often associated with other risk factors like a history of instituitionalization in orphanages (e.g., Hostinar et al., 2015a), negative relationships with parents (e.g., Luecken et al., 2009), and social and behavioral problems (Ouellet-Morin et al., 2011). This pattern of hypocortisolism appears to persist into adulthood (e.g., Bunea et al., 2017), and blunted cortisol in response to acute stress is associated with maternal dysfunction, such as depression (Burke et al., 2005a; Burke et al., 2005b). Maternal depression, in turn, has been associated with impaired parenting capacities and concomitant attachment issues with infants (e.g., Bigelow et al., 2018). Given that high or low flat cortisol trajectories are both problematic and linked to a history of child maltreatment, exploring cortisol recovery dynamics may be a more informative metric of overall HPA functioning in this population than simply examining reactivity or absolute levels of cortisol alone. Mindfulness may function as a resilience factor for survivors of child maltreatment, potentially moderating possible problematic connections between maternal history of child maltreatment and mother-infant stress regulation (e.g., Laurent et al., 2017). Mindfulness and mindful parenting may also enhance attachment outcomes in the next generation (Siegel, 2007; Siegel & Hartzell, 2014). Dispositional mindfulness

has shown positive associations with mindful parenting (Parent et al., 2016), which in turn has been linked to better parenting and secure attachment (e.g., Medeiros, Gouveia, Canavarro, & Moreira, 2016; Siu, Ma, & Chui, 2016).

The Present Study

The current study examines whether maternal history of child maltreatment predicts both mother and infant physiological recovery from stress, and the infant's quality of attachment. Maternal dispositional mindfulness and mindful parenting are considered as potential protective mechanisms that may moderate associations between maternal history of child maltreatment and consequential outcomes (i.e., mother and infant stress regulation and quality of attachment) in beneficial ways. Given the important role that mothers play in helping infants learn to regulate their stress responses (e.g., Bosquet Enlow et al., 2014b; Dawson, Hessl, & Frey, 1994; Essex, Klein, Cho, & Kalin, 2002; Hostinar et al., 2014), the current study focuses on mother-infant stress recovery, rather than reactivity, in the context of parent-child attachment as a valid indicator of adaptive HPA functioning. Additionally, given the possibility of multiple, adaptive stress regulatory phenotypes depending on specific life circumstances, the current study links HPA outcomes to an important index of adaptive functioning – infant attachment – to provide more information about how HPA functioning might be relating to consequential outcomes (Del Guidice et al., 2011). In contrast with much of the previous research on acute HPA functioning among adult child maltreatment survivors in response to psychosocial stress (e.g., Bunea et al., 2017), which has primarily relied on the Trier Social Stress; (Kirschbaum, Pirke, & Hellhammer, 1993), the current study utilizes a parenting-specific stressor that provides information about infant attachment. This

enhances the generalizability of findings related to mother-infant stress regulation to the critical context of parent-child interaction, where the intergenerational transmission of child maltreatment is either perpetuated or prevented.

In sum, the current study involves a unique focus on the impact of maternal history of child maltreatment on mother-infant stress recovery from an acute, attachment-related stressor. Focusing on stress recovery within the context of attachment will enhance the field's understanding of how a history of child maltreatment influences potentially problematic outcomes (i.e., impaired acute stress recovery; insecure or disorganized attachment) in the next generation. Finally, this study is among the first of its kind to explore the potentially beneficial role of mindfulness and mindful parenting in buffering against possible risks imposed on children of survivors of child maltreatment. Please note this dissertation includes unpublished coauthored material. Chapter II METHOD, while entirely written by Robin M. Hertz, describes methodology designed by Heidemarie Laurent.

Hypotheses

Main effects of maternal history of child maltreatment.

1. A history of child maltreatment has been associated with problematic parenting behaviors, which may or may not be overtly maltreating and influence the development of insecure or disorganized attachment in the next generation (e.g., Abrams, Rifkin, & Hesse, 2006; Bailey et al., 2007; Bernier & Meins, 2008; George & Solomon, 2008; Goldberg et al., 2003; Lyons-Ruth et al., 1999; Lyons-Ruth et al., 2005; MacDonald et al., 2008). Sub-optimal parenting, especially child maltreatment, has been linked to physiological

stress dysregulation characterized by flat cortisol recovery trajectories among children (e.g., Harkness, Stewart, & Wynne-Edwards, 2011; Hostinar, Johnson, & Gunnar, 2015; Miller et al., 2007; Siegel & Hartzell, 2014; Tarullo & Gunnar, 2006). Therefore, it is hypothesized that high levels of maternal history of child maltreatment will be associated with a lack of infant cortisol recovery.

2. Likewise, a history of child maltreatment has been associated with flat cortisol recovery trajectories among adult survivors of child maltreatment (e.g., Bunea et al., 2017). Thus, high levels of maternal history of child maltreatment will be associated with a lack of maternal cortisol recovery.
3. A history of maltreatment in childhood has been associated with problematic parenting behavior (e.g., Bailey et al., 2012; Burkett, 1991; Driscoll & Easterbrooks, 2007; Lyons-Ruth & Block, 1996; Moehler et al., 2007) and disorganized attachment (e.g., Abrams et al., 2006; Bailey et al., 2007; Bernier & Meins, 2008; Cyr et al., 2010; Hesse & Main, 2006; Jacobvitz et al., 2006; Schuengel et al., 1999). Therefore, it is hypothesized that high levels of maternal history of child maltreatment will be associated with insecure and disorganized infant attachment classifications.

Main effects of dispositional mindfulness.

1. Given the empirical links among dispositional mindfulness, mindful parenting, and positive parenting behavior (Parent et al., 2016), which could impact infant stress regulation in beneficial ways, it is hypothesized that higher levels of maternal dispositional mindfulness will be associated with infant cortisol

recovery (see Method section for more information on the operationalization of cortisol recovery, and what constitutes better vs. worse recovery).

2. Higher levels of maternal dispositional mindfulness will be associated with maternal cortisol recovery, in line with previous work linking greater mindfulness with better recovery from psychosocial stressors (e.g., Brown et al., 2012). This hypothesis is further supported by demonstrated associations between emotional non-acceptance and difficulties in emotion regulation, qualities that are incompatible with mindfulness, and blunted cortisol trajectories indicative of hypocortisolism (Cărnuţă et al., 2015; England-Mason et al., 2017).
3. Maternal dispositional mindfulness will be associated with secure infant attachment classification given the empirical link among dispositional mindfulness, mindful parenting, and more positive parenting behavior (Parent et al., 2016), which could be associated with attachment in positive ways.

Main effects of mindful parenting.

1. Previous work with the current sample demonstrated that mindful parenting was associated with lower infant cortisol levels (i.e., average levels across all samples measured in response to an acute stressor; Laurent et al., 2017). Although this operationalization of infant cortisol functioning does not provide specific information about recovery, it may be that lower overall cortisol output may be associated with better cortisol recovery. Therefore, it is hypothesized that greater mindful parenting will be associated with infant cortisol recovery.

2. Laurent and colleagues (2017) found a significant interaction of mindful parenting and life stress indicating that when life stress was high, greater mindful parenting was associated with more extended elevations in maternal cortisol. Given mindful parenting's interaction with varying levels of environmental stress described in earlier work (i.e., Laurent et al., 2017), and the likelihood of the current sample including women with a varying levels of current and historical life stress, it is predicted that mindful parenting will have a null effect on maternal cortisol recovery due to mindful parenting influencing cortisol recovery in opposing directions between participants in response to third variables not measured in the current study.
3. Mindful parenting will be associated with secure infant attachment, consistent with previous research demonstrating associations among mindful parenting, more effective parenting, and secure attachment (Bögels et al., 2014; Coatsworth et al., 2010; Medeiros et al., 2016; Perez-Blasco et al, 2013; Siu et al., 2016; Van der Oord et al., 2012).

Interaction between maternal history of child maltreatment and dispositional mindfulness. The following interaction effects are predicted:

1. Dispositional mindfulness will significantly moderate the association between maternal history of child maltreatment and infant cortisol, such that as mindfulness increases the association between maternal history of child maltreatment and infant cortisol recovery will decrease. In other words, when mindfulness is low, higher levels of maternal history of child maltreatment will be associated with lack of infant cortisol recovery but when mindfulness is high,

maternal history of child maltreatment will be associated with infant cortisol recovery. Such a finding would extend previous work linking dispositional mindfulness and positive parenting behavior (Parent et al., 2016), which may be associated with enhanced infant stress regulation.

2. Dispositional mindfulness will significantly moderate the association between maternal child maltreatment and maternal cortisol recovery, such that as mindfulness increases the association between maternal history of child maltreatment and maternal cortisol recovery will decrease. In other words, when mindfulness is low, greater maternal history of child maltreatment will be associated with lack of maternal cortisol recovery but when mindfulness is high, maternal history of child maltreatment will be associated with maternal cortisol recovery. This prediction is based on research that has associated flat and low cortisol recovery trajectories often observed in survivors of child maltreatment (e.g., Bunea et al., 2017) with traits that are inconsistent with mindfulness (i.e., emotional non-acceptance and difficulties in emotion regulation; Cărnuţă et al., 2015; England-Mason et al., 2017).
3. Dispositional mindfulness will significantly moderate the association between maternal child maltreatment and infant attachment, such that as mindfulness increases the association between maternal history of child maltreatment and infant insecure and disorganized attachment will decrease. In other words, based on initial findings linking mindful parenting to better parenting behavior and child outcomes (Bögel et al., 2014; Coatsworth et al., 2010; Perez-Blasco et al., 2013; Van der Oord et al., 2012), it is expected that as maternal mindfulness increases,

the risk for infants of adult survivors of child maltreatment developing insecure or disorganized attachment styles with their caregivers will be reduced.

Interaction between maternal history of child maltreatment and mindful parenting. The following interaction effects are hypothesized:

1. Mindful parenting will significantly moderate the association between maternal history of child maltreatment and infant cortisol, such that as mindful parenting increases the association between maternal history of child maltreatment and infant cortisol will decrease. In other words, when mindful parenting is low, it is expected that maternal history of child maltreatment will be associated with a lack of infant cortisol recovery, but when mindful parenting is high, maternal history of child maltreatment will be associated with infant cortisol recovery. Such a finding is based on previous research demonstrating significant associations between greater levels of mindful parenting and more positive parenting behavior (e.g., Parent et al., 2016), which has been linked to enhanced social buffering and better stress recovery among infants (Albers et al., 2008; Blair et al., 2006).
2. Mindful parenting will not significantly moderate the association between maternal history of child maltreatment and maternal cortisol recovery. Maternal history of child maltreatment is predicted to have a significant main effect on maternal cortisol, such that greater levels of child maltreatment are associated with a lack of recovery. This would be expected to be the case at low levels of mindful parenting, given previous associations found between emotional non-acceptance and difficulties in emotion regulation, which are

incompatible with mindfulness, and blunted cortisol trajectories (i.e., flat and low profiles; Cărnuţă et al., 2015; England-Mason et al., 2017). Additionally, previous research has found associations between mindful parenting and extended cortisol elevations (i.e., flat and high recovery profiles) among women with greater life stress (Laurent et al., 2017). Thus, despite high levels of mindful parenting, it is expected that the association between maternal history of child maltreatment and lack of cortisol recovery will persist.

3. Mindful parenting will significantly moderate the association between maternal history of child maltreatment and infant attachment, such that as mindful parenting increases, the association between maternal history of child maltreatment and infant insecure and disorganized attachment will decrease. In other words, as mindful parenting increases, the risk of insecure or disorganized attachment in infants of adult survivors of child maltreatment will be reduced. Again, this is based on initial findings linking mindful parenting to more effective parenting behavior (Bögels et al., 2014; Coatsworth et al., 2010; Perez-Blasco et al., 2013; Van der Oord et al., 2012), and secure attachment (Medeiros et al., 2016; Siu et al., 2016).

CHAPTER II

METHOD

This chapter, while entirely written by Robin M. Hertz, describes methodology designed by Heidemarie Laurent.

Participants

Ninety-one initial dyads of mothers and their infants were recruited from community agencies serving low-income mothers, such as the Women, Infants, and Children (WIC) program, to participate in a longitudinal study of stress regulation. The current analyses are based on 61 mother-infant dyads with complete data at both T1 and T3. Thirty women dropped out of the study or failed to provide complete data at both time points. The 61 mother-infant dyads with complete data at both T1 and T3 were compared to the 30 mother-infant dyads that participated in the study only at T1. On average, women who completed both phases of the study were significantly older (M=28.08, SD=5.685) than women who completed only T1 (M=25.03, SD=4.14; t[88]=-2.610, p=.011). The two groups of women did not differ significantly in terms of racial/ethnic background (X^2[5, N=91]=9.199, p=.101), relationship status (X^2[5, N=91]=2.589, p=.763), education level (X^2[6, N=91]=8.500, p=.204), household income (X^2[7, N=91]=11.576, p=.115), or occupation (X^2[6, N=91]=11.133, p=.084).

However, women who completed both phases reported significantly more dispositional mindfulness (M=3.712, SD=.481) than women who only completed the first phase (M=3.433, SD=.559; t[85]=-2.358, p=.021). There were no significant differences between the two groups of women in terms of mindful parenting (t[81]=-.423, p=.673), or

in their self-reported levels of child maltreatment on the Childhood Trauma Questionnaire (CTQ; t[86]=.241, p=.811).

The current sample (N=61) somewhat reflected the racial/ethnic composition of the Pacific Northwestern community from which it was drawn. The majority of participants, 76.70% (N=46), identified as White, 13.33% (N = 8) identified as Latina, 3.33% (N=2) identified as Native American, 3.33% (N=2) identified as Asian American, and 3.33% (N=2) identified as Other. Concerning relationship status, 46.70% (N=28) of the women were married, 33.33% (N=20) were living with someone but not in a legal domestic partnership, 6.67% (N=4) were in a legal/registered domestic partnership, 6.67% (N=4) were dating, 5.00% (N=3) were single, and 1.67% (N=1) reported being separated. Education levels among the women were mixed; 10% (N=6) held master's degrees, 50% (N=30) had some college education, 10% (N=6) had completed 2-year vocational/technical school, and 20% (N=12) had graduated high school or the equivalent. Approximately 31.67% (N=19) of women were full-time homemakers; 25% (N=15) reported household incomes of less than $5,000, 21.67% ($N$=13) reported household income between $20,000-$29,000, and 15% (N=9) reported household incomes of greater than $50,000. The average age of women in the study was 28.03 years old (SD = 5.73). On average, women had a total of two or three biological children (M=2.95, SD=.96).

Measures

Interpersonal Mindfulness in Parenting – Infant Version (IMP-I; Duncan, 2007). This measure of mindful parenting is an adaptation of the original Interpersonal Mindfulness in Parenting Scale, and focuses on parenting during infancy (Duncan, 2007;

Duncan et al., 2009). It includes 27 items rated on a 5-point Likert-type scale from *never* to *always* true. The measure includes both the attentional (e.g., "I pay close attention to my baby when we are spending time together") and attitudinal (e.g., "When things I try to do as a parent do not work out, I can accept them and move on") components of mindfulness as they pertain to parenting an infant (Laurent et al., 2017). Internal consistency for the scale was good (α=.81). Scores ranged from 3.17 to 4.77 (*M*=4.16, *SD*=.36).

Five Facet Mindfulness Questionnaire (FFMQ; Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006). This is a measure of trait, or dispositional, mindfulness. It contains 39 items rated on a 5-point Likert-type scale from *never or very rarely* to *often or always true.* It yields a total mindfulness score as well as five subscale scores corresponding to five facets of mindfulness: Acting with Awareness, Describing, Observing, Nonjudgment, and Nonreactivity. Example items include, "I don't pay attention to what I'm doing because I'm daydreaming, worrying, or otherwise distracted," (reverse scored), and, "In difficult situations, I can pause without immediately reacting." Internal consistency for the scale was good (α=.82). FFMQ scores ranged from 2.48 to 4.47 (*M*=3.62, *SD* = .47).

Childhood Trauma Questionnaire (CTQ; Bernstein & Fink, 1998). The CTQ is a 28-item retrospective self-report measure that assess five types of child maltreatment: (1) emotional neglect (e.g., "I felt loved"; reverse scored), (2) emotional abuse (e.g., "People in my family said hurtful or insulting things to me"), (3) physical neglect (e.g., "I didn't have enough to eat"), (4) physical abuse (e.g., "I was punished with a belt, a board, a cord, or some other hard object"), and (5) sexual abuse (e.g., "Someone tried to make

me do sexual things or watch sexual things"). The measure also includes three items to assess the respondents' tendency to minimize or deny abuse experiences. Each item is rated on a 5-point Likert-type scale from 1 (*never true*) to 5 (*very often true*). The CTQ has demonstrated validity and reliability, including good test-retest reliability coefficients (α=.79 to .86 over on average of 4 months; Scher, Stein, Asmundson, McCreary, & Forde, 2001; Bernstein & Fink, 1998). Cronbach's alpha for the total scale was .77. Child maltreatment was operationalized as a total score, reflecting the sum of all five subscales.

The most common types of child maltreatment reported in the sample were emotional abuse (*M*=9.69, *SD*=5.38) and emotional neglect (*M*=9.67, *SD*=5.01), followed by physical neglect (*M*=8.21, *SD*=4.25), physical abuse (*M*=7.56, *SD*=3.64), and sexual abuse (*M*=7.48, *SD*=4.84). Total child maltreatment scores ranged from 25.00 to 100.00 (*M* = 42.61, *SD*=19.41). These averages approached previously published clinical cut-points of ≥10 for emotional abuse; and ≥8 for physical abuse, physical neglect, and sexual abuse, but were well under the clinical cut-point of ≥15 for emotional neglect (Zalewski, Cyranowski, Cheng, & Swartz, 2013). However the emotional abuse score did exceed a previously established non-clinical norm on the emotional abuse subscale (*M*=7.36, *SD*=3.98;Scher, Stein, Asmundson, McCreary, & Forde, 2001).

The maternal child maltreatment variable was found to be positively skewed (ϒ=1.386, *SE*=.306). Of natural log (ϒ=.828, *SE*=.306), square root (ϒ=1.01, *SE*=.306), and inverse transformations (ϒ=-.322, *SE*=.306), the inverse transformation best normalized the data; thus an inverse transformation was applied to the maternal child maltreatment variable. When interpreting statistical analyses using inversely transformed variables it is important to note that the inverse transformation reverses the direction of

any linear relationship between the transformed variable and other variables. Thus, when interpreting regression coefficients associated with the inversely transformed CTQ variable, the sign of the coefficient should be switched from positive to negative, or vice versa, to reveal the true direction of the relationship between the CTQ and outcome variables.

