Maternal Depressive Symptoms and Mind-Mindedness among Young Mothers

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Abstract

The present study sought to shed light on questions related to maternal depression, parenting attitudes and Mind-Mindedness (MM) among young mothers by exploring the links between depression and Mind-Mindedness, parenting attitudes and Mind-Mindedness, and the moderating effects of a home-visiting program on the relation between depression and Mind-Mindedness. Data were used from the Massachusetts Healthy Families Evaluation, a study of a home-visiting program for young mothers. Using regression analysis, no statistically significant results were found for the relation between depressive symptoms and MM, or for the moderating role that the treatment had on this relation. Statistically significant results were found between the AAPI Corporal Punishment construct and the percentage of mind-related comments that mothers made, suggesting that higher risk AAPI Corporal Punishment scores were associated with a lower percentage of mind-related comments, another risk factor.

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Maternal Depressive Symptoms and Mind-Mindedness among Young Mothers

Maternal depression is a serious public health concern because it can have dramatic effects on mother and child (Crean, Hightower, & Allan, 2001; Dawson et al., 2003; Schwarz & O'Sullivan, 2007). Risks associated with maternal depression can be seen throughout the life-course in both effects on parenting and the development of the child. Families experiencing maternal depression are more likely to live in poverty and experience social isolation and attachment difficulties. Children can have difficulties in school and may exhibit increased depressive symptoms themselves (Cicchetti & Toth, 2009; Gerhardt, 2004; Turner, Sorenson, & Turner, 2000).

Wachs, Black, and Engle (2009) explained that depressive symptoms of "sadness, negative affect, loss of interest in daily activities, fatigue, difficulty thinking clearly, and bouts of withdrawal and intrusiveness may interfere with consistent, attentive, and responsive caregiving" (p. 51). Maternal depression is associated with disruptions in parent-child interactions and higher rates of insecure attachments (Wachs et al., 2009). For low-income mothers and mothers of young children, the documented prevalence is as much as five times greater than the general population; between 40-49% report clinical levels of depression (Administration for Children and Families, 2003; Loeb, Fuller, Kagan, & Carroll, 2004; Malik et al., 2007).

Depression rates among young mothers are also disproportionately high relative to the general population (Woodward & Ferguson, 1999). For example,

in one study of a large sample of young mothers enrolled in a parenting support program (Massachusetts Healthy Families Evaluation), 45% of young mothers reported clinical levels of depression at the end of the evaluation; 27% had been chronically depressed, scoring above the clinical cutoff on three occasions (Jacobs, Easterbrooks, Brady, & Mistry, 2005). Black et al. (2002) found the prevalence of their sample of adolescent mothers with children four to five years of age to be slightly lower, at 32%. Deal and Holt (1998) found that as high as 48% of young mothers experience depressive symptoms.

Being a young mother, and being born to a young mother, pose their own risk factors for health and development, which also include social isolation, academic difficulties, and relationship struggles (Cox, Hopkins, & Hans, 2000; Woodward & Fergusson, 1999). Given the high rates of depression in adolescent parents, understanding depressive symptoms can offer insight into the behavior of young mothers.

The presence of depressive symptoms affects behavior. Depressive symptoms can cause a mother to be withdrawn and not responsive to her child's needs (Gerhardt, 2004). Symptoms of self-consciousness, an exaggerated preoccupation with one's own thoughts and emotions are high during adolescence; self-consciousness has been associated with internalizing symptoms, such as depression (Bowker & Rubin, 2009). Depression is thought to preoccupy one with oneself, which may affect maternal representations or cognitions about her child and the child's behavior. It may not come as a surprise, then, that

adolescent mothers, compared to older mothers, are less likely to attribute intentions to their child's actions.

Mind-Mindedness (MM) is a measure of maternal representations, defined as "one's proclivity to adopt the intentional stance" in their interactions with, and representations of others (Meins, 2010, p. 2). The "intentional stance" (Dennett, 1987) refers to the tendency to assign mental states, such as beliefs and desires, to explaining actions of others (Gergerly, Nadasdy, Csibra, & Biro, 1995). In comparing adolescent parents to their adult counterparts, one study found that adolescents were less likely to make mind-related comments about their children, and less likely to make positive comments as well (Demers, Bernier, Tarabulsy, & Provost, 2010). MM has been linked in the research literature to a variety of aspects of development, such as attachment, maternal sensitivity, and children's Theory of Mind development (Demers et al., 2010; Laranjo, Bernier, Meins, & Carlson, 2010; Meins, 2010). Mothers who have higher proportions of mind-related comments about their children's behavior are more likely to have a secure attachment with their children, more likely to be sensitive to them, and the children are more likely to exhibit Theory of Mind.

The association between caregiver and child has many implications for development. To say that the relationship between a mother and a child is important is an understatement. Healthy relationships are the foundation of healthy growth and development (Gerhardt, 2004). Given the multitude of mechanisms through which depression can impact the mother-child relationship,

examining how maternal depression is associated with MM may shed light on an important social issue.

In this study I answer the question, "is there a link between depression and Mind-Mindedness among young mothers?" Since the mothers in the sample are participating in an evaluation of a parenting support program, Healthy Families Massachusetts (HFM), I also have the opportunity to ask, "does participation in the HFM program moderate the link between maternal depressive symptoms and MM?" A final research question is related to parenting beliefs and attitudes: "Is MM linked to parenting attitudes of empathy, role-reversal, and corporal punishment?"

Review of the Literature

Factors Influencing Depression and Depression Effects

Meins, Fernyhough, Arnott, and Turner (2010) explored the link between maternal depression and Mind-Mindedness (MM). They found no strong support for a direct relation between MM and depression at the time of assessment. The sample, however, was limited to low-risk mothers who reported mean Beck Depression Inventory (BDI) scores of 8.41 (SD = 7.69), which falls in the lowest scoring category, "minimal depression" (Meins et al., 2010, p. 9). Depression, however, does have an indirect relation with MM, such that depression is associated with variables such as maternal sensitivity, which is linked to MM (Demers et al., 2010). Although direct effects of depression on MM are not well documented in the research literature, it is important to consider them when looking at a population of mothers with high reports of depressive symptoms. As

a group, young mothers report high rates of depressive symptoms. Additionally, we know that depression is related to many aspects of young motherhood and maternal representations, such as attachment, socioeconomic status (SES), and social support (Demers et al., 2010).

Whether depressive symptoms are measured by diagnostic criteria, or self-reported identification of symptoms, risks to child outcomes are great (Milan, Snow, & Belay, 2009). High rates of depressive symptoms are often associated with teenage parenthood (Kalil & Kunz, 2002), making this population additionally vulnerable. The prevalence of depression rates has been documented as high as 50% among low-income teenage mothers, compared to 13% of women in the general population (Kalil & Kunz, 2002).

Postpartum depression must not be confused with "baby blues." Symptoms of baby blues occur in the first few days after a mother gives birth. Baby blues are characterized by feelings of tearfulness, sadness, and irritability. An important characterization of baby blues is that they are less severe and less persistent than postpartum depression (Blum, 2007). Also, not to be confused with postpartum depression is postpartum psychosis. Postpartum psychosis occurs much less frequently than postpartum depression or the baby blues and is characterized by a loss of touch with reality, psychosis and hallucinations (Blum, 2007).

With regards to maternal depression, symptoms may be present prior to the birth of a child, or become apparent shortly after delivery. Studies of the etiology of postpartum depression have largely focused on biological causes,

given the amount of hormonal changes that occur during pregnancy and childbirth (Blum, 2007). According to Blum, no study has found a link between biological changes in childbirth and subsequent major depression. A history of depressive symptoms prior to pregnancy is a risk to the development of depression postnatally (Blum, 2007).

Andrews and Anderson Thomson, Jr. (2009) suggested that depressive symptoms are our mind's evolutionary response to life's stressors. Complex social problems, they argued, might be the main trigger for this response. Regardless of one's position on the evolutionary aspect of depressive symptoms, psychosocial factors such as socioeconomic status, social support, and whether or not the pregnancy was planned are associated with maternal depression (Blum, 2007; Smith & Howard, 2008).

Socioeconomic status plays a large role in the prevalence of both teenage childbirth and depressive symptoms; many teenage mothers experience depressive symptoms into adulthood, as their financial strains persist as well (Kalil & Kunz, 2002). This is particularly important as "depression predicts lower levels of socioeconomic success (e.g., unemployment) in low-income single mothers and is associated with rapid repeat pregnancy and poor school performance" (Kalil & Kunz, 2002, p. 1749).

Some studies indicate that women who had children as adolescents never catch-up financially with their counterparts who postponed childbearing until their adult years as they struggle to balance their roles as a parent and teenager. Unwed, teenage mothers in poverty have many barriers to overcome, including

being more likely to drop out of high school, less likely to be employed in a stable, meaningful job, and more likely to utilize public assistance (Crean, Hightower, & Allan, 2001). The relation between maternal depression and socioeconomic status is bidirectional. Mothers of lower SES are more likely to experience symptoms of psychological distress, especially if they have young children (Petterson & Burke Albers, 2001), and are more likely to be unemployed or of lower SES (Kalil & Kunz, 2002). Not only are these young moms at risk for socioeconomic disadvantage due to being young mothers, but depressive symptoms add to the risk of being, and staying, poor, while their socioeconomic status remains a risk to their emotional health.

