

The Relation Between Adolescent Mothers' Trauma, Emotional Availability,
and Children's Emotion Regulation

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Abstract

Given the literature on the impact of trauma on Emotional Availability (EA) in mothers, and research on the effects of parental practices on children's emotional regulation, this study aimed to examine: 1) the relation between maternal trauma, EA, and children's emotion regulation (ER); 2) the predictive quality of emotional availability (EA) in adolescent mothers, specifically as a predictor of their children's emotion regulation outcomes; 3) the role EA plays in *moderating* the relation between maternal trauma and children's emotional regulation and; 4) the role social support programs play in moderating this relation. The study emphasized the acute vulnerability of adolescent mothers exposed to various contextual risk factors affecting their children and their own development. The findings highlight the consistency of EA as a predictor of ER, and that the EA construct might display a curvilinear curve, where both "too little" and "too much" EA constitute a potentially harmful effect on the child's ability to emotionally regulate. Additionally, the findings show that EA construct scores are consistently lower on freeplay tasks than on teaching tasks, suggesting that low EA scores may be an artifact arising out of unstructured play activities in this population. Clinical observations indicate that play might be particularly triggering to mothers with trauma, and research on cross-cultural play indicates that there are various cultural differences with diverging norms and standards for play. The findings underscore the importance of trauma-informed, culturally sensitive home-visiting programs with flexible strength-based models that accommodate children and families from all kinds of contexts.

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“I am what time, circumstance, history, have made of me, certainly, but I am also so much more than that. So are we all.”

— James Baldwin

“The talented adult is the child who survived.”

— Ursula K. Le Guin

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Introduction

Early experiences of trauma, including direct trauma such as physical, emotional, sexual, and verbal abuse, and indirect trauma such as unexpected or violent events such as death or accident, have been documented to have long-lasting impacts in adulthood (The American Psychiatric Association, 2013). These traumatic experiences can materialize in a number of psychological outcomes including higher rates of depression, diagnoses of PTSD, and other internalizing and externalizing behavioral problems (Ammerman, Chard, Ginkel, Putnam & Stevens, 2011). Individuals' experiences of childhood trauma can also affect other people they interact with. For example, mothers who have experienced emotional abuse in their childhood experience disruptions in parenting patterns, and are less likely to be responsive to their children's emotional needs (Fuchs, Mohler, Resch, & Kaess 2015). This phenomenon is well documented through the extant literature on intergenerational transmission of trauma, where parents who have been exposed to traumatic experiences are more likely to neglect, maltreat, or abuse their children (Bert, Guner, & Lanzi, 2009; DiLillo & Damashek, 2003; Ruscio 2001). Unequivocally, childhood trauma, specifically childhood maltreatment, and childhood sexual abuse (CSA) have been linked to disrupted parenting patterns in adult and adolescent mothers (DiLillo & Damashek, 2003; Lang, Gartstein, Rodgers, & Lebeck, 2010; Noll, Trickett, Harris, & Putnam, 2008).

Although the literature establishes a strong positive correlation between childhood trauma and disruptions in parental practices, the research has not delineated specific mechanisms that increase children's likelihood of

experiencing emotional disruptions when their parents have been traumatized. One of the most salient links between trauma and parenting practices relates to the construct of emotional availability (EA). The emotional availability construct refers to the relation between the mother and child, and more specifically, the dyad's ability to share and enjoy an emotional connection, co-regulate emotions, and experience a mutually fulfilling and health relationship (Biringen & Easterbrooks 2012). The construct has its history and early origins in the early attachment literature posited by John Bowlby and Mary Ainsworth (1982), both of whom studied the role of maternal sensitivity in mother-child interactions. However, Mahler, Pine, and Bergman (1975) first used the term EA to describe a mother's ability to display a supportive attitude in the context of her infant or toddler's explorations when she is not present. They determined that healthy mother-child relationships allowed for child autonomy while recognizing the importance of response physical contact and "emotional refueling". Other theorists expanded the EA definition to include not only physical contact but also emotional "signaling and receiving" (Emde, 1980; Sorce & Emde, 1981). In this sense, the EA in a caregiver-child relationship also encompasses the adult's ability to display a "receptive presence," a type of presence that is best likened to the ways in which a friend, relative, or therapist is available to support an individual. Emde and Easterbrooks (1985) established EA as an affective barometer for the relationship between a caregiver and a young child, emphasizing attunement to a range of emotions with diverging valences. All in all, EA refers to a caregiver's responsiveness, sensitivity, and attunement to the child's needs, regardless of the valence of the emotion expressed (both negative and

positive). For instance, when a child expresses negative emotions by crying, she signals to the caregiver that something about her environment needs to be changed. Alternatively, when a child is smiling to her caregiver, she is signaling that she is enjoying her environment and wanting the current conditions to be maintained. A caregiver's "attuned" response to the child's expressions of emotion constitutes the construct of emotional availability.

Studies have shown that mothers who have experienced complex trauma are more likely to be intrusive when interacting with their children, less responsive and less attuned to their child's emotional needs, and more likely to display controlling parenting behaviors (Fuchs et al., 2015; Moehler, Biringen, & Poustka 2007; Schechter et al., 2014). In return, another host of studies have shown that parents' lower emotional responsiveness is positively correlated with disrupted emotional regulation patterns in their children (Schechter et al., 2014). Furthermore, children's disrupted emotional regulation can materialize into maladaptive behaviors, internalizing and externalizing disorders, low academic achievement, and delinquent behavior. These factors increase the overall risk of trauma for the child (Aldao, Nolen-Hoeksema, & Schweizer, 2010; Bosquet et al., 2011; Chang, Schwartz, Dodge, & McBride-Chang, 2003; Graziano, Reavis, Keane, & Calkins, 2007; Morris, Silk, Steinberg, Myers, & Robinson, 2007).

While there is research studying the impact of trauma on EA in mothers, and research on the effects of parental practices on children's emotional regulation, there are no studies examining how EA *moderates* the relation between maternal trauma and children's poor emotional regulation. Thus, studying the specific relation between EA and children's emotional

regulation can highlight a protective factor (high emotional availability) moderating the relation between maternal trauma and children's emotion regulation. Understanding this mechanism can provide the evidence for specific, sensitive intervention programs that target emotional availability and its impact on the emotional regulation of the child.

Literature Review

The Impact of Trauma on Parenting Practices

The American Psychiatric Association defines trauma as an event “that involves actual or threatened death or serious injury, or threat to one's physical integrity; or witnessing an event that involves death, injury, or a threat to the physical integrity of another person; or learning about the unexpected or violent death, serious harm, or threat of death or injury experienced by a family member or other close associate” (The American Psychiatric Association, 2013). Traumatic events can be both direct – experienced in military combat or terrorist attacks, or through physical, sexual, and emotional abuse – or indirect such as witnessing physical assault, domestic violence, acts of terrorism, or learning about an event such as the violent death of a loved one. Childhood trauma, including child abuse and maltreatment, has been linked to disrupted parenting patterns in adult and adolescent mothers (DiLillo & Damashek, 2003; Lang et al., 2010; Noll et al., 2008).

DiLillo and Damshek (2003) conducted a comprehensive review of studies examining the effects of childhood sexual abuse on maternal parenting patterns. Specifically, the review considered various aspects of parenting including parenting skills and behaviors, general attitudes towards parenting, and parental violence towards children (DiLillo & Damashek, 2003). The

review found that mothers who experienced childhood sexual abuse were more permissive in their parenting and tended to avoid assertions of authority. One hypothesis accounted for this behavior by suggesting that mothers who experienced sexual abuse avoided exertion of authority due to their own traumatic experiences with adult power (Ruscio, 2001). The second hypothesis posited that mothers who are more emotionally burdened by trauma might have less emotional energy and thus has difficulty focusing on their children due to the residual effects of abuse (Ruscio, 2001). The overall findings of the review suggest that childhood sexual abuse (CSA) survivors experience general difficulties with parenting. These difficulties include being more permissive in parenting and resorting to harsh physical discipline more frequently compared to parents who are not CSA survivors. However, the authors concluded that although an association has been established between CSA and parenting difficulties, none of the studies reviewed provided any causal inferences, accounted for the particular pathways connecting CSA with parenting behaviors, or sought to delineate any single aspect of parental functioning amongst this population.

Furthermore, in addition to CSA, adolescent mothers are also exposed to emotional abuse, interpersonal partner violence (IPV), community violence, witnessing violence against family members, and the loss of a loved one. These traumatic experiences have been shown to negatively impact maternal behaviors, including decreasing maternal responsiveness and decreasing the sense of parental control (Bert et al., 2009). Bert et al. (2009) assessed the effects of childhood trauma in a sample of 681 adolescent and adult first-time mothers ranging in age from 14 to 36 years. The authors collected data on a

number of measures including History of Abuse using the Childhood Trauma Questionnaire, parenting knowledge (knowledge on infant development), and parenting behavior, defined as parental abuse potential and measured using the Child Abuse Potential Inventory (CAPI: Milner, 1986). The study found that exposure to childhood emotional and physical abuse was positively correlated with adverse parenting behaviors, but was not correlated at all with parenting knowledge. For the total sample of mothers, as past exposure to emotional and physical abuse increased, maternal responsiveness decreased and abusive behavior towards the child increased.

Importantly, Bert et al. (2009) asserted that there is no clear evidence regarding the mechanisms involved in the relation between maternal trauma and children's emotion disruptions. However, they hypothesized that mothers who have been abused have a lower "reaction threshold" to their children. In other words, mothers who have been abused may react with greater sensitivity to their children's misbehavior, which in turn leads to the use of harsher discipline methods. While this hypothesis explains why parents who have been abused are more likely to physically abuse their children, the low "reaction threshold" hypothesis does not conceptually explain why parents who have been abused are also more likely to be neglectful, withdrawn, and emotionally abusive towards their children (Bert et al., 2009). However, the findings from this study are important because they support the claim that exposure to multiple traumatic experiences (with a specific emphasis on physical and emotional abuse) impacts future parenting behaviors for teen moms (Bert et al., 2009).

Similarly, Schwerdtfeger & Goff (2007) conducted a study evaluating the relation between the trauma of 41 expectant mothers and the development of their bonding with their children once they were born. Their findings indicated that a history of interpersonal trauma had a negative effect on prenatal attachment. Consequently, Schwerdtfeger, Larzelere, Werner, Peters, & Oliver (2013) explored parenting styles, and conducted a study examining the parenting styles of parents with a history of interpersonal trauma. These findings suggested that in a sample of 105 mothers of toddlers, mothers who had experienced interpersonal trauma were more likely to have an authoritarian parenting style. Verbal hostility, specifically, predicted more prevalent toddler symptoms associated with oppositional defiant disorders and other affective disorders as well.

All in all, the findings on the relations between trauma and parental practices indicate that complex, childhood trauma is positively associated with adverse parenting practices in adulthood (Lesser & Koniak-Griffin, 2000; Mitchell et al., 2009). However, the literature does not include causal inferences explaining how trauma-related disruptions in parental practices lead to an increase in children's likelihood of experiencing trauma as well.

The Impact of Trauma on Emotional Availability and Parent-Child Interactions

In addition to being related to adverse parenting, childhood trauma is also associated with specific psychological outcomes, such as depression and low emotional availability (EA) in adulthood (Ammernman et al., 2011; Banyard, Williams, & Siegel, 2003; Lesser & Koniak-Griffin, 2000). Studies have suggested that EA is one of the psychological functions that mediate the

relation between maternal trauma and the risk of trauma for the child. In one study of the relations between adolescent mothers' PTSD symptoms and EA during mother-child play, mothers with high PTSD numbing symptoms were less sensitive and less attuned (EA constructs) to their child during the free play task (Miranda-Julian, 2013). Additionally, mothers who met the DSM-IV criteria for PTSD were also more hostile towards their child, and displayed both covert and overt aggressive behaviors during free play tasks, even when controlling for depression. These findings suggest that the effects of PTSD may be mediated through a lack of EA in adolescent mothers.