Cortisol. Saliva samples were assayed in duplicate using Salimetrics' recommended protocol for Salivary Cortisol Enzyme Immunoassay (Salimetrics, Carlsbad, CA). The test uses 25 µl of saliva, with a lower sensitivity limit of .007 µg/dl, and a standard curve range of .012 µg/dl to 3.0 µg/dl. On average, the intra-assay coefficient of variation was less than 15% (Laurent et al., 2017). Cortisol was also found to be positively skewed (γ=6.364-3.458, *SE*=.302-306). A natural log transformation was applied to cortisol scores prior to analysis to correct for positive skew (γ=.492-1.932, *SE*=.302-306).

Mother and infant cortisol recovery levels were operationalized as the residual of the fourth and final sample regressed on the third sample. Operationalizing cortisol in this way helps circumvent some of the methodological issues (e.g., low reliability; increased probability of Type 1 and Type II errors; multicollinearity with component measures) associated with the use of difference scores (e.g., see Edwards, 2001). The residual score represents the amount of variance in the fourth sample not explained by cortisol levels at the third sample, and can be understood as a measure of whether actual, observed cortisol values at the fourth sample are higher, lower, or approximately equivalent to what might be predicted based on the level of cortisol observed at the third sample. Like change scores, negative residual values reflect recovery (i.e., the cortisol level observed at the

fourth sample is lower than predictions based on the third sample), and positive residual scores reflect a lack of recovery (i.e., the cortisol level observed at the fourth sample is higher than predictions based on the third sample).

Prior to model testing, a number of variables that could confound salivary cortisol were examined for influence. These included infant sex, saliva sampling start time, recent intake of food, tooth brushing, dental work, illness, use of prescription and nonprescription drugs and alcohol in the past 24 hours, wake time, hours of sleep, exercise, and body mass index. The only control variable that was significantly associated with cortisol outcomes was the mother's use of nonprescription drugs in the past 24 hours, which was significantly correlated with the infant cortisol residual (r=.417, p<.001). Just 4 of 63 mothers endorsed nonprescription drug use in the last 24 hours, with 3 individuals reporting cannabis use and 1 reporting the use of an over-the-counter pain reliever. Further inspection of the data revealed that the significant correlation appeared to be driven by a single outlier (i.e., 3 of 4 infants of these 4 mothers had cortisol recovery levels within the normal distribution, while the remaining infant had a cortisol value well outside the normal range). The outlying value was winsorized to 3 standard deviations about the mean. The winsorized version of the infant cortisol variable was used in analyses.

Attachment. Videos of the Strange Situation (SS) procedures were coded by Dr. Elizabeth Carlson at the University of Minnesota. Videos were coded for 5 types of infant behaviors during the reunion periods with the mother during the SS: proximity seeking, contact maintenance, resistance, avoidance, and disorganization. Each type of behavior was rated as a continuous score. Each infant was given a primary attachment

classification based on these observed behaviors. The majority of infants (*N*=29, 46.00%) were classified as secure, while 18 (26.60%) were classified as disorganized, 6 (9.5%) were classified as avoidant, 6 (9.5%) were classified as resistant, and 4 (6.3%) were categorized as cannot classify due to procedural interference (*N*=3) and a possible neurological source of disordered behavior (*N*=1). Two aggregate dummy codes were created to reflect insecure versus secure and disorganized versus organized attachment classifications.

Procedures

This protocol was granted IRB approval by Research Compliance Services at the University of Oregon (Protocol number 06242013.033). The data collected for the current study was part of a longitudinal study with four data collection time points (T1-T4). The data from the current study are derived from T1 and T3. Mothers were compensated $20 for their participation at T1, $30 for their participation at T2, $30 for their participation at T3, and $40 for their participation at T4. Mothers provided informed consent for both herself and her infant before participating in study procedures. Mothers could choose to discontinue study procedures at any time and still receive compensation for the day's session.

The data for the present study were collected at 2 time points. Mothers completed all self-report questionnaires (i.e., the retrospective report of child maltreatment history, the measure of interpersonal mindfulness in parenting, and the measure of dispositional mindfulness) in their homes via an online questionnaire when infants were approximately 3 months of age. When infants were approximately 12 months old, mothers and infants

came into the lab and participated in the Strange Situation during which they provided saliva samples.

Saliva sampling. Both mothers and infants provided 4 saliva samples during and after the Strange Situation. All sessions were scheduled for the early afternoon to account for diurnal variability in cortisol levels. It takes 15 to 20 minutes before the peak cortisol response to an acute stressor becomes detectable in saliva (Laurent & Powers, 2007). The first sample (i.e., reflecting baseline cortisol levels) was collected promptly following arrival at the lab after completing a questionnaire that screened for relevant covariates of salivary hormone (e.g., birth control usage, recent meals). The second sample (i.e., reflecting anticipatory stress) was collected immediately after the SS task concluded. The third sample (i.e., cortisol levels reflecting HPA response during the SS, or peak stress) was collected 20 minutes following the second separation during the SS, and the final saliva sample (i.e., recovery) was taken 30 minutes after the third sample. Saliva was collected from mothers using the passive drool technique into a collection vial; infant saliva samples were collected using a swab held in the baby's mouth by a research assistant with the mother's assistance.

The Strange Situation (Ainsworth & Wittig, 1969). A research assistant explained the procedure to the mother while both she and her 12-month-old were in the initial saliva collection room. After initial instructions, the mother and infant were escorted into a different room. The SS involved 7, approximately 3-minute-long sequences: (1) Mother and infant were left alone in a room with a chair for the mother to sit in and toys for the child to play with; (2) A "stranger" (research assistant) entered the room, sat quietly, then conversed with the mother, and finally played with the infant on

the floor; (3) The mother left the room and remained separated from her baby for 3 minutes or until the infant cried continuously for 30 seconds, whichever came first; (4) The first reunion: the mother entered the room and reconnected with her infant while the stranger discreetly left the room; (5) The mother left the room again for 3 minutes or until the infant cried continuously for 30 seconds, whichever came first; (6) The stranger returned to the room; (7) Finally, the mother entered the room for the second and final reunion as the stranger discreetly left the room. After a brief period of reunion, the mother and infant provided the second saliva sample. The mother remained in the same room to complete self-report questionnaires on a computer while her baby freely played with toys or interacted with her. During this period the final two saliva samples were also collected from the mother and infant.

CHAPTER III

RESULTS

Preliminary Analyses

The assumptions of the multiple regression model are (1) that variables are normally distributed, (2) that the independent and dependent variables are linearly related, (3) that variables were measured without systematic error, and (4) homoscedasticity (Osborne & Waters, 2002). Two variables (raw cortisol and maternal history of child maltreatment) were significantly positively skewed, which was normalized by applying a natural log transformation and inverse transformation respectively (see pp. 29-30, this manuscript for full description of skew and transformations). After this, exploratory data analyses revealed the assumptions of the multiple linear regression model were sufficiently met. Dispositional mindfulness (FFMQ), mindful parenting (IMP), and the inverse transformation of maternal history of child maltreatment (CTQ) were all standardized to z-scores for use in regression analyses (raw variables were used when obtaining descriptive statistics and bivariate correlations; Tables 1 and 2). Interaction terms were created using these z-score (i.e., mean-centered) variables.

Descriptive statistics for all study variables, including raw cortisol variables, are provided below (see Table 1). For raw and log-transformed cortisol scores, greater values reflect greater levels of cortisol. To provide a context for interpreting the main findings involving cortisol residual scores, change scores were calculated by subtracting the third saliva sample from the fourth saliva sample. For change scores, negative values reflect a decrease in cortisol from the third to fourth sample (i.e., negative change scores reflect

recovery); positive scores reflect an increase in cortisol from the third to the fourth sample (i.e., positive change scores reflect a lack of recovery).

Table 1

Descriptive Statistics for Cortisol, Maternal History of Child Maltreatment, and Maternal Mindfulness

Variable	Minimum	Maximum	*M*	*SD*
M_RCort_3	.018	1.053	.128	.149
M_RCort_4	.010	1.799	.127	.234
I_RCort_3	.035	2.864	.360	.442
I_RCort_4	.058	3.771	.380	.610
ΔM_Cort	-.206	.746	.000	.107
ΔI_Cort	-.588	2.905	.023	.426
CTQ	25.00	100.00	42.607	19.410
Emotional abuse	4.00	25.00	9.689	5.381
Emotional neglect	5.00	23.00	9.672	5.012
Physical neglect	5.00	19.00	8.213	4.251
Physical abuse	4.00	18.00	7.557	3.640
Sexual abuse	4.00	23.00	7.475	4.843
FFMQ	2.70	4.69	3.712	.481
IMP	3.50	4.77	4.174	.331

Note. M_RCort_3=Maternal raw cortisol sample 3; M_RCort_4=Maternal raw cortisol sample 4; I_RCort_3=Infant raw cortisol sample 3; I_RCort_4=Infant raw cortisol sample 4; ΔM_Cort=Maternal raw cortisol sample 4 – sample 3; ΔI_Cort=Infant raw cortisol sample 4 – sample 3; CTQ=maternal child maltreatment; FFMQ=total dispositional mindfulness; IMP=mindful parenting.

Maternal cortisol recovery – difference scores. Based on absolute cortisol change scores from the third to the fourth sample, 73.0% of mothers (*N*=46) decreased in cortisol during the recovery period, 23.8% of mothers (*N* = 15) increased, and 3.2% showed no change (1 mother) or did not have sufficient data to calculate a change score due to saliva sampling error (1 mother). Over half of mothers (*N* =37, or 58.7%) showed substantive recovery, as evidenced by a reduction of 10% or greater from sample three to sample four.

Infant cortisol recovery – difference scores. Based on absolute cortisol change scores from the third to the fourth sample, 49.2% (*N*=31) of infants decreased in cortisol, 47.6% *(N* = 30) increased, and 3.2% *(N* = 2) did not have sufficient data to calculate a change score due to saliva sampling error. Somewhat fewer than half of infants (*N* = 26, or 41.3%) showed a reduction of 10% or greater from sample three to sample four.

Cortisol recovery - residual values. Cortisol recovery was operationalized for the primary analyses as the residual score of the fourth sample regressed on the third sample. Exploratory data analyses showed that, as expected, cortisol change scores and cortisol residual scores were significantly positively correlated for both mothers (*r*=.592, *p*<.001) and infants (*r*=.662, *p*<.001; for a full correlation matrix of all study variables see Table 2). Cortisol residual values, like change scores, can be positive or negative values. Lower cortisol residual values reflect enhanced recovery and are associated with lower cortisol change scores (i.e., values below zero). Higher cortisol residual values reflect a lack of recovery and are associated with higher cortisol change scores (i.e., values above zero).

Bivariate correlations. Contrary to hypotheses, maternal history of child maltreatment (raw score values) was significantly negatively correlated with the maternal cortisol residual (*r*=-.281, *p*=.029), indicating that greater levels of maternal child maltreatment were associated with enhanced recovery. Mindful parenting was significantly positively correlated with the natural log transformed infant cortisol at sample 3 (*r*=.336, *p*=.011), and marginally correlated in the same direction with the raw cortisol variable at the same sample (*r*=.257, *p*=.056). Thus, women reporting greater mindful parenting had infants with higher cortisol at the third sample (i.e., reflecting peak

stress). Maternal dispositional mindfulness was positively correlated with mindful parenting (r=.264, p=.047). Expected correlations between cortisol variables and between the two attachment variables were also demonstrated. Maternal raw cortisol scores correlated positively with maternal natural log transformed cortisol scores (r=.657-.937, p<.01), 4th sample scores (both raw and transformed) correlated with maternal cortisol difference scores (r=.516-.873, p<.01, respectively) and maternal cortisol residuals (r=.374-.451, p<.01, respectively). Infant raw cortisol scores correlated positively with natural log transformed scores (r=.612-.848, p<.01), 4th sample scores (both raw and transformed) showed positive correlations with infant cortisol difference scores (r=.437-.695, p<.01, respectively) and infant cortisol residuals (r=.559-.657, p<.01, respectively; see Table 2 for complete statistics).

Primary Analyses - Cortisol Outcomes

Multiple regression analyses were used to test the hypotheses that mindfulness (i.e., dispositional mindfulness and mindful parenting, tested in separate models), maternal history of child maltreatment, and the interaction of these two terms would predict a significant portion of the variance in cortisol residuals. Mindfulness and maternal history of child maltreatment were entered in the first step of the model, with the interaction term added in the second step.

Maternal history of child maltreatment and dispositional mindfulness. A model of main effects of maternal dispositional mindfulness and maternal history of child maltreatment did not significantly predict the infant cortisol residual (R^2 =.029 F[2, 56]=.841, p=.437; f^2 =.030; Power=.194 [Note: Post-hoc power analyses were conducted with G*Power software; Faul, Erdfelder, Lang, & Buchner, 2007].

Table 2

Summary of Bivariate Correlations of Study Variables

Measure	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1.CTQ	-																
2.FFMQ	-.166	-															
3.IMP	-.074	.264*	-														
4.Sec/Insec	-.082	.183	.015	-													
5.Org/Disorg	-.068	.045	-.140	.651**	-												
6.M_RCort_3	-.015	-.076	-.055	-.103	-.028	-											
7.M_LCort_3	.046	-.073	-.123	-.079	-.135	.825**	-										
8.M_RCort_4	-.129	-.071	.045	-.096	.066	.937**	.657**	-									
9.M_LCort_4	-.131	-.030	-.035	-.064	-.018	.810**	.893**	.755**	-								
10.ΔM_Cort	-.223	-.031	.190	-.076	.163	.648**	.280*	.873**	.516**	-							
11.Z_M Cort	-.281*	.124	.215	-.017	.176	.161	.000	.374**	.451**	.592**	-						
12.I_RCort_3	-.021	-.026	.257	-.112	-.221	.153	.217	.053	.114	-.090	-.153	-					
13.I_LCort_3	.126	.021	.336*	-.120	-.173	.137	.164	.037	.025	-.097	-.226	.848**	-				
14.I_RCort_4	.083	-.178	.154	-.110	-.233	.148	.219	.054	.116	-.078	-.147	.720**	.612**	-			
15.I_LCort_4	.038	-.016	.137	-.048	-.111	.214	.244	.101	.160	-.065	-.087	.733**	.730**	.831**	-		
16.ΔI_Cort	.136	-.229	-.031	-.036	-.105	.053	.092	.022	.050	-.019	-.052	.001	.003	.695**	.437**	-	
17.Z_I_Cort	-.067	-.081	-.144	.043	.009	.115	.142	.065	.162	-.008	.104	.138	-.040	.559**	.647**	.662**	-

Note. *. Correlation is significant at the .05 level (2-tailed).

**. Correlation is significant at the .01 level (2-tailed).

1. CTQ = maternal child maltreatment; 2. FFMQ = dispositional mindfulness; 3. IMP = mindful parenting; 4. Sec/Insec = Attachment dummy variable 1 = secure attachment classification / 0 = avoidant, resistant, disorganized, or cannot classify attachment classifications; 5. Org/Disorg = Attachment dummy variable 1 = avoidant, resistant, or secure attachment classifications / 0 = disorganized attachment classification; 6. M_RCort_3 = mother raw cortisol sample 3; 7. M_LCort_3 = natural log transformed mother cortisol sample 3; 8. M_RCort_4 = mother raw cortisol sample 4; 9. M_LCort_4 = natural log transformed mother cortisol sample 4; 10.ΔM_Cort 4 = mother raw cortisol sample 4 – raw cortisol sample 3; Z_M_Cort = mother standardized residual of 4th cortisol sample regressed on the 3rd cortisol sample; 12. I_RCort_3 = infant raw cortisol sample 3; 13. I_LCort_3 = natural log transformed infant cortisol sample 3; 14. I_RCort_4 = infant raw cortisol sample 4; 15. I_LCort_4 = natural log transformed infant cortisol sample 4; 16.ΔI_Cort = infant raw cortisol sample 4 – raw cortisol sample 3; 17. Z_I_Cort = infant standardized residual of 4th cortisol sample regressed on the 3rd cortisol sample.

However, adding the interaction of these two variables to the model marginally predicted the infant cortisol residual (R^2 =.130, F[3, 55]=2.731, p=.052; f^2 =.149; Power=.669). The interaction of maternal child maltreatment and mindfulness was the only significant individual predictor (β= .323 [-.323 when correcting for the inverse transformation], p=.015). The remaining coefficients were not significant (β *child maltreatment*=.196, p=.132; β *dispositional mindfulness*=-.064, p=.617). Full model statistics are listed in Table 3.

Table 3

Infant Cortisol Residual Regressed on Maternal Dispositional Mindfulness, Maternal History of Child Maltreatment, and Their Interaction

Step		***β***	***t***	***p***	***F***	***df***	***p***	***R²***	***f²***	***Power***
1	Overall Model				.841	2, 56	.437	.029	.030	.194
	zFFMQ	-.101	-.763	.448						
	zCTQ	.151	1.140	.259						
2	Overall Model				2.731	3, 55	.052	.130	.149	.669
	zFFMQ	-.064	-.503	.617						
	zCTQ	.196	1.528	.132						
	zFFMQ X zCTQ	.323	2.520	.015						

Note. zFFMQ=dispositional mindfulness z-score; zCTQ=maternal child maltreatment z-score

The interaction was explored further using Preacher, Curran, and Bauer's (2012) region of significance calculator. The region of significance analysis for the significant interaction between maternal dispositional mindfulness and maternal history of child maltreatment indicated that, after correcting for the influence of the inverse transformation of the CTQ scores, the simple slope for maternal history of child maltreatment predicting the infant cortisol residual was significant and negative when the dispositional mindfulness score exceeded the 50th percentile (z=.149); the boundary value

at which the simple slope would be significant and positive fell outside the range of observed dispositional mindfulness values (z=-2.1176).

Figure 1 depicts simple main effects of maternal history of child maltreatment (corrected for the influence of the inverse transformation) plotted at high and low (+/- 1 standard deviation from the mean) values of the maternal dispositional mindfulness predictor. Only the slope for high dispositional mindfulness (i.e., 1 *SD* above the mean) falls within the region of significance, while the slope for low dispositional mindfulness (i.e., 1 *SD* below the mean) falls outside of the region of significance and thus does not differ from zero. Correcting for the inverse transformation of the maternal history of child maltreatment score, this means that for mothers high in dispositional mindfulness (i.e., above the mean), a history of child maltreatment predicted enhanced recovery among their infants (see Figure 1).

Dispositional mindfulness and maternal history of child maltreatment marginally predicted the maternal cortisol residual, but only in the first step of the model before the interaction term was introduced (R^2=.086, F(2, 57)=2.678, p=.077; f^2=.094; Power=.533). The coefficient for maternal history of child maltreatment was significant (β *child maltreatment*=.270 [-.270, when correcting for the inverse transformation], p=.040), indicating that mothers with a maltreatment history tended to show stronger cortisol recovery. The coefficient for dispositional mindfulness was not significant (β *dispositional mindfulness* =-.064, p=.617). The model was no longer marginally significant when the interaction term was added (R^2=.095, F[3, 56]=1.953, p=.132; f^2=.105; Power=.509; for full model statistics see Table 4).