Social stressors and supports. Research supports the contention that risks for adolescent depression include "social isolation, weight/shape disturbances, and self-efficacy as a mother… in addition to their struggle to integrate their life roles of adolescent, daughter, student, partner and/or employee" (Schwarz & O'Sullivan, 2007, p. 486). Social support is a widely researched topic related to maternal depression, as the two are negatively associated; higher levels of social support are linked with lower levels of depression (Dawson et al., 2003). Social support can come from a variety of sources, but considerable attention is paid towards the supportive role of the father of the child. Due to the impact that the father can play in offering social support, it is important to consider the potential impact of his involvement. As Smith and Howard (2008) explain:

> Fathers can be involved with their children by having physical proximity, taking financial and emotional responsibility for their well-being, and/or engaging in direct activities with their children. Each of these types of support has been linked to positive outcomes for both mothers and children. (p. 763)

Fathers also provide instrumental and emotional support to mothers. Instrumental support refers to assistance with childcare, finances, and transportation. Emotional support refers to the father being available to support the emotional life of the mother, mainly by being someone to listen and talk to (Smith & Howard, 2008). Both forms of support have been linked to maternal depression. Higher levels of each type of support are associated with lower levels of depression (Smith & Howard, 2008).

Mothers who are not married or who are not in a romantic relationship with the fathers of their children receive less emotional and instrumental support, particularly emotional support, than mothers who are in a relationship with the fathers of their children. Emotional support is linked to the status of a relationship, whereas instrumental support is present when a father is involved with a child whether the father remains in a relationship with the mother or not (Smith & Howard, 2008). Adolescent mothers are more likely to be unmarried and in shorter relationships with the fathers of their children than are their older counterparts, making the effects of a lack of paternal support a risk for their mental health. In cases of postpartum depression, the amount of support that a

mother receives from the father has been a factor that influences the rate at which symptoms subside (Smith & Howard, 2008).

Impacts of depression on maternal behavior. Maternal depression can have varying effects on those with symptoms. Maternal depression may affect a mother's ability to form social relationships, maintain intimate relationships, adequately complete educational requirements or demands occupationally, and provide the needed attentive, nurturing behaviors that her young children need (Turner et al., 2000).

Compared to non-depressed mothers, the behavior of depressed mothers is "less responsive, more helpless, hostile, critical, alternatively disengaged or intrusive, disorganized and less active, avoidant of confrontation, and generally less competent" (Petterson & Burke Albers, 2001, p. 1795). Petterson and Burke Albers (2001) found, however, that mother-child interactions can mediate the effects of maternal depression, such that maintaining a positive connection between mother and child may moderate some of the effects of depression. In addition, mother-child interactions appear to be a mechanism through which depression affects the child (Petterson & Burke Albers, 2001).

In addition to mother-child interactions, marital adjustment and social support also play a role in the behavior of depressed mothers. Depressed mothers have fewer social and emotional resources to devote to parenting (Dawson et al., 2003); this directly impacts how consistent and effective depressed mothers are in their parenting. Dawson et al. (2003) examined the role of maternal depression on maternal behavior and found that chronically depressed mothers were more

likely to display withdrawn behaviors in interactions with their children. Regarding the withdrawal behaviors, Dawson et al. explained:

> The withdrawal score was composed of mother's flat affect and lack of talking across tasks. Flat affect included mother facial expressions, vocal cues, or body postures indicating a lack of emotional expressiveness or disengagement from the child. Examples of flat affect included mumbling, blank face, or downcast eyes. (p. 1165)

The study did not find any association between maternal depression and maternal behaviors of warmth and encouragement. This was proposed as being a result of using a sample of largely middle and upper class mothers, due to attrition in the study of participants of lower socioeconomic status (SES). Typically lower SES is also associated with less positive parenting than mothers with more financial resources (Dawson et al., 2003).

Impacts on child behavior. Research has documented that risks of maternal depression to the child extend from fetal developmental through adolescence and beyond (Bagner, Pettit, Lewinsohn, & Seeley, 2010; Dawson et al., 2003; Field, Diego, & Sanders, 2001). Maternal depression has especially received attention in its relation to parent-child interactions and attachment. Even in the first year of life, infants of depressed mothers have "higher levels of distress, negativity and avoidance of the mother" (van Doesum, Risken-Walraven, Hosman, & Hoefnagels, 2008, p. 247), which has implications for the attachment security of the mother-infant relationship (Flykt, Kanninen, Sinkkonen, & Punamaki, 2010).

By two months of age, infants of depressed mothers are already showing signs of difficulty engaging socially and with objects. Petterson and Burke Albers (2001) described that infants of depressed mothers:

> [L]ook less at the mother, engage less with objects, show less positive affect and more negative affect, and exhibit lower activity levels, and greater physiological reactivity as indexed by higher heart rates and cortisol levels than infants of non-depressed mothers. (p. 1794)

In neurobiological studies of infants and children of depressed mothers, research has shown reduced activation in the left frontal regions of the brain, which is often associated with emotions such as joy. Infants with reduced frontal lobe activity tend to be more irritable (Dawson et al., 2003). Dawson et al. (2003) found that preschool-aged children of depressed mothers were more likely to show "internalizing and externalizing behavior problems" (Dawson et al., 2003, p. 1171). EEGs of preschool-aged children showed atypical patterns and reduced activation, which may be a sign of less "alertness, focused attention, and readiness to respond to the environment" (Dawson et al., 2003, p. 1172). The effects of maternal depression on brain electrical activity may be attributed to genetic or environmental influences.

A suggested mediating mechanism for the effects of maternal depression on child maladaptation is mother-child attachment (Toth, Rogosch, Sturge-Apple, & Cicchetti, 2009). According to Toth et al. (2009), "Maternal depression has been associated with higher rates of insecure attachment" (p. 192). The early relationships that children form with their caregivers influence the child's own

representations of self as well, indicating that rejection by the mother will result in an internal working model that the self is not worthy of love. The potential result is "later maladpataion and depression, including low self-esteem, helplessness, and negative attributional biases" (Toth et al., 2009). Due to the influence that attachment security can have on later adaptation in many realms, Toth et al. proposed interventions to target the mother-child bond in an effort to increase protective factors for mothers and children.

Chronicity and timing. The chronicity of maternal depression is a key feature of the condition that requires consideration. According to Milan et al. (2009), the way in which children are affected by maternal depression varies according to the severity, timing, chronicity, and types of behaviors exhibited by the mother. The longer a mother experiences symptoms, the more profound the effect will be on her child. Campbell, Cohn, and Meyers (1995) found that for mothers in the study who reported depressive symptoms for six months had less positive interactions with their infants during feeding, face-to-face interactions, and playing than mothers whose depressive symptoms did not persist for six months (Petterson & Burke Albers, 2001). Studies assessing longer-term effects on chronically depressed mothers were less consistent than studies looking specifically at infancy (Petterson & Burke Albers, 2001). Studies have shown that the more chronic depressive symptoms are, the poorer cognitive and social functioning the children show, including scoring:

> …more poorly on tests of school readiness and expressive language, were rated as having more externalizing problems and poorer social skills and

> were more likely to be insecurely attached at 36 months than children whose mothers were not depressed or whose symptoms were only intermittent. (Campbell, Matestic, von Stauffenber, Mohan, & Kirchner, 2007, p. 1202)

Dawson et al. (2003) looked at behavior problems of preschoolers and found that preschoolers whose mothers' depressive symptoms had abated were as likely to exhibit behavior problems as those whose mothers continued to suffer from chronic depression. This finding is especially important as it indicates that maternal depression can have lasting effects on child behavior even after symptoms have subsided.

Of important note is that intermittent maternal depression may be a protective factor for childhood mental health. According to Milan et al. (2009), "in families where mothers reported intermittent depressive symptoms… children with insecure attachment histories actually reported less depression than did children with secure histories" (p. 1030). They posit that, perhaps, children with insecure attachments who have exposure to non-chronic depression may, in fact, develop strategies that buffer effects to their own depressive symptoms. Studies along these lines must be replicated and interpreted with care, as it may be that these children are not expressing depressive symptoms in an effort to avoid negative emotions for the purpose of preserving relationships (Milan et al., 2009).

In addition to the issue of chronicity of maternal depression, timing is also important to consider. Bureau, Easterbrooks, and Lyons-Ruth (2009) explored effects of the timing of maternal depressive symptoms on child development.

They noted that multiple authors (Alpern & Lyons-Ruth, 1993; Essex, Klein, Miech, & Smiders, 2001) identify infancy as a "sensitive period for the occurrence of internalizing symptoms later in childhood" (Bureau et al., 2009, p. 521), referencing the notion that children who are exposed to maternal depression in infancy are more likely to experience internalizing symptoms of anxiety or depression later in childhood compared to children whose mothers were depressed later, but not in infancy. Infancy is an important time during which the child is experiencing rapid growth and development in sensory processing, emotion regulation, and attachment; this may explain why effects of maternal depression during infancy may be particularly disruptive (Bureau et al., 2009).

Maternal Representations of Child

As stated earlier, there is strong evidence in the research literature of the effects of depression on maternal behavior, particularly related to parent-child interactions. Given the risks associated with young motherhood, it will be important to explore behavioral impacts of maternal depression among young mothers. Maternal representations may shed light on one mechanism through which the behavior of a mother is impacted by depression.

Maternal representations refer to how a mother internally and subjectively experiences the relationship between herself and her child, essentially her own mental model of the child (Malone, Levendosky, Dayton, & Bogat, 2010; Sokolowsky, Hans, Bernstein, & Cox, 2007). The majority of mothers form mental representations of their children by the second or third trimester of their pregnancies (Ammaniti et al., 1992); these representations are thought to remain

relatively constant throughout parenting. As maternal representations are forming, a mother is developing an internal working model (IWM) of her own subjective, internal perceptions of the relationship that exists between herself and her child by using past attachment experiences from her own childhood (Malone et al., 2010). Maternal representations are largely studied through descriptions that mothers give about their children, particularly the way that mothers structure the descriptions that they offer and what they say about their children (Sokolowsky et al., 2007). Ideally, maternal representations result in the perception of the child as an individual who is separate from the mother and who has needs for "care" and "autonomy" (Malone et al., 2010, p. 435). Research related to maternal mental representations of their children has examined how these representations are formed and what effect they have on child outcomes, such as attachment, cognitive development, and achievement (Sokolowsky et al., 2007).