Similarly, Moehler et al. (2007) also studied the relation between maternal childhood trauma and the construct of EA. They included mothers who met a severe cutoff on the Childhood Trauma Questionnaire, asking them to complete an Emotional Availability questionnaire that assessed sensitivity, nonintrusiveness, and nonhostility. The study found that mothers who experienced childhood abuse reported significantly more intrusive behavior when interacting with their five-month olds during free play activities. Contrastingly, Schechter et al. (2014) showed that mothers exposed to interpersonal violence who had a history of depression and PTSD were less likely to participate in mutual emotion regulation – or adequate responses to their child's emotional responses – during their children's first years of life. The study also found that PTSD related to intimate partner violence (IPV-PTSD) severity, difficulty in identifying emotions, and lower socio-economic status were all associated with less maternal sensitivity, and “with more maternal controlling and unresponsive behavior on the CARE-Index” (Schechter et al., 2014). These findings suggest that psychological functions

such as EA may interact differentially with external factors, such as socio-economic status, social support systems, and developmental periods.

To assess how EA interacts with a specific external factor (developmental period), Fuchs et al. (2015) studied the relation between the impact of a maternal history of trauma and abuse on the mother-infant interaction in both infancy and early toddlerhood. They assessed EA by observing mother-infant interactions over an 18-month period. Women reporting severe sexual or physical abuse were assigned to the maltreatment group and investigated under conditions when the children were 5 months and 18 months of age using the Emotional Availability Scales. In the 5-month conditions, there were few differences in EA between mothers in the maltreatment group and mothers in the control group. However, EA differed significantly in mothers in the maltreatment group from the control group at 18 months, due specifically to the lack of an increase in EA observed in the maltreatment group. Exploratory analyses showed an additional effect of emotional abuse on EA at 18 months. These data indicate that specific periods of development may be more sensitive than others for mothers with a history of abuse. These findings highlight the importance of utilizing a developmental framework when assessing the effect of maternal abuse on mother-child interactions, with interactions during different developmental periods having distinct impacts on the child.

In conclusion, the literature on the effect of EA on the mother-dyad interactions suggests that a history of trauma affects mothers' EA and mother-child relations. It also importantly discerns that the impact of the psychological outcome of EA differs depending on external factors including

socioeconomic background, social support, and the specific period of child development. Thus, it is important to study EA as a moderator of maternal trauma and its relation to the child's increased risk of emotion dysregulation.

The Impact of Trauma-Related Disruptions in Mothers' EA on Children's Ability to Regulate Emotions

Studies have evaluated the relations between maternal trauma and infant emotional reactivity and emotion regulation (Aldao et al., 2010; Cassidy, 1994; Chang et al., 2003; Hastings et al., 2008; Maughan & Cicchetti, 2002; Morris et al., 2007). Bosquet et al. (2011) studied the relation between trauma and emotional regulation in children during the first year of life in a primarily low-income, urban, ethnic/racial minority sample of 52 mother-infant dyads. The study utilized the Still-Face paradigm (SFP-R), a commonly used measure in assessing a dyad's relationship. Importantly, the mother's history of trauma and PTSD diagnosis predicted the infant's emotional regulation at 6 months as assessed by the infant's ability to recover from arousal or distress. Maternal PTSD symptoms also predicted maternal report of infant externalizing, internalizing, and emotional deregulation symptoms at 13 months. These findings suggest that negative poor emotion regulation might also increase the risk of mental health problems among children of mothers with PTSD.

Similarly, Shipman et al. (2007) found that mothers who themselves had been maltreated during their childhood engage in less emotional validation and emotional coaching with regards to their children. They also found that compared to families with no history of child maltreatment, children from families where parents reported childhood trauma demonstrate

fewer adaptive regulation skills and more emotion deregulation. These findings highlight the importance of studying specific variables affecting children's emotional regulation, including parental context and practices. In addition, Morris et al. (2007) systematically reviewed the various variables that affect children's emotional regulation. They posited that children's emotional regulation develops according to a Tripartite Model, which includes observation (observational learning, modeling and social referencing), parenting practices (such as emotional coaching and emotional availability to one's child), and the overall emotional climate of the family. Interestingly, the review identified that, compared to other factors affecting emotional regulation development, parents who were committed to parenting practices related to EA affected their children's emotional regulation more than parents who were not. Specifically, parents affected their children's emotional regulation by responding to their children's positive or negative reactions (Eisenberg, Cumberland, & Spinrad, 1998), encouraging their children to openly display their emotions, and teaching their children about emotional control strategies (Morris et al., 2007).

The findings from this literature review suggest that the EA construct may have a distinct impact on children's ability to emotionally regulate, serving as a protective factor against the impacts of parental trauma. Thus, studying the relation between maternal trauma, EA and children's emotional regulation outcome may provide important insights on a potential protective factor against the impact of trauma

All in all, the research cited demonstrates a relation between traumatic experiences in adolescent mothers and their emotional availability to care for,

interact with, and “parent” the child. Additionally, absence of adequate EA in adolescent mothers affects the parenting behaviors of the mothers, and ultimately their interaction with the child. The literature on mother-child interactions indicates that adverse parenting practices can lead to a number of negative developmental outcomes including poor emotional regulation, maladaptive behaviors and internalizing and externalizing disorders. One limitation of the literature on children’s emotion regulation is that it relies exclusively on maternal reports of both trauma history and children’s functioning. The studies cited in this review do not include independent measures of emotion regulation, indicating a potential methodological limitation of the research design. Additionally, there is not much written about the pathways underlying disrupted emotion regulation in children, and the ways in which caregiver’s history of trauma and EA contributes to these outcomes.

Factors Affecting Parenting in Adolescent Mothers as a Vulnerable Population

Factors that impact psychological functioning and parenting among adolescent mothers with history of trauma include childhood histories of maltreatment and exposure to intimate partner violence (IPV), which have both been linked to maladaptive parenting among both adult and adolescent mothers (DiLillo & Damashek, 2003; Lang, Gartstein, Rodgers, & Lebeck, 2010; Noll, Trickett, Harris, & Putnam, 2008). Compared to adult mothers, studies on rates of trauma exposure among adolescent mothers vary greatly. The literature points to both a wide range and intensity of traumatic experiences among adolescent mothers, rendering them a more vulnerable

population that must be supported in ways different than adult mothers. The type of traumatic experiences adolescent mothers are exposed to include physical, sexual, and emotional abuse, neglect, witnessing interpersonal violence and IPV, direct experience of IPV, sexual assault and rape, and witnessing community level violence.

With regards to exposure to the aforementioned traumatic experiences, studies including both adolescents and nulliparous adolescents have found trauma exposure rates ranging from 2% to 94% (Adams & East, 1999; Herrenkohl, Herrenkohl, Egolf, & Russo, 1998; Lansford et al., 2007, Milan, Ickovics, Kershaw, Lewis, Meade, & Ethier, 2004). Studies have also found differences in the impacts of trauma exposure between nulliparous adolescents and pregnant/parenting adolescents. For instance, Lansford et al. (2007) reported that abused youth were more likely to report being a parent, being pregnant, or impregnating someone, when compared to non-abused youth. Additionally, there were gender differences in the likelihood of pregnancy among youth who have been physically abused. Abused adolescent females were more likely to report being pregnant than males were to impregnate someone. In another study of traumatized youth, Herrenkohl, Herrenkohl, Egolf, and Russo (1998) found that almost all parenting adolescents in the study reported experiencing childhood maltreatment, and that the incidence of maltreatment was 5 times more likely than not being maltreated among adolescent parents. Furthermore, studies that focused on adolescent mothers as opposed to adult mothers found that exposure to various types of traumatic experiences within a given sample of this population (adolescent mothers) varies from 9% to 98% (Adams & East, 1999; Herrenkohl, Herrenkohl, Egolf,

& Russo, 1998; Lansford et al., 2007, Milan, Ickovics, Kershaw, Lewis, Meade, & Ethier, 2004). This wide range can be accounted for through multiple factors, such as the ways in which studies define the scope of trauma, and the varying demographics of the sample population (homeless individuals, minority groups, and members of lower socioeconomic status). A significant number of the studies on adolescent parents specifically reported that half or more of the participants report experiencing traumatic events in their lifetime (Bert, Guner, & Lanzi, 2009; Browne & Bassuk, 1997; Rickert, Wiemann, Harrykisson, Berenson, & Kolb, 2002). In the current study, more than two thirds of adolescent mothers endorse having experienced at least one traumatic event in their lifetime. These numbers are significant, indicating that trauma is very common amongst adolescent mothers compared to adult parents. Even further, longitudinal studies of participants from childhood to adolescence indicated that youth who become pregnant during teenage years were more likely to report a history of trauma exposure than youth who did not become pregnant (Herrenkohl, Herrenkohl, Egolf, & Russo, 1998; Lansford et al., 2007). These findings suggest childhood abuse, maltreatment, and trauma may put some adolescents at greater risk of engaging in risky behaviors resulting in early teen pregnancies. All in all, the presence of high rates of trauma and maltreatment exposure amongst pregnant/parenting adolescents, especially females, makes them a highly vulnerable population that must be studied independently of parenting adults.

Social Support Programs' Theory of Change

Home visiting is a commonly used mode of providing services to parents of young children and other vulnerable families. Most home visiting

programs in the United States are based around a model of social support (which could be instrumental, informational, and emotional) to participants. Specifically, home visiting programs attempt to reduce the risk of child abuse and maltreatment by offering in-home services and visitors to vulnerable families. Home visitors assist parents by providing parenting education, child health education, referral to resources, and overall social support (Donelan-McCall, Eckenrode, & Olds, 2009; Galano & Schellenbach, 2007; Howard & Brooks-Gunn, 2009).

The HFM home visiting program is a statewide variant of the Healthy Families America for first time parents under the age of 20. The program is comprehensive, and emphasizes child abuse prevention, early childhood health and development, adult educational attainment, prevention of repeat teen pregnancies, and promotion of healthy parents and families as its main objectives (Easterbrooks et al., 2016).

In order to achieve these goals, HFM's home visiting logic model centers home visitors as the primary source of support for teen mothers. Home visitors are able to elicit the desired outcomes by promoting positive parent-child interactions, encouraging healthy attachment, enhancing family growth and development, and referring parents to necessary services and resources that support positive family functioning. The program's theory of change posits that the program goals can be achieved through sustained and persistent contact between home visitors and the family. The home visitor plays an instrumental role in establishing rapport with the adolescent mother, building a personal and supportive relationship, and acting as a liaison between the family and other collaborative partnerships and informal sources of support.

Additionally, and in contrast to other home visiting program, HFM specifically addresses parent-child interactions and attachment as a central area to be targeted during the family's involvement with the program. One of the home visitor's central responsibilities is to observe and become attuned to parent-child interactions, developing family-specific curricula addressing caregiver-child interaction patterns. The HFM program is thus not only a support program but also one that recognizes early childhood attachment as a central area of intervention. The home visitor can also help the parent develop various stress coping mechanisms that may interfere with the caregiver's ability to remain responsive towards the infant.

Conceptual Frameworks

To account for the complex relation between maternal trauma, emotional availability constructs, and children's emotion regulation patterns, the interactions of the aforementioned variables must be situated within theoretical frameworks. A Complex PTSD framework can help explain the complex effects of trauma on development and parenting practices, especially when trauma is experienced during sensitive developmental periods and persists chronically. Furthermore, trauma-related alterations in parenting practices can affect the child-caregiver relation. This dynamic is best understood through Attachment Theory, which explains the ways in which early parent-child relations set the foundation for long term developmental outcomes. Finally, situating the Complex PTSD and Attachment Theory frameworks within a larger Integrative Model for Study of Developmental Competencies in Minority Children can help account for the broader

ecological contexts and factors affecting the development of children and families.