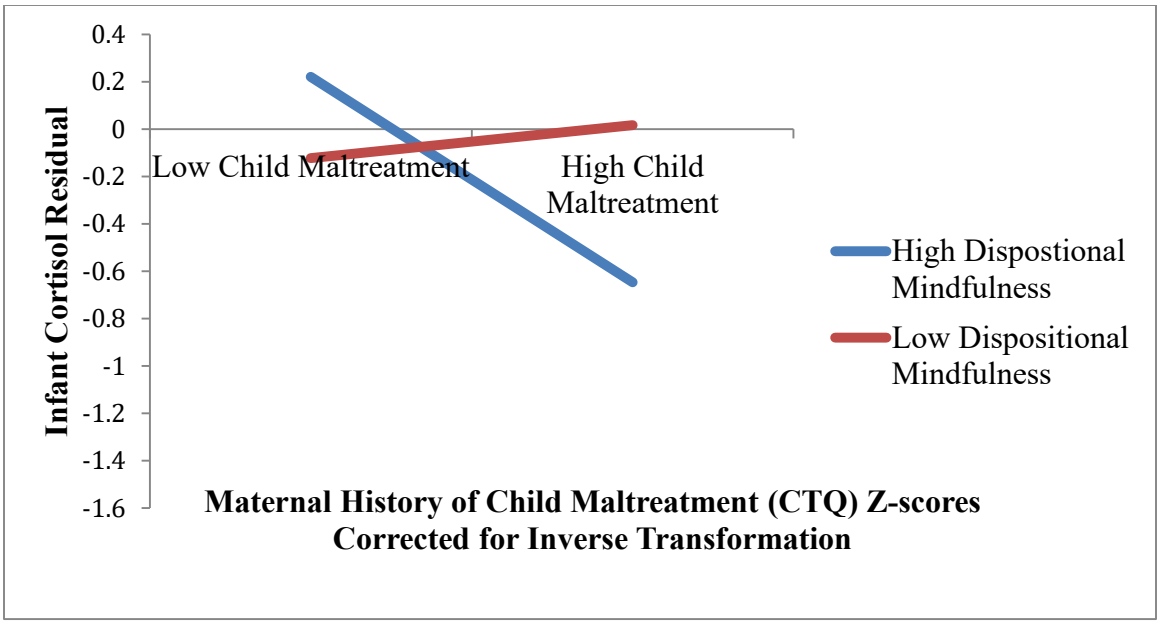

Figure 1. Maternal history of child maltreatment interacts with dispositional mindfulness to predict infant cortisol recovery residual values. After correcting for the influence of the inverse transformation of CTQ scores, the association between maternal history of child maltreatment predicting the infant cortisol residual was significant and negative, indicating enhanced infant recovery when maternal dispositional mindfulness was above average (i.e., exceeding z=.149). Only the simple slope for high dispositional mindfulness is significant; the simple slope for low dispositional mindfulness is not significantly different from zero.
Note: "high"=1 *SD* above the mean; "low"=1 *SD* below the mean. Values shown on the y-axis are standardized infant cortisol residuals. Interaction is significant (β= .323 [-.323 when correcting for the inverse transformation], p=.015); overall model is marginally significant (p=.052).

Table 4

Maternal Cortisol Residual Regressed on Dispositional Mindfulness, Maternal History of Child Maltreatment, and Their Interaction

Step		*β*	*t*	*p*	*F*	*df*	*p*	R^2	f^2	*Power*
1	Overall Model				2.678	2, 57	.077	.086	.094	.533
	zFFMQ	.074	.575	.568						
	zCTQ	.270	2.097	.040						
2	Overall Model				1.953	3, 56	.132	.095	.105	.509
	zFFMQ	.068	.528	.599						
	zCTQ	.251	1.904	.062						
	zFFMQ X zCTQ	-.096	-.738	.464						

Note. zFFMQ=dispositional mindfulness z-score; zCTQ=maternal child maltreatment z-score

Maternal history of child maltreatment and mindful parenting. A model of main effects of mindful parenting and maternal history of child maltreatment did not significantly predict the infant cortisol residual (R^2=.044, F[2, 52]=1.211, p=.306; f^2=.046; Power=.263. Adding the interaction of maternal history of child maltreatment and mindful parenting did not significantly predict the infant cortisol residual (R^2=.049, F[3, 51]=.874, p=.461; f^2=.052; Power=.244; for full model statistics see Table 5).

Table 5

Infant Cortisol Residual Regressed on Mindful Parenting, Maternal History of Child Maltreatment, and Their Interaction

Step		*β*	*t*	*p*	*F*	*df*	*p*	R^2	f^2	*Power*
1	Overall Model				1.211	2, 52	.306	.044	.046	.263
	zIMP	-.183	-1.348	.183						
	zCTQ	.121	.892	.377						
2	Overall Model	-	-	-	.874	3, 51	.461	.049	.052	.244
	zIMP	-.183	-1.335	.188						
	zCTQ	.125	.908	.368						
	zIMP X zCTQ	-.066	-.486	.629						

Note. zIMP=mindful parenting z-score; zCTQ=maternal history of child maltreatment z-score

A model of main effects of mindful parenting and maternal history of child maltreatment significantly predicted the maternal cortisol residual (R^2 = .182, F[2, 53]=5.899, p=.005; f^2=.222; Power=.877). The significance of the model was driven by the effect of maternal history of child maltreatment, the only significant coefficient in the model (β=.356 [-.356 when correcting for the inverse transformation], p=.006), again indicating that mothers with a maltreatment history tended to show stronger cortisol recovery. The coefficient for mindful parenting was not significant (β *mindful parenting*=.194, p=.128). The model remained significant when the interaction of mindful parenting and maternal history of child maltreatment was added to the model (R^2=.186, F[3, 52]=3.971, p=.013; f^2=.229; Power=.836). The significance of the model

was again driven by the effect of maternal history of child maltreatment, the only significant coefficient in the model (β=.356 [-.356 when correcting for the inverse transformation], p=.007). Coefficients for mindful parenting and the interaction term were not significant (β *mindful parenting* = .190, p=.138; β *interaction* =.066, p=.600; for full model statistics see Table 6).

Table 6

Maternal Cortisol Residual Regressed on Mindful Parenting, Maternal History of Child Maltreatment, and Their Interaction

Step		***β***	***t***	***p***	***F***	***df***	***p***	R^2	f^2	***Power***
1	Overall Model				5.899	2, 53	.005	.182	.222	.877
	zIMP	.194	1.545	.128						
	zCTQ	.356	2.839	.006						
2	Overall Model	-	-	-	3.971	3, 52	.013	.186	.229	.836
	zIMP	.190	1.505	.138						
	zCTQ	.356	2.822	.007						
	zIMP X zCTQ	.066	.527	.600						

Note. zIMP=mindful parenting z-score; zCTQ=maternal history of child maltreatment z-score

Exploratory analysis: Differences in maternal cortisol values by history of child maltreatment. Maternal history of child maltreatment was negatively correlated with the maternal cortisol residual (r=-.281, p=.029), and showed significant main effects in the prediction of the maternal cortisol residual when controlling for both dispositional mindfulness (β=-.270 when correcting for the inverse transformation), and mindful parenting (β=-.356 when correcting for the inverse transformation, p=.006). These findings suggest that women reporting a history of greater child maltreatment showed enhanced recovery, an unexpected finding. To explore whether the severity of maternal child maltreatment was differentially associated with cortisol levels, exploratory independent t-tests were conducted by splitting women into two groups. One group reflected clinical levels of child maltreatment (i.e., total CTQ scores equal to or greater

than the sum of clinical cut-points for all 5 CTQ subscales, or a score of 49; *N*=16; 25.8%). The other group comprised women reporting sub-clinical-threshold levels of child maltreatment (i.e., CTQ scores below 49; *N*=46; 74.2%). Independent samples t-tests revealed that these two groups of women did not differ in their natural log transformed levels of cortisol at sample 3 (t[60]=.874, p=.386) or at sample 4 (t[59]=-.446, p=.658). This means that differences noted in maternal cortisol recovery were unrelated to broader HPA hyperactivation or blunting.

Primary Analyses: Attachment Outcomes

Multiple regression analyses were utilized to test the effects of mindfulness (i.e., dispositional mindfulness and mindful parenting, tested in separate models), maternal history of child maltreatment, and the interaction of these two terms in predicting infant attachment classification based on observations from the Strange Situation. Two aggregate attachment outcomes were evaluated; one reflected whether the infant was classified as secure or insecure (i.e., avoidant, resistant, disorganized, and cannot classify) and the second reflected whether the infant was classified as disorganized or organized (avoidant, secure and resistant; cannot classify cases were excluded from the two models that examined this attachment outcome). The effects of mindfulness (dispositional mindfulness and mindful parenting, tested separately) and maternal history of child maltreatment were entered in a first step, and the interaction product entered in the second step of the model.

A model of the main effects of maternal dispositional mindfulness and maternal history of child maltreatment on secure versus insecure attachment status was not significant (R^2 = .035, F[2, 58]=1.032, p=.363; f^2=.035; Power=.229). Adding the

interaction to the model did not significantly predict secure versus insecure attachment status (R^2 = .045, F[3, 57]=.897, p=.449; f^2=.047; Power=.248). Full model statistics are presented in Table 7.

Table 7

Secure vs. Insecure Infant Attachment Regressed on Dispositional Mindfulness, Maternal History of Child Maltreatment and Their Interaction

Step		***β***	***t***	***p***	***F***	***df***	***p***	R^2	f^2	***Power***
1	Overall Model				1.032	2, 58	.363	.034	.035	.229
	zFFMQ	.179	1.374	.175						
	zCTQ	.028	.217	.829						
2	Overall Model				.897	3, 57	.449	.045	.047	.248
	zFFMQ	.191	1.449	.153						
	zCTQ	.041	.311	.757						
	zFFMQ X zCTQ	.105	.800	.427						

Note. zFFMQ=dispositional mindfulness z-score; zCTQ=maternal history of child maltreatment z-score

A model of the main effects of maternal dispositional mindfulness and maternal history of child maltreatment on organized versus disorganized attachment status was not significant (R^2 = .011, F[2, 54]=.311, p=.734; f^2=.011; Power=.098). Adding the interaction to the model did not significantly predict disorganized versus organized attachment (R^2=.020, F[3, 53]=.360, p=.782; f^2=.020; Power=.122). Full model statistics are presented in Table 8.

Table 8

Organized vs. Disorganized Infant Attachment Regressed on Dispositional Mindfulness, Maternal History of Child Maltreatment and Their Interaction

Step		*β*	*t*	*p*	*F*	*df*	*p*	R^2	f^2	*Power*
1	Overall Model				.311	2, 54	.734	.011	.011	.098
	zFFMQ	.037	.269	.789						
	zCTQ	.097	.716	.477						
2	Overall Model				.360	3, 53	.782	.020	.020	.122
	zFFMQ	.034	.251	.803						
	zCTQ	.092	.672	.505						
	zFFMQ X zCTQ	-.093	-.682	.498						

Note. zFFMQ=dispositional mindfulness z-score; zCTQ=maternal history of child maltreatment z-score

A model of the main effects of mindful parenting and maternal history of child maltreatment on secure versus insecure attachment classification was not significant (R^2=.006, F[2, 54]=.176, p=.839; f^2 = .006; Power=.075). Adding the interaction to the model did not significantly predict secure versus insecure attachment classification (R^2=.009, F[3, 53]=.167, p=.918; f^2 = .009; Power=.080). Full model statistics are presented in Table 9.

Table 9

Secure vs. Insecure Infant Attachment Regressed on Mindful Parenting, Maternal History of Child Maltreatment and Their Interaction

Step		*β*	*t*	*p*	*F*	*df*	*p*	R^2	f^2	*Power*
1	Overall Model				.176	2, 54	.839	.006	.006	.075
	zIMP	.052	.384	.702						
	zCTQ	.056	.413	.681						
2	Overall Model				.167	3, 53	.918	.009	.009	.080
	zIMP	.053	.386	.701						
	zCTQ	.060	.434	.666						
	zIMP X zCTQ	-.054	-.391	.697						

Note. zIMP=mindful parenting z-score; zCTQ=maternal history of child maltreatment z-score

A model of the main effects of mindful parenting and maternal history of child maltreatment on organized versus disorganized attachment classification was not significant (R^2=.033, F[2, 50]=.856, p=431; f^2 = .034; Power=.197). Adding the interaction to the model did not significantly predict secure versus insecure attachment classification (R^2=.034, F[3, 49]=.580, p=.631; f^2 = .035; Power=.170). Full model statistics are presented in Table 10.

Table 10

Organized vs. Disorganized Infant Attachment Regressed on Mindful Parenting, Maternal History of Child Maltreatment and Their Interaction

Step		***β***	***t***	***p***	***F***	***df***	***p***	***R²***	***f²***	***Power***
1	Overall Model				.856	2, 50	.431	.033	.034	.197
	zIMP	-.135	-.963	.340						
	zCTQ	.139	.992	.326						
2	Overall Model				.580	3, 49	.631	.034	.035	.170
	zIMP	-.132	-.935	.354						
	zCTQ	.135	.950	.347						
	zIMP X zCTQ	.034	.242	.810						

Note. zIMP=mindful parenting z-score; zCTQ=maternal history of child maltreatment z-score

Summary

While the above analyses failed to support the majority of study hypotheses, two significant effects—one in the hypothesized direction and one in the non-hypothesized direction--emerged. First, maternal history of child maltreatment interacted with dispositional mindfulness to predict the infant cortisol residual. Decomposition of this interaction showed that increasing levels of maternal history of child maltreatment were associated with enhanced infant cortisol recovery, but only when maternal dispositional mindfulness was above average. Additionally, maternal history of child maltreatment had a main effect on the maternal cortisol residual, such that mothers with more significant maltreatment histories tended to show stronger cortisol recovery. There was no evidence

for main effects of maternal mindfulness on mother/infant cortisol, nor for main effects or interactive effects of maternal history of child maltreatment and mindfulness on infant attachment outcomes.

CHAPTER IV

DISCUSSION

The present study explored the potential of maternal mindfulness to moderate potential risk imposed by a history of child maltreatment on mother-infant stress recovery and infant attachment. It was hypothesized that maternal history of child maltreatment would be associated with a lack of cortisol recovery for mothers and infants, as well as insecure and/or disorganized infant attachment, but that maternal dispositional mindfulness and mindful parenting would reduce the strength of these associations. Although most study hypotheses were not supported, there was some support for the role of maternal dispositional mindfulness in buffering the negative impact of maternal history of child maltreatment on infant cortisol recovery profiles. Results suggested that when maternal dispositional mindfulness was above average, maternal history of child maltreatment was associated with enhanced infant cortisol recovery. This finding is suggestive of enhanced social buffering (i.e., quicker return to baseline following an acute stressor) facilitated by higher levels of dispositional mindfulness, which previous research has found to be associated with enhanced parenting behavior (e.g., Parent et al., 2016). It may be that among adult survivors of child maltreatment, compared to mothers who are lower in mindfulness, mothers who are higher in mindfulness are more attuned to their infants' cues and thus better able to enact sensitive and nurturing maternal behavior, helping their infant to more effectively down-regulate their stress response following an upsetting event.

It is interesting to note that women low in child maltreatment and high in dispositional mindfulness had infants that showed a lack of recovery (see Figure 1). It

may be that when mindfulness is high, having a history of child maltreatment enhances motivation to provide sensitive parenting. Women who are high in mindfulness but have less maltreatment in their histories may lack personal experiences that highlight the potential consequences of failing to provide sensitive care, and may thus have lower motivation to provide sensitive care. Alternatively, there may be another third variable, such as maternal attachment style and maternal distress, which could help explain this finding. Previous research has shown that adults who are high in attachment anxiety are more likely to endorse psychological distress and seek support (Vogel & Wei, 2005). This is consistent with theory on anxious attachment, which states that high attachment anxiety is associated with preoccupation with distress and stronger, more persistent attempts to elicit support from caregivers. Corroborating this interpretation, the current study also found that less severe maternal histories of child maltreatment were associated with less maternal cortisol recovery. It may be the case that women who reported lower levels of child maltreatment and higher mindfulness were more aware of, or preoccupied with, their own distress, which could have interfered with effectively helping their infants to down-regulate their distress.

Decomposition of the significant interaction of maternal dispositional mindfulness and history of maltreatment in predicting infant cortisol recovery showed that dispositional mindfulness had a protective effect only when mindfulness was above average; the lower bound of the region of significance fell outside the range of the data. Thus, for mothers who reported lower than average levels of mindfulness in the current sample, history of child maltreatment was unrelated to infant cortisol recovery. However, it should be noted that compared to mothers who only completed the first round of data

collection, mothers in the current sample who completed both rounds of data collection were significantly higher in dispositional mindfulness. Hypothetically then, retaining more mothers who reported less mindfulness would have increased the range of the data to the point where the lower bound of the region of significance could have become relevant. If this were the case, the lower bound of the region of significance would suggest that for women reporting very low levels of mindfulness (i.e., greater than 2 standard deviations below the mean of the current sample), maternal history of child maltreatment might predict a lack of infant recovery as hypothesized. Having more mothers with lower levels of mindfulness in the sample would help to further clarify how both high and low levels of dispositional mindfulness influence the impact of maternal history of child maltreatment on infant stress recovery, since across the range of mindfulness scores observed in the current sample, the interaction effect was only significant for women who were high in mindfulness.

Regarding maternal cortisol recovery, higher levels of maternal history of child maltreatment significantly predicted enhanced cortisol recovery, in contrast to the hypothesis. The effect size was small when dispositional mindfulness was included in the model and medium when mindful parenting was included in the model (Cohen, 1988). The nature of the cortisol residual score may have influenced this finding. Over half of mothers showed at least a 10% reduction in cortisol across the recovery period, which typically indicates substantive recovery. However, this metric may be limited within the context of hypocortisolism (i.e., flat and low cortisol recovery trajectories) often seen in this population (e.g., Bunea et al., 2017). In cases where cortisol was very low, cortisol would only need to show very modest reductions to meet the 10% benchmark. Cortisol

residual scores were significantly positively correlated with cortisol difference scores and may be limited in a similar manner. Thus, it is unclear what underlies the significant correlation between greater levels of maternal history of child maltreatment and maternal cortisol recovery. Cortisol residuals may be a reliable indicator of recovery in the absence of hypocortisolism, providing better information on the absence of a flat and high cortisol recovery trajectory. However, cortisol residuals may be less informative regarding recovery in the context of hypocortisolism. It may be that these women appeared to have enhanced cortisol recovery because their overall cortisol levels were already quite low.