Mind-Mindedness. Mind-Mindedness (MM) has been identified as a construct that represents one aspect of maternal representations (Demers et al., 2010; Meins, 1999). MM is a construct that refers to "mothers' proclivity to consider and treat their infant as having an active and autonomous mental life of thoughts, intentions, desires, etc." (Demers et al., 2010, p. 3). MM can be measured through observations of parent-child interactions and through parental representations during an interview when asked to describe her child. The ability of a mother to think of her child as being motivated by intention and having an

active mental life allows her to assign meaning to the child's behavior (Demers et al., 2010).

According to Demers et al. (2010), "Mind-Mindedness appears to be a useful construct in the study of maternal behavior and child development" (p. 3) as it has been documented to be associated with maternal sensitivity and parent-child attachment security (De Wolff & van IJzendoorn, 1997; Demers, Bernier, Tarabulsy, & Provost, in press). If a mother is mind-minded in her approach to her child, she is better able to attribute meaning to her child's behaviors. Essentially, she has developed an understanding that the child's actions are fueled by his or her mental life (Demers et al., 2010). Meins (1999) posits that MM is necessary for maternal sensitivity, and maternal sensitivity is one of the most important precursors to attachment security (De Wolff & van IJzendoorn, 1997). A mother who describes her child in a Mind-Minded matter uses descriptors that reference the child's mental life, such as, "he knows what to say to make me laugh," "she loves movies," or "he's learning so much so fast". In contrast, mothers who use fewer mind-related comments may use behavioral comments such as, "he talks a lot," "he's hyper," or "he loves to run," physical comments, such as, "she has hair like mine" or "he's such a handsome baby," or general comments such as, "he's a good baby", or "she's just like me". Any comment without enough information or context to know what a mother is referring to is coded as a general comment. An important distinction to make in the coding scheme is that comments that describe the child's preference for an action or behavior, such as "he loves to play basketball," and "she loves to dance," are

coded as behavioral comments. A preference for anything else is coded as mental.

Maternal sensitivity. Mind-Mindedness was initially introduced as a construct to return to the idea of maternal sensitivity and elaborate on its cognitive component (Demers et al., 2010). Research has found a link between MM and Maternal Sensitivity (Demers et al., 2010; Laranjo, Bernier, & Meins, 2008). In addition to MM, maternal sensitivity also requires a mother to appropriately interpret signals of her child rather than simply recognize them. Demers et al. (2010) studied the link between maternal MM and maternal sensitivity, taking the work of Meins et al. (1998) further by using the valence of comments made by mothers, and identified them as positive, negative, or neutral.

Demers et al., (2010) found the relation between MM and maternal sensitivity to be attributable to the valence of comments, "the more a mother used positive mental descriptors, the more sensitive she was observed to be to her child's signals" (p. 105). However, negative attributions were not found to be negatively associated with maternal sensitivity; more negative comments did not result in lower maternal sensitivity. It is possible that given their propensity to view their children positively and to believe their children have positive intentions, mothers may be more likely to read their children more accurately as well as to respond with warmth, both of which indicate sensitivity (Demers et al., 2010). It is important to note that entirely positive comments about one's children may not be the best predictor of maternal sensitivity. Mothers who are able to be flexible in their perceptions of their children, and to consider all aspects of their

behavior and development, are found to be securely attached and mind-minded as well. Positive mental comments along with some negative and neutral comments still predicted maternal sensitivity (Demers et al., 2010).

Attachment. As stated by Meins (1999), Mind-Mindedness, maternal sensitivity, and attachment security are closely linked. Understanding the importance of attachment in the parent-child bond sheds light on what makes MM an area of interest regarding the relationship between mother and child. Research has repeatedly supported that there is a link between maternal representations and the attachment security between mother and child (Sokolowsky et al., 2007). If Bowlby, Bronfrenbrenner, Erikson, and Freud agreed on one principle, it would likely be that the nature of the relationship between a parent and a child is one of the most influential factors in a child's development (Vando, Rhule-Louie, McMahon, & Spieker, 2007).

Attachment theory, largely associated with theories of John Bowlby, uses an evolutionary framework to explain the set of behaviors a human infant uses to get his or her needs met by a caregiver, especially needs necessary for survival; these behaviors explain the relationship that develops between a caregiver and child as a result of these survival mechanisms (Gervai, 2009). Relationships with caregivers are the foundation of attachment; as infants interact with individuals around them, they develop their own internal working models (IWM) for the nature of self, caregivers, and relationships; all are theorized to impact behavior and later relationships. If infants learn that adults are available and eager to meet

their needs, children develop a sense that they are worth being loved, and learn how to care for others in return (Gervai, 2009).

The connection between maternal representations of their children and attachment can be seen in Ainsworth et al.'s (1978) assertion that a component of a secure mother-child attachment is the ability to consider the child's point of view. Essentially, in order to have a secure attachment, a mother must be able to take into consideration the child's "feelings, underlying motives, wishes, and goals" (Oppenheim, Koren-Karie, & Sagi, 2001, p. 16).

According to Gervai (2009), environmental risk factors also exist for attachment security between mother and child. Gervai elaborates that "income and family size, parental age and education, major stressful events, such as loss of a parent, birth of a sibling, severe illness, marital relationships and breakdown, affect the quality of attachment relationships" (p. 2). A greater number of risk factors present indicate an increased risk.

Effects of secure attachments are noticeable immediately. Children in secure attachment relationships are seen to show more positive affect and behavior with their caregiver in interactions; caregivers are also more positive and responsive (Thompson, 1999). Secure attachment in the first two years of life has been linked to more optimal social development, positive behavior, and increased emotion regulation; insecure attachment styles, on the other hand, are often linked to conduct problems and psychopathology (Vando et al., 2007). While direct effects of attachment on later developmental outcomes become more complicated to measure due to confounding variables, effects have been measured into

adulthood (Gerhardt, 2004); however, it is likely that other environmental factors, such as school experiences and personality, are influential as well. However, early attachment experiences are associated with later developmental outcomes by increasing risk through a predisposition to continued strain in the relationship and subsequent events such as abuse, neglect, and school and relationship difficulties (Vando et al., 2007).

Child's Theory of Mind. It is reasonable to assume that a child with a mother who is more inclined to comment on her child's mental states would be more likely to understand his or her own mental states, as well as to be more attuned to the feelings and thoughts of others. Thus, understanding the prevalence of MM among young mothers, as well as potential influences on MM (such as depression) is relevant for young children's cognitive development. Laranjo et al. (2010) confirmed this to be the case. Mothers' use of positive mind-minded comments was positively related to children's understanding of desires and perspectives. Theory of Mind (ToM) is a construct that refers to a child's ability to understand "mental states, such as desires, perceptions, beliefs, and intentions" (Laranjo et al., 2010, p. 301). The preschool period is marked as an important time in the development of ToM, and has been researched as a milestone typically mastered during the preschool years. Emerging research, however, is finding evidence that Theory of Mind begins to develop as early as one year of age.

The development of ToM is influenced by early social experiences (Laranjo et al., 2010). Secure attachment, in particular, is associated with increased "emotional understanding" (Laranjo et al., 2010, p. 302), among

children. The mechanism through which attachment is thought to influence ToM is that in a secure attachment, parents convey consistent and organized thoughts to their children, which are generalizable to others (Laranjo et al., 2010).

Influences on Mind-Mindedness. In thinking of the connections between maternal depression, mental representations, and adolescent parenting, we can see a great deal of overlap in associated risks, such as socioeconomic status, childhood history, age at the birth of the first child, and support networks. In order to gain a picture of MM among a group of young mothers, it is important to understand what can influence how a mother mentally perceives her child and how she forms mental representations of him or her.

Intergenerational transmission. The relation between maternal representations and attachment is bidirectional: maternal representations have an effect on attachment, but mothers' childhood attachment experiences also affect maternal representations of their own children. Maternal childhood histories also have the potential to impact a mother's mental representations of her child (Malone, 2010). Mothers who report more "secure" representations of their attachments with their own parents hold more balanced and positive representations in their relationships with their own children (Sokolowski, 2007). Demers et al. (2010) report that an empirically supported precursor to MM is "parental state of mind", referencing parents' own attachment experiences in childhood (p. 96). According to Huth-Bocks, Levendosky, Bogat, and von Eye (2004), there is also a significant relation between what a mother remembers of her own attachment relationships and the attachment she has with her children.

Prenatal representations. In the same way that a mother's internal working model for attachment can be influenced by her own attachment experiences, her childhood history can remain influential in her perception of her unborn child (Bowlby, 1988). Fonagy, Steele, and Steele (1991) examined how an expectant mother's maternal representations of attachment may influence the relationship with her child. They found that the way a mother conceived of relationships prior to the birth of her child was associated with the child's attachment security at one year of age. Fonagy, Steele, and Steele noted that it is not the quality of past experiences that provides predictive power for a child's attachment security, but rather the way that the mother has organized her conceptions of relationships and attachment-related issues.

Quality of attachment formed after birth. While maternal representations are forming prenatally, the sustained representations are also related to the attachment that the mother forms with the child after birth (Huth-Bocks et al., 2004). Multiple factors may be responsible for the attachment between mother and child. One well-researched contextual variable associated with mother-infant attachment is the social support available to the mother (Huth-Bocks et al., 2004). Social supports can refer to family, friends, neighbors, or even community resources available to a parent that assist in a variety of capacities ranging from last-minute child care to emotional support during a phone call. A social support system that allows a mother to tend to parenting duties is valuable in allowing her to be emotionally available to her child. Other factors such as SES, maternal self-efficacy, maternal childhood history, and goodness of fit between mother and

child have also been shown to be associated with attachment (Huth-Bocks et al., 2004).