Attachment Theory. Early childhood attachment to a caregiver has been studied extensively through the work of John Bowlby and Mary Ainsworth. Bowlby studied the relation between maternal loss and deprivation and the emergence of different personalities later in development, while Mary Ainsworth investigated security relations through a seminal laboratory technique called “The Strange Situation” (Ainsworth, 1982). In the Strange Situation, the infant in the study (usually 12-18 months of age) is separated from and then reunited with a caregiver in two brief, but separate, episodes. Through observing infants in the “Strange Situation,” typologies of infant behavior have been thoroughly identified and described. Through this research, three types of organized attachment behaviors have been identified: secure, insecure-avoidant, and insecure-ambivalent attachment. In a secure attachment, the infant typically displays distress at the moment of separation but is quick to be comforted once reunited with the caregiver. In contrast, in insecure-avoidant attachment, the infant is not distressed at the time of separation and actively avoids the caregiver once they return to the room. In an insecure-ambivalent attachment, the infant is distressed at separation and is not easily comforted upon reunion with the caregiver, demonstrating resistance and ambivalence toward the attachment figure. Infants who do not display any organized behaviors or patterns are classified as disorganized in their attachment style (Liotti, Silverman & Gold, 2004).

The aforementioned-caregiver attachment patterns, emerging at a formative developmental period, provide a reference point for analyzing and

understanding behaviors displayed by the child throughout her development. Furthermore, by investigating attachment types and the concepts of “maternal sensitivity” and deprivation, Bowlby and Ainsworth both underscored the role of the caregiver as the “secure-base” through which a child can feel safe to investigate and explore the external world (Bretherton, 1992). In contemporary attachment literature, the earlier work on early childhood attachment has provided the foundation for research on Adult Attachment types, underscoring the lasting impact of early childhood experiences with responsive and sensitive (or unresponsive and insensitive) caregivers. The literature on Adult Attachment investigates the relation between early childhood experiences and the ways in which individuals arrange their adult intimate relationships.

The proposed study follows this tradition of attachment theory by investigating the potential links between adolescent maternal trauma, the impact of trauma on maternal sensitivity, and the ways in which disruptions in maternal sensitivity can interrupt infant-caregiver attachment processes. These disruptions in attachment may explain changes in the infant’s behavioral, socioemotional, and developmental outcomes.

Complex Post Traumatic Stress Disorder (PTSD). Within the last decade, the field of psychotraumatology (long term psychological impact of trauma) has made a concerted effort to differentiate between different types of trauma based on duration, impact, and the time of development in which they occur. Incorporating a developmental framework placed an emphasis on a different typology of trauma symptoms, specifically, symptoms experienced by individuals with chronic or even lifelong trauma exposure (Herman 1992;

1997). Herman made significant contributions to this field, referring to this type of trauma symptomology as *complex post-traumatic stress disorder* (Complex PTSD). Complex PTSD is characterized by alterations in consciousness, self-perception and perception of the perpetrator, relations with others, and affect regulation. Additionally, Ford & Courtois (2009) also noted the importance of identifying the timing of trauma, specifically if it occurs during developmentally vulnerable times such as childhood or adolescence. This model of trauma is different from the DSM-IV criteria in that it is dynamic and extends over longer periods of time, accounting for the developmental processes that are impacted by trauma.

As mentioned earlier, parents with exposure to chronic traumatic experiences and a higher number of traumatic events display more adverse parenting behaviors compared to parents with no traumatic history. Complex PTSD provides a framework for understanding the impact of chronic trauma, illustrating that many adolescents in high-risk contexts experience multiple traumatic events before reaching adulthood (Buka, Stichick, Birdthistle, & Earls, 2001; Horowitz, Weine, & Jekel, 1995; Lipschitz, Rasmussen, Anyan, Cromwell, & Southwick, 2000; Macy, Barry, & Noam, 2003). Additionally, these traumatic experiences are not limited to one-time events but also extend to prolonged traumatic exposure such as child abuse, neglect and maltreatment, or chronic interpersonal violence in the home. In order to better understand the adult behaviors of these adolescents, it is important to consider traumatic histories and their impact on parental functioning later on in life.

The complex PTSD framework posits that complex trauma during developmentally sensitive periods has a long-term impact on an individual's

psychological outcomes. These outcomes include alternations in one's self-perception, relation with others, and affect regulation (mutual emotional regulation in parent-child interactions, for instance). Thus, the framework establishes a link between childhood trauma and adverse parenting behaviors by presenting psychological outcomes as the mediating mechanism between the two. In the current proposed study, the complex PTSD framework will be utilized to understand the ways in which complex traumatic events affect adolescent mothers' emotional availability, altering their ability to parent and interact with their child.

Integrative Model for Study of Developmental Competencies in Minority Children. Cynthia Garcia Coll's theoretical integrative model of child development addresses the gaps in the field of development with regards to children of color. In this regard, the model proposed differs from previous frameworks in that it presents children's social positions and stratifications at the core of their developmental processes, as opposed to the periphery. Additionally, the model embodies a strengths-based approach, highlighting minority children's kin and family networks as potential protective factors against economic and political hardship in the United States. To avoid both cultural and genetic deficiency models, an integrative model includes mainstream elements and conceptions of developmental theories while incorporating social stratification as an overarching factor impacting development. An integrative model posits that families of color's social position does not directly affect developmental outcomes but is rather mediated through racism, prejudice, discrimination and oppression, which are all socially pervasive within the United States. These factors create segregated

physical environments for children of color and their families. Within these environments, including schools, neighborhoods, and other institutions such as healthcare, children are developmentally impacted by both macro system factors (race relations, socioeconomic status, segregation) and the direct influences of racism, discrimination, and prejudice more apparent in social interactions. Thus, indirect macrosystem influences become direct through social interactions, affecting children of color's developmental processes and competences.

One macrosystem affecting children of colors' developmental processes is their families' socioeconomic status. Employment discrimination in both salary levels and hiring practices has contributed to economic segregation of minority populations. This factor is critical to children's developmental processes, as families with higher economic status have access to services and resources that enhance their children's development. In contrast, even upwardly mobile minority families in the United States lack access to the generational wealth necessary for families to thrive. The integrative model posits that in order to deal with some of these macrosystem influences, families of color develop parenting practices that are adaptive in nature. For instance, in families of color, caregiving roles are flexible, developing as an adaptive response to cultural and societal pressures, as well as adherence to traditional culturally defined roles. By identifying the influences of social position, racism, prejudice, discrimination, and segregation, we can more fully understand adolescent mothers' emotional unavailability, particularly mothers who are vulnerable to these risk factors. The integrative model allows us to understand patterns of family interaction as

a reflection of adaptive cultures rather than personal shortcomings or individual patterns of interaction (Garcia Coll, 1996).

The Present Study

Although a link has been established between maternal trauma and EA, it is unclear whether or not EA acts as a moderator of parental trauma's impact on the child's ability to emotionally regulate. Is a history of trauma related to low EA in adolescent mothers, and is that associated with low emotion regulation in the child? Is the decrease in maternal EA related to the child's diminished ability to regulate his or her emotions, thus increasing the child's overall risk of trauma? These questions need to be investigated further while paying special attention to how emotional availability affects trauma's impact on children's emotion regulation as measured on cognitive tasks.

Understanding the specifics of this relation can help develop home visiting and other support programs that focus specifically on caregiver EA as a protective factor to enhance emotion regulation for the child.

The main questions that will be investigated in this study are:

Research Question 1: Is there a relation between adolescent mothers' PTSD symptoms, EA, and child emotion regulation?

Research Question 2: Does EA predict emotion regulation in children of mothers with full or partial PTSD?

Research Question 3: Does EA moderate the relation between adolescent mothers' PTSD diagnosis and their child's emotion regulation?

Research Question 4: Does participation by mothers in a family support program affect the relation between adolescent mothers' PTSD and their children's emotion regulation?

Methods

The proposed study is a secondary data analysis study using data from the Massachusetts Healthy Families Evaluation Study (MHFE) conducted by the Tufts Interdisciplinary Evaluation Research (TIER) team. MHFE is a randomized control trial examining the implementation effects of the Health Families Massachusetts program (HFM). HFM is a statewide home visiting program for young mothers. Contracted by The Children's Trust, the team of researchers at TIER took on a project to evaluate the HFM home visiting program. HFMs overarching goals are to 1) prevent child abuse and neglect; 2) achieve optimal development and growth in early childhood; 3) develop life skills and encourage educational attainment; 4) prevent early pregnancies or repeat pregnancies; and 5) promote effective parenting behaviors, and parental health and well-being. HFM services provided by paraprofessionals proceeded as follows: weekly visits for participants during pregnancy, weekly home visits for 6 months after birth, and then decreasing visits until the child reached three years of age, depending on each family's progress.

TIER conducted a randomized control trial (RCT) to assess whether or not HFM met its long-term goals, and examined the ways in which participants' personal, family, program, and community contexts influenced and explained program utilization and program outcomes. Eligible participants (female, 16 years or older) were recruited through HFM personnel and MHFE-2 researchers at Tufts University, and randomly assigned to a program group called the Home Visiting Services group (HVS), or a control group called Referrals and Information Only group (RIO). A total of 837 participants were recruited for the study through HFM. 517 participants were assigned to

HVS (62%), and 320 (38%) to RIO. The Tufts evaluation team then recruited the participants in two phases. During Phase 1, the participants were asked to complete a phone interview and to sign a release allowing access to administrative agency data. Mothers who provided data through either an interview or an agency release were included in a sample referred to as the Impact Study Sample (n=704, 433 to HVS and 271 to RIO). Subsequently, MHFE-2/MHFE-2EC interviews were conducted at five time points: Time 1 (T1) interviews were completed 1-month post enrollment, Time 2 (T2) interviews were completed 12 months after enrollment, Time 3 (T3) interviews were completed 24 months post enrollment, Time 4 (T4) interviews were completed approximately 60 months post enrollment, and Time 5 (T5) interviews were completed approximately 74 months post enrollment.

During the 45-minute phone interview, participants (female adolescent moms 16 years or older) were asked to provide information in the following areas: 1) demographics (age, birthplace, race, ethnicity, languages spoken, relationship status, employment status; level of education; housing status); 2) pregnancy/parenting status; 4) information on father of the baby; 5) economic resources; 6) formal and informal supports; 6) history of pregnancy; 7) family history of adolescent pregnancy; and 7) depression symptomatology.

Additionally, participants were asked to provide information in the following areas: 1) program participation; 2) timeline of significant life events; 3) community help-seeking behaviors; 4) quantity and quality of social supports; 5) family and education narratives; 6) health behaviors; 7) trauma and PTSD symptomatology; 8) representations of parenting; and 9) parenting stress.

At 12 and 24 months post enrollment (T2 and T3 respectively),

mothers and their children also participated in a ten-minute videotaped interaction assessing parent-child interaction while engaging in a 5-minute freeplay and 5-minute teaching task. For this study, the ten-minute videotaped interactions 24 months post enrollment (T3) will be used to assess emotional availability (sensitivity and nonhostility) of mothers interacting with their child. Additionally, the RCT design of the MHFE-2 study included two additional time points, T4 and T5. Data for T4 was collected 60 months post enrollment, and firstborn children were enrolled in preschool by at that time. A fifth wave of data was collected 72-months post enrollment (T5) when firstborn children were in early elementary school. During T4 and T5 respectively, 70% and 65% of the original sample enrolled in the study. Participants were assessed using the same mixed methods approach with an added child protocol that included standardized child assessments, research-based measures of child executive functioning, and a child narrative completion task. Children's emotion regulation was assessed using the Emotional Regulation Checklist during T4 and T5. For this study, the data collected during T5 on children's emotion regulation will be utilized.