On the other hand, lower cortisol activation among women higher in child maltreatment could reflect the use of avoidant coping strategies, such as a lack of emotional engagement with the child, where a stress-response and approach-oriented actions would be necessary for optimal parenting (Crockett, 2013; Miller et al., 2007). As stated previously, limitations interpreting the cortisol residual make it difficult to determine whether the "better" stress recovery seen among women high in child maltreatment reflects (1) a typical stress reaction accompanied by good recovery or (2) consistently low cortisol levels indicative of hypocortisolism. Hypocortisolism in response to acute psychosocial stress tends to be the trend among women high in child maltreatment (e.g., Bunea et al., 2017), which may be problematic, given flat and low cortisol recovery profiles have been associated with parenting risk factors such as maternal depression (e.g., Burke et al., 2005a/2005b). Flat and low recovery profiles may reflect less sensitivity to the environment (Boyce & Ellis, 2005). This may originate as an adaptation for enduring a maltreating environment, where the child is unable to effectively eliminate or resolve the abuse or neglect. However, if this unemotional

phenotype persists into parenthood it may impair the parent's ability to provide sensitive and responsive parenting (Del Giudice et al., 2011). Unemotional profiles have been linked to antisocial traits such as lack of empathy, manipulativeness, emotional constrictedness, low cooperation, aloof interpersonal styles, and a lack of parental investment among women (Booth et al., 2008; Del Giudice et al., 2011; Hawes et al., 2009; Shirtcliff et al., 2009). If the enhanced cortisol recovery observed among women high in child maltreatment is indicative of this unemotional profile, it may not be adaptive for the parent-child relationship.

Alternatively, there may be something particularly salient about the interpersonal parenting stressor utilized in the present study that provoked more of a response from mothers high in child maltreatment in the current study. Previous work suggests the type of stressor utilized with adult survivors of child maltreatment may effect cortisol regulation (e.g., Bremner et al., 2003). It may be that the enhanced recovery observed in the current study is related to an increase in responsivity based on the emotional salience of parenting based stressors, which influenced mothers high in child maltreatment to show more of an adaptive response to the stressor, accompanied by greater recovery. However, the nature of using the cortisol residual score to index recovery precludes the ability to confirm whether this may be the case. Future research should model the entire cortisol trajectory to further explore HPA functioning among mothers with severe child maltreatment histories, and to help clarify possible interpretations of the low cortisol residual scores observed in women with a history of child maltreatment in the current study.

A related question concerns potential reasons why women with more severe maltreatment histories would show enhanced recovery relative to women with less maltreatment in their histories. It may be that for women with severe histories of child maltreatment, the controlled lab setting, the predictability of lab procedures (which were communicated to the mother in detail beforehand), and the presence of supportive, professional research assistants together created a sense of security and certainty that would starkly contrast with the unpredictable, prolonged, and potentially dangerous and traumatic experiences that characterized these women's pasts. It has been noted that the laboratory environment can affect HPA regulation in children if, for example, the risk of escalation and violence is low in the lab but quite high at home (Del Giudice et al., 2011), and it may also be the case that the lab setting influenced maternal stress recovery in a similar manner. Women without a history of severe child maltreatment, on the other hand, appear to have had relatively more difficulty recovering physiologically from the lab stressor, and may not have been reassured by the relative safety of the lab setting to the same extent.

Alternatively, it may be that among women low in self-reported history of child maltreatment, other variables such as attachment anxiety or mental health influenced them to recover from the stressor more slowly. For example, previous work has demonstrated that post-partum depression, in the absence of perinatal depression, was associated with a lack of cortisol recovery among mothers in response to the Strange Situation (Laurent, Ablow, & Measelle, 2011). Additionally, other evidence suggests that the attachment relationship may also be related to maternal recovery from stress in response to the Strange Situation, with mothers of insecure-resistant infants in particular

showing a lack of physiological stress recovery (Smith, Woodhouse, Clark, & Skowron, 2016; Zelenko, Kraemer, Huffman, Gschwendt, Pageler, & Hans Steiner, 2005). This pattern is consistent with theorizing on attachment anxiety that suggests women of anxiously attached children are less consistently able to effectively soothe their children, which may have provoked anxiety and prolonged distress in the lab setting where their parenting behavior was being observed and assessed by researchers.

The hypothesis that mindful parenting would have a null effect on maternal cortisol recovery was confirmed. Previous work with this sample demonstrated that mindful parenting predicted a lack of cortisol recovery, but only in the context of high life stress (Laurent et al., 2017), indicating that mindful parenting may influence maternal stress regulation differently depending on varying environmental demands. This is consistent with tenants of the ACM (Del Giudice et al., 2011), which state that patterns of stress regulation are susceptible to change, especially during sensitive periods such as the transition to motherhood, in ways that maximize reproductive fitness in response to environmental characteristics. In a high stress environment, parenting may be enhanced by a greater degree of HPA activation, especially if that activation influences adaptive action to cope with stressors. However, mindful parenting may have an opposing influence on maternal cortisol recovery when life stress is low. Given the likelihood that life stress levels were mixed in the current sample, it seems likely mindful parenting would influence cortisol recovery in opposing directions between participants, resulting in a lack of significant main effects of mindful parenting on maternal cortisol recovery.

Similarly, the hypothesis that mindful parenting would not significantly moderate potential associations between maternal history of child maltreatment and maternal

cortisol recovery was also confirmed. In addition to the confounding environmental factors discussed in the previous paragraph, other evidence suggests that both a lack of mindfulness (as evidenced by the presence of emotional non-acceptance and difficulties in emotion regulation; Cărnuţă et al., 2015; England-Mason et al., 2017) and the presence of mindfulness (Laurent et al., 2017) may be associated with a lack of recovery from acute stress, depending on specific circumstances (e.g., mental health symptoms, life stress). Although the nature of this lack of recovery may differ, with low mindfulness associated with flat and low cortisol recovery profiles, and high mindfulness associated with flat and high cortisol recovery profiles, a lack of recovery characterizes individuals in both instances. Thus, no significant interaction effect of mindful parenting and maternal history of child maltreatment on maternal cortisol recovery was predicted or found.

Null Findings

Infant cortisol recovery. Based on previous research linking a history of child maltreatment with poorer parenting (e.g., Abrams, Rifkin, & Hesse, 2006; Bailey et al., 2007; Bernier & Meins, 2008; George & Solomon, 2008; Goldberg et al., 2003; Lyons-Ruth et al., 1999; Lyons-Ruth et al., 2005; MacDonald et al., 2008), which in turn has been associated with impaired stress recovery among offspring (e.g., Harkness, Stewart, & Wynne-Edwards, 2011; Hostinar, Johnson, & Gunnar, 2015; Miller et al., 2007; Siegel & Hartzell, 2014; Tarullo & Gunnar, 2006), it was predicted that maternal history of child maltreatment would be associated with a lack of infant cortisol recovery. Additionally, since both dispositional mindfulness and mindful parenting have previously been associated with more positive parenting (Parent et al., 2016), it was predicted that

these constructs would predict enhanced infant cortisol recovery, and that mindful parenting would buffer against the problematic associations of maternal history of child maltreatment and infant cortisol recovery. However, these hypotheses were not supported.

One possible reason for these null findings is a lack of statistical power. Power for main effects models of maternal dispositional mindfulness and maternal history of child maltreatment was low (19.40%). Power improved but was still lower than ideal in the interaction model (66.90%). Power for main effects models of mindful parenting and maternal history of child maltreatment was again low (26.30%), and remained low in the interaction model (24.40%). Thus, the probability of a Type II error is high, and greater sample sizes will be required before it can be determined if these null findings represent a true lack of any effect.

Another possible issue influencing the lack of significant findings for mindful parenting's potential impact on infant cortisol recovery may be the restricted range of mindful parenting observed in the current sample. Mothers in the current study tended to report high levels of mindful parenting on average, with very few women reporting low levels of mindful parenting. It may be that an effect of mindful parenting on infant outcomes would emerge with a greater range of mindful parenting represented in a sample. Additionally, these scores may be inflated by social desirability bias. Although mindful parenting has been associated with self-reported positive and negative parenting behavior (Parent et al., 2016), studies associating self-reported mindful parenting with parenting behavioral observations are lacking. Therefore the degree to which mothers' self-reports of mindful parenting correspond to their actual parenting behavior is unclear.

Future research should explore associations between self-reported mindful parenting and observed parent behavior during interactions with their infants.

These same issues apply to models of main and interaction effects involving dispositional mindfulness. Although the range of these scores were not as restricted as the scores for mindful parenting, it should again be noted that women who completed both phases of data collection reported significantly more dispositional mindfulness than did women who completed only the first phase of data collection, restricting the range of data. It is likewise unclear how self-reported dispositional mindfulness relates to actual behavior. Previous work utilizing the FFMQ has noted inconsistencies in the way that various groups of people rate themselves on the scale (e.g., college binge drinkers self-reporting more dispositional mindfulness than experienced meditators; Leigh, Bowen & Marlatt, 2005). Although FFMQ scores have been associated with more positive self-reported parenting behavior (Parent et al., 2016), future research should utilize parent behavior observations to explore how these self-reported attributes relate to actual parenting behavior. It may be that maternal behavior is more likely to influence infant outcomes than are maternal self-perceptions.

With the exception of the significant interaction of dispositional mindfulness and maternal history of child maltreatment predicting infant cortisol recovery, dispositional mindfulness and mindful parenting did not significantly predict mother or infant stress recovery or infant attachment. A possible explanation for this may be that enhancing present-moment awareness among stressed or traumatized populations, who are likely to experience greater levels of negative affect as a natural response to trauma exposure, may lead to greater awareness of emotional distress, rather than stress reduction. The current

sample reported a high degree of maternal history of child maltreatment, and it is possible that these potentially traumatic experiences continue to influence adult survivors. Under stressful conditions, greater mindfulness has been found to predict higher subjective anxiety and negative affect (Bergeron & Dandeneau, 2016). Additional research has found positive associations between distress related to traumatic experiences and higher mindfulness, especially greater mindful observing (i.e., awareness of present moment thoughts and feelings; Boughner, Thornley, Charles, & Frewen, 2016). Boughner and colleagues (2016) found that lifetime exposure to trauma was associated with less acting with awareness, less non-judging, but higher observing, and that greater mindful observing partially mediated the association between exposure to traumatic events, including early life adversity, and PTSD and dissociative symptoms. These authors suggest mindful observing could be a risk factor for greater psychological distress among individuals facing early life adversity. However, this could also be explained by construct overlap between certain facets of mindfulness (i.e., observation) and certain PTSD symptoms (e.g., hypervigilance, reexperiencing; Boughner et al., 2016).

Another study showed that greater present moment focus in the absence of nonjudgment led to significantly less positive and greater negative affect (Valdez, Sherrill, & Lilly, 2016) pointing to the necessity of combining present moment focus with compassionate attitudes if dispositional mindfulness is to alleviate suffering among trauma survivors (e.g., Lang et al., 2012). Thus, mindfulness may have been influencing outcomes in opposing directions depending on the level of posttraumatic dysfunction being experienced by women in the study. For women without a history of child maltreatment or other trauma, or for those women who had successfully recovered from

trauma associated with child maltreatment, mindfulness may have enhanced their abilities to regulate their stress and that of their infants. However, if women were experiencing lasting posttraumatic stress related to their history of child maltreatment or another traumatic event, mindfulness may have actually interfered with their abilities to regulate their stress or that of their infants.

Maternal cortisol recovery. Based on previous work suggesting that higher dispositional mindfulness may be associated with better stress recovery (e.g., Brown et al., 2012; Cărnuţă et al., 2015; England-Mason et al., 2017), it was predicted that greater maternal dispositional mindfulness would be associated with better maternal cortisol recovery, and that dispositional mindfulness would buffer against impaired stress recovery linked to maternal history of child maltreatment. These hypotheses were not confirmed. Given that statistical power was lower than ideal for both models (53.30% and 50.90% respectively), it may be that results were limited due to a lack of statistical power. Despite limitations of power, it is interesting to consider the null findings of maternal dispositional mindfulness on maternal stress recovery, especially in light of effects related to infant cortisol recovery, which were suggestive of enhanced social buffering (i.e., enhanced cortisol recovery) as demonstrated by the significant interaction between mindful parenting and maternal history of child maltreatment in predicting infant cortisol recovery.

It may be that maternal dispositional mindfulness influences maternal stress recovery in varying ways depending on characteristics of the environment (e.g., current life stress; Del Giudice et al., 2011), as was the case with mindful parenting, which predicted a lack of cortisol recovery among mothers when life stress was high (Laurent et

al., 2017). Additionally, current mental health problems, age, and genetic factors all interact with the experience of child maltreatment in producing diverse outcomes in HPA functioning (Abravanel & Sinha, 2015; Harkness et al., 2011; Tarullo & Gunnar). Varying levels of posttraumatic dysfunction is yet another third variable that could lead mindfulness to influence outcomes in opposing directions, as discussed previously. These confounds were not accounted for in the models tested in the current study and might also contribute to the differential impact of dispositional mindfulness on infant versus maternal cortisol recovery.

Infant attachment classification. High levels of maternal history of child maltreatment did not predict insecure and disorganized infant attachment, nor did higher levels of mindfulness predict secure and organized attachment classification as hypothesized. Likewise, maternal dispositional mindfulness and mindful parenting did not moderate the influence of maternal history of child maltreatment on infant attachment classification. Once again, the low power of these models should be taken into consideration when interpreting these null findings. Power was very low, ranging from 7.5%% to 24.8% (for specific statistics, see Tables 7 through 10). Given these extremely low power statistics, even if the predicted effects do exist, the probability of detecting them in the current, small sample is low.

It may also be that third variables related to self-reported history of child maltreatment and mindfulness have more of an influence on infant attachment, over and above the influence of the self-report variables measured in the current study. For example, while the current study measured maternal history of child maltreatment, it did not include constructs, such as adult state of mind with respect to attachment, which

could provide key information about the degree to which maternal history of child maltreatment continued to impact maternal functioning. In other words, it was not possible to distinguish between mothers who had successfully dealt with and resolved any issues related to their history of child maltreatment and those women who continued to experience distress or other negative outcomes related to their history of child maltreatment. Better metrics for predicting infant attachment might be adult attachment status (e.g., unresolved with respect to loss or traumatic child maltreatment), or aspects of observed parenting behavior. Greater self-reported mindfulness or mindful parenting may not influence infant outcomes unless it translates into observable differences in behavior, such as increased maternal sensitivity, lower parental criticism, or more shared positive emotion between mother and infant. Likewise, a history of maternal child maltreatment alone may not influence attachment unless that history continues to influence the mother to interact with her infant in sub-optimal ways.

Limitations and Future Directions

This study has a number of strengths. It utilized an ecologically valid attachment-related parenting stressor, which makes this study unique relative to other research on psychosocial stress regulation among adult survivors of child maltreatment. Additionally, the current study focuses on an important subset of adult survivors of child maltreatment – parents. This is an important group to study and intervene with given the propensity for child maltreatment to be perpetuated intergenerationally (Child Welfare Information Gateway, 2013; McCloskey & Bailey, 2000; Schuetze & Eiden, 2005; Seng, Sperlich, Low, Ronis, Muzik, & Liberzon, 2013; Spieker, Bensely, McMahon, Fung & Ossiander, 1996). The current study is one of the first to explore links between maternal history of

child maltreatment, mindfulness, and consequential outcomes such as mother-infant HPA regulation and infant attachment outcomes.

One significant limitation of the study is the operationalization of cortisol recovery. Although utilizing the residual did capture an important aspect of recovery (i.e., whether the final sample was higher, lower, or approximately equivalent to what would be expected based on cortisol levels at sample 3), the cortisol residual does not allow for distinguishing between patterns of cortisol non-recovery (i.e., flat-high and flat-low), discussed previously. Additionally, the cortisol residual does not allow an individual's baseline cortisol levels to be taken into account, nor does it provide information on the degree of observed reactivity to the stressor. Nonetheless, the operationalization of cortisol in the present study did provide a relative approximation of whether cortisol levels were increasing, decreasing, or remaining flat, which provides valuable information about cortisol recovery dynamics. One of the best indicators of the adaptability of HPA functioning concerns recovery and the avoidance of flat recovery trajectories (e.g., Burke et al., 2005a; 2005b). Future research should address these limitations by utilizing multi-level modeling techniques to characterize cortisol trajectories in a more complete way, computing reactivity and recovery slopes, as well as quadratic terms that depict the entire cortisol trajectory.

As mentioned previously, while statistical power was adequate in some cases and did allow for the detection of several effects, statistical power was low for many models, especially models of infant attachment outcomes. These models were not adequately powered to enable the detection of hypothesized effects. Future research should conduct a

priori power analyses if possible and ensure adequate sample sizes for detection of possible effects.

Additionally, in keeping with the tenants of BSC theory (Boyce & Ellis, 2005) and the ACM (Del Giudice et al., 2011) the adaptability of HPA regulation is difficult to understand in the absence of more detailed information about internal (e.g., current mental health problems, age, and genetic factors; Abravanel & Sinha, 2015; Harkness et al., 2011; Tarullo & Gunnar) and external maternal factors (e.g., life stress, SES, coparenting support; Del Giudice et al., 2011; Laurent et al., 2017; Parent et al., 2016). Future studies should account for these cortisol covariates to provide a more complete picture of how maternal history of child maltreatment and mindfulness interact with other personal qualities and environmental characteristics to influence HPA regulation.

Regarding mothers with a high degree of early life adversity, more research is needed to understand how mindfulness capacities may or may not be helpful to alleviate risk of problematic parenting outcomes with their own children. In particular, given that women with a high degree of adversity in their pasts may lack the early life experiences that would facilitate the spontaneous development of compassionate, nonjudgmental attitudes, and self-regulatory capacities, skilled intervention may be necessary to provide the interpersonal scaffolding necessary to learn, practice, and adopt these attitudes and skills. Future applied clinical research might examine to what extent capacities associated with mindfulness and mindful parenting can be developed in these women, and how the application of such capacities might influence outcomes of interest, such as mother-infant stress regulation, parenting behaviors, and infant attachment.

Conclusion

In contrast to other studies exploring the impact of maternal history of child maltreatment on HPA functioning, which have largely utilized psychosocial stressors unrelated to parenting, the current study utilized a an attachment related parenting stressor. Studying HPA regulation within the highly consequential context of attachment provides an important reference point for assessing the functionality of mother-infant stress regulation, since it is within the context of this attachment relationship that the intergenerational transmission of child maltreatment, and concomitant maladaptive sequela, either persists or is prevented. The current study is among the first of its kind to provide preliminary evidence that higher levels of maternal dispositional mindfulness may indirectly help infants of mothers with more severe histories of child maltreatment better recover from attachment-related stress. More research is needed to further explore the potential protective benefits of mindfulness for preventing the intergenerational transmission of child maltreatment.