Depression also plays a large role in a mother's capacity to be available to her child and form a secure attachment (Turner et al., 2000). Given what we know about the impact that depression and maternal representations have on parent-child interactions, the current study looked at whether levels of depression predicted MM among young mothers, and whether the timing and chronicity of depressive symptoms exaccerbated the effects.

Parenting Attitudes

Prior research has explored links between adolescent parenting, self-esteem, and parenting attitudes, such as the belief in corporal punishment and empathy (Meyers & Battistoni, 2003). As identified by Meyers and Battistoni (2003), parenting attitudes are a core component of parenting behavior and reveal a great deal about parents' actions towards their children and their beliefs about their children and their children's development. Given the theoretical notion that parenting attitudes represent parents' conceptions of their children, parental attitudes are meaningful in our analyses of maternal representations.

Parenting attitudes have gained attention in the research literature related to their significant associations with child maltreatment. It was even determined that parenting attitudes can moderate the relation between maternal stress and use of corporal punishment (Crouch & Bell, 2001), such that the belief that corporal punishment is harmful prevents parents' use of corporal punishment, even in the

face of stressful events that may otherwise contribute to the use of corporal punishment.

Of important note when interpreting parenting attitudes are cultural bases for parenting attitudes and beliefs. For example, Lau, Litrownik, Newton, Black, and Everson (2006) reported that parental warmth and the use of physical discipline are not associated among Black parents. Also, while warm parental attitudes among White parents protect against later behavioral problems in children, it appears to exaccerbate early behavioral problems in Black children (Lau et al., 2006). Lau et al. points to the idea that physical discipline is associated with a different set of parenting characteristics in Black parents than it is in White parents. Given cultural and racial differences in parenting practices and norms, it is important to understand what is normed as "high-risk" parenting attitudes in a given cultural context.

Research points to a connection between parental stress and a propensity for child maltreatment. When environmental factors, such as poverty and isolation, which often accompany adolescent parenthood, are present, risks of child maltreatment are higher. Parenting beliefs against corporal punishment and other potentially abusive measures can serve as a buffer against the effect of stress on maltreatment (Crouch & Bell, 2001).

Luckily, parenting attitudes are not static. Home-based interventions have been shown to have an effect on parenting attitudes. Barnet et al. (2007) found that participants in an evaluation of a home-visiting program did improve their parenting attitudes as measured by the Adult-Adolescent Parenting Inventory.

Katz et al. (2011) also found home-visitation services for young, high-risk mothers to reduce parenting attitudes associated with increased risk of maltreatment. Given the high stress associated with adolescent parenting, scores on the parenting inventory used in the Massachusetts Healthy Families Evaluation will be explored as they may provide insight into a potential buffer against the impact of stress on parenting.

Adolescent Parenting

The majority of MM research has been undertaken with low-risk populations. Demers et al. (2010) offered the first look at MM among adolescent mothers. Demers et al. reported that adolescent mothers were less likely to make mind-related comments about their infants and were less positive and less attuned to their infants than were their adult counterparts. Theory and research have marked adolescence as a time of risk-taking, reduced impulse control, and egocentrism (Bacon & Richardson, 2001). While these developmental markers can be debated, the risks associated with adolescent and young motherhood are supported in research literature (Letourneau, Stewart, & Barnfather, 2004, p. 509). Risks associated with young motherhood can have implications for the health and well being of the mother and child.

Approximately 400,000 teenagers, aged 15 to 19, give birth every year (Cox et al., 2008). While risks associated with young parenthood are well documented, it is important to note that childbearing likely is not the only cause of such risks. "Selection factors" (Kalil & Kunz, 2002), or conditions that existed prior to pregnancy may also be relevant in their associations with later life

outcomes for teenage mothers. Essentially, the typical adolescent who becomes pregnant already had risk factors for her later development prior to the pregnancy. For example, childhood poverty predicts early childbearing status as well as lower socioeconomic status after childbearing. Essentially, this creates a "selection bias" (Furstenberg, Jr., 2003); recent research directly links teenage childbearing with poverty and a vast array of risks impacting social-economic advantage (Cox et al., 2008; Furstenberg, Jr., 2003). Early research did not account for factors that existed prior to childbearing. The message is becoming clear that teenage childbearing has profound impacts on the mother, child, and society.

Most unwed teenagers who become pregnant report that the pregnancy was unwanted according to data from the National Survey of Family Growth and the National Maternal and Infant Health Survey (Butler, 2002). Furstenberg (1991) described adolescents as "drifting" into parenthood. Factors during adolescence such as "difficulties with obtaining and consistently using birth control, fear of possible side effects of contraceptives, the risk-taking behaviors of adolescents, insufficient motivation among poor teenagers to avoid bearing a child and the moral dilemmas posed by abortion" reflect teenage childbearing may occur by "default" rather than "intention" for disadvantaged teens who become sexually active (Butler, 2002, p. 296).

Studies have revealed that young mothers initially report that their pregnancies were accidental in interview questions, but later report that they meant to become pregnant; the varying reports likely due to social desirability bias (Butler, 2002). Reported reasons for intentionally becoming pregnant

included, "to have someone to love, to strengthen a relationship with a boyfriend, to be accepted as an adult, or to adhere to the role expectations of their families" (Butler, 2002, p. 296).

The "selection factors" mentioned earlier are relevant when considering risks to teenage parents. The circumstances leading up to childrearing, whether accidental or intentional, present an array of risk factors prevalent in the life of the adolescent as well as the risk factors leading into childrearing. Woodward, Fergusson, and Horwood (2001) identified four domains into which risk factors for adolescent mothers fall: social background factors, family relations, individual factors, and peer relations. Additionally, an undebatable risk for adolescents who become parents is poverty (Berlin, Brady, & Brooks-Gunn, 2002; Brooks-Gunn, 2004; Fessle, 2003).

Risks for adolescent parents: individual to economic factors.

Poverty. There is a clear association between socioeconomic disadvantage and early childrearing. The factors associated with socioeconomic adversity experienced prior to pregnancy, such as, "welfare dependence, large family size, early motherhood, academic underachievement, and low parental educational aspirations are all linked to adolescent childbearing" (Woodward et al., 2001, p. 1172).

Family relations. Adolescents who report strain in family relationships, including distant relationships with parents, being raised in single parent households, and experiencing parental marital strain, are more likely to engage in sexual relationships earlier (Woodward et al., 2001). Adolescent parents are also

more likely than their non-parenting peers to have experienced physical or sexual abuse during childhood, received poor limit setting from their parents, and have had high levels of family dysfunction (Cox et al., 2008).

Teenage parenthood is also strongly identified as an intergenerational phenomenon. Across genders, children born to adolescent mothers are more likely to become adolescent parents themselves (Pogarsky, Thornberry, & Lizotte, 2006). Not only the age of parenthood for an adolescent's mother indicates risk, but the age that an adolescent's sister conceived a child has a strong correlation as well. According to East, Reyes, and Horn (2007), "Young women who had only a sister who had had a teenage birth had greater odds of pregnancy than young women who had only had a mother who had had a teenage birth" (p. 108).

Individual factors and peer relations. Links between behavior problems and adolescent parenting can be seen as early as age eight. In a study by Woodward and Ferguson (1999), girls ranking in the top 10% on measures of conduct problems at age eight were five times more likely to be pregnant by the age of 18 than their counterparts who were ranked in the lower 50% of the sample. The externalizing behavior problems of aggression, and tobacco, drug, and alcohol use are also associated with earlier onset of sexual activity. Peer engagement in deviant behaviors is also a risk.

Academic indicators of risk are also prevalent in research literature. Teens who value education, have academic plans, and are of good academic standing are less likely to become young mothers. Adolescents who also feel emotionally vulnerable may be at increased risk, particularly depressed teens (Woodward,

Fergusson et al., 2001), and teens exhibiting low self-efficacy and low self-esteem (Kalil & Kunz, 2002).

Post-pregnancy risks. Sorting out risk factors that are a result of young parenthood is complicated by the multitude of early risk factors that are associated with increased sexual activity and adolescent pregnancy. As Turner et al. (2000) summarized, "…an array of adversities occurs with disproportionate frequency in the lives of girls who become pregnant in their teens – both prior to and after the pregnancy" (p. 778). When controlling for risks prevalent before pregnancy, the effects of the childrearing are reduced, such that effects thought of as being associated with teenage childrearing may actually be effects of the risk factors making an individual more likely to become a teenage parent. However, some associations persist (Kalil & Kunz, 2002). When comparing adolescent mothers with their sisters or cousins who had not had a child until after age 20, "income, high school graduation, and child developmental outcomes were not very different between these groups" (Schwarz & O'Sullivan, 2007, p. 483); however, young mothers were less likely to get married and were also less likely to receive any postsecondary education.

While the research literature has yet to identify each risk factor unique to the event of teenage childbearing, some common risks are prevalent following pregnancy. Compared to older parents, teenage parents are more likely to "live in poor conditions, lack adequate financial resources, suffer high stress, encounter family instability, and have limited educational opportunities" (Letourneau, Stewart, & Barnfather, 2004, p. 509). Teenage mothers are also more likely to

suffer from depression (Cox et al., 2008), have another child sooner, and have lower educational and occupational attainment (Kalil & Kunz, 2002).

Risks of adolescent parenthood for the child. A great deal of evidence exists to support the idea that children born to teenage mothers are at risk for "adverse social, cognitive, and behavioral outcomes" (Keown, Woodward, & Field, 2001, p. 129). Of important note is that the age of the mother at the birth of her first child has effects on that child's outcomes and those of subsequent children; this phenomenon is called the "Early First Birth Effect" (Pogarsky et al., 2006). The vast number of risks associated with teenage childbearing, including, strained parent-child relationships, changes in environment and caretakers, and poverty, affect the health and development of children (Pogarsky et al., 2006).