The proposed study will be based on a quantitative analysis examining the relation between participants' trauma symptomatology, maternal emotional availability (sensitivity and nonhostility) and the participant's child's emotion regulation as assessed through the Emotional Regulation Checklist (ERC). UCLA Post-Traumatic Stress Disorder Reaction Index scores, Emotional Availability scores, and the Emotional Regulation Checklist will be used to study the relation between adolescent mothers' trauma, their emotional availability, and their children's emotional regulation.

Sample

A total of 837 participants were recruited for the study through HFM. During phase one of the study, mothers were asked to provide data through either an interview or agency release, or both. Mothers who were able to provide data through either medium were included in a sample referred to as the Impact Study Sample (n=704, 433 participants referred to HVS and 271 referred to RIO). Subsequently, 684 mothers completed phone interviews one month after enrollment at T1 (97%), 564 mothers 12 months after enrollment at T2 (80%), and 594 mothers 24-months post enrollment at T3 (84%). The in-person interview was completed by 473 mothers at T1 (69%), 401 at T2 (71%), and 409 at T3 (69%). During T4 (approximately 60 months after enrollment) and T5 (74 months enrollment), a follow up early childhood study was conducted post with 490 and 450 participants enrolled at each point in time respectively. At the time of enrollment, the sample was comprised of first-time mothers under the age of 21. The average age of mothers at enrollment was 18.6, and the majority of mothers were 19 years of age or younger. 8% of the sample was non-Hispanic black, 36% Hispanic, and 37% non-Hispanic white. At Times 4 and 5, the target child sex (male) was determined to be 52.7% and 51.9%, respectively.

Measures

TIER researchers used a mixed-methods data collection approach to examine a wide variety of constructs. The measures that will be used for this study are described in greater detail below.

University of California at Los Angeles Post-Traumatic Stress Disorder Reaction Index. Adolescent mothers' exposure to trauma and

PTSD symptomology was assessed using the adolescent version of the UCLA PTSD Reaction Index for DSM IV (PTSD-RI). For this study, data collected using the UCLA PTSD Index during T1 (one month after enrollment) will be utilized. The index is one of the most widely used instruments for assessing trauma and PTSD symptomatology among children and adolescents. It is a self-report instrument that screens for exposure to traumatic events (i.e., natural disasters, accidents, domestic violence, witnessing of domestic violence, community violence, witnessing of community violence, sexual abuse, medical illness, unexpected death, and any other event considered frightening by the respondent) and for all 17 DSM-IV PTSD symptoms. The participants rate the presence of 13 discrete trauma experiences and one open-ended question which elicits any experiences considered frightening, dangerous, or violent that do not fit into any of the 13 categories. If a traumatic event is endorsed as having occurred, the participant continues on to complete symptom ratings. Participants rate the frequency of their PTSD symptoms on a 5-point Likert scale (0 = none to 4 = most of the time) over the most recent 30-day period. This instrument is typically used as a screening tool for trauma exposure and PTSD symptomology. It can be scored through summing items to form a severity score, or categorically. The categorical scoring of the UCLA PTSD Reaction Index forms a diagnostic categorization that can be mapped on to the DSM-IV criteria for PTSD diagnosis. For the present study, the items are summed to form a severity of PTSD symptoms score (0 to 68).

Psychometric Properties: The instrument has been reported to have high diagnostic validity, with a sensitivity of .93 and a specificity of .87, using a

cut-off score of 38 (Steinberg, Brymer, Decker, & Pynoos, 2004). Alpha coefficients have demonstrated good to excellent internal consistency (Layne et al., 2010; Nygaard, Jensen, & Dyb, 2012).

In the MHFE-2 study sample, Cronbach's α were as follows:

- Number of events experienced: T1 = .69; T2 = .62
- Meets Criteria A1: T1 = .43; T2 = .44
- Meets Criteria A2: T1 = .53; T2 = .53
- Meets Criteria A: T1 = .63; T2 = .59
- Meets Criteria B (Re-experiencing): T1 = .85; T2 = .88
- Meets Criteria C (Avoidance): T1 = .80; T2 = .84
- Meets Criteria D (Hyperarousal): T1 = .70; T2 = .75
- Meets PTSD Diagnosis: T1 = .89; T2 = .91

Emotional Availability Scale (EAS). The EAS was used to assess observational data collected during Time 3, where a subset of mothers consented to being video-recorded as they interacted with their child. The mother-child dyad was given a set of magnetic blocks and asked to build a variety of structures based on an instruction sheet. Maternal-child interactions captured on the video were coded using the EAS scale. According to Biringen, Robinson, & Emde (1998), Emotional Availability is “an individual's emotional responsiveness and affective attunement to another's needs and goals...it is not simply the mother's physical availability but her emotional availability that promotes infant's self expression.” For the purposes of this study, two subscales representing emotional availability are used; sensitivity and nonhostility. The sensitivity construct refers to factors including positive affect responses; appropriate and sensitive parent responsiveness, an

awareness of timing, variety and creativity of modes of play, conflict negotiation, and acceptance of the child. This measure was assessed using observational data collected during T3 where mothers were consented to being video-recorded. During the recording, mothers were asked to play with their child (freeplay, 5 minutes of recording) and were then asked to complete a task that would be challenging for the child to complete on his or her own (teaching task, 5 minutes of recording). The sensitivity construct was then scored with scores ranging from 1 (“highly insensitive”) to 9 (“highly sensitive”). Nonhostility, on the other hand, considers overt and covert hostile behaviors and expressions including punishment, physical aggression, harshness, boredom, impatience, and sarcasm. Using the same video recording, nonhostility was scored using Scores ranging from 1 (“markedly and overtly hostile”) to 5 (“nonhostile”). Higher scores on both subscales indicate more evidence of mothers’ emotional availability. For the present study, the 5-minute freeplay video will be used to assess emotional availability.

Psychometric Properties: Interrater reliability information for maternal availability at T2 is described below.

The filmed observations were coded for maternal sensitivity and nonhostility by a team of trained coders. Coders followed a three-step procedure for each of the videotaped segments. First, coders viewed the five-minute free play session to get a sense of the mother-infant dyad interaction. Second, coders viewed the segment again and took detailed notes about the interaction, focusing on specific behavioral examples of maternal sensitivity, structuring, and nonhostility. Finally, coders viewed the segment a third time

in order to determine what final codes they would assign. This three-step process was repeated for the videotaped teaching task. The majority of the time coders coded the free play portion followed by the teaching portion during the same period of time. Coders were kept blind to pertinent information regarding the mother-child dyads (i.e. program participation and mother's age).

The team consisted of three coders. One coder was trained by Easterbrooks and Biringen and after completing her training this coder trained the remaining two coders. Coders achieved interrater reliability during an initial training period using 20 to 30 videotaped observations from a previous evaluation study. Interrater reliability for the sensitivity and nonhostility scales was assessed using average absolute agreement intraclass correlation coefficients (ICC) in a two-way random effects model (McGraw & Wong, 1996) and ranged from .88 to .91 ($M = .87$), indicating excellent reliability (Freeplay sensitivity = .91; Teaching task sensitivity = .90; Freeplay nonhostility = .90; Teaching task nonhostility = .88).

Following the training period, all three coders independently examined approximately 56% ($n=140$) of all videotaped interactions. In order to protect against observer drift, all three coders met on a regular basis to code independently and then discuss assigned codes. Disagreements beyond one-point were discussed until agreement was reached. For the post-training period, ICCs for sensitivity ranged from .75 to .93 ($M = .86$) and for nonhostility .83 to .90 ($M = .86$) indicating a range in reliability from good to excellent.

Emotion Regulation Checklist (ERC). The ERC used in this study was adapted from The Emotion Regulation Checklist (ERC; Cicchetti & Shields, 1997). It is used to measure emotionality and regulation of affect, intensity, flexibility and valence of emotions. It is also used to measure situational appropriateness and timing of various emotional expressions, emotional understanding, and empathy. Mothers were provided a checklist and asked to indicate how often their child exhibited the behaviors described. Data were collected using the ERC checklist during T4 of the study (60 months post-enrollment), where the firstborn child was in early elementary school. Mothers indicated how often their child exhibits the behaviors/states described on a 4-point scale (1 = Rarely/Never, 2 = Sometimes, 3 = Often, 4 = Almost Always). The original measure consisted of 24 items with 2 subscales: Liability/Negativity (15 items) and Emotion Regulation (8 items). The Liability/Negativity items measure the child's propensity for mood swings, angry reactivity, and emotion intensity, while the Emotion Regulation items assess equanimity, emotional understanding, and empathy (Choi & Oh, 2014). A third new subscale was created combining items from both of the original subscales – dysregulation (12 items: e.g., “Is easily frustrated”).

Scoring: There were two original subscales, and the TIER team created a third subscale, which will be used for this study.

- Liability/Negativity (original subscale, but not used)
- Emotion Regulation (original subscale, but not used)
- Dysregulation (TIER created subscale)

Developmental and Clinical Considerations: The ERC was validated on a sample of 6-12 year olds (Cicchetti & Shields, 1997). Emotion regulation is

associated with social competence; difficulties with emotion regulation in preschoolers are predictive of internalizing and externalizing problems across the lifespan (Röll, Koglin, & Petermann, 2013).

Psychometric Properties: Validity of the ERC was established by correlating with observers' ratings of children's regulatory abilities and the proportion of expressed positive and negative affect (Shields & Cicchetti, 1997). The subscales (Lability/Negativity and Emotion Regulation) were derived from a factor analysis of data from 513 children between the ages of 6 and 12 (Shields & Cicchetti, 1997). Cronbach's α were high for the overall scale (.89) and for each of the two subscales (Lability/Negativity = .96, Emotion Regulation = .83; Shields & Cicchetti, 1997).

Institutional Review Procedure

The current proposed study is a secondary data analysis of de-identified data acquired through interviews and questionnaires. Thus, this study is categorized as exempt from IRB approval. A modification was made to the IRB protocol to add me as a Co-Investigator for the MHFE Childhood Study.