REFERENCES CITED

Abrams, K. Y., Rifkin, A., & Hesse, E. (2006). Examining the role of parental frightened/frightening subtypes in predicting disorganized attachment within a brief observational procedure. *Development and Psychopathology*, *18*(2), 345–361. https://doi.org/10.1017/S0954579406060184

Abravanel, B. T., & Sinha, R. (2015). Emotion dysregulation mediates the relationship between lifetime cumulative adversity and depressive symptomatology. Journal of Psychiatric Research, 61, 89–96. https://doi.org/10.1016/j.jpsychires.2014.11.012

Ahlfs-Dunn, S. M., & Huth-Bocks, A. C. (2014). Intimate partner violence and infant socioemotional development: The moderating effects of maternal trauma symptoms: Interpersonal violence, Posttraumatic Stress Disorder, and infant socioemotional development. *Infant Mental Health Journal*, *35*(4), 322–335. https://doi.org/10.1002/imhj.21453

Ahnert, L., Gunnar, M. R., Lamb, M. E., & Barthel, M. (2004). Transition to childcare: Associations with infant-mother attachment, infant negative emotion, and cortisol elevations. *Child Development*, *75*(3), 639–650. https://doi.org/10.1111/j.1467-8624.2004.00698.x

Ainsworth, M. D., & Wittig, B. (1969). Attachment, exploration, and separation: illustrated by the behavior of one-year-olds in a strange situation. *Determinants of Infant Behavior*, *4*, 113–136.

Albers, E. M., Riksen-Walraven, J., Sweep, F. C. G. J., & de Weerth, C. (2008). Maternal behavior predicts infant cortisol recovery from a mild everyday stressor. *Journal of Child Psychology and Psychiatry*, *49*(1), 97–103. https://doi.org/10.1111/j.1469-7610.2007.01818.x

Anderson, C., Bechara, A., Damasio, H., Tranel, D., & Damasio, A. (1999). Impairment of social and moral behavior related to early damage in human prefrontal cortex. *Nature Neuroscience*, *18*, 1032–1037.

Aupperle, R. L., Melrose, A. J., Stein, M. B., & Paulus, M. P. (2012). Executive function and PTSD: Disengaging from trauma. *Neuropharmacology*, *62*(2), 686–694. https://doi.org/10.1016/j.neuropharm.2011.02.008

Babenko, O., Kovalchuk, I., & Metz, G. A. S. (2015). Stress-induced perinatal and transgenerational epigenetic programming of brain development and mental health. *Neuroscience & Biobehavioral Reviews*, *48*, 70–91. https://doi.org/10.1016/j.neubiorev.2014.11.013

Baer, R. A., Smith, G. T., Hopkins, J., Krietemeyer, J., & Toney, L. (2006). Using self-report assessment methods to explore facets of mindfulness. *Assessment*, *13*(1), 27–45. https://doi.org/10.1177/1073191105283504

Bailey, H. N., DeOliveira, C. A., Wolfe, V. V., Evans, E. M., & Hartwick, C. (2012). The impact of childhood maltreatment history on parenting: A comparison of maltreatment types and assessment methods. *Child Abuse & Neglect*, *36*(3), 236–246. https://doi.org/10.1016/j.chiabu.2011.11.005

Bailey, H. N., Moran, G., Pederson, D. R., & Bento, S. (2007). Understanding the transmission of attachment using variable- and relationship-centered approaches. *Development and Psychopathology*, *19*(2), 313–343. https://doi.org/10.1017/S0954579407070162

Bandura, A. (1963). *Social learning and personality development*. New York, NY: Holt, Rinehart, and Winston.

Bariola, E., Gullone, E., & Hughes, E. K. (2011). Child and adolescent emotion regulation: The role of parental emotion regulation and expression. *Clinical Child and Family Psychology Review*, *14*(2), 198–212. https://doi.org/10.1007/s10567-011-0092-5

Baxter, M., Parker, A., Lindner, C., Izquierdo, A., & Murray, E. (2000). Control of response selection by reinforcer value requires interaction of amygdala and orbital prefrontal cortex. *Journal of Neuroscience*, *20*, 4311–4319.

Bazzano, A., Wolfe, C., Zylowska, L., Wang, S., Schuster, E., Barrett, C., & Lehrer, D. (2015). Mindfulness Based Stress Reduction (MBSR) for Parents and Caregivers of Individuals with Developmental Disabilities: A Community-Based Approach. *Journal of Child and Family Studies*, *24*(2), 298–308. https://doi.org/10.1007/s10826-013-9836-9

Becker-Blease, K., & Kerig, P. K. (2016). *Child maltreatment: a developmental psychopathology approach* (First edition). Washington, DC: American Psychological Association.

Bergeron, C. M., & Dandeneau, S. (2016). Implicitly activating mindfulness promotes positive responses following an ego threat. *Journal of Social and Clinical Psychology*, *35*(7), 551–570. https://doi.org/10.1521/jscp.2016.35.7.551

Berlin, L. J., Cassidy, J., & Appleyard, K. (2008). The influence of early attachments on other relationships. In *Handbook of attachment: Theory, research, and clinical applications* (2nd ed., pp. 333–347). New York, NY: The Guilford Press.

Bernard, K., Frost, A., Bennett, C. B., & Lindhiem, O. (2017). Maltreatment and diurnal cortisol regulation: A meta-analysis. *Psychoneuroendocrinology*, *78*, 57–67. https://doi.org/10.1016/j.psyneuen.2017.01.005

Bernier, A., & Meins, E. (2008). A threshold approach to understanding the origins of attachment disorganization. *Developmental Psychology*, *44*(4), 969–982. https://doi.org/10.1037/0012-1649.44.4.969

Bernstein, D. P., & Fink, L. (1998). *Childhood Trauma Questionnaire: A retrospective self-report manual*. San Antonio, TX: The Psychological Corporation.

Bigler, E.D. (2001). Frontal lobe pathology and antisocial personality disorder. *Archives of General Psychiatry*, *58*(6), 609–611.

Bigelow, A. E., Beebe, B., Power, M., Stafford, A.-L., Ewing, J., Egleson, A., & Kaminer, T. (2018). Longitudinal relations among maternal depressive symptoms, maternal mind-mindedness, and infant attachment behavior. *Infant Behavior and Development*, *51*, 33–44. https://doi.org/10.1016/j.infbeh.2018.02.006

Blair, C., Granger, D., Willoughby, M., & Kivlighan, K. (2006). Maternal sensitivity is related to hypothalamic-pituitary-adrenal axis stress reactivity and regulation in response to emotion challenge in 6-month-old infants. *Annals of the New York Academy of Sciences*, *1094*(1), 263–267. https://doi.org/10.1196/annals.1376.031

Bögels, S. M., Hellemans, J., van Deursen, S., Römer, M., & van der Meulen, R. (2014). Mindful Parenting in Mental Health Care: Effects on Parental and Child Psychopathology, Parental Stress, Parenting, Coparenting, and Marital Functioning. *Mindfulness*, *5*(5), 536–551. https://doi.org/10.1007/s12671-013-0209-7

Booth, A., Granger, D. A., & Shirtcliff, E. A. (2008). Gender- and Age-Related Differences in the Association Between Social Relationship Quality and Trait Levels of Salivary Cortisol. *Journal of Research on Adolescence*, *18*(2), 239–260. https://doi.org/10.1111/j.1532-7795.2008.00559.x

Boričević Maršanić, V., Aukst Margetić, B., Jukić, V., Matko, V., & Grgić, V. (2014). Self-reported emotional and behavioral symptoms, parent-adolescent bonding and family functioning in clinically referred adolescent offspring of Croatian PTSD war veterans. *European Child & Adolescent Psychiatry*, *23*(5), 295–306. https://doi.org/10.1007/s00787-013-0462-2

Bosquet Enlow, M., Egeland, B., Blood, E. A., Wright, R. O., & Wright, R. J. (2012). Interpersonal trauma exposure and cognitive development in children to age 8 years: a longitudinal study. *Journal of Epidemiology and Community Health*, *66*(11), 1005–1010. https://doi.org/10.1136/jech-2011-200727

Bosquet Enlow, M., Egeland, B., Carlson, E., Blood, E., & Wright, R. J. (2014a). Mother–infant attachment and the intergenerational transmission of posttraumatic stress disorder. *Development and Psychopathology*, *26*(01), 41–65. https://doi.org/10.1017/S0954579413000515

Bosquet Enlow, M., King, L., Schreier, H. M., Howard, J. M., Rosenfield, D., Ritz, T., & Wright, R. J. (2014b). Maternal sensitivity and infant autonomic and endocrine stress responses. *Early Human Development*, *90*(7), 377–385. https://doi.org/10.1016/j.earlhumdev.2014.04.007

Bosquet Enlow, M., Kitts, R. L., Blood, E., Bizarro, A., Hofmeister, M., & Wright, R. J. (2011). Maternal posttraumatic stress symptoms and infant emotional reactivity and emotion regulation. *Infant Behavior and Development*, *34*(4), 487–503. https://doi.org/10.1016/j.infbeh.2011.07.007

Boughner, E., Thornley, E., Kharlas, D., & Frewen, P. (2016). Mindfulness-related traits partially mediate the association between lifetime and childhood trauma exposure and PTSD and dissociative symptoms in a community sample assessed online. *Mindfulness*, *7*(3), 672–679. https://doi.org/10.1007/s12671-016-0502-3

Bowers, M. E., & Yehuda, R. (2016). Intergenerational transmission of stress in humans. *Neuropsychopharmacology*, *41*(1), 232–244. https://doi.org/10.1038/npp.2015.247

Bowlby, J. (1969). *Attachment and loss: Attachment (Vol. 1)*. New York, NY: Basic Books.

Bowlby, J. (1973). *Attachment and loss: Vol. 2. Separation: Anxiety and anger*. New York: Basic Books.

Boyce, W. T., & Ellis, B. J. (2005). Biological sensitivity to context: I. An evolutionary–developmental theory of the origins and functions of stress reactivity. *Development and Psychopathology*, *17*(02). https://doi.org/10.1017/S0954579405050145

Brand, S. R., Engel, S. M., Canfield, R. L., & Yehuda, R. (2006). The effect of maternal PTSD following in utero trauma exposure on behavior and temperament in the 9-month-old infant. *Annals of the New York Academy of Sciences*, *1071*(1), 454–458. https://doi.org/10.1196/annals.1364.041

Bremner, J. ., Vythilingam, M., Vermetten, E., Adil, J., Khan, S., Nazeer, A., … Charney, D. . (2003). Cortisol response to a cognitive stress challenge in posttraumatic stress disorder (PTSD) related to childhood abuse. *Psychoneuroendocrinology*, *28*(6), 733–750. https://doi.org/10.1016/S0306-4530(02)00067-7

Bremner, J., Scott, T., Mason, J., Johnson, D., Innis, R., McCarthy, G., & Charney, D. (1993). Deficits in short-term memory in posttraumatic stress disorder. *American Journal of Psychiatry*, *150*(7), 1015–1019. https://doi.org/10.1176/ajp.150.7.1015

Briere, J. (1992). *Child abuse trauma: Theory and treatment of the lasting effects*. Newbury Park, CA: Sage Publications.

Brown, K. W., Weinstein, N., & Creswell, J. D. (2012). Trait mindfulness modulates neuroendocrine and affective responses to social evaluative threat. *Psychoneuroendocrinology*, *37*(12), 2037–2041. https://doi.org/10.1016/j.psyneuen.2012.04.003

Buchheim, A., Erk, S., George, C., Kächele, H., Kircher, T., Martius, P., … Walter, H. (2008). Neural correlates of attachment trauma in borderline personality disorder: A functional magnetic resonance imaging study. *Psychiatry Research: Neuroimaging*, *163*(3), 223–235. https://doi.org/10.1016/j.pscychresns.2007.07.001

Buchheim, A., Erk, S., George, C., Kächele, H., Ruchsow, M., Spitzer, M., … Walter, H. (2006). Measuring attachment representation in an fMRI environment: A pilot study. *Psychopathology*, *39*(3), 144–152. https://doi.org/10.1159/000091800

Buchheim, A., & George, C. (2011). The representational, neurobiological, and emotional foundation of attachment disorganization in borderline personality disorder and anxiety disorder. In J. Solomon & C. George (Eds.) *Disorganized attachment and caregiving*. New York: Guilford Press.

Bugental, D. B., Ellerson, P. C., Lin, E. K., Rainey, B., Kokotovic, A., & O'Hara, N. (2002). A cognitive approach to child abuse prevention. *Journal of Family Psychology*, *16*(3), 243–258. https://doi.org/10.1037/0893-3200.16.3.243

Bunea, I. M., Szentágotai-Tătar, A., & Miu, A. C. (2017). Early-life adversity and cortisol response to social stress: a meta-analysis. *Translational Psychiatry*, *7*(12). https://doi.org/10.1038/s41398-017-0032-3

Burke, H. M., Davis, M. C., Otte, C., & Mohr, D. C. (2005a). Depression and cortisol responses to psychological stress: A meta-analysis. *Psychoneuroendocrinology*, *30*(9), 846–856. https://doi.org/10.1016/j.psyneuen.2005.02.010

Burke, H. M., Fernald, L. C., Gertler, P. J., & Adler, N. E. (2005b). Depressive Symptoms Are Associated With Blunted Cortisol Stress Responses in Very Low-Income Women: *Psychosomatic Medicine*, *67*(2), 211–216. https://doi.org/10.1097/01.psy.0000156939.89050.28

Burkett, L. P. (1991). Parenting behaviors of women who were sexually abused as children in their families of origin. *Family Process*, *30*(4), 421–434. https://doi.org/10.1111/j.1545-5300.1991.00421.x

Carlson, L. E., Speca, M., Faris, P., & Patel, K. D. (2007). One year pre–post intervention follow-up of psychological, immune, endocrine and blood pressure outcomes of mindfulness-based stress reduction (MBSR) in breast and prostate cancer outpatients. *Brain, Behavior, and Immunity*, *21*(8), 1038–1049. https://doi.org/10.1016/j.bbi.2007.04.002

Cărnuţă, M., Crişan, L. G., Vulturar, R., Opre, A., & Miu, A. C. (2015). Emotional non-acceptance links early life stress and blunted cortisol reactivity to social threat. *Psychoneuroendocrinology*, *51*, 176–187. https://doi.org/10.1016/j.psyneuen.2014.09.026

Carpenter, L. L., Carvalho, J. P., Tyrka, A. R., Wier, L. M., Mello, A. F., Mello, M. F., … Price, L. H. (2007a). Decreased adrenocorticotropic hormone and cortisol responses to stress in healthy adults reporting significant childhood maltreatment. *Biological Psychiatry*, *62*(10), 1080–1087. https://doi.org/10.1016/j.biopsych.2007.05.002

Carver, L. J., & Vaccaro, B. G. (2007). 12-month-old infants allocate increased neural resources to stimuli associated with negative adult emotion. *Developmental Psychology*, *43*(1), 54–69. https://doi.org/10.1037/0012-1649.43.1.54

Cassidy, J., & Mohr, J. J. (2006). Unsolvable fear, trauma, and psychopathology: Theory, research, and clinical considerations related to disorganized attachment across the life span. *Clinical Psychology: Science and Practice*, *8*(3), 275–298. https://doi.org/10.1093/clipsy.8.3.275

Cerqueira, J. J., Mailliet, F., Almeida, O. F. X., Jay, T. M., & Sousa, N. (2007). The prefrontal cortex as a key target of the maladaptive response to stress. *Journal of Neuroscience*, *27*(11), 2781–2787. https://doi.org/10.1523/JNEUROSCI.4372-06.2007

Chambers, R., Gullone, E., & Allen, N. B. (2009). Mindful emotion regulation: An integrative review. *Clinical Psychology Review*, *29*(6), 560–572. https://doi.org/10.1016/j.cpr.2009.06.005

Charmandari, E., Kino, T., Souvatzoglou, E., & Chrousos, G. P. (2003). Pediatric stress: Hormonal mediators and human development. *Hormone Research in Pediatrics*, *59*(4), 161–179. https://doi.org/10.1159/000069325

Chemtob, C. M., Gudiño, O. G., & Laraque, D. (2013). Maternal posttraumatic stress disorder and depression in pediatric primary care: Association with child maltreatment and frequency of child exposure to traumatic events. *JAMA Pediatrics*, *167*(11), 1011. https://doi.org/10.1001/jamapediatrics.2013.2218

Child Welfare Information Gateway. (2013). Long-term consequences of child abuse and neglect. Factsheet. Retrieved February 21, 2018, from http://www.childwelfare.gov/pubs/factsheets/long_term_consequences.cfm

Cicchetti, D. (2013). Annual research review: Resilient functioning in maltreated children - past, present, and future perspectives: Resilient functioning in maltreated children. *Journal of Child Psychology and Psychiatry*, *54*(4), 402–422. https://doi.org/10.1111/j.1469-7610.2012.02608.x

Cicchetti, D., & Rogosch, F. A. (2001). Diverse patterns of neuroendocrine activity in maltreated children. *Development and Psychopathology*, *13*(3), 677–693. https://doi.org/10.1017/S0954579401003145

Cicchetti, D., & Valentino, K. (2006). An ecological transactional perspective on child maltreatment: Failure of the average expectable environment and its influence upon child development. In D. J. Cicchetti & D. J. Cohen (Eds.), *Developmental psychopathology* (2nd ed., Vol. 3, pp. 129–201). New York: Wiley.

Cloitre, M., Miranda, R., Stovall-McClough, K. C., & Han, H. (2005). Beyond PTSD: Emotion regulation and interpersonal problems as predictors of functional impairment in survivors of childhood abuse. *Behavior Therapy*, *36*(2), 119–124. https://doi.org/10.1016/S0005-7894(05)80060-7

Cloitre, M., Stovall-McClough, C., Zorbas, P., & Charuvastra, A. (2008). Attachment organization, emotion regulation, and expectations of support in a clinical sample of women with childhood abuse histories. *Journal of Traumatic Stress*, *21*(3), 282–289. https://doi.org/10.1002/jts.20339

Coan, J. A., Beckes, L., & Allen, J. P. (2013). Childhood maternal support and social capital moderate the regulatory impact of social relationships in adulthood. *International Journal of Psychophysiology*, *88*(3), 224–231. https://doi.org/10.1016/j.ijpsycho.2013.04.006

Coan, J. A., Schaefer, H. S., & Davidson, R. J. (2006). Lending a hand: Social regulation of the neural response to threat. *Psychological Science*, *17*(12), 1032–1039. https://doi.org/10.1111/j.1467-9280.2006.01832.x

Coatsworth, J. D., Duncan, L. G., Greenberg, M. T., & Nix, R. L. (2010). Changing parent's mindfulness, child management skills and relationship quality with their youth: Results from a randomized pilot intervention trial. *Journal of Child and Family Studies*, *19*(2), 203–217. https://doi.org/10.1007/s10826-009-9304-8

Cohen, L. R., Hien, D. A., & Batchelder, S. (2008). The impact of cumulative maternal trauma and diagnosis on parenting behavior. *Child Maltreatment*, *13*(1), 27–38. https://doi.org/10.1177/1077559507310045

Cole, P. M., & Putnam, F. W. (1992). Effect of incest on self and social functioning: A developmental psychopathology perspective. *Journal of Consulting and Clinical Psychology*, *60*(2), 174–184. https://doi.org/10.1037/0022-006X.60.2.174

Collishaw, S., Pickles, A., Messer, J., Rutter, M., Shearer, C., & Maughan, B. (2007). Resilience to adult psychopathology following childhood maltreatment: Evidence from a community sample. *Child Abuse & Neglect*, *31*(3), 211–229. https://doi.org/10.1016/j.chiabu.2007.02.004

Cook, A., Spinazzola, J., Ford, J., Lanktree, C., Blaustein, M., Cloitre, M., … van der Kolk, B. (2005). Complex trauma in children and adolescents. *Psychiatric Annals*, *35*, 390–398.