Emotion recognition and regulation are crucial in the social and emotional development of young children. Children of teenage mothers struggle with emotional impairments (Turner et al., 2000). Difficulties regulating emotions and navigating social situations can have a profound impact on the social and academic success of children.

Studies show that when compared to children of older mothers, children born to teenage mothers typically score lower on measures of cognitive ability, language skills and achievement tests in school (Luster, Bates, Fitzgerald, & Vandenbelt, 2000). Risks related to school achievement become more pronounced as children of teenage parents progress through school; approximately half of adolescents who were born to teenage parents have failed a grade (Luster et al., 2000).

Behavioral effects associated with teenage parenthood are well documented. Male children of adolescent parents are more likely to participate in gangs, use drugs, be unemployed and become teenaged fathers themselves (Pogarsky et al., 2006). The only effect Pogarsky et al. (2006) found for the female counterparts was increased likelihood of teenage motherhood. The idea that behavioral effects and risks, in general, are differentiated by gender is debated. Some research literature supports the contention that family stress creates greater risk for males than females, while other studies argue that both males and females alike are vulnerable to the same risks (Pogarsky et al., 2006).

Again, in considering child risk factors, it is important to consider confounding effects of the risks prevalent regardless of teenage parenthood. "However, there is growing evidence to suggest that associations between teenage motherhood and language and school achievement problems may persist even after accounting for confounds, such as socioeconomic status, maternal educational achievement and marital status" (Keown et al., 2001, p. 131). Another confounding effect is the early health characteristics of the child, such as birth weight and temperament; all of these factors that are associated with poverty can have an effect on language development and academic achievement (Keown et al., 2001). Another explanation for the association between age at the time of pregnancy and child outcomes is related to parenting differences.

Attachment and parenting styles. Research has documented qualitatively different interaction styles between adolescent mothers and their adult counterparts (Keown et al., 2001). Teenage mothers typically exhibit

parenting styles that are considered less optimal for a child's cognitive development; they "provide their child with less verbal stimulation, are less warmly affectionate, and behave in a more intrusive and less sensitive way towards their children" (Keown et al., 2001, p. 131).

Berlin, Brady-Smith, and Brooks-Gunn (2002) support this notion in their finding that adolescent mothers were "significantly less supportive and significantly more detached and intrusive than older childbearers" (p. 121); adolescent mothers were not found to be more negative, however. Of important note is the reflection of these behaviors as behaviors referenced earlier in depressed mothers. Results of this study remained when effects of potentially confounding variables of "race/ethnicity, education, family type, family income, and child sex and age" (p. 121) were controlled for. The research literature shows that adolescent parenting is "associated with ineffective parenting styles, defined as low affective ties, poor monitoring, and harsh, inconsistent discipline" (Pogarsky et al., 2006, p. 333). These parenting characteristics put young mothers into a higher risk group compared to their older counterparts; they are at a higher risk of "problems in parenting behavior, of developing a disorganized attachment relationship with their infant, and often lack general knowledge about child development" (Demers et al., 2010, p. 98).

Strengths associated with adolescent parenting. A greater volume of research exists on the risks associated with adolescent parenting than on the strengths related to this phenomenon. However, it is important to note the strengths exist within young mothers as well. As discussed by Breen and McLean

(2010), many young mothers and their children avoid the many risks so commonly associated with young motherhood. Many young mothers describe their pregnancies and births of their children as turning points, which made a positive impact on their lives and provided "new opportunities for developing resilience" (p. 151). Although the current study examines risk factors of young motherhood, including depression, maintaining a large picture image of the risk and resilience occurring within these families is important.

Parenting Interventions

Multiple interventions exist, following different models, to support families and encourage positive parenting attitudes and behavior. Despite the proliferation of parenting support programs, few treatment modalities are supported by empirical evidence of effectiveness (Daro & McCurdy, 2007). Interventions that have demonstrated the most effective treatment have a strong research base, offer intense services, and follow a model based on "ecological theories of human development and cognitive learning theories" (Daro & McCurdy, 2007, p. 139). Programs aimed at the child's first three years of life, such as Early Head Start and Healthy Families America, are also the most promising (Daro & McCurdy, 2007). Results of a meta-analysis of parenting training programs conducted by Kaminski, Valle, Filene, and Boyle (2008) indicated that programs can change parenting behavior. The meta-analysis focused on an end goal of programs seeking to change parenting behavior to affect child behavior.

A common model used in parenting education and maltreatment prevention is home-visiting. Home-visiting programs are based on the belief that parents are the mechanism through which change can occur for children (Sweet & Applebaum, 2004). Services are aimed at training parents to provide a nurturing, supportive environment for their children through direct coaching and indirect support such as connecting the family to financial resources or mental health counseling (Sweet & Applebaum, 2004, p. 1435). Home-visiting, although used often in reference to a classification of intervention, really refers to a way of delivering services and not the actual "type of intervention" (Sweet & Applebaum, 2004, p. 435). Home-visiting programs differ from one another along many dimensions, including the targeted population served, the desired outcomes, intensity of services, and program admission criteria (Sweet & Applebaum, 2004).

Due to the variability in service delivery, it is important for home-visiting programs to explore best practices. Duggan et al. (2004) concluded that the home-visiting program they evaluated, Hawaii's Healthy Start Program, "did not reduce major risk factors for child abuse that made families eligible for service" (p. 624), including maternal mental health. The lack of effects was attributed to the program not reducing mediating parental risks (Duggan et al., 2007).

Contradictory to Duggan's (2007) findings, Daro and McCurdy (2007) examined three meta-analyses and concluded "home-visiting programs significantly prevent child abuse and neglect in families with children three years old or younger" (p. 145). Additionally, Daro and McCurdy found that "the timing

of service initiation, multiple- vs. single-component programs structure, actual service length, child age at service initiations, and year of study publication did not significantly influence the effect of home-visitation services" (p. 146). Although many aspects of service delivery did not alter effects, the number of visits received was linked to child cognition, but not prevention of child maltreatment, parental behavior, or maternal education (Daro & McCurdy, 2007). Unexpectedly, programs with a broad focus and mission (e.g. providing financial support, increasing social support, and providing parent education), ended up being less effective at reducing child maltreatment than specified interventions that aimed, for example, to just provide concrete support of money or connection to another resource, such as family therapy.

While home-visiting interventions are associated with positive outcomes for participants, results must also be interpreted with care. Astuto and Allen (2009) explained that in terms of home-visiting evaluations, different conclusions can be drawn about effectiveness depending on which evaluation you look at. Sweet and Applebaum (2004) highlighted the fact that although home-visiting services appear to help families, there may be a more cost-beneficial way of delivering the same help. The components that make a home-visiting program successful are often not identified in research literature. In Astuto and Allen's report, it was suggested that the field move away from the perception that home-visiting is a cure-all, towards the view of it as a service delivery system aimed at coordinating care and helping families structure a support network. Given the current budget cuts to programs that provide home-visiting services, it is now

more important than ever to ensure that we are delivering the most cost-effective strategies, and the way to do that may be by individualizing support networks based on family need. Understanding mental health and behavioral needs of mothers and their children is a crucial piece.

Targeting adolescent parents. Parenting interventions work to directly address the stressors and challenges facing young mothers and their children. Programs are built on the premise that the demands of adolescent development, in combination with the demands of parenthood, can prevent young mothers from being entirely available and responsive to their child. In addition, young mothers are also less likely to finish high school, more likely to have lower incomes, and more likely to respond to demands of their own development and their new parenthood with symptoms of depression, which necessitates parenting interventions for adolescents to also address social supports and resources in addition to parent education (Drummond, Letourneau, Neufeld, Stewart, &Weir, 2008). Evaluations of teen parenting programs are finding that this population is exhibiting high scores on depression measures (Cox et al., 2008; Goldberg, Jacobs, Mistry, & Easterbrooks, 2010), which makes the need for interventions geared towards adolescents to offer support and resources for mental health symptoms as well. Healthy Families Massachusetts is one intervention that seeks to address the mental health needs of young participants.

Healthy Families Massachusetts (HFM). Healthy Families Massachusetts is a voluntary home-visiting program for first-time, young mothers under the age of 21, and is funded by the Massachusetts Children's Trust Fund

(MCTF). HFM is based on the larger, national, Healthy Families America program and provides universally accessible services throughout Massachusetts. HFM seeks to improve outcomes for young parents and their children, including the intention to reduce rates of abuse and neglect, promote the optimal development of the child, increase educational attainment among parents, reduce the rate of repeat pregnancies for the young mothers, and increase the health and well-being of the mothers (Children's Trust Fund, 2010).

First-time parents can enroll in services prenatally up until their child's first birthday and continue services until their child turns three. Home-visits are carried out by paraprofessionals and services can include family members, such as grandparents, fathers, and extended family members (Children's Trust Fund, 2010). The types of services provided in HFM vary by individual sites, though typically program components include home-visits, group activities, goal setting, and referrals for other resources (Jacobs et al., 2005).

Healthy Families America believes that attachment is the cornerstone for healthy development. By beginning services early through a home-visitation model, home-visitors shape the quality of early interactions between parents and their children, which supports trust in the relationship between parent and child and fosters the attachment relationship in the parent-child dyad (Prevent Child Abuse America, 2001).