Data Analysis Plan

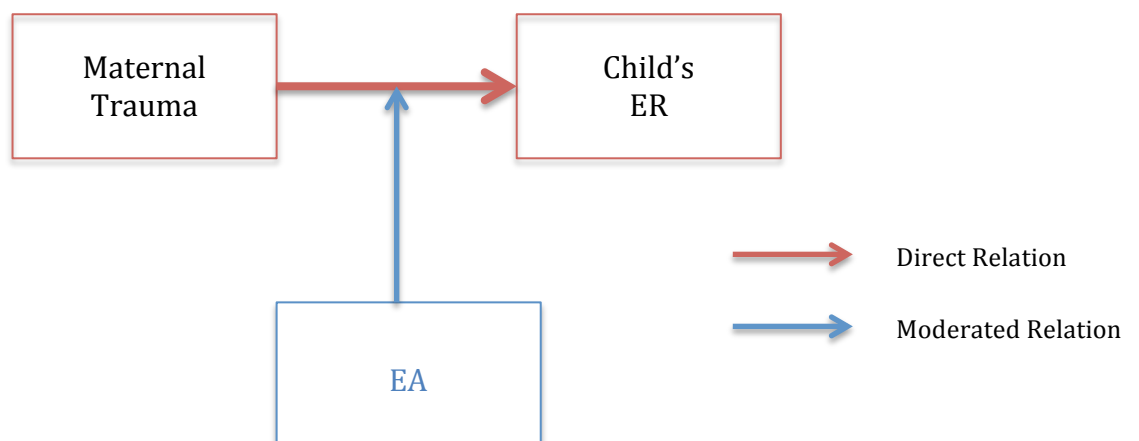
Research Question	Hypothesis	Data Analysis
Research Question 1: Is there a relation between adolescent mothers' PTSD	There will be a correlation between maternal trauma symptomology (PTSD, partial PTSD, and no PTSD) as measured through the UCLA PTSD Reaction-Index and mothers' emotional availability (sensitivity and nonhostility). PTSD and partial PTSD will	Descriptive analyses will be conducted to assess the descriptive qualities of adolescent mothers' trauma symptomology, emotional availability scores, and reports of child emotion regulation

<p>symptoms, EA, and child emotion regulation?</p>	<p>be correlated with emotional unavailability</p> <p>High maternal trauma (PTSD symptoms) and emotional availability (sensitivity and nonhostility) are correlated with children's scores on the dysregulation scale of the Emotional Regulation Checklist.</p>	<p>on the ERC checklist.</p> <p>Pearson correlation tests will be conducted to assess the relation between PTSD symptoms, EA, and child emotion regulation while controlling for potential confounding factors.</p>
<p>Research Question 2: Does EA predict emotion regulation in the child?</p>	<p>EA in mothers with trauma (PTSD/ partial PTSD diagnosis) according to the UCLA PTSD Reaction-Index will predict ER outcomes in their children as measured by the Emotion Regulation Checklist dysregulation scale.</p>	<p>A simple regression will be used to assess the predictive quality of EA as a predictor of children's emotion regulation, while controlling for mothers' education level and the child's gender.</p>
<p>Research Question 3: Does EA moderate the relation between adolescent mothers' trauma symptomology and their child's emotion regulation as measured by the ERC dysregulation subscale?</p>	<p>High EA in mothers with PTSD/partial PTSD will moderate the relation between PTSD and children's dysregulation, leading to a decrease in dysregulation scores (greater over all ER for the target child).</p> <p>Low EA in mothers with PTSD/partial PTSD will moderate the relation between PTSD and the child's dysregulation, leading to an increase in dysregulation scores.</p>	<p>Moderation analyses using Andrew Hayes' SPSS Process Macro. Moderation analysis will be conducted to assess the impact of emotional availability (in mothers with PTSD diagnosis) on their target children's emotion regulation as measured by the dysregulation subscale.</p>

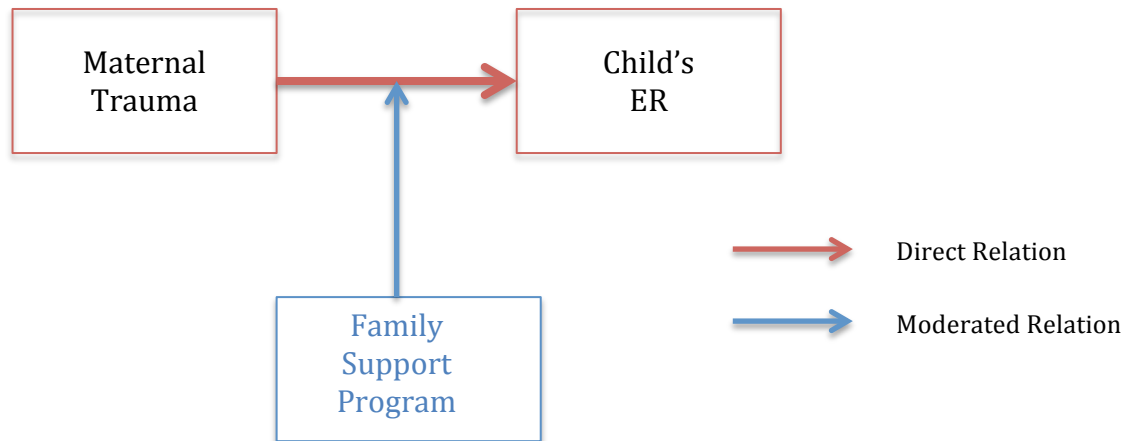
<p>Research Question 4: Does participation by mothers in a family support program affect the relation between adolescent mothers' PTSD and their children's emotion regulation?</p>	<p>Participation in a family support program moderates the effect of trauma on children's emotional regulation. Children with mothers who participate in a family support program will display better emotion regulation than children with mothers who do not participate in a family support program despite a history of trauma.</p>	<p>Moderation analysis of family support program impact on children's emotion regulation will be conducted using the Process SPSS Macro.</p>
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To test the hypotheses, descriptive analyses were conducted to assess the descriptive qualities of adolescent mothers' trauma symptomology, emotional availability scores, and reports of child emotional regulation on the ERC checklist. Additionally, SPSS statistics software was used to conduct correlational tests on the relation between trauma, EA, and emotional regulation outcomes. Multiple regression analysis was used to test the predictive quality of EA as a predictor of children's emotional regulation outcomes. Finally, a moderation analysis was conducted to assess EA constructs and the HFM program as a moderator of trauma.

Graphic representation of moderation research questions (R3 and R4):



Moderation 1: Emotional Availability moderates the relation between maternal trauma and child's emotional regulation outcome.



Moderation 2: Family support program moderates the relation between maternal trauma and child's emotional regulation outcome.

Results

The Present Sample

The sample for this study included 304 of the mothers enrolled in the original study who completed a measure of PTSD symptomology (UCLA PTSD-Reaction Index). All 304 mothers were coded as having full, partial, or no PTSD symptoms at Time 1 (T1) of the study. Of the 304 mothers, 53.9% (n=164) were enrolled in MHFE home-visiting services while 46.1% (n=140) received referrals only.

Descriptive Analyses

Demographic factors. Descriptive analyses were conducted to identify the final sample of mothers' general characteristics and their average scores on PTSD and EA measures. These analyses were conducted to gain a deeper understanding of the unique sample in the current study.

The average age of mothers at T1 of the study was 18.6 years ($M=18.6$; $SD=1.29$). Of the 304 mothers who completed the UCLA PTSD Reaction-Index, 36.8% identified as White non-Hispanic, 19.4% as Black non-Hispanic, 34.2% as Hispanic, and 9.2% as Other. 42.1% of the mothers had finished high school or attained a GED, while 57.2% dropped out or were still in school at the time of enrollment. Finally, at Time 4 (T4), 302 target children of the 304 mothers who completed the PTSD Reaction Index completed the ERC measure. Of the 302 target children, 52% ($n=158$) were male and 47.4% were female ($n=144$) (See Table 1).

Exposure to trauma and PTSD. All of the mothers who completed the UCLA PTSD Reaction Index ($n=304$) endorsed having experienced at least one traumatic event a priori to completing the UCLA PTSD-RI. Furthermore, 57.9% of the sample endorsed having experienced 3 or more traumatic events ($n= 176$). The mean number of traumatic events for the sample of mothers who completed the UCLA PTSD-RI was ($M= 3.44$; $SD= 0.124$) (See Table 3).

With regards to a PTSD diagnosis, only 19.4% ($n= 59$) did not meet PTSD criteria (symptoms 1-2 times a week), while 34.5% met partial PTSD criteria ($n= 105$) and 46.1% met full PTSD criteria ($n=104$). In terms of the specific traumatic experiences the sample of adolescent mothers encountered, 22.2% reported being domestically abused, 33.2% reported witnessing the abuse of a family member, 27% reported experiencing community violence (such as being beaten up, shot at, or being threatened to be hurt badly in one's town). More than two-thirds of mothers reported witnessing someone in their community being shot at or beaten, and 59.9% have heard about the violent

death or serious injury of a loved one. Cumulative trauma, specifically trauma due to community and interpersonal violence, was thus highly prevalent amongst this sample of mothers (Refer to Table 4).

Emotional Availability and Emotion Regulation. Of the 304 mothers who completed the PTSD Reaction-Index at T1 of the study, only 138 returning at Time 3 were also video-taped with their children and assessed using the Emotional Availability Scales (EAS) Index. All 138 mothers were assessed for emotional availability (sensitivity and nonhostility constructs) using the EAS during two tasks: the freeplay and the teaching task. The average sensitivity score for mothers on the freeplay task was a 4.8 on a scale of 1 to 9 ($M= 4.80$; $SD= .109$), with lowest score on the scale indicating “highly insensitive” and highest score on the scale indicating “highly sensitive”. On the teaching task, the score for sensitivity was on a scale of 1 to 9, with a mean score of ($M= 4.85$; $SD= .109$) (Table 2).

Additionally, the average score for sensitivity on both the freeplay and teaching task was calculated for each mother on a scale of 1 to 9 ($M=4.85$; $SD= .102$). The nonhostility subscale was also assessed on both the freeplay and teaching task. Lower scores of nonhostility indicated greater hostility towards the target child (lower overall emotional availability), while higher scores indicated nonhostility towards the child. Mothers’ mean nonhostility score was a 4.24 on a scale of 1 to 5 ($M= 4.24$; $SD= .078$) on the freeplay task, ($M=4.21$; $SD= .076$) on the teaching task, and ($M=4.24$; $SD= .067$) on the average of both tasks (Table 2). The baseline scores for both constructs (sensitivity and nonhostility) in this sample were generally low, with not much variance in scores within each task paradigm. This indicated that mothers in

this sample are starting with low emotional availability towards the target child, particularly on the sensitivity construct, with low score averages of 4 and 5 on a score scale of 1 to 9.

On the ERC, target children were rated on a scale of 1 to 4 on the dysregulation subscale, with higher scores indicating greater dysregulation. The mean score on the dysregulation subscale was found to be 1.81 ($M=1.81$; $SD=.033$) (See Table 2).

RQ1: Is There a Relation Between Adolescent Mothers' PTSD Symptoms, EA, and the Target Child's Emotion Regulation - Bivariate Analyses

Correlations Between PTSD, Emotional Availability, and Emotion Regulation. In order to assess the relation between PTSD, EA, and ER, various intercorrelations within variables of interest were conducted (See Table 5 for a full matrix). Then, Pearson Correlations were conducted between PTSD diagnoses, EA, and ER (Table 6). There were no significant correlations between any of the emotional availability constructs (sensitivity and nonhostility) and a PTSD diagnosis (partial, full, or no PTSD). There were no significant correlations between PTSD diagnosis (full, partial, or no PTSD) in the mother and scores on the dysregulation subscale of the Emotion Regulation Checklist for the target child.

Correlations Between Emotional Availability and Emotion Regulation. Pearson's correlation tests were run to determine the relation between the EA constructs (sensitivity and nonhostility) on both tasks, and the dysregulation subscale measured for the target child. There was a significant negative correlation between mother's sensitivity score on the freeplay task and the target child's dysregulation score on the ERC ($r=-.257$, $p<.000$).

Similarly, there were significant negative correlations between mothers' sensitivity scores on the teaching task ($r = -.208, p < .003$) and mothers' mean sensitivity scores on both tasks ($r = -.237, p < .001$) and the child's dysregulation score respectively. The negative correlation indicated that as mothers' sensitivity scores increased, their children's dysregulation scores decreased, indicating greater overall emotion regulation for the child (Table 6).

With regards to the nonhostility construct, a significant negative correlation was found only between mothers' nonhostility scores on the freeplay task and the target child's dysregulation score ($r = -.221, p < .001$). The correlation between mothers' nonhostility scores on the teaching task ($r = -.119, p = .089$) and mothers' mean nonhostility scores on both tasks ($r = -.050, p = .483$) and the child's dysregulation scores respectively were both nonsignificant (Table 6).