Cowell, R. A., Cicchetti, D., Rogosch, F. A., & Toth, S. L. (2015). Childhood maltreatment and its effect on neurocognitive functioning: Timing and chronicity matter. *Development and Psychopathology*, *27*(02), 521–533. https://doi.org/10.1017/S0954579415000139

Craig, A. D. (2002). How do you feel? Interoception: the sense of the physiological condition of the body. *Nature Reviews Neuroscience*, *3*(8), 655–666. https://doi.org/10.1038/nrn894

Crockett, E. E., Holmes, B. M., Granger, D. A., & Lyons-Ruth, K. (2013). Maternal disrupted communication during face-to-face interaction at 4 months: Relation to maternal and infant cortisol among at-risk families. *Infancy*, *18*(6), 1111–1134. https://doi.org/10.1111/infa.12015

Cross, D., Fani, N., Powers, A., & Bradley, B. (2017). Neurobiological development in the context of childhood trauma. *Clinical Psychology: Science and Practice*, *24*(2), 111–124. https://doi.org/10.1111/cpsp.12198

Cyr, C., Euser, E. M., Bakermans-Kranenburg, M. J., & Van Ijzendoorn, M. H. (2010). Attachment security and disorganization in maltreating and high-risk families: A series of meta-analyses. *Development and Psychopathology*, *22*(01), 87. https://doi.org/10.1017/S0954579409990289

Damasio, A. R. (2000). A neural basis for sociopathy. *Archives of General Psychiatry*, *57*(2), 128. https://doi.org/10.1001/archpsyc.57.2.128

Davies, J., Slade, P., Wright, I., & Stewart, P. (2008). Posttraumatic stress symptoms following childbirth and mothers' perceptions of their infants. *Infant Mental Health Journal*, *29*(6), 537–554. https://doi.org/10.1002/imhj.20197

Dawson, G., Hessl, D., & Frey, K. (1994). Social influences on early developing biological and behavioral systems related to risk for affective disorder. *Development and Psychopathology*, *6*(04), 759. https://doi.org/10.1017/S0954579400004776

De Wolff, M. S., & van Ijzendoorn, M. H. (1997). Sensitivity and attachment: A meta-analysis on parental antecedents of infant attachment. *Child Development*, *68*(4), 571–591. https://doi.org/10.1111/j.1467-8624.1997.tb04218.x

DeKlyen, M., & Greenberg, M. T. (2008). Attachment and psychopathology in childhood. In J. Cassidy & P. R. Shaver (Eds.) *Handbook of Attachment* (2nd ed., pp. 637–665). New York, NY: The Guilford Press.

Del Giudice, M., Ellis, B. J., & Shirtcliff, E. A. (2011). The Adaptive Calibration Model of stress responsivity. *Neuroscience & Biobehavioral Reviews*, *35*(7), 1562–1592. https://doi.org/10.1016/j.neubiorev.2010.11.007

DeOliveira, C. A., Bailey, H. N., Moran, G., & Pederson, D. R. (2004). Emotion socialization as a framework for understanding the development of disorganized attachment. *Social Development*, *13*(3), 437–467. https://doi.org/10.1111/j.1467-9507.2004.00276.x

DePrince, A. P., Weinzierl, K. M., & Combs, M. D. (2009). Executive function performance and trauma exposure in a community sample of children. *Child Abuse & Neglect*, *33*(6), 353–361. https://doi.org/10.1016/j.chiabu.2008.08.002

DeSantis, S. M., Baker, N. L., Back, S. E., Spratt, E., Ciolino, J. D., Moran-Santa Maria, M., … Brady, K. T. (2011). Gender differences in the effect of early life trauma on hypothalamic-pituitary-adrenal axis functioning. *Depression and Anxiety*, *28*(5), 383–392. https://doi.org/10.1002/da.20795

Dienes, K. A., Hazel, N. A., & Hammen, C. L. (2013). Cortisol secretion in depressed, and at-risk adults. *Psychoneuroendocrinology*, *38*(6), 927–940. https://doi.org/10.1016/j.psyneuen.2012.09.019

Dozier, M., Stovall-McClough, K. C., & Albus, K. (2008). Attachment and psychopathology in adulthood. In J. Cassidy & P. R. Shaver (Eds.) *Handbook of Attachment* (2nd ed., pp. 718–744). New York, NY: The Guilford Press.

Driscoll, J. R., & Easterbrooks, M. A. (2007). Young mothers' play with their toddlers: individual variability as a function of psychosocial factors. *Infant and Child Development*, *16*(6), 649–670. https://doi.org/10.1002/icd.515

Duncan, L. G. (2007). *Assessment of mindful parenting among families of early adolescents: Development and validation of the Interpersonal Mindfulness in Parenting Scale*. Unpublished doctoral dissertation, Pennsylvania State University, University Park, PA.

Duncan, L. G., Coatsworth, J. D., & Greenberg, M. T. (2009). A model of mindful parenting: Implications for parent–child relationships and prevention research. *Clinical Child & Family Psychology Review*, *12*(3), 255–270.

Dunn, E. C., Nishimi, K., Powers, A., & Bradley, B. (2017). Is developmental timing of trauma exposure associated with depressive and post-traumatic stress disorder symptoms in adulthood? *Journal of Psychiatric Research*, *84*, 119–127. https://doi.org/10.1016/j.jpsychires.2016.09.004

Earley, M. D., Chesney, M. A., Frye, J., Greene, P. A., Berman, B., & Kimbrough, E. (2014). Mindfulness Intervention for Child Abuse Survivors: A 2.5-Year Follow-Up: MICAS-II. *Journal of Clinical Psychology*, *70*(10), 933–941. https://doi.org/10.1002/jclp.22102

Edwards, J. R. (2001). Ten difference score myths. *Organizational Research Methods, 4*(3), 265–287. https://doi.org/10.1177/109442810143005

Ehlert, U. (2013). Enduring psychobiological effects of childhood adversity. *Psychoneuroendocrinology*, *38*(9), 1850–1857. https://doi.org/10.1016/j.psyneuen.2013.06.007

Ehrensaft, M. K., Knous-Westfall, H. M., Cohen, P., & Chen, H. (2015). How does child abuse history influence parenting of the next generation? *Psychology of Violence*, *5*(1), 16–25. https://doi.org/10.1037/a0036080

Elliott, R. (2000). Dissociable functions in the medial and lateral orbitofrontal cortex: Evidence from human neuroimaging studies. *Cerebral Cortex*, *10*(3), 308–317. https://doi.org/10.1093/cercor/10.3.308

Elwood, L. S., Williams, N. L., Olatunji, B. O., & Lohr, J. M. (2007). Interpretation biases in victims and non-victims of interpersonal trauma and their relation to symptom development. *Journal of Anxiety Disorders*, *21*(4), 554–567. https://doi.org/10.1016/j.janxdis.2006.08.006

Elzinga, B. M., Roelofs, K., Tollenaar, M. S., Bakvis, P., van Pelt, J., & Spinhoven, P. (2008). Diminished cortisol responses to psychosocial stress associated with lifetime adverse events. *Psychoneuroendocrinology*, *33*(2), 227–237. https://doi.org/10.1016/j.psyneuen.2007.11.004

Elzinga, B. M., Spinhoven, P., Berretty, E., de Jong, P., & Roelofs, K. (2010). The role of childhood abuse in HPA-axis reactivity in social anxiety disorder: A pilot study. *Biological Psychology*, *83*(1), 1–6. https://doi.org/10.1016/j.biopsycho.2009.09.006

England-Mason, G., Kimber, M., Khoury, J., Atkinson, L., MacMillan, H., & Gonzalez, A. (2017). Difficulties with emotion regulation moderate the association between childhood history of maltreatment and cortisol reactivity to psychosocial challenge in postpartum women. *Hormones and Behavior*, *95*, 44–56. https://doi.org/10.1016/j.yhbeh.2017.07.007

Essex, M. J., Klein, M. H., Cho, E., & Kalin, N. H. (2002). Maternal stress beginning in infancy may sensitize children to later stress exposure: Effects on cortisol and behavior. *Biological Psychiatry*, *52*(8), 776–784. https://doi.org/10.1016/S0006-3223(02)01553-6

Fang, X., Brown, D., Florence, C., & Mercy, J. (2012). The economic burden of child maltreatment in the United States and implications for prevention. *Child Abuse & Neglect*, *36*, 156–165.

Faul, F., Erdfelder, E., Lang, A. G., & Buchner, A. (2007). G*Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior Research Methods*, *39*, 175–191.

Fearon, R. P., Bakermans-Kranenburg, M. J., van IJzendoorn, M. H., Lapsley, A.-M., & Roisman, G. I. (2010). The significance of insecure attachment and disorganization in the development of children s externalizing behavior: A meta-analytic study. *Child Development*, *81*(2), 435–456. https://doi.org/10.1111/j.1467-8624.2009.01405.x

Field, T. (2010). Postpartum depression effects on early interactions, parenting, and safety practices: A review. *Infant Behavior and Development*, *33*(1), 1–6. https://doi.org/10.1016/j.infbeh.2009.10.005

Filey, C., Price, B., Nell, V., Antoinette, T., Morgan, A., Bresnahan, J., … Kelly, J. (2001). Toward an understanding of violence: Neurobiobehavioral conference consensus statement. *Neuropsychiatry, Neuropsychology, and Behavioral Neurology*, *14*, 1–14.

Forcada-Guex, M., Borghini, A., Pierrehumbert, B., Ansermet, F., & Muller-Nix, C. (2011). Prematurity, maternal posttraumatic stress and consequences on the mother–infant relationship. *Early Human Development*, *87*(1), 21–26. https://doi.org/10.1016/j.earlhumdev.2010.09.006

Frewen, P. A., Dozois, D. J. A., Neufeld, R. W. J., & Lanius, R. A. (2012). Disturbances of emotional awareness and expression in posttraumatic stress disorder: Meta-mood, emotion regulation, mindfulness, and interference of emotional expressiveness. *Psychological Trauma: Theory, Research, Practice, and Policy*, *4*(2), 152–161. https://doi.org/10.1037/a0023114

Fries, A. B. W., Shirtcliff, E. A., & Pollak, S. D. (2008). Neuroendocrine dysregulation following early social deprivation in children. *Developmental Psychobiology*, *50*(6), 588–599. https://doi.org/10.1002/dev.20319

Gaensbauer, T. J., & Siegel, C. H. (1995). Therapeutic approaches to posttraumatic stress disorder in infants and toddlers. *Infant Mental Health Journal*, *16*(4), 292–305. https://doi.org/10.1002/1097-0355(199524)16:4<292::AID-IMHJ2280160405>3.0.CO;2-3

Galantino, M. L., Baime, M., Maguire, M., Szapary, P. O., & Farrar, J. T. (2005). Association of psychological and physiological measures of stress in health-care professionals during an 8-week mindfulness meditation program: mindfulness in practice. *Stress and Health*, *21*(4), 255–261. https://doi.org/10.1002/smi.1062

Gartstein, M. A., Crawford, J., & Robertson, C. D. (2008). Early markers of language and attention: Mutual contributions and the impact of parent–infant interactions. *Child Psychiatry and Human Development*, *39*(1), 9–26. https://doi.org/10.1007/s10578-007-0067-4

George, C., & Solomon, J. (2008). The caregiving system: A behavioral systems approach to parenting. In *Handbook of attachment* (2nd ed., pp. 833–856). New York, NY: The Guilford Press.

George, C., & Solomon, J. (2011). Caregiving helplessness: The development of a screening measure for disorganized maternal caregiving. In *Disorganized attachment and caregiving* (pp. 133–166). Guilford Publications.

Gex-Fabry, M., Jermann, F., Kosel, M., Rossier, M. F., Van der Linden, M., Bertschy, G., … Aubry, J.-M. (2012). Salivary cortisol profiles in patients remitted from recurrent depression: One-year follow-up of a mindfulness-based cognitive therapy trial. *Journal of Psychiatric Research*, *46*(1), 80–86. https://doi.org/10.1016/j.jpsychires.2011.09.011

Gilliom, M., Shaw, D. S., Beck, J. E., Schonberg, M. A., & Lukon, J. L. (2002). Anger regulation in disadvantaged preschool boys: Strategies, antecedents, and the development of self-control. *Developmental Psychology*, *38*(2), 222–235. https://doi.org/10.1037/0012-1649.38.2.222

Girdler, S. S., Sherwood, A., Hinderliter, A. L., Leserman, J., Costello, N. L., Straneva, P. A., … Light, K. C. (2003). Biological Correlates of Abuse in Women with Premenstrual Dysphoric Disorder and Healthy Controls: *Psychosomatic Medicine*, *65*(5), 849–856. https://doi.org/10.1097/01.PSY.0000088593.38201.CD

Gold, P. W., & Chrousos, G. P. (2002). Organization of the stress system and its dysregulation in melancholic and atypical depression: high vs low CRH/NE states. *Molecular Psychiatry*, *7*(3), 254–275. https://doi.org/10.1038/sj.mp.4001032

Goldberg, S., Benoit, D., Blokland, K., & Madigan, S. (2003). Atypical maternal behavior, maternal representations, and infant disorganized attachment. *Development and Psychopathology*, *15*(2), 239–257. https://doi.org/10.1017/S0954579403000130

Goldin, P. R., McRae, K., Ramel, W., & Gross, J. J. (2008). The neural bases of emotion regulation: Reappraisal and suppression of negative emotion. *Biological Psychiatry*, *63*(6), 577–586. https://doi.org/10.1016/j.biopsych.2007.05.031

Goodall, K., Trejnowska, A., & Darling, S. (2012). The relationship between dispositional mindfulness, attachment security and emotion regulation. *Personality and Individual Differences*, *52*(5), 622–626. https://doi.org/10.1016/j.paid.2011.12.008

Gould, F., Clarke, J., Heim, C., Harvey, P. D., Majer, M., & Nemeroff, C. B. (2012). The effects of child abuse and neglect on cognitive functioning in adulthood. *Journal of Psychiatric Research*, *46*(4), 500–506. https://doi.org/10.1016/j.jpsychires.2012.01.005

Goyal, M., Singh, S., Sibinga, E. M. S., Gould, N. F., Rowland-Seymour, A., Sharma, R., … Haythornthwaite, J. A. (2014). Meditation programs for psychological stress and well-being: A systematic review and meta-analysis. *JAMA Internal Medicine*, *174*(3), 357. https://doi.org/10.1001/jamainternmed.2013.13018

Gu, J., Strauss, C., Bond, R., & Cavanagh, K. (2016). Corrigendum to "how do Mindfulness-Based Cognitive Therapy and Mindfulness-Based Stress Reduction improve mental health and wellbeing? A systematic review and meta-analysis of mediation studies" [Clinical Psychology Review 37 (2015) 1–12]. *Clinical Psychology Review*, *49*, 119. https://doi.org/10.1016/j.cpr.2016.09.011

Gunnar, M. R. (2017). Social buffering of stress in development: A career perspective. *Perspectives on Psychological Science*, *12*(3), 355–373. https://doi.org/10.1177/1745691616680612

Gunnar, M. R., Brodersen, L., Nachmias, M., Buss, K., & Rigatuso, J. (1996). Stress reactivity and attachment security. *Developmental Psychobiology*, *29*(3), 191–204. https://doi.org/10.1002/(SICI)1098-2302(199604)29:3<191::AID-DEV1>3.0.CO;2-M

Gunnar, M. R., & Vazquez, D. M. (2001). Low cortisol and a flattening of expected daytime rhythm: Potential indices of risk in human development. *Development and Psychopathology*, *13*(3), 515–538. https://doi.org/10.1017/S0954579401003066

Hagan, M. J., Roubinov, D. S., Gress-Smith, J., Luecken, L. J., Sandler, I. N., & Wolchik, S. (2011). Positive parenting during childhood moderates the impact of recent negative events on cortisol activity in parentally bereaved youth. *Psychopharmacology*, *214*(1), 231–238. https://doi.org/10.1007/s00213-010-1889-5

Hanley, A. W., Garland, E. L., & Tedeschi, R. G. (2016). Relating dispositional mindfulness, contemplative practice, and positive reappraisal with posttraumatic cognitive coping, stress, and growth. *Psychological Trauma: Theory, Research, Practice, and Policy*. https://doi.org/10.1037/tra0000208

Harkness, K. L., Stewart, J. G., & Wynne-Edwards, K. E. (2011). Cortisol reactivity to social stress in adolescents: Role of depression severity and child maltreatment. *Psychoneuroendocrinology*, *36*(2), 173–181. https://doi.org/10.1016/j.psyneuen.2010.07.006

Hawes, D. J., Brennan, J., & Dadds, M. R. (2009). Cortisol, callous-unemotional traits, and pathways to antisocial behavior: *Current Opinion in Psychiatry*, *22*(4), 357–362. https://doi.org/10.1097/YCO.0b013e32832bfa6d

Haydicky, J., Shecter, C., Wiener, J., & Ducharme, J. M. (2015). Evaluation of MBCT for Adolescents with ADHD and Their Parents: Impact on Individual and Family Functioning. *Journal of Child and Family Studies*, *24*(1), 76–94. https://doi.org/10.1007/s10826-013-9815-1

Heim, C. (2000). Pituitary-adrenal and autonomic responses to stress in women after sexual and physical abuse in childhood. *JAMA*, *284*(5), 592. https://doi.org/10.1001/jama.284.5.592

Heim, C., Newport, D. J., Wagner, D., Wilcox, M. M., Miller, A. H., & Nemeroff, C. B. (2002). The role of early adverse experience and adulthood stress in the prediction of neuroendocrine stress reactivity in women: A multiple regression analysis. *Depression and Anxiety*, *15*(3), 117–125. https://doi.org/10.1002/da.10015

Hesse, E. (2008). The Adult Attachment Interview: Protocol, method of analysis, and empirical studies. In J. Cassidy & P. R. Shaver (Eds.) *Handbook of attachment* (2nd ed., pp. 552–598). New York: Guilford Press.