Summary

When discussing the risks of adolescent parenting and maternal depression, we see a substantial overlap regarding risks to parents, children, and

the community: risks of poverty, social isolation, relationship stress, and parent-child difficulties are linked to both (Dawson et al., 2003; Kalil & Kunz, 2001; Letourneau, Stewart, & Barnfather, 2004; Turner et al., 2000). Given the significantly higher rates of maternal depression within this cohort, relative to their older counterparts (Woodward & Ferguson, 1999), examining the mechanisms through which effects take shape is crucial in structuring and evaluating targeted interventions. Although maternal depression has not been linked to MM in adults (Meins & Fernyhough, 2010), given the increased risk associated with adolescent parenting and depression, a closer look among adolescents is warranted. It may be argued that depression among young mothers can manifest itself as a social phenomenon, meaning that many of the social characteristics specific to young motherhood may have an impact on maternal depression. Adolescent parenthood can be characterized by social isolation, identity and role conflicts, and life changes, all of which may impact mothers' mental representations of her children. For these reasons, the proposed study examined the link between maternal depression and MM and the role that intervention may play in moderating these links and also looked at the relation between parenting attitudes and MM.

Overview of Present Study

Research on maternal representations has linked MM to child outcomes, and has identified young mothers as less Mind-Minded of their children in general (Demers et al., 2010; Laranjo et al., 2010; Meins, 2010). The current study sought to further explore areas of MM in a sample of young mothers to

investigate aspects of MM as a potential mediator for some of the effects of adolescent parenting on child outcomes.

In prior analyses of data from Healthy Families Massachusetts participants, disproportionately high rates of depression were found (Goldberg et al., 2010). A plethora of research exists related to effects of maternal depression on young mothers, both for the mother and her child; these include threats to the attachment relationship between parent and child and an increased risk of abuse and neglect (Dawson et al., 2003; Kalil & Kunz, 2002; Petterson & Burke Albers, 2001; Turner et al., 2000). Another construct related to attachment and maltreatment is MM (Meins et al., 2010). MM is a relatively new construct that has received little attention in the research literature (Meins, 2010). In this study, I explored the relation between depression and MM, the moderating effect that a home-visiting service, Healthy Families Massachusetts, had on that relation, and the link between parenting attitudes and MM.

Hypotheses

Given recent literature related to the impacts of maternal depression, and the impacts of adolescent motherhood, we see many similarities, making the proposed study important in understanding the risks of this population. Research questions and hypotheses for the study were as follows:

- First, the study provided descriptive statistics on depression and MM scores among the mothers.
    - Q_{01a}: What was the range and mean of depressive scores each time they were measured?

- Q_{01b}: What percentage of participants met the clinical cutoff for depression on the CES-D?
- Q_{01c}: What was the range and group mean for percentage of mind-related, behavioral, physical, and general comments?

- Secondly, the study addressed the potential link between maternal depression and Mind-Mindedness among a sample of young mothers under the age of 21.
  - Q_{02a}: Did a relation between maternal depression and Mind-Mindedness exist in the sample?
    - H_{02a}: I predicted that depression and MM would be negatively correlated, such that mothers who reported high depressive symptoms had lower scores of MM. The rationale that I used to develop this hypothesis is based the prior research that both depression and MM are associated with similar risks to the parent-child bond and child outcomes.
  - Q_{02b}: Did the strength of the relation between depression and Mind-Mindedness vary by the timing and chronicity of clinical depressive scores?
    - H_{02b}: Regarding timing of depression, I expected that the strength of the association was highest with individuals reporting clinical depressive symptoms in their child's earlier infancy when depression was first

measured, as opposed to mothers who reported depressive symptoms a year later. The hypothesis is based on brain development research on the importance of early experience due to effects of stress and deprivation on the developing brain (Fox & Levitt, 2010; Shonkoff & Levitt, 2010). With regard to chronicity, I expected that the association was also strongest among mothers reporting clinical levels of depressive symptoms at both time points given that the symptoms and effects are persisting for a longer period of time.

- I, then, explored the role that home-based intervention services had on the sample in moderating that relation.
    - Q_{03}: Do home-visiting services have a moderating effect on the association between depression and Mind-Mindedness?
        - H_{03}: I anticipated that the relation between maternal depression and MM would be different between the group receiving home-visiting services through Healthy Families Massachusetts (HVS) and the group receiving referrals and information only (RIO); the association between depression and MM, I thought, would be stronger among participants not receiving Healthy Families services.

- The final phases of my analysis involved exploring the association between parenting attitudes and MM.
    - Q_{04}: Is MM linked to parenting attitudes of empathy, role-reversal, and corporal punishment?
        - H_{04}: Regarding the exploratory look at the association between parenting attitudes and MM, I expect that parenting beliefs of empathy will be positively correlated with MM, such that mothers who score higher on the measure of empathy indicating lower risk were more Mind-Minded in their descriptions of their children. I also expected that the measures of role reversal and belief in corporal punishment would be positively correlated with MM, indicating that the lower scores on these measures (greater risk) would be linked to lower scores on Mind-Mindedness.

Methods

Procedure

Data for the study were collected from young mothers in the Massachusetts Healthy Families Evaluation (MHFE2). Healthy Families Massachusetts (HFM) is a voluntary home-visiting program for first-time, young mothers under the age of 21, and is funded by the Massachusetts Children's Trust Fund. The Children's Trust Fund contracted with a research team at Tufts University, headed by Dr. M. Ann Easterbrooks and Dr. Francine Jacobs to

conduct an initial evaluation of HFM, referred to as MHFE1. After the conclusion of MHFE1, a second phase of evaluation began (MHFE2), that used a randomized control trial design to evaluate the program. Dr. Jayanthi Mistry joined Drs. Easterbrooks and Jacobs as a Co-Principal Investigator for the second phase (Goldberg et al., 2009). The evaluation uses a mixed-methods approach, using semi-structured interviews, questionnaires, and observations.

Interview data have been collected annually across three time points (Time 1, Time 2, and Time3). The third series of interviews is underway, so participants in the current study were limited to those who had completed their research interview for the third time point. If participants had not yet completed their third research interview, there is no recorded MM data. Interviewers met with participants primarily in their homes, but occasionally other locations preferred by the mother. The interviewers took written notes, and also audio-recorded the interviews. One of the questionnaires used at each time point was a maternal report of depressive symptoms (The Center for Epidemiological Studies-Depression Questionnaire; Radloff, 1977). The Adult-Adolescent Parenting Inventory (Bavolek & Keene, 1999) was also administered during Time 1 and Time 3 interviews to gather information on parenting attitudes.

During the Time 3 interviews, participants were asked the question, "Describe your child to me". The responses to this question were transcribed and coded for Mind-Mindedness using the Meins and Fernyhough (2010) coding manual. Additional data were collected across varying demographic, family, and program variables. Whether they are receiving Healthy Families services or not,

participants are asked if they are enrolled in a home-visiting program other than Healthy Families. In addition to exploring the effects of Healthy Families, this variable was also used to explore the effects of any home-visiting service. See Table 1 for a complete list of variables and measurements.

Participants. The sample for the study included 127 participants of the Massachusetts Healthy Families Evaluation (MHFE2). Participants were recruited for the MHFE when they sought out services for Healthy Families Massachusetts. At that time, they were informed that an evaluation was being conducted, and they would be randomly assigned to either the treatment group (HVS), receiving HFM services (60% odds) or the control group (RIO) receiving resources and referrals (40% odds). Individuals who wished to continue are part of the evaluation.

All participants who were involved with the evaluation and had completed their third round of interviews by May 1, 2011 were included in this current sample. All participants were between the ages of 16 and 21 at the birth of their first child. The mean age of the participants in the present sample was 18.5 at initiation of the evaluation; 21% are Black, 37% White, 33% Hispanic, and 11% multiracial. A total of 57% of the sample was pregnant at the time of the Time 1 intake. Fifty-seven percent of the sample is in the treatment group (HVS), forty-three percent in the control (RIO). The average age of the mothers at the Time 3 Research Interview was 20.6 (SD = 1.29), and the average age of their child was 22 months (SD = 4.6). See Table 2 for demographic comparisons between the present sample and the total sample in the evaluation.

Measures

Maternal Mind-Mindedness (MMM). Mind-Mindedness references a mother's ability to see the behavior of her child as being motivated by the child's own internal state (Meins & Furnyhough, 2010). According to Meins and Furnyhough (2010), "Interactional measures of MM are appropriate for assessing MM with infants in the first year of life. In assessing individuals' MM in relation to older children and adults, representational measures of MM have most commonly been used" (p. 2).

A representational measure of MM was used in the present study, using the interview question, "Describe your child to me." Interviewers asked this question during the Time 3 interview protocol. Probing questions, such as, "whatever comes to your mind" and "anything else you would like to tell me?" were used. The question was coded for MM based on the coding scheme developed by Meins and Furnyhough (2010). The proportion of mind-related comments was calculated for the responses from each participant.

Using the Meins and Furnyhough (2010) Version 2.0 coding manual, comments were coded into one of four identified classifications: mental, behavioral, physical, and general. Examples of mental comments include "happy," "she loves animals," and "he's learning the alphabet." Behavioral manifestations of emotions, such as "always smiling" and descriptions of something a child loves to do, "loves to play with animals" are two examples of comments coded as behavioral. Physical comments refer to the child's physical attributes, such as "he's tall," or "my second child," and general comments are

coded for comments without enough of a description to qualify them in another category, such as "he has my personality" or "he's a good boy" (Meins & Fernyhough, 2010). Mind-related, or mental, comments are also classified into subcategories of desires/preferences (e.g. "loves spaghetti"), cognitions (e.g. "can count to 10," "interested in watching") and emotions (e.g. "shy," "scared of strangers").

Although the MM coding manual (Meins, 2010) provided guidance on coding the representational measure, it was not exhaustive, and coders for the present study created an addendum to the published manual, that includes information on how to code sarcasm ("she's a brat, just kidding"), how to code elaborations on the same descriptor ("he's smart, he watches me whenever I cook, he likes to get out a spoon, and he copies me"), and how to code amplified statements ("happy, very happy," and "a good baby, the best baby").