RQ 2: Does EA Predict Emotion Regulation in Children of Mothers with Full or Partial PTSD? - Multiple Linear Regressions

To assess the predictive quality of the EA constructs (sensitivity and nonhostility) as predictors of emotion regulation (dysregulation subscale) in the target child, the relation between EA and ER was assessed using multiple linear regressions. Regression analyses were conducted while controlling for the education level of the mother and the gender of the target child (Table 7). A significant regression equation was found for the relation between the sensitivity construct in the freeplay task and the target child's dysregulation score ($F(3, 201) = 5.797, p < .001$) with an $R^2 .080$. These findings indicated

that the EA sensitivity construct on the freeplay task accounted for 8% of the variance in the target child's dysregulation score on the ERC.

Similarly, there were significant regression equations for maternal sensitivity on the teaching task ($F(3,198) = 3.362, p < .020$), and maternal sensitivity average scores' ($F(3,197) = 4.510, p < .004$) predictive quality of the target child's emotion dysregulation. Sensitivity on the teaching task accounted for 4.8% of the variance in dysregulation scores, while the average of sensitivity scores on both tasks accounted for 5% of the variance in child dysregulation scores. On the other hand, the nonhostility construct of emotional availability was only a significant predictor of the target child's dysregulation score on the freeplay task ($F(3,201) = 4.498, p < .004$). Nonhostility on the freeplay task accounted for 4.9% of the variance in the target child's dysregulation score (Table 7).

All in all, these results indicated that Emotional Availability serves as a predictor of the dysregulation subscale of the Emotion Regulation Checklist for the target child, and that maternal sensitivity was more consistently a predictor of emotion regulation than maternal nonhostility.

RQ3: Does EA Moderate the Relation Between Adolescent Mothers' PTSD Diagnosis and Their Children's Emotion Regulation? - Moderation Analyses

Moderation analyses were conducted using the SPSS macro Process written by Andrew Hayes (Hayes, 2012). Moderation analyses were used to address RQ3 and RQ4 (Tables 8, 9, & 10). First, a moderation analysis was conducted to assess the moderating role of EA on the impact of maternal trauma on children's emotion regulation. A significant interaction was found

between the moderator (maternal sensitivity) and the predictor (PTSD diagnosis) on the teaching task ($F(3,118)=3.026, p<.0275, \Delta R^2=.0713$). When maternal sensitivity was low on the teaching task, there was a positive significant relation between PTSD diagnoses (full, partial, or no PTSD) and children's dysregulation scores ($t(118)=2.03, p<.0442$)(Table 10). This indicated that as PTSD symptoms increase, children's dysregulation scores increased in mothers with low maternal sensitivity on the teaching task. For average ($t(118)=.595, p<.553$) and low maternal sensitivity on the teaching task ($t(118)=-1.139, p<.257$), there were no significant relations between PTSD diagnoses and the target children's dysregulation scores. There was no significant interaction between PTSD diagnoses and maternal sensitivity scores on the freeplay task ($F(3,120)=3.8672, p=.0515, \Delta R^2=.0295$) (Table 8).

As for the maternal nonhostility construct, there was no significant interaction between PTSD and maternal nonhostility scores on the freeplay task ($F(1,120)=.0094, p=.9230, \Delta R^2=.0472$) (Table 8). A significant interaction, however, was found between maternal nonhostility and PTSD diagnoses on the teaching task ($F(1,118)=4.4947, p<.0361, \Delta R^2=.0359$)(Table 10). When maternal nonhostility was low on the teaching task, there was a significant positive relation between PTSD and the target children's dysregulation scores ($t(118)=1.9895, p<.0490$). For average and low maternal nonhostility, there was no significant relation between PTSD and dysregulation.

In a previous study using the same data, Dr. Claudia Miranda-Julian (2013) found a significant relation between specific symptoms of PTSD and the emotional availability constructs (sensitivity and nonhostility). The study

found that these EA constructs were associated with Clusters C (avoiding/numbing) and D (hyperarousal) of the PTSD symptoms. Building upon these findings, analyses were conducted to assess if EA constructs moderated the relation between scores on specific symptom clusters (Cluster C: Avoiding/Numbing) measured by the UCLA PTSD Reaction-Index and the target children's dysregulation scores. There was no significant interaction found between the maternal sensitivity construct and Cluster C scores on the UCLA PTSD Reaction-Index on both the freeplay and teaching task. However, there was a significant interaction between the maternal nonhostility construct and Cluster C scores on the UCLA PTSD Reaction-Index only on the teaching task ($F(1,120)=7.4305, p<.0074, \Delta R^2=.0568$) (Table 8). When nonhostility scores were low or average, there was no significant relation between Cluster C scores and the children's dysregulation scores. When nonhostility scores were high, there was a significant positive relation between Cluster C symptoms and children's dysregulation scores ($t(120)=2.6638, p<.008$) (Table 10). These results indicate that when nonhostility scores were high (greater EA), target children's dysregulation scores increased as maternal Cluster C symptoms increased.

RQ 4: Does Participation by Mothers in a Family Support Program Affect the Relation Between Adolescent Mothers' PTSD and their Children's Emotion Regulation?

Finally, moderation analyses were conducted to assess if a social support program (MHFE home visiting services) moderated the relation between maternal PTSD diagnoses and target children's dysregulation scores. There was no significant interaction between PTSD diagnoses (full, partial,

and no PTSD) and home visiting services ($F(3,226) = .4077, p = .7476, \Delta R^2 = .0054$) (Table 9).

Discussion

Adolescent mothers experience a host of developmental and ecological challenges that compromise the caregiver-child attachment more readily when compared to adult mothers and their infants. In contrast to adult mothers, adolescent mothers are generally more likely to report a history of child abuse and maltreatment, especially childhood sexual abuse and intimate partner violence (DiLillo & Damashek, 2003; Lang, Gartstein, Rodgers, & Lebeck, 2010; Lesser, J. & Koniak-Griffin, D., 2000; Noll, Trickett, Harris, & Putnam, 2008). In addition to the risk factors of adolescent motherhood presented in the literature review, the specific sample in this study faced a host of unique challenges, undoubtedly affecting both the adolescent mothers and their target children's development.

The descriptive analyses conducted in this study show that over two thirds of the sample of adolescent mothers was from minority groups experiencing various forms of marginalization in the United States (only a third of the sample is white). Less than half of mothers, for instance, were able to obtain a degree at the time of the study and more than half had already dropped out of high-school or a GED program. In the larger sample from which this study's sample was obtained, more than 80% of mothers endorsed having experienced at least one traumatic event in their lifetime. In contrast, all of the mothers in the sample for this study had experienced at least one traumatic event before being given the PTSD-RI to complete. However, 57.9% of them have experienced three or more traumatic experiences and

particularly interpersonal and community violence. These statistics provide a clear picture – in addition to the challenges that come with motherhood, this sample has experienced several adverse childhood experiences in their lifetime.

Additionally, the mothers in the study display remarkably low EA scores overall, with very low variability in the EA scores across the entire sample. It is important to take into consideration that in addition to personal childhood experiences, even the early literature on attachment theory has purported that ecological context, family support systems, socioeconomic conditions, and marginalization all play a role in the extent of mothers' emotion availability and responsiveness to their children (Banyard, V.L., Williams, L.M., & Siegel, J.A., 2003; Bretherton, I., 1992; Garcia-Coll, 1996). Furthermore, as outlined in Garcia-Coll's Integrative Theory of Childhood, these factors must be systematically and methodically accounted for when investigating vulnerable populations to avoid perpetuating the deficit-based models that have characterized the field of child development for so long (Bretherton, I., 1992; Garcia-Coll 1996). The sample mothers' EA scores can be accounted for by considering both the conceptual and methodological aspects of this study. First, for the purposes of this study, other factors potentially influencing mothers' EA scores were not considered. As posited by the Garcia-Coll model, mothers' relatively low EA scores may be a result of other ecological and contextual factors such as the mothers' neighborhoods, economic viability, and perceived access to resources. Additionally, the mothers may be displaying low EA scores as an artifact produced by the age of the child during the time the data were collected. In other words,

observations of mothers' Emotional Availability occurred during T3 of the study, when the target children were approximately 2 years of age. This period of development is particularly challenging for parents, and especially young adolescent mothers who may be experiencing significant levels of parental distress (a construct that was measured at this time and could have potentially been controlled for) or lack of access to support services. The observations of maternal EA at this time may actually be reflecting the nature of the relation between mothers and their children during a specific period of development (18-30 months).

Additionally, mother's sensitivity and nonhostility EA scores were determined based on observations collected during both a play and teaching context. The coding of these EA scores could have been subject to a number of observer errors or biases, where observers perceived certain behaviors as non-sensitive or hostile depending on the coder's own racial or cultural background. Because this sample was highly diverse (over two thirds of the mothers were from minority backgrounds), normative definitions of EA may be inadequate for capturing the ways in which individuals from different cultural backgrounds display behaviors of responsivity and attunement to their children. Furthermore, for mothers with a history of PTSD, and especially immigrant mothers, environments where the mother is asked to play may be inducing particularly triggering or painful experiences (Noroña, personal communication). Mothers with a history of trauma have an especially difficult time playing with their children when play activities trigger memories of caregivers in their past who were either absent, unable to play, or unresponsive. Additionally, mothers from immigrant backgrounds may also be

experiencing alienation from the ways in which their US born children are able to play or experience their surroundings. For these reasons, the freeplay task investigated in this study may be obscuring the observations of EA amongst the mothers, leading coders to assign unusually low scores that can otherwise be attributed to the specific task.

In a similar fashion of applying Garcia-Coll's model to the mothers' EA scores, an integrative theory of child development can help us understand why the target children in this study show low scores on the dysregulation subscale of the ERC. First, it is noteworthy to highlight that the MHFE report on this study included the general incident rates of child maltreatment amongst the entire target children sample. Data from the Department of Children and Families indicated that by T5, 38% of children experienced at least one substantiated child maltreatment report since birth, and 2% of children were no longer in their mothers' custody. This percentage indicates that about a third of the target children had, by the end of the study, experienced a form of trauma themselves. In light of the intergenerational transmission of trauma literature, the target children's experiences of maltreatment (occurring as a result of the caregiver's own history of maltreatment) may be the main factor contributing to the children's emotion regulation capabilities more acutely than the mother's ability to be emotionally available and responsive towards the child. It is also worth pointing out that this statistic includes strictly substantiated reports of child maltreatment, and the numbers of children actually maltreated may be higher. Regardless, these findings on child maltreatment amongst the sample may partially explain the relatively low emotion regulation scores.

In addition to parent-child interactions, the children in this study have likely experienced a number of ecological factors impacting their development including housing insecurity, food insecurity, economic challenges, and racial prejudice given that the sample is largely non-white. Additionally, and because this study is a longitudinal study with data being collected several years apart, it is important to consider that there are many other factors that may have come into play at various time points of the study. Data on emotional availability were collected at T3, when children were approximately two years of age. Data on ER, however, were collected at Times 4 and 5, when children were preschoolers. Between T3 and T4/T5, several events could have occurred in the life of the child (such as maltreatment for instance, or neighborhood changes) that may have interfered with their ability to regulate emotions more proximally and more acutely than parental EA. It is important to take into account these developmental and ecological factors in order to avoid perpetuating the “deficit-based” models permeating much of the child development field.

While bearing the larger ecological context in mind, parent-child relationships are important to consider when delineating possible protective factors that can shield children from challenging experiences. Understanding how parental behavior acts as a moderator of various negative developmental outcomes (such as poor child emotion regulation outcomes) can help us develop sensitive programming that capitalizes on the protective nature of parenting practices. With regards to emotional availability as one of these potential protective factors, the results in this study indicate that as mothers’ emotional availability increased (sensitivity scores) their children’s

dysregulation score decreased, indicating greater overall emotion regulation for the child. The relation between maternal sensitivity and the child's ER confirms the findings from previous studies on the correlation between parental behaviors and children's developmental outcomes (Bert, Guner, & Lanzi, 2009; DiLillo & Damashek, 2003; Ruscio 2001).