Hesse, E., & Main, M. (1999). Second-generation effects of unresolved trauma in nonmaltreating parents: Dissociated, frightened, and threatening parental behavior. *Psychoanalytic Inquiry*, *19*(4), 481–540. https://doi.org/10.1080/07351699909534265

Hesse, E., & Main, M. (2006). Frightened, threatening, and dissociative parental behavior in low-risk samples: Description, discussion, and interpretations. *Development and Psychopathology*, *18*(2), 309–343. https://doi.org/10.1017/S0954579406060172

Hildyard, K. L., & Wolfe, D. A. (2002). Child neglect: developmental issues and outcomes. *Child Abuse & Neglect*, *26*(6–7), 679–695. https://doi.org/10.1016/S0145-2134(02)00341-1

Hill, J. M., Vernig, P. M., Lee, J. K., Brown, C., & Orsillo, S. M. (2011). The development of a brief acceptance and mindfulness-based program aimed at reducing sexual revictimization among college women with a history of childhood sexual abuse. *Journal of Clinical Psychology*, *67*(9), 969–980. https://doi.org/10.1002/jclp.20813

Hilton, L., Maher, A. R., Colaiaco, B., Apaydin, E., Sorbero, M. E., Booth, M., … Hempel, S. (2016). Meditation for Posttraumatic Stress: Systematic Review and Meta-analysis. *Psychological Trauma: Theory, Research, Practice, and Policy*. https://doi.org/10.1037/tra0000180

Hostinar, C. E., Johnson, A. E., & Gunnar, M. R. (2015). Early social deprivation and the social buffering of cortisol stress responses in late childhood: An experimental study. *Developmental Psychology*, *51*(11), 1597–1608. https://doi.org/10.1037/dev0000029

Hofmann, S. G., Sawyer, A. T., Witt, A. A., & Oh, D. (2010). The effect of mindfulness-based therapy on anxiety and depression: A meta-analytic review. *Journal of Consulting and Clinical Psychology*, *78*(2), 169–183. https://doi.org/10.1037/a0018555

Hostinar, C. E., Sullivan, R. M., & Gunnar, M. R. (2014). Psychobiological mechanisms underlying the social buffering of the hypothalamic–pituitary–adrenocortical axis: A review of animal models and human studies across development. *Psychological Bulletin*, *140*(1), 256–282. https://doi.org/10.1037/a0032671

Jacobvitz, D., Leon, K., & Hazen, N. (2006). Does expectant mothers' unresolved trauma predict frightened/frightening maternal behavior? Risk and protective factors. *Development and Psychopathology*, *18*(2), 363–379. https://doi.org/10.1017/S0954579406060196

Joormann, J. (2010). Cognitive inhibition and emotion regulation in depression. *Current Directions in Psychological Science*, *19*(3), 161–166. https://doi.org/10.1177/0963721410370293

Kabat-Zinn, J. (2006). Mindfulness-based interventions in context: Past, present, and future. *Clinical Psychology: Science and Practice*, *10*(2), 144–156. https://doi.org/10.1093/clipsy.bpg016

Kabat-Zinn, J. (2013). *Full catastrophe living: using the wisdom of your body and mind to face stress, pain, and illness* (Revised and updated edition). New York: Bantam Books trade paperback.

Kavanaugh, B., & Holler, K. (2014). Executive, emotional, and language functioning following childhood maltreatment and the influence of pediatric PTSD. *Journal of Child & Adolescent Trauma*, *7*(2), 121–130. https://doi.org/10.1007/s40653-014-0014-z

Kim, J., & Cicchetti, D. (2009). Longitudinal pathways linking child maltreatment, emotion regulation, peer relations, and psychopathology: Pathways linking maltreatment, emotion regulation, and psychopathology. *Journal of Child Psychology and Psychiatry*, *51*(6), 706–716. https://doi.org/10.1111/j.1469-7610.2009.02202.x

Kimbrough, E., Magyari, T., Langenberg, P., Chesney, M., & Berman, B. (2009). Mindfulness intervention for child abuse survivors. *Journal of Clinical Psychology*, *66*, 17–33.

Kirschbaum, C., Pirke, K. M., & Hellhammer, D. H. (1993). The 'Trier Social Stress Test'--a tool for investigating psychobiological stress responses in a laboratory setting. *Neuropsychobiology*, *28*(1–2), 76–81. https://doi.org/10.1159/000119004

Knudsen, E. I. (2004). Sensitive periods in the development of the brain and behavior. *Journal of Cognitive Neuroscience*, *16*(8), 1412–1425. https://doi.org/10.1162/0898929042304796

Kobak, R., & Madsen, S., (2008). Disruptions in attachment bonds: Implications for theory, research, and clinical intervention. In Cassidy, J. & Shaver, P. R. (Eds.), *Handbook of attachment: Theory, research, and clinical applications* (2nd ed., pp. 23–44). New York, NY: The Guilford Press.

Koob, G. F., & Le Moal, M. (2008). Neurobiological mechanisms for opponent motivational processes in addiction. *Philosophical Transactions of the Royal Society B: Biological Sciences*, *363*(1507), 3113–3123. https://doi.org/10.1098/rstb.2008.0094

Koren-Karie, N., Oppenheim, D., & Getzler-Yosef, R. (2004). Mothers who were severely abused during childhood and their children talk about emotions: Co-construction of narratives in light of maternal trauma. *Infant Mental Health Journal*, *25*(4), 300–317. https://doi.org/10.1002/imhj.20007

Lang, A. J., & Gartstein, M. A. (2018). Intergenerational transmission of traumatization: Theoretical framework and implications for prevention. *Journal of Trauma & Dissociation*, *19*(2), 162–175. https://doi.org/10.1080/15299732.2017.1329773

Lang, A. J., Strauss, J. L., Bomyea, J., Bormann, J. E., Hickman, S. D., Good, R. C., & Essex, M. (2012). The theoretical and empirical basis for meditation as an intervention for PTSD. *Behavior Modification*, *36*(6), 759–786. https://doi.org/10.1177/0145445512441200

Lanius, R. A., Vermetten, E., Loewenstein, R. J., Brand, B., Schmahl, C., Bremner, J. D., & Spiegel, D. (2010). Emotion modulation in PTSD: Clinical and neurobiological evidence for a dissociative subtype. *American Journal of Psychiatry*, *167*(6), 640–647. https://doi.org/10.1176/appi.ajp.2009.09081168

Laurent, H. K., Ablow, J. C., & Measelle, J. (2011). Risky shifts: How the timing and course of mothers' depressive symptoms across the perinatal period shape their own and infant's stress response profiles. *Development and Psychopathology*, *23*(02), 521–538. https://doi.org/10.1017/S0954579411000083

Laurent, H. K., Duncan, L. G., Lightcap, A., & Khan, F. (2017). Mindful parenting predicts mothers' and infants' hypothalamic-pituitary-adrenal activity during a dyadic stressor. *Developmental Psychology*, *53*(3), 417–424. https://doi.org/10.1037/dev0000258

Laurent, H., Laurent, S., Hertz, R., Egan-Wright, D., & Granger, D. A. (2013). Sex-specific effects of mindfulness on romantic partners' cortisol responses to conflict and relations with psychological adjustment. *Psychoneuroendocrinology*, *38*(12), 2905–2913. https://doi.org/10.1016/j.psyneuen.2013.07.018

Laurent, H., & Powers, S. (2007). Emotion regulation in emerging adult couples: Temperament, attachment, and HPA response to conflict. *Biological Psychology*, *76*(1–2), 61–71. https://doi.org/10.1016/j.biopsycho.2007.06.002

Leigh, B., & Milgrom, J. (2008). Risk factors for antenatal depression, postnatal depression and parenting stress. *BMC Psychiatry*, *8*(1). https://doi.org/10.1186/1471-244X-8-24

Luecken, L. J., & Appelhans, B. M. (2006). Early parental loss and salivary cortisol in young adulthood: The moderating role of family environment. *Development and Psychopathology*, *18*(01). https://doi.org/10.1017/S0954579406060160

Luecken, L. J., Kraft, A., & Hagan, M. J. (2009). Negative relationships in the family-of-origin predict attenuated cortisol in emerging adults. *Hormones and Behavior*, *55*(3), 412–417. https://doi.org/10.1016/j.yhbeh.2008.12.007

Luke, N., & Banerjee, R. (2013). Differentiated associations between childhood maltreatment experiences and social understanding: A meta-analysis and systematic review. *Developmental Review*, *33*(1), 1–28. https://doi.org/10.1016/j.dr.2012.10.001

Lyons-Ruth, K., & Block, D. (1996). The disturbed caregiving system: Relations among childhood trauma, maternal caregiving, and infant affect and attachment. *Infant Mental Health Journal*, *17*(3), 257–275. https://doi.org/10.1002/(SICI)1097-0355(199623)17:3<257::AID-IMHJ5>3.0.CO;2-L

Lyons-Ruth, K., Bronfman, E., & Parsons, E. (1999). Chapter IV. Maternal frightened, frightening, or atypical behavior and disorganized infant attachment patterns. *Monographs of the Society for Research in Child Development*, *64*(3), 67–96. https://doi.org/10.1111/1540-5834.00034

Lyons-Ruth, K., & Jacobvitz, F. (1999). Attachment disorganization: Unresolved loss, relational violence and lapses in behavioral and attentional strategies. In *Handbook of attachment: Theory, research, and clinical applications*. New York: Guilford Press.

Lyons-Ruth, K., Yellin, C., Melnick, S., & Atwood, G. (2005). Expanding the concept of unresolved mental states: hostile/helpless states of mind on the Adult Attachment Interview are associated with disrupted mother-infant communication and infant disorganization. *Development and Psychopathology*, *17*(1), 1–23.

MacDonald, H. Z., Beeghly, M., Grant-Knight, W., Augustyn, M., Woods, R. W., Cabral, H., … Frank, D. A. (2008). Longitudinal association between infant disorganized attachment and childhood posttraumatic stress symptoms. *Development and Psychopathology*, *20*(2), 493–508. https://doi.org/10.1017/S0954579408000242

MacMillan, H. L., Georgiades, K., Duku, E. K., Shea, A., Steiner, M., Niec, A., … Schmidt, L. A. (2009). Cortisol response to stress in female youths exposed to childhood maltreatment: Results of the youth mood project. *Biological Psychiatry*, *66*(1), 62–68. https://doi.org/10.1016/j.biopsych.2008.12.014

Mason, J. W., Wang, S., Yehuda, R., Riney, S., Charney, D. S., & Southwick, S. M. (2001). Psychogenic Lowering of Urinary Cortisol Levels Linked to Increased Emotional Numbing and a Shame-Depressive Syndrome in Combat-Related Posttraumatic Stress Disorder: *Psychosomatic Medicine*, *63*(3), 387–401. https://doi.org/10.1097/00006842-200105000-00008

Matchim, Y., Armer, J. M., & Stewart, B. R. (2011). Effects of Mindfulness-Based Stress Reduction (MBSR) on Health Among Breast Cancer Survivors. *Western Journal of Nursing Research*, *33*(8), 996–1016. https://doi.org/10.1177/0193945910385363

McCloskey, L. A., & Bailey, J. A. (2000). The intergenerational transmission of risk for child sexual abuse. *Journal of Interpersonal Violence*, *15*(10), 1019–1035. https://doi.org/10.1177/088626000015010001

McDonald, H. M., Sherman, K. A., Petocz, P., Kangas, M., Grant, K.-A., & Kasparian, N. A. (2016). Mindfulness and the experience of psychological distress: The mediating effects of emotion regulation and attachment anxiety. *Mindfulness*, *7*(4), 799–808. https://doi.org/10.1007/s12671-016-0517-9

McLaughlin, K. A., Peverill, M., Gold, A. L., Alves, S., & Sheridan, M. A. (2015). Child maltreatment and neural systems underlying emotion regulation. *Journal of the American Academy of Child & Adolescent Psychiatry*, *54*(9), 753–762. https://doi.org/10.1016/j.jaac.2015.06.010

Medeiros, C., Gouveia, M. J., Canavarro, M. C., & Moreira, H. (2016). The indirect effect of the mindful parenting of mothers and fathers on the child's perceived well-being through the child's attachment to parents. *Mindfulness*, *7*(4), 916–927. https://doi.org/10.1007/s12671-016-0530-z

Mielock, A. S., Morris, M. C., & Rao, U. (2017). Patterns of cortisol and alpha-amylase reactivity to psychosocial stress in maltreated women. *Journal of Affective Disorders*, *209*, 46–52. https://doi.org/10.1016/j.jad.2016.11.009

Mikulincer, M., & Shaver, P. R. (2008). Adult attachment and affect regulation. In. J. Cassidy and P. R. Shaver (Eds.) *Handbook of attachment,* (2nd ed., pp. 503–531). New York, NY: The Guilford Press.

Miller, G. E., Chen, E., & Zhou, E. S. (2007). If it goes up, must it come down? Chronic stress and the hypothalamic-pituitary-adrenocortical axis in humans. *Psychological Bulletin*, *133*(1), 25–45. https://doi.org/10.1037/0033-2909.133.1.25

Moehler, E., Biringen, Z., & Poustka, L. (2007). Emotional availability in a sample of mothers with a history of abuse. *American Journal of Orthopsychiatry*, *77*(4), 624–628. https://doi.org/10.1037/0002-9432.77.4.624

Moran, G., Bailey, H. N., Gleason, K., DeOliveira, C. A., & Pederson, D. R. (2008). Exploring the mind behind unresolved attachment: Lessons from and for attachment-based interventions with infants and their traumatized mothers. In H. Steel, & M. Steele (Eds.)*, Clinical applications of the adult attachment interview* (pp. 371–398). New York, NY: Guilford Press.

Muzik, M., Bocknek, E. L., Broderick, A., Richardson, P., Rosenblum, K. L., Thelen, K., & Seng, J. S. (2013). Mother–infant bonding impairment across the first 6 months postpartum: the primacy of psychopathology in women with childhood abuse and neglect histories. *Archives of Women's Mental Health*, *16*(1), 29–38. https://doi.org/10.1007/s00737-012-0312-0

Nachmias, M., Gunnar, M., Mangelsdorf, S., Parritz, R. H., & Buss, K. (1996). Behavioral inhibition and stress reactivity: The moderating role of attachment security. *Child Development*, *67*(2), 508. https://doi.org/10.2307/1131829

Netter, P., (2004). Personality and hormones. In: Stelmmack, R.M. (Ed.), *On the Psychobiology of Personality* (353-377). Elsevier: Ottawa, Canada.

Nikulina, V., & Widom, C. S. (2013). Child maltreatment and executive functioning in middle adulthood: A prospective examination. *Neuropsychology*, *27*(4), 417–427. https://doi.org/10.1037/a0032811

Nolin, P., & Ethier, L. (2007). Using neuropsychological profiles to classify neglected children with or without physical abuse. *Child Abuse & Neglect*, *31*(6), 631–643. https://doi.org/10.1016/j.chiabu.2006.12.009

Noll-Hussong, M., Otti, A., Laeer, L., Wohlschlaeger, A., Zimmer, C., Lahmann, C., … Guendel, H. (2010). Aftermath of sexual abuse history on adult patients suffering from chronic functional pain syndromes: An fMRI pilot study. *Journal of Psychosomatic Research*, *68*(5), 483–487. https://doi.org/10.1016/j.jpsychores.2010.01.020

O'Leary, K., O'Neill, S., & Dockray, S. (2016). A systematic review of the effects of mindfulness interventions on cortisol. *Journal of Health Psychology*, *21*(9), 2108–2121. https://doi.org/10.1177/1359105315569095

Opitz, B., & Friederici, A. D. (2003). Interactions of the hippocampal system and the prefrontal cortex in learning language-like rules. *NeuroImage*, *19*(4), 1730–1737. https://doi.org/10.1016/S1053-8119(03)00170-8

Osborne, J., & Waters, E. (2002). Four assumptions of multiple regression that researchers should always test. *Practical Assessment, Research & Evaluation, 8*(2), 1-9.

Ouellet-Morin, I., Odgers, C. L., Danese, A., Bowes, L., Shakoor, S., Papadopoulos, A. S., … Arseneault, L. (2011). Blunted cortisol responses to stress signal social and behavioral problems among maltreated/bullied 12-year-old children. *Biological Psychiatry*, *70*(11), 1016–1023. https://doi.org/10.1016/j.biopsych.2011.06.017

Parent, J., McKee, L. G., Anton, M., Gonzalez, M., Jones, D. J., & Forehand, R. (2016). Mindfulness in parenting and coparenting. *Mindfulness*, *7*(2), 504–513. https://doi.org/10.1007/s12671-015-0485-5

Paivio, S. C., & Laurent, C. (2001). Empathy and emotion regulation: Reprocessing memories of childhood abuse. *Journal of Clinical Psychology*, *57*(2), 213–226. https://doi.org/10.1002/1097-4679(200102)57:2<213::AID-JCLP7>3.0.CO;2-B

Palaszynski, K. M., & Nemeroff, C. B. (2009). The medical consequences of child abuse and neglect. *Psychiatric Annals*, *39*(12), 1004–1009. https://doi.org/10.3928/00485718-20091123-02

Parke, R. D. (1994). Progress, paradigms, and unresolved problems: A commentary on recent advances in our understanding of children's emotions. *Merrill-Palmer Quarterly*, *40*(1), 157–169.