The MM coding manual makes distinctions in the coding scheme that are often confusing to coders and consumers of the data that emerge. For one, comments relating to a preference for something are coded as mind-related, unless that preference is for a behavior. For example, "my son loves books" is coded as mind-related, but "my son loves to read" is coded as behavioral because he loves an action. In the absence of context, comments are typically coded as general. For example, in isolation, "he's a good boy" is coded as general. But, if the parent provides context of "he's a good boy because he does what I say," that would be given two behavioral codes – one for "he's a good boy" and "he does what I say." Repetitions of the same comment are only coded once.

Reliability of Mind-Mindedness coding. Two coders were trained together, and established an addendum to the coding manual to address comments not covered in Version 2.0 of the Meins and Fernyhough coding manual, including how to code sarcasm, when responses were influenced by others, and how to code elaborations. Interrater reliability was calculated for the MM coding. Raters were trained to criterion reliability of at least .7 using the kappa statistic. MM coding resulted in a mean reliability value of .71; subcategories achieved a reliability of .87. Both raters coded 51 of the 127 cases (40%). Coders came to a consensus when there were conflicting codes in cases used for reliability to determine which codes would be used for data analysis.

Maternal depression scores (CES-D). The Center for Epidemiological Studies developed a depression screening instrument for adolescents (CES-D) (Radloff, 1972; Radloff, 1977). The instrument consists of 20 self-report questions with Likert scale responses, "0 = not at all, 1 = little, 2 = some, 3 = a lot" (Carnevale, 2010, p. 54), with higher scores indicating greater depressive symptoms. The CES-D results in scores ranging from 0 to 60. The clinical cutoff is at 16, such that scores of 0 to 15 are scored as "nondepressed", while 16 and above are scored as "depressed." Wilcox et al. (1998) measured reliability and validity of multiple adolescent depression screening instruments, and concluded that the CES-D is adequate in detecting depression symptoms for teenage mothers and is highly correlated with the Beck Depression Inventory (as referenced in Carnevale, 2010).

Interview data were collected from all participants in the evaluation and scores were grouped according to whether or not they met clinical cutoffs for depression at any time point. To measure depression, CES-D scores will be used from each of the first two time points collected during interviews.

Parenting Attitudes (AAPI-2). To assess parenting attitudes, the Adult-Adolescent Parenting Inventory (AAPI-2) was used (Bavolek & Keene, 1999). The AAPI was administered during the first and third research interviews. For the present study, Time 1 AAPI results were used. The AAPI-2 is a self-report questionnaire consisting of 40 items. Participants respond to each item on a five-point Likert scale with responses of "Strongly Agree," "Agree," "Uncertain," "Disagree," and "Strongly Disagree." Of important note is that higher scores represent parenting attitudes associated with a lower risk for maltreatment. Each item falls under one of five domains of risk, including inappropriate parental expectations, inability to demonstrate empathy towards child's needs, strong belief in the use of corporal punishment, reversing parent-child family roles, and oppressing children's power and independence (Bavolek & Keene, 1999).

The three subscales used in the present study are "Lack of Empathy," "Values Corporal Punishment," and "Oppressing Children's Power and Independence." Examples of items from the empathy subscale include, "children cry just to get attention," "children who express their opinions usually make things worse," and "parents' needs are more important than children's needs." For the Corporal Punishment subscale, item examples include, "children who are spanked behave better than children who are not," "children learn violence from

their parents," and "children who bite others need to be bitten to show them what it feels like." Examples of items in the Power and Independence subscale include, "parents' expectations of their children should be high, but appropriate," "children who learn to recognize feelings in others are more successful in life," and "rewarding children's appropriate behavior is a good form of discipline" (Bavolek & Keene, 1999).

Results

Research Question 1: Descriptive Statistics and Preliminary Analyses

Descriptive statistics were gathered to provide a portrait of the group in terms of depressive symptoms and MM, including mean scores for depressive symptoms, percentage of participants above the clinical cutoff for both time-points, valence percentages and mean MM proportions. Means, standard deviations, and ranges for MM collected at Time 3 and depression during Time 1 and Time 2 are presented in Table 2 for the MHFE2 (n = 567) sample and the current study's sample (n = 127). Time 3 depression data were not used because they were not available. The average age of the mothers in the current study's sample at the birth of their child was 18.8 years (SD = 1.23). The average age of the mothers at the Time 3 research interview when MM data were collected was 20.6 years (SD = 1.29). The average age of the child was 22.3 months (SD = 8.3).

Mind-Mindedness. Of the current study's total sample, participants made from 0 to 32 comments about their children when asked, "Describe your child to me" during the Time 3 research interview, with a mean of 9.8 (SD = 6.5). The percentage of mind-related comments ranged from 0 to 80, with a mean of 29%

(SD = 20.2). Mean percentages for behavioral, general, and physical comments were 47.6% (SD = 23.6), 17.1% (SD = 16.4), and 4.7% (SD = 13.6), respectively. See Table 3 for additional descriptive statistics. Of the quotations that were coded as Mind-Minded, the majority were assigned the subcategory of "cognitive" (49%); these were often comments related to the child's development related to learning new tasks or references to how the child thinks. Twenty-six percent of the mind-related comments were "emotional," typically related to the child's mood in certain situations. Twenty-five percent were related to the child's desires and preferences; often parents described what their child liked, such as "loves music," or "knows what she wants."

The total responses to the MM coding questions, and the percentage of mind-related, general, and physical comments were all positively skewed. All MM variables had a floor effect at zero. The total responses mothers used to describe their child were positively correlated with the percentage of those comments that were mind related, $r(125) = .2$, $p < .05$. Although prior studies have found links between age of mother and MM, the present study did not. Maternal age at the time of the Time 3 research interview was not associated with MM; there was similarly no correlation between the age of the child at Time 3 and MM. Bivariate correlations using Pearson's correlation analyses resulted in $r(125) = .147$, $p = .10$ and $r(125) = -.05$, $p = .57$, respectively for mother's age and child's age with the percentage of Mind-related comments.

Depression. Data from The Center for Epidemiological Studies depression questionnaire (CES-D) were gathered during the Time 1 and Time 2

research interviews, spaced roughly a year apart. Data were recorded for the continuous summed scores during each time point as well as a dichotomous variable, whether or not the participant scored above the clinical cutoff. The number of time points each participant met clinical cutoffs for depression was calculated to provide a measure of the chronicity of depression. The mean score on the CES-D at Time 1 was 15.1 (SD = 11.5), and 13.4 for Time 2 (SD = 10.8). Although the mean score at each time point was below the clinical cutoff, 47 participants (38%) were above the clinical cutoff, and thus rated as "depressed" during Time 1, and 41 (35%) were depressed at Time 2. A total of 48% of participants were not clinically depressed at either time point, 31% were depressed at either Time 1 or Time 2, and 21% of participants were depressed at both time points. See Table 4 for a distribution of depression status across time points. The depression scores at Time 1 and Time 2 both had floor effects at zero and were positively skewed.

Research Question 2: Maternal Depression x Mind Mindedness (Q_{02})

Q_{02}, exploring the association between depression and MM, was looked at using regression analysis. Linear regression assumption violations were checked. Despite threats to linearity assumptions and heteroscedasticity between CES-D scores and the percent of Mind-Related comments, linear transformations were not used given the floor effect of "zero" on both measures (S. Parker, personal communication, October 7, 2011). In our sample of 116 adolescent mothers in the Massachusetts Healthy Families Evaluation, when controlling for age of

mother and baby at the Time 3 interview, no statistically significant relation was found between any measure of depression and maternal MM.

Regression analysis was used to test the relation between MM and each measure of depression, including Time 1 summed scores, Time 2 summed scores, and the average CES-D scores between Time 1 and Time 2. Average CES-D was not statistically significant $F(57,56) = .90$, $p = 0.66$; see Table 5 for regression data. Time 1 summed scores was not significant $F(39,80) = 1.2$, $p = .22$ and neither was Time 2 summed scores $F(31,83) = .93$, $p = .58$. The estimated marginal means were $M = 28.5$ ($SD = 2.30$), $M = 28.9$ ($SD = 2.1$), and $M = 27.6$ ($SD = 2.26$) respectively.

The relation between MM and depression was also explored using a dummy code in SPSS for depressed or not during Time 1 and Time 2. Controlling again for mother and child's ages at Time 3, regression analysis was used to test the relation between whether or not a parent was depressed and their score of MM. No statistically significant observations were made for the categorical scores for Time 1 ($F[1,118] = .02$, $p=.89$) or Time 2 ($F[1,113] = 1.15$, $p = .29$); the estimated marginal means for Time 1 and Time 2 were $M = 29.3$ ($SD = 1.88$), and 29.0 ($SD = 1.93$) respectively.

Another depression variable was created to assess the chronicity of participants' depression. Each participant was given a score to represent the number of times she met the clinical cutoff for depression on the CES-D: during no time point, one time point, or both time points. The frequency in which participants met or exceeded the clinical cutoff for the CES-D was also not

statistically significant, F(2,110) = .15, p = .86, with an estimated marginal mean of M = 28.9 (SD = 1.95). We failed to reject the null hypothesis that there was no relation between any depression measure and MM when controlling for mother's age at Time 3 and child's age at Time 3. See Table 6 for a summary of regression data for depression constructs regressed on MM.

Research Question 3: The Intervention Effect – Q_{03}

The second step in the analysis was to examine the potential role of Healthy Families Massachusetts services in moderating the potential relation between chronicity of depressive symptoms and MM using multiple regression analysis. When controlling for mother's age at the Time 3 research interview and the child's age at Time 3, the percentage of mind-related comments was regressed on treatment category (HVS or RIO), the chronicity of depressive symptoms, and the interaction between HVS and depression chronicity, there was no statistically significant interaction between the percentage of mind-related comments and the chronicity of depressive symptoms, F(2,107) = .05, p = .95 with a grand marginal mean of 28.7 (SD = 1.99). Five separate regression analyses were conducted using other depression measures of summed scores at Time 1 and Time 2, categorical scores at Time 1 and Time 2, and an average Time 1 and Time 2 score. Again controlling for mother's age and child's age at Time 3, no statistically significant results were found for Time 1 summed scores (p = .63), Time 1 categorical scores (p = .68), Time 2 summed scores (p = .95), Time 2 categorical scores (p = .61) or average CES-D scores (p = .53). See Table 7 for results. Interaction effects were also included in each model, and the regression

analysis confirmed that no statistically significant main effects existed for home-visiting services, and the depression measures, meaning services from Healthy Families Massachusetts did not have an effect on scores of MM.

To assess the impact of any home-visiting services, not HFM alone, a variable was created for the use of any home-visiting service, taking into account participants in the control group who were participating in a home-visiting service other than HFM. Participants were identified as either receiving home-visiting services or not. Thus, participants in the control group who were receiving home-visiting services were in the same group as participants in the treatment group (HVS). See Tables 8 and 9 for mean MM scores for each condition and the ANOVA summary table. Of the current sample, 66% of the sample (84 participants) was receiving some type of home-visiting service, 34% (43 participants) was not. Controlling for mother's age at Time 3, and child's age, regressing MM on home-visiting services, depression, and the interaction between the two, no statistically significant results were found. Summed Time 1 scores ($p = .70$), categorical Time 1 ($p = .78$), summed Time 2 ($p = .56$), categorical Time 2 ($p = .29$), average CES-D ($p = .86$), and chronicity ($p = .68$) were all assessed. A one-way ANOVA was used to determine if there were significant differences between the means of participants receiving HFM services only, HFM and another home-visiting service, not in HFM, but receiving home-visiting services elsewhere, and participants receiving no home-visiting services at all. No significant results were found for the effect of home-visiting services on MM for the four conditions, $F(3,119) = .104$, $p = .958$.

Research Question 4: Parenting Attitudes

In interpreting Time 1 AAPI score data, it is important to note that low scores on the AAPI scales indicate a lower risk. A small to moderate correlation was found between measures of the AAPI Corporal Punishment construct and the percentage of mind-related comments that mothers made, $r(115) = -.212$, $p < .05$, suggesting that higher risk AAPI Corporal Punishment scores was associated with a lower percentage of mind-related comments, suggesting that mothers who have higher beliefs in corporal punishment, are less likely to attribute their children's actions to the children's mental states. Another link was found between the percentage of behavioral comments and the AAPI Oppression of Power and Independence scale scores, $r(115) = -.218$, $p < .05$, and the percentage of behavioral comments and the AAPI Corporal Punishment scale scores, $r(115) = -.189$, $p < .05$.

Contrary to the hypothesis on empathy, there were no significant correlations between empathy and MM, $r(115) = .055$, $p = .555$. Role-reversal was also not significantly correlated with MM, $r(116) = .030$, $p = .746$. See Table 10 for a correlation matrix of MM scores and AAPI scores.

Discussion

Given the emerging field of research around maternal representations, specifically maternal Mind-Mindedness (Meins & Fernyhough, 2010), this study aimed to serve as an initial investigation of the relation between maternal depression, parenting attitudes, and MM among a sample of high-risk young mothers. I also examined the potential moderating effect of a specific home-

visiting program, Healthy Families Massachusetts, on the relation between maternal depression and MM. MM is a relatively new construct, particularly when using the representational coding scheme of MM used in this study, meaning there is limited research on its associations with constructs and its predictive capacity for child outcomes in the present population. As a result, the present study can shed light on areas of MM specific to a young, high-risk sample. Contrary to assumptions that higher rates of depression would predict lower rates of MM, and that program participation would reduce the strength of that relation, no statistically significant results were found.

Relation between Depression and Mind-Mindedness

The present study first sought to explore the link between depression and MM. From prior research we know that if a mother is Mind-Minded in her approach to her child, she is better able to attribute meaning to her child's behaviors. She has developed an understanding that her child's actions are fueled by their mental life (Demers et al., 2010); this understanding is necessary for maternal sensitivity (Meins, 1999). In turn, maternal sensitivity is one of the most important precursors to attachment security (De Wolff & van IJzendoorn, 1997). Based on past research, we know that depression is linked to many aspects of both young motherhood and MM, including a lack of social support, less sensitive caregiving, and less secure attachments between parent and child (Demers et al., 2010; Turner et al., 2000; Wachs et al., 2009). The interest in attachment security stems from long-standing research on the developmental effects of secure attachment, including increased emotion regulation and ability to form social

connections (Thompson, 1999; Vando et al., 2007). Given the potential predictive power for healthy attachment and later outcomes, I predicted that depression and MM would be linked.

The results of the research question related to the relation between depression and MM among the present sample failed to document an association between depression and MM in young mothers. Despite a lack of significant findings, the present study is useful as an exploratory effort, given the emerging field related to maternal MM, particularly within a young, high-risk sample.

The Moderating Effect of Home-Visiting and Depression on Mind-Mindedness

In this study I also sought to explore the moderating role that home-visiting services, particularly Healthy Families Massachusetts, played in the relation between depression and MM. Early intervention programs, particularly home-visitation programs, have been widely researched and evaluated to determine their role in improving outcomes for high-risk children and families. Interventions aimed towards the first three years of life are thought to be the most promising (Daro & McCurdy, 2007), as are interventions using parents as the mechanism for change (Sweet & Applebaum, 2004). As a result, the present study was interested in what effect Healthy Families Massachusetts had in moderating the effects of depression on MM.

Results failed to confirm that any interaction exists between depressive symptoms and treatment effects on MM. It is important to note that Demers et al. (2010) also found a near absence of significant results in their study of MM

among a high-risk sample. These authors emphasized the need for further analysis regarding pathways and processes leading to MM, particularly in high-risk samples. The lack of significant findings may be a result of a similar phenomenon that Demers et al. observed among a high-risk sample. Perhaps influences of MM among young, high-risk mothers are so varied that a comprehensive model of mediating factors has yet to be discovered. Without knowing the pathways for how depression affects MM, we may not have the right model to show effects.

There are additional ways to think about the reason behind why there is an absence of significant results in program effects, whether from Healthy Families Massachusetts or any other type of home-visiting service. The results may indicate that home-visiting does not have an effect on MM. Perhaps because the curriculum of home-visiting does not directly address mental motivations to behavior in children, we should not expect results. That is, if HFM never explicitly intended to affect MM, or more broadly, the way that a mother thinks about her child, we likely should not expect effects in this area.

Also, perhaps because the participants in the sample are working on coping with mental illness, past trauma, single-parenthood, and poverty, the program has yet to cause effects on the representations that these young mothers have of their children. Perhaps, the program is laying a foundation for the relationship between the mother and her child, and her future representations will be impacted. This may be an area for further exploration in continued evaluation, as data on how participants utilize and prioritize services would have important

program and policy implications. An alternate way to think about the lack of significant results is that there may be a relation between the variables in the population, but the limitations outlined in the discussion section prevented the present study from finding those links.

Parenting Beliefs and Mind-Mindedness

The present study also explored the link between parenting attitudes and MM. The data revealed that mothers who are more likely to have views and practices favoring corporal punishment, such as the view that spanking is an effective form of behavior modification, are less likely to use mind-related descriptors of their children, and are more likely to use behavioral descriptors of their children compared to their counterparts who do not favor corporal punishment to the same degree. Essentially, the greater a mother's propensity for corporal punishment, the more likely she is to use behavioral descriptions of her child. Knowing what we know about MM, parents who use fewer mind-related descriptors have a difficult time attributing meaning to their children's actions, and may have a difficult time interpreting their behavior (Meins, 1999). These may be parents who interpret their child's crying as an inconvenience or an act of misbehaving rather than an intentional way to communicate a feeling or state. They may have difficulty viewing their child as intentional and thus respond directly to the child's behaviors rather than what may be fueling those behaviors.

The study also found links between parenting attitudes and MM, specifically AAPI Corporal Punishment scores and MM, and Oppressing Power and Independence and MM. The Corporal Punishment subscale assesses

mothers' attitudes towards the use of spanking, among other forms of corporal punishment. The subscale of Oppressing Power and Independence is closely aligned with corporal punishment and a lack of empathy, and references a parent's belief that children must always do as they are told, and not question or challenge authority, voice opinions or have choices (Bavolek, 2009).

Results of the link between mothers' attitudes regarding Corporal Punishment and MM, and Corporal Punishment and Oppressing Power and Independence with Behavioral responses must be interpreted with care. First, the parenting attitudes were assessed two years prior to the MM data. Parenting Attitudes may not be static for all participants and their parenting attitudes at Time 1 may not reflect their parenting attitudes at Time 3 when MM was assessed. In addition, many of the mothers were still pregnant when parenting attitudes were assessed. Whether a mother is pregnant or parenting, and how old her child is when her parenting attitudes are assessed may have an impact on how she responds to questions on the AAPI.

Cultural sensitivity is also a concern in the present study and with the AAPI in particular as parenting attitudes vary between cultural groups (Guilamo-Ramos et al., 2011). Different groups tend to respond differently to items on the AAPI and an AAPI result indicating risk for one subgroup of the population may not carry the same risk for another. Before giving AAPI measures predictive value for MM measures, future analyses should move beyond the present correlations and take into account race, childhood history, and other potentially

confounding variables to extrapolate these findings onto programmatic implications.