Furthermore, the diverging outcomes for the nonhostility construct – namely that there was only a correlation between nonhostility and dysregulation on the freeplay task and not the teaching task – indicates that a lack of maternal emotional availability may serve as a greater challenge in particularly unstructured environments. This differential impact on EA constructs, depending on the task at hand (freeplay or teaching), was observed throughout the study. For instance, both the sensitivity and nonhostility constructs significantly predicted variation in emotional regulation for the child specifically on the freeplay task. Additionally, the multiple regression results also indicated that the freeplay task displayed significant relations between parental EA and the target child's dysregulation. These findings further highlight the notion that play with one's child may be a particularly difficult task for mothers with a history of trauma. As previously mentioned, the low EA scores can possibly be attributed to the nature of the task, especially when mothers with a history of trauma find play with their child to be disorienting, triggering, or simply too painful and thus dissociate during the activity. Additionally, it may be the case that when parents are asked to interact with their children with no guidelines, they are likely to fall into comfortable or familiar patterns of interactions, thus exacerbating the effects of emotional unavailability in the parent-child relationship. In this sense, the

freeplay task exacerbates the effects of low emotional availability due to nature of the task: entirely unstructured and potentially overwhelming to the already distressed or traumatized caregiver.

The differential results I have found based on the type of task (freeplay v.s. teaching) can also be explained through a cultural lens. Specifically, the teaching task in this study came with a predetermined set of guidelines that, colloquially, equalized the playing field for all caregivers. The freeplay task, on the other hand, may have acted as a proxy for various cultural (or even immigrant vs. non immigrant) differences in play amongst mothers. There is very limited research on the differences in play between mothers with trauma and their children across various cultures. One study on the differences in play compared immigrant (Japanese and South Americans in the United States) families' with families in their countries of origin (Japan and Argentina, respectively) and a common country of destination (European Americans in the United States) (Cote & Bornstein 2005). The findings indicated that generally, the play of immigrant children and mothers was similar to European American children's and mothers' play. However, Japanese and Argentine children in the country of origin engaged in more symbolic play, whereas immigrant children engaged in more exploratory play. Similarly, South American immigrant mothers demonstrated and solicited more exploratory play than Argentine mothers, while Japanese mothers solicited more symbolic play, and Argentine mothers demonstrated more symbolic play than immigrant mothers. Although the demographics from this paper do not match the demographics from the current study, these findings suggest that there are indeed cultural differences in play, not only amongst

children but amongst mothers as well. Bearing this in mind, observer bias may have coded parental behaviors of play in a normative way, prioritizing the dominant forms or behaviors associated with play in the context of the United States. Other studies have also highlighted the cultural differences in mother-child play, emphasizing that various cultures have different modes of play that differentially utilize exploration, representation, and interaction as the main facets of shared parent child activities. Even further, the literature on play in different cultures purports that different cultures emphasize either “functional” or “combinatorial” exploration, and that these “allocentric versus idiocentric stresses accord with larger cultural concerns of collectivism versus individualism in the two societies” (Borenstein, Haynes, Pascual, Painter, & Galperin 1999). Although this literature is limited to differential play between mothers and children from various cultures, it does not take into account the specific nuances of an even further vulnerable demographic: play between mothers with PTSD and their young children. The findings from this current study suggest that there might be even greater differences when one or more members of the parent-child dyad have experienced trauma or currently deal with PTSD. This is an area for potential further research on how trauma disrupts parent-child interactions.

In order to specifically assess the role EA plays in potentially moderating the relation between maternal trauma and child’s emotion regulation, moderation analyses were conducted with the sensitivity and nonhostility EA constructs as the proposed moderators. The moderation analyses indicated that there is an interaction between the maternal sensitivity EA construct and PTSD diagnoses, suggesting that EA may in fact play a

moderating role on the relation between maternal trauma and child emotion regulation. When the interaction was probed, there was only positive relation between PTSD diagnoses and child's dysregulation scores when emotion availability constructs were **low**, and not when emotion availability constructs were high. In other words, when both the maternal sensitivity and nonhostility EA constructs were low, respectively, the relation between PTSD diagnoses and the target child's dysregulation scores was positive. There was no significant result for high emotion availability scores on both constructs. However, bearing in mind the sample's baseline scores, these results can be attributed to the fact that mothers' emotional availability scores were not very high to begin with (the range of EA scores was very limited, with not much variance discernable in all EA constructs and on both tasks).

Overall, these results indicate that there is a moderation effect, where the relation between parental PTSD and child emotion regulation varies depending on the levels of EA. However, the findings also indicate that there is no relation between PTSD and ER when EA was high. There are a few ways to explain this in light of the literature. First, maternal PTSD may impact children through mechanisms that do not solely interact with the role of emotional availability. Furthermore, high emotion availability in mothers with PTSD might not moderate the relationship between PTSD and child dysregulation because the impact of PTSD operates through another mechanism that has not been accounted for in this study. This would explain why low emotion availability exacerbates the relation between PTSD diagnoses and child's dysregulation scores, while high emotional energy does not moderate the same relation. A potential confounding factor may be that

most mothers in this sample experience high rates of depression. PTSD in this sample may be interacting more acutely with maternal depression, and thus the impact of trauma on child emotion regulation can be more thoroughly understood by assessing depression (or lack thereof) as a mediator or moderator of this relation.

Another important consideration is that this study used PTSD diagnoses (full, partial, and no PTSD) as the predictor of emotion regulation outcomes for the target child. As other studies have indicated, it may not be the presence of a PTSD diagnosis itself, but rather the symptoms or behaviors associated with PTSD that affect both the parents' interactions with the child, and the child's developmental outcomes respectively (Braga, L. L., Mello, M. F., & Fiks, J. P., 2012; Dixon, L., Browne, K., & Hamilton-Giachritsis, C., 2005; Enlow, M., Egeland, B., Carlson, E., Blood, E., & Wright, R., 2014). I attempted to account for this by conducting moderation analyses with PTSD cluster symptoms as the predictor as opposed to the less nuanced predictor of PTSD diagnoses. Using Dr. Claudia Miranda-Julian's findings (a significant relation between specific symptoms of PTSD and the emotional availability constructs (sensitivity and nonhostility), Clusters C (avoiding/numbing) of the PTSD symptoms were used as the potential predictor of children's dysregulation scores. The analyses conducted to assess the EA constructs as moderators of the relation between scores on specific symptom clusters showed that there was no significant interaction between the maternal sensitivity construct (moderator) and Cluster C scores on the UCLA PTSD Reaction-Index (predictor) on both the freeplay and teaching task. There was, however, a significant interaction between the maternal nonhostility construct

and Cluster C scores on the UCLA PTSD Reaction-Index only on the teaching task. When probed, the interaction showed that when the nonhostility scores were low or average, there was no significant relation between Cluster C scores and the children's dysregulation scores. When nonhostility scores were high, there was a significant positive relation between Cluster C symptoms and children's dysregulation scores.

These results were counterintuitive. They indicated that when nonhostility scores are high (greater overall emotional availability), there was a positive significant relation between target children's dysregulation score and their mother's Cluster C symptom score (target children's dysregulation scores increased as maternal Cluster C symptoms increased). The relation between dysregulation and PTSD symptom cluster indicated that the relation between PTSD and ER is only positive when the mothers displayed high emotion availability. This further affirms the previous hypothesis in this discussion section – namely that the relation between PTSD and child's emotion dysregulation operates through another mechanism that is not accounted for through this study's design. For instance, high emotion availability in tandem with PTSD may actually manifest in hypervigilant maternal behaviors that negatively impact the child's emotion regulation ability. Lower hostility and overt sensitivity may lead the child to rely heavily on the parent as a co-regulator of emotions, thus unable to regulate on her own. In this sense, EA may display a curvilinear curve, where a parent who is “too attuned” or “too sensitive” may actually be interfering with her child's ability to develop adequate emotion regulation skills, or explore his or her environment while feeling like an autonomous actor.

Finally, moderation analyses conducted to assess the role of a social support program in moderating the relation between maternal PTSD diagnoses and target children's dysregulation scores showed that there was no significant interaction between PTSD diagnoses (full, partial, and no PTSD) and home visiting services. These results may be particular and not universal in that they only show the impact of this program in moderating the effect of PTSD on child emotion regulation. Although the home-visiting program had elements focusing on parental practices and behaviors, thus targeting emotion availability constructs, it was also not a trauma-informed program strictly speaking. Thus, it was not targeting the effects of trauma or PTSD that operated separate from the mother's emotional availability abilities. A program with trauma-informed practices may be better able to moderate the negative effects of maternal trauma on the overall development of the child.

Additionally, mothers in the home-visiting group did not receive the full number of home visits offered and often dropped out of the program before its full duration had elapsed (until the child turned 3 years of age). Approximately 14% of mothers in the home visiting group (HVS) did not actually receive any program services. These factors may account partially for the results with regards to the program's moderating effect. In other words, if the mothers' did not receive the full program as it was intended, it is not possible to fully detect the program's impact. In any case, the findings from this study shed light on a few potential practices that should be adapted by various home-visiting programs (especially ones targeting adolescent mothers) to adopt. First, as we have seen throughout the study, cultural sensitivity is of utmost importance. This is necessary to avoid the pathologizing or deficit-

based reasoning that may occur when professionals or researchers interact with families of color. In order to prevent this from occurring in the home-visitor and family relationship, all home visitors should receive thorough and careful trauma-informed and cultural sensitivity training. These trainings can ensure that a professional will examine her own preconceived notions, biases, and so on when interacting with families from backgrounds different from her own. Additionally, it might be beneficial to include a component focusing on parent-child play dynamics within home-visiting programs to help mothers navigate a potentially traumatic or painful aspect of parenting. This component might be individually executed by the home visitor, or as part of a larger “play group” component for various families to come together and find mutual support with regards to child rearing difficulties. Finally, and in addition to trauma-informed training for personnel, it would be beneficial for young mothers with experiences of trauma to have access to a home-visiting program that is specifically trauma-informed, targeting the short and long term impacts of trauma on the caregiver individually, and the family as a whole. These recommendations can help inform home visiting services that are more attuned, sensitive, and responsive to the needs of children and families while accommodating and embracing various racial, cultural, and ethnic backgrounds.

All in all, this study examined only a small aspect of the relation between maternal trauma and children’s emotion regulation outcomes, or the adverse effects of maternal trauma more generally. The literature in the field of the intergenerational transmission of trauma (the phenomenon that trauma is transferred from one generation of trauma survivors to their offspring (and

their offspring's offspring and so on) accounts for this phenomenon through a number of mechanisms, including but not limited to the effect of maternal parenting practices and emotion availability (Dixon, Browne, & Hamilton-Giachritsis, 2005; Schechter, 2003; Schwerdtfeger et al., 2007). Based on this framework, maternal trauma can indeed influence the child's risk of experiencing trauma through adverse parenting practices, which include a wide range of constructs not limited to emotion availability (Dixon et al., 2005; Schechter, 2003; Schwerdtfeger et al., 2007). This study only considered one of these constructs, attempting to delineate it as a potential moderator of the impact of trauma. It is thus incumbent in future studies to consider both alternative mechanisms moderating the relation between maternal trauma and child emotion regulation outcomes, and the overall ecological circumstances that further exacerbate these challenges within already vulnerable communities.

Conclusions

This study added to the body of literature on the relation between maternal trauma, parenting practices, and children's developmental outcomes by investigating the construct of emotional availability as a potential protective factor moderating the impact of trauma on emotion regulation. EA constructs consistently predicted changes in target children's emotion regulation (dysregulation subscale scores), EA was found to be a moderator of the relation between trauma (diagnosis and symptoms) and emotion regulation outcomes. These findings suggest that EA might display a curvilinear curve, where both too little and too much EA within a caregiver possessing potentially harmful effects on the child's ability to emotionally regulate.