Pepping, C. A., Davis, P. J., & O'Donovan, A. (2013). Individual differences in attachment and dispositional mindfulness: The mediating role of emotion regulation. *Personality and Individual Differences*, *54*(3), 453–456. https://doi.org/10.1016/j.paid.2012.10.006

Pepping, C. A., Duvenage, M., Cronin, T. J., & Lyons, A. (2016). Adolescent mindfulness and psychopathology: The role of emotion regulation. *Personality and Individual Differences*, *99*, 302–307. https://doi.org/10.1016/j.paid.2016.04.089

Perez-Blasco, J., Viguer, P., & Rodrigo, M. F. (2013). Effects of a mindfulness-based intervention on psychological distress, well-being, and maternal self-efficacy in breast-feeding mothers: Results of a pilot study. *Archives of Women's Mental Health*, *16*(3), 227–236. https://doi.org/10.1007/s00737-013-0337-z

Perry, R. J., Rosen, H. R., Kramer, J. H., Beer, J. S., Levenson, R. L., & Miller, B. L. (2001). Hemispheric dominance for emotions, empathy and social behaviour: Evidence from right and left handers with frontotemporal dementia. *Neurocase*, *7*(2), 145–160. https://doi.org/10.1093/neucas/7.2.145

Pollak, S. D. (2008). Mechanisms linking early experience and the emergence of emotions: Illustrations from the study of maltreated children. *Current Directions in Psychological Science*, *17*(6), 370–375. https://doi.org/10.1111/j.1467-8721.2008.00608.x

Powers, A., Etkin, A., Gyurak, A., Bradley, B., & Jovanovic, T. (2015). Associations between childhood abuse, posttraumatic stress disorder, and implicit emotion regulation deficits: Evidence from a low-income, inner-city population. *Psychiatry*, *78*(3), 251–264. https://doi.org/10.1080/00332747.2015.1069656

Preacher, K. J., Curran, P. J., & Bauer, D. J. (n.d.). Two-Way Interaction Effects in MLR. *Kristopher J. Preacher*. Retrieved May 9, 2018, from http://quantpsy.org/interact/mlr2.htm

Putnam, F. W., Helmers, K., Horowitz, L. A., & Trickett, P. K. (1995). Hypnotizability and dissociativity in sexually abused girls. *Child Abuse & Neglect*, *19*(5), 645–655. https://doi.org/10.1016/0145-2134(95)00022-Z

Rao, U., Hammen, C., Ortiz, L. R., Chen, L.-A., & Poland, R. E. (2008). Effects of early and recent adverse experiences on adrenal response to psychosocial stress in depressed adolescents. *Biological Psychiatry*, *64*(6), 521–526. https://doi.org/10.1016/j.biopsych.2008.05.012

Savage, C. R., Deckersbach, T., Heckers, S., Wagner, A. D., Schacter, D. L., Alpert, N. M., … Rauch, S. L. (2001). Prefrontal regions supporting spontaneous and directed application of verbal learning strategies: Evidence from PET. *Brain*, *124*(1), 219–231. https://doi.org/10.1093/brain/124.1.219

Schechter, D. S., Coots, T., Zeanah, C. H., Davies, M., Coates, S. W., Trabka, K. A., … Myers, M. M. (2005). Maternal mental representations of the child in an inner-city clinical sample: Violence-related posttraumatic stress and reflective functioning. *Attachment & Human Development*, *7*(3), 313–331. https://doi.org/10.1080/14616730500246011

Scher, C. D., Stein, M. B., Asmundson, G. J. G., McCreary, D. R., & Forde, D. R. (2001). The childhood trauma questionnaire in a community sample: Psychometric properties and normative data. *Journal of Traumatic Stress*, *14*(4), 843–857. https://doi.org/10.1023/A:1013058625719

Schore, A. (2003a). *Affect dysregulation and disorders of the self*. New York: Norton.

Schore, A. (2003b). Early relational trauma, disorganized attachment, and the development of a predisposition to violence. In *Healing trauma: Mind, body, and brain* (pp. 107–167). New York, NY: W. W. Norton & Company.

Schore, A. N. (1994). *Affect regulation and the origin of the self: the neurobiology of emotional development*. Hillsdale, N.J: L. Erlbaum Associates.

Schuengel, C., Bakermans-Kranenburg, M. J., & Van IJzendoorn, M. H. (1999). Frightening maternal behavior linking unresolved loss and disorganized infant attachment. *Journal of Consulting and Clinical Psychology*, *67*(1), 54–63. https://doi.org/10.1037/0022-006X.67.1.54

Schuetze, P., & Eiden, R. D. (2005). The relationship between sexual abuse during childhood and parenting outcomes: Modeling direct and indirect pathways. *Child Abuse & Neglect*, *29*(6), 645–659. https://doi.org/10.1016/j.chiabu.2004.11.004

Seedat, S., Stein, M. B., Kennedy, C. M., & Hauger, R. L. (2003). Plasma cortisol and neuropeptide Y in female victims of intimate partner violence. *Psychoneuroendocrinology*, *28*(6), 796–808. https://doi.org/10.1016/S0306-4530(02)00086-0

Seng, J. S., Sperlich, M., Low, L. K., Ronis, D. L., Muzik, M., & Liberzon, I. (2013). Childhood abuse history, posttraumatic stress disorder, postpartum mental health, and bonding: A prospective cohort study. *Journal of Midwifery & Women's Health*, *58*(1), 57–68. https://doi.org/10.1111/j.1542-2011.2012.00237.x

Sexton, M. B., Hamilton, L., McGinnis, E. W., Rosenblum, K. L., & Muzik, M. (2015). The roles of resilience and childhood trauma history: Main and moderating effects on postpartum maternal mental health and functioning. *Journal of Affective Disorders*, *174*, 562–568. https://doi.org/10.1016/j.jad.2014.12.036

Shields, A., Ryan, R. M., & Cicchetti, D. (2001). Narrative representations of caregivers and emotion dysregulation as predictors of maltreated children's rejection by peers. *Developmental Psychology*, *37*(3), 321–337. https://doi.org/10.1037//0012-1649.37.3.321

Shipman, K., Zeman, J., Penza, S., & Champion, K. (2000). Emotion management skills in sexually maltreated and nonmaltreated girls: A developmental psychopathology perspective. *Development and Psychopathology*, *12*(1), 47–62. https://doi.org/10.1017/S0954579400001036

Shirtcliff, E. A., Vitacco, M. J., Graf, A. R., Gostisha, A. J., Merz, J. L., & Zahn-Waxler, C. (2009). Neurobiology of empathy and callousness: Implications for the development of antisocial behavior. *Behavioral Sciences & the Law*, *27*(2), 137–171. https://doi.org/10.1002/bsl.862

Siegel, D. (2012). *The developing mind: how relationships and the brain interact to shape who we are* (2nd ed.). New York, NY: The Guilford Press.

Siegel, D. J. (2007). *The mindful brain: reflection and attunement in the cultivation of well-being*. New York: W.W. Norton.

Siegel, D.J., & Hartzell, M. (2014). *Parenting from the inside out: How a deeper self-understanding can help you raise children who thrive* (10th Anniversary ed.). New York: TarcherPerigee.

Simeon, D., Guralnik, O., Knutelska, M., Hollander, E., & Schmeideler, J. (2001). Hypothalamic-pituitary-adrenal axis dysregulation in depersonalization disorder. *Neuropsychopharmacology*, *25*(5), 793–795. https://doi.org/10.1016/S0893-133X(01)00288-3

Siu, A. F. Y., Ma, Y., & Chui, F. W. Y. (2016). Maternal mindfulness and child social behavior: The mediating role of the mother-child relationship. *Mindfulness*, *7*(3), 577–583. https://doi.org/10.1007/s12671-016-0491-2

Skowron, E. A., Cipriano-Essel, E., Gatzke-Kopp, L. M., Teti, D. M., & Ammerman, R. T. (2014). Early adversity, RSA, and inhibitory control: Evidence of children's neurobiological sensitivity to social context. *Developmental Psychobiology*, *56*(5), 964–978. https://doi.org/10.1002/dev.21175

Slattery, M. J., Grieve, A. J., Ames, M. E., Armstrong, J. M., & Essex, M. J. (2013). Neurocognitive function and state cognitive stress appraisal predict cortisol reactivity to an acute psychosocial stressor in adolescents. *Psychoneuroendocrinology*, *38*(8), 1318–1327. https://doi.org/10.1016/j.psyneuen.2012.11.017

Smith, J. D., Woodhouse, S. S., Clark, C. A. C., & Skowron, E. A. (2016). Attachment status and mother–preschooler parasympathetic response to the strange situation procedure. *Biological Psychology*, *114*, 39–48. https://doi.org/10.1016/j.biopsycho.2015.12.008

Solomon, J., & George, C. (1999). The caregiving system in mothers of infants: a comparison of divorcing and married mothers. *Attachment & Human Development*, *1*(2), 171–190. https://doi.org/10.1080/14616739900134221

Solomon, J., George, C., & De Jong, A. (1995). Children classified as controlling at age six: Evidence of disorganized representational strategies and aggression at home and at school. *Development and Psychopathology*, *7*(03), 447. https://doi.org/10.1017/S0954579400006623

Spann, M. N., Mayes, L. C., Kalmar, J. H., Guiney, J., Womer, F. Y., Pittman, B., … Blumberg, H. P. (2012). Childhood abuse and neglect and cognitive flexibility in adolescents. *Child Neuropsychology*, *18*(2), 182–189. https://doi.org/10.1080/09297049.2011.595400

Spieker, S. J., Bensley, L., McMahon, R. J., Fung, H., & Ossiander, E. (1996). Sexual abuse as a factor in child maltreatment by adolescent mothers of preschool aged children. *Development and Psychopathology*, *8*(03), 497. https://doi.org/10.1017/S0954579400007239

Stein, A., Lehtonen, A., Harvey, A. G., Nicol-Harper, R., & Craske, M. (2009). The influence of postnatal psychiatric disorder on child development. *Psychopathology*, *42*(1), 11–21. https://doi.org/10.1159/000173699

Stein, D. J., Koenen, K. C., Friedman, M. J., Hill, E., McLaughlin, K. A., Petukhova, M., … Kessler, R. C. (2013). Dissociation in posttraumatic stress disorder: Evidence from the World Mental Health surveys. *Biological Psychiatry*, *73*(4), 302–312. https://doi.org/10.1016/j.biopsych.2012.08.022

Steuwe, C., Lanius, R. A., & Frewen, P. A. (2012). Evidence for a dissociative subtype of PTSD by latent profile and confirmatory factor analyses in a civilian sample. *Depression and Anxiety*, *29*(8), 689–700. https://doi.org/10.1002/da.21944

Stevens, J. S., Jovanovic, T., Fani, N., Ely, T. D., Glover, E. M., Bradley, B., & Ressler, K. J. (2013). Disrupted amygdala-prefrontal functional connectivity in civilian women with posttraumatic stress disorder. *Journal of Psychiatric Research*, *47*(10), 1469–1478. https://doi.org/10.1016/j.jpsychires.2013.05.031

Stormshak, E. A., Bierman, K. L., McMahon, R. J., & Lengua, L. J. (2000). Parenting practices and child disruptive behavior problems in early elementary school. *Journal of Clinical Child Psychology*, *29*(1), 17–29. https://doi.org/10.1207/S15374424jccp2901_3

Tarullo, A. R., & Gunnar, M. R. (2006). Child maltreatment and the developing HPA axis. *Hormones and Behavior*, *50*(4), 632–639. https://doi.org/10.1016/j.yhbeh.2006.06.010

Tees, M. T., Harville, E. W., Xiong, X., Buekens, P., Pridjian, G., & Elkind-Hirsch, K. (2010). Hurricane Katrina-related maternal stress, maternal mental health, and early infant temperament. *Maternal and Child Health Journal*, *14*(4), 511–518. https://doi.org/10.1007/s10995-009-0486-x

Teicher, M. H. (2002). Scars that won't heal: the neurobiology of child abuse. *Scientific American*, *286*(3), 68–75.

Teicher, M. H., Dumont, N. L., Ito, Y., Vaituzis, C., Giedd, J. N., & Andersen, S. L. (2004). Childhood neglect is associated with reduced corpus callosum area. *Biological Psychiatry*, *56*(2), 80–85. https://doi.org/10.1016/j.biopsych.2004.03.016

Thomaes, K., Dorrepaal, E., Draijer, N., de Ruiter, M. B., van Balkom, A. J., Smit, J. H., & Veltman, D. J. (2010). Reduced anterior cingulate and orbitofrontal volumes in child abuse–related complex PTSD. *The Journal of Clinical Psychiatry*, *71*(12), 1636–1644. https://doi.org/10.4088/JCP.08m04754blu

Thompson, R. A. (2008). Early attachment and later development: Familiar questions, new answers. In J. Cassidy and P. R. Shaver (Eds.) *Handbook of attachment: Theory, research, and clinical applications* (2nd ed., pp. 348–365). New York, NY: The Guilford Press.

Tomoda, A., Suzuki, H., Rabi, K., Sheu, Y.-S., Polcari, A., & Teicher, M. H. (2009). Reduced prefrontal cortical gray matter volume in young adults exposed to harsh corporal punishment. *NeuroImage*, *47*, T66–T71. https://doi.org/10.1016/j.neuroimage.2009.03.005

Tottenham, N., & Sheridan, M. A. (2009). A review of adversity, the amygdala and the hippocampus: a consideration of developmental timing. *Frontiers in Human Neuroscience*. https://doi.org/10.3389/neuro.09.068.2009

Trickett, P. K., Noll, J. G., & Putnam, F. W. (2011). The impact of sexual abuse on female development: Lessons from a multigenerational, longitudinal research study. *Development and Psychopathology*, *23*(02), 453–476. https://doi.org/10.1017/S0954579411000174

Trickett, P. K., Noll, J. G., Susman, E. J., Shenk, C. E., & Putnam, F. W. (2010). Attenuation of cortisol across development for victims of sexual abuse. *Development and Psychopathology*, *22*(01), 165. https://doi.org/10.1017/S0954579409990332

U.S. Department of Health and Human Services, Administration for Children, Youth, and Families, Children's Bureau. (2017). *Child Maltreatment 2015*. Retrieved from http://www.acf.hhs.gov/programs/cb/research-data-technology/statistics-research/child maltreatment

Valdez, C. E., Sherrill, A. M., & Lilly, M. (2016). Present moment contact and nonjudgment: pilot data on dismantling mindful awareness in trauma-related symptomatology. *Journal of Psychopathology and Behavioral Assessment*, *38*(4), 572–581. https://doi.org/10.1007/s10862-016-9548-8

van der Oord, S., Bögels, S. M., & Peijnenburg, D. (2012). The Effectiveness of Mindfulness Training for Children with ADHD and Mindful Parenting for their Parents. *Journal of Child and Family Studies*, *21*(1), 139–147. https://doi.org/10.1007/s10826-011-9457-0

van Harmelen, A.-L., van Tol, M.-J., Dalgleish, T., van der Wee, N. J. A., Veltman, D. J., Aleman, A., … Elzinga, B. M. (2014). Hypoactive medial prefrontal cortex functioning in adults reporting childhood emotional maltreatment. *Social Cognitive and Affective Neuroscience*, *9*(12), 2026–2033. https://doi.org/10.1093/scan/nsu008

Van Ijzendoorn, M. H., Schuengel, C., & Bakermans–Kranenburg, M. J. (1999). Disorganized attachment in early childhood: Meta-analysis of precursors, concomitants, and sequelae. *Development and Psychopathology*, *null*(02), 225–250. https://doi.org/null

Voellmin, A., Winzeler, K., Hug, E., Wilhelm, F. H., Schaefer, V., Gaab, J., … Bader, K. (2015). Blunted endocrine and cardiovascular reactivity in young healthy women reporting a history of childhood adversity. *Psychoneuroendocrinology*, *51*, 58–67. https://doi.org/10.1016/j.psyneuen.2014.09.008

Vogel, D. L., & Wei, M. (2005). Adult attachment and help-seeking intent: The mediating roles of psychological distress and perceived social support. *Journal of Counseling Psychology*, *52*(3), 347–357. https://doi.org/10.1037/0022-0167.52.3.347

Walsh, J. J., Balint, M. G., Smolira SJ, D. R., Fredericksen, L. K., & Madsen, S. (2009). Predicting individual differences in mindfulness: The role of trait anxiety, attachment anxiety and attentional control. *Personality and Individual Differences*, *46*(2), 94–99. https://doi.org/10.1016/j.paid.2008.09.008

Waters, S. F., West, T. V., & Mendes, W. B. (2014). Stress contagion: Physiological covariation between mothers and infants. *Psychological Science*, *25*(4), 934–942. https://doi.org/10.1177/0956797613518352

Weinfield, N. S., Sroufe, A. L., Egeland, B., & Carlson, E. (2008). Individual differences in infant-caregiver attachment: Conceptual and empirical aspects of security. In J. Cassidy and P. R. Shaver (Eds.) *Handbook of attachment: Theory, research, and clinical applications* (2nd ed., pp. 78–101). New York, NY: The Guilford Press.

Wendelken, C., & Bunge, S. A. (2010). Transitive inference: Distinct contributions of rostrolateral prefrontal cortex and the hippocampus. *Journal of Cognitive Neuroscience*, *22*(5), 837–847. https://doi.org/10.1162/jocn.2009.21226

Westerink, J., & Giarratano, L. (1999). The impact of posttraumatic stress disorder on partners and children of Australian Vietnam veterans. *Australian & New Zealand Journal of Psychiatry*, *33*(6), 841–847. https://doi.org/10.1046/j.1440-1614.1999.00638.x

Whitaker, R. C., Dearth-Wesley, T., Gooze, R. A., Becker, B. D., Gallagher, K. C., & McEwen, B. S. (2014). Adverse childhood experiences, dispositional mindfulness, and adult health. *Preventive Medicine*, *67*, 147–153. https://doi.org/10.1016/j.ypmed.2014.07.029

Wilson, C., & White, C. (2006). A preliminary investigation of the effect of intervention on parental attributions and reported behaviour. *Behavioural and Cognitive Psychotherapy*, *34*(04), 503. https://doi.org/10.1017/S1352465806003043

Yehuda, R., Daskalakis, N. P., Desarnaud, F., Makotkine, I., Lehrner, A. L., Koch, E., … Bierer, L. M. (2013). Epigenetic biomarkers as predictors and correlates of symptom improvement following psychotherapy in combat veterans with PTSD. *Frontiers in Psychiatry*, *4*. https://doi.org/10.3389/fpsyt.2013.00118

Zalewski, M., Cyranowski, J. M., Cheng, Y., & Swartz, H. A. (2013). Role of maternal childhood trauma on parenting among depressed mothers of psychiatrically ill children. *Depression and Anxiety*, *30*(9), 792–799. https://doi.org/10.1002/da.22116

Zalewski, M., Lengua, L. J., Kiff, C. J., & Fisher, P. A. (2012). Understanding the relation of low income to HPA-axis functioning in preschool children: Cumulative family risk and parenting as pathways to disruptions in cortisol. *Child Psychiatry & Human Development*, *43*(6), 924–942. https://doi.org/10.1007/s10578-012-0304-3

Zelenko, M., Kraemer, H., Huffman, L., Gschwendt, M., Pageler, N., & Steiner, H. (2005). Heart rate correlates of attachment status in young mothers and their infants. *Journal of the American Academy of Child & Adolescent Psychiatry*, *44*(5), 470–476. https://doi.org/10.1097/01.chi.0000157325.10232.b1

Zemestani, M., & Ottaviani, C. (2016). Effectiveness of mindfulness-based relapse prevention for co-occurring substance use and depression disorders. *Mindfulness*. https://doi.org/10.1007/s12671-016-0576-y

Zerach, G., Kanat-Maymon, Y., Aloni, R., & Solomon, Z. (2016). The role of fathers' psychopathology in the intergenerational transmission of captivity trauma: A twenty three-year longitudinal study. *Journal of Affective Disorders*, *190*, 84–92. https://doi.org/10.1016/j.jad.2015.09.072