Furthermore, participation in a social support program was not found to be a moderator of the relation between maternal trauma and emotion regulation in the target child. The finding that there was only a significant relation between trauma (PTSD diagnoses) and emotion regulation (dysregulation subscale score) when EA is low suggested that the relation between PTSD and ER is likely to interact in tangent to other parenting behaviors (not EA).

Additionally, the scores of EA constructs on the free playtask were found to be more consistent predictors of ER scores than EA constructs on the teaching task. These findings suggest that EA scores on the freeplay task may actually be artifacts of unstructured activities that retraumatize or overwhelm parents with a history of trauma. These findings can also be attributed to cultural differences in play between mothers and children from various cultural, racial, and immigrant-based contexts.

Limitations

The differential moderating effects in this study might be partly attributed to particular design limitations. First, the emotional availability constructs scores did not display a wide range or variance of scores. In other words, most mothers involved in the study had relatively low EA to begin with, and thus differential moderating effects of low vs. high EA are more difficult to discern quantitatively. This limitation can be avoided in the future by ensuring that data are collected from a wide range of participants. Second, because this was a longitudinal study, there was a large gap in time between Times 3 and 4 where data on EA and ER were collected respectively. The gap between these times is when life for these children and their families continued to happen. Thus, and due to design, it is difficult to attribute ER

scores for the target children to the EA of their mothers measured several months ago. The target children's ER scores may be more appropriately attributed to other events that occurred in the children's lives, including the possibilities of abuse and maltreatment.

With regards to the social support program as a moderator, the HVS participants in the sample did not all receive the full services of the program, or remain enrolled until the end of the services period. This may interfere with the findings on the program as a moderator simply because mothers may have not gained the full benefits of the program. Furthermore, while this study attempted to account for ecological factors affecting parental stress and parenting practices, and children's developmental outcomes (including emotion regulation) by relying on integrative theories of child development, this theoretical endeavor was not matched quantitatively. In other words, there were several factors such as socioeconomic background, perceived prejudice or discrimination scale, and access to resources that were neither accounted nor controlled for when investigating the relations between trauma, EA, and ER. Additionally, intrinsic cultural differences in play were not accounted for when studying and observing mothers during the freeplay task. Oversight or pathologizing of potentially adaptive behaviors during play may have resulted in lower EA scores for mothers who did not display normative play behaviors dominant in US culture. It is of utmost importance for future studies within the field to make all efforts feasible to collect adequate ecological information when investigating or making claims regarding the development of vulnerable children and families.

Table 1
Demographic Factors of Sample of Study Participants (n=304)

	Full Sample %; Mean (SD); Range	HVS Sample (n=164)%; Mean (SD)	RIO Sample (n=140)%; Mean (SD)
Maternal age at T1	18.6 (1.29); 16.08-21.25	18.66 (1.31)	18.53 (1.28)
Race			
White non Hispanic	36.8%	30.5%	44.1%
Black non- Hispanic	19.4%	21.3%	17.1%
Hispanic	34.2%	40.2%	27.1%
Other	9.2%	7.1%	11.4%
Educational Attainment			
Completed HS or GED	42.1%	42.1%	42.1%
Dropped out of HS or GED	57.2%	57.3%	57.1%
Target Child Gender			
Female	47.4%	48.2%	46.4%
Male	52%	51.2%	52.9%

Table 2

PTSD Diagnoses, Emotion Availability, and Emotion Regulation Outcomes

	Full Sample %; Mean (SD); Range	HVS Sample %; Mean (SD)	RIO Sample %; Mean (SD)
Number of Traumatic Events Experienced	3.44(.124)	3.28(2.00)	3.62(2.34)
PTSD Diagnoses			
Full PTSD	46.1%	42.1%	50.7%
Partial PTSD	34.5%	37.8%	30.7%
No PTSD	19.4%	20.1%	18.6%
Parenting Outcomes			
Freeplay Sensitivity Score	4.80(.109) 1-7	4.54(1.34) 1-7	5.07(1.19) 2-7
Teaching Sensitivity	4.85(.109) 1-8	4.59(1.28) 1-8	5.11(1.27) 3-8
Mean Sensitivity Score	4.85(.102) 1-7	4.61(1.23) 1-7	5.09(1.15) 3-7
Freeplay Nonhostility Score	4.24 (.078) 1.67-5	4.14(1.00) 1.67-5.00	4.35(.844) 2-5
Teaching Nonhostility Score	4.21(.076) 2-5	4.11(.940) 2-5	4.30(.838) 2-5
Mean Nonhostility Score	4.24(.067) 2-5	4.15(.834) 2-5	4.33(.741) 2-5
Target Child Emotion Dysregulation Score	1.81(.033) 1-3.42	1.80(.512) 1-3.42	1.822(.500) 1-3

Table 3
Distributions of Number of Traumatic Experiences Among All Participants
(n=304)

	Percentage (n)
1 Event	22.7% (69)
2 Events	19.4% (59)
3 Events	14.1% (43)
4 Events	14.8% (45)
5 Events	11.8% (36)
6 Events	6.9% (21)
7 Events	5.3% (16)
8 Events	3.0% (9)
9 Events	1.0% (3)
10 Events	.3% (1)
11 Events	.7% (2)
Mean	3.44
SD	.124

Table 4
Types of Traumatic Experiences Endorsed by Study Participants

	Percentage (n)
Earthquake	2.00% (6)
Fire, tornado, flood or hurricane	20.7% (63)
Bad accident	25.3% (77)
Scary medical procedure or treatment	23% (70)
Hearing about the violent death or injury of a loved one	59.9% (182)
Witnessing community violence	61.5% (187)
Seeing a dead body in your town	22.7% (69)
War or conflict	2.3% (7)
Being beaten up, shot at, or threatened to be hurt in your town	27.0% (82)
Being hit, kicked or punched at home	22.0% (67)
Witnessing a family member being hit, kicked or punched	33.2% (101)
Child sexual abuse	61.5% (187)

Table 5
Intercorrelations Between Various EA Constructs

Variables	1	2	3	4	5	6
1. Sensitivity (Freeplay)	--					
2. Sensitivity (Teaching Task)	.771 ***	--				
3. Sensitivity (Mean Score)	.941 ***	.941 ***	--			
4. Nonhostility (Freeplay)	.654 ***	.519 ***	.621 ***	--		
5. Nonhostility (Teaching Task)	.467 ***	.689 ***	.612 ***	.535 ***	--	
6. Nonhostility (Mean Score)	.318 ***	.449 ***	.420 ***	.267 ***	.539 ***	--

Note. * $p < .05$. ** $p < .01$ *** $p < .001$

Table 6
Correlations Between EA Constructs, PTSD Diagnoses, and Dysregulation Subscale Scores

Variables	1	2	3	4	5	6	7	8
1. Sensitivity (Freeplay)	--							
2. Sensitivity (Teaching Task)	.771 ***	--						
3. Sensitivity (Mean Score)	.941 ***	.941 ***	--					
4. Nonhostility (Freeplay)	.654 ***	.519 ***	.621 ***	--				
5. Nonhostility (Teaching Task)	.467 ***	.689 ***	.612 ***	.535 ***	--			
6. Nonhostility (Mean Score)	.318 ***	.449 ***	.420 ***	.267 ***	.539 ***	--		
7. PTSD Diagnoses	.039	.037	.044	-.083	-.023	-.103	--	
8. ERC Dysregulation Subscale	-.257 ***	-.208 ***	-.237 ***	-.221 ***	-.119	-.050	-.062	--

Note. *p<.05. **p<.01 ***p<.001

Table 7
Results of Multiple Linear Regressions by EA Construct

Predictor	t	p	β	F	df	p	adj. R ²
Sensitivity (Freeplay)	-3.766	.000	-.261	5.797	3,201	.001	.066
Sensitivity (Teaching Task)	-2.794	.006	-.198	3.362	3,198	.020	.034
Sensitivity (Mean Score)	-3.351	.001	-.237	4.510	3,197	.004	.050
Nonhostility (Freeplay)	-3.216	.002	-.221	4.498	3,201	.004	.049
Nonhostility (Teaching Task)	-1.579	.116	-.112	1.572	3,198	.197	.008
Nonhostility (Mean Score)	-2.551	.012	-.180	2.918	3,197	.035	.028

Note. The dependent variable for all regressions was ERC Subscale Dysregulation score. Maternal educational attainment and child gender were controlled for.

Table 8
Moderation Analyses with EA Constructs as Moderators of Relation Between PTSD Diagnoses/Symptom C Clusters and ERC Dysregulation Subscale

Predictor	β	<i>p</i>	95% CI
PTSD Diagnoses	.047	.609	-.135, .230
Maternal Sensitivity (Freeplay)	-.092	.007	-.159, -.026
PTSD Diagnoses x MS (Freeplay)	-.1370	.052	-2.75, .009
PTSD Diagnoses	.054	.553	-.126, .234
Maternal Sensitivity (Teaching Task)	-.060	.072	-.125, .005
PTSD Diagnoses x MS (Teaching Task)	-.1500	.028**	-.283, -.017
PTSD Diagnoses	.065	.493	-.122, .252
Nonhostility (Freeplay)	-.116	.019	-.213, -.019
PTSD Diagnoses x Nonhostility (Freeplay)	-.010	.923	-.208, .188
PTSD Diagnoses			
Nonhostility (Teaching Task)	.061	.509	-.121, .242
PTSD Diagnoses x Nonhostility (Teaching Task)	-.065	.188	-.163, .032
	-.210	.036	-.407, -.0139
PTSD Cluster C Score	.116	.206	-.065, .296
MS (Freeplay)	-.085	.018	-.154, -.015
PTSD CC Score x MS (Freeplay)	.118	.110	-.207, .263
PTSD CC Score	.118	.198	-.062, .298
MS (Teaching Task)	-.066	.047	-.131, -.001
PTSD CC Score x MS (Teaching Task)	.119	.081	-.015, .254
PTSD CC Score	.087	.363	-.102, .276
Nonhostility (Freeplay)	-.109	.032	-.209, -.009
PTSD CC Score x (Freeplay)	.011	.920	-.207, .229
PTSD CC Score	.094	.293	-.083, .271
Nonhostility (TT)	-.103	.038	-.200, -.006
PTSD CC Score x Nonhostility (TT)	.291	.007	.080, .503

Table 9
*Moderation Analyses with Program Participation as Moderator of Relation
 Between PTSD Diagnoses and ERC Dysregulation Subscale*

Predictor	β	<i>p</i>	95% CI
PTSD Diagnoses	-.062	.372	-.197, .074
Program Participation	-.033	.628	-.165, .100
PTSD Diagnoses x Program Participation	-.049	.725	-.321, .224

Table 10

Conditional Effects of EA Constructs on Emotion Dysregulation Scores with PTSD Diagnoses and Cluster C Symptoms as Predictors

Variable	β	p	95% CI
Maternal Sensitivity on Teaching Task (PTSD Predictor)			
One SD Below Mean	.257	.044	.007, .508
At the Mean	.054	.553	-.126, .234
One SD Above the Mean	.149	.257	-.408, .110
Nonhostility on Teaching Task (PTSD Predictor)			
One SD Below Mean	.253	.049	.001, .505
At the Mean	.061	.051	-.1205, .242
One SD Above the Mean	-.111	.371	-.356, .134
Nonhostility on Teaching Task (Cluster C Symptoms Predictor)			
One SD Below Mean	-.171	.200	-.432, .091
At the Mean	.095	.293	-.083, .272
One SD Above the Mean	.334	.009	.086, .582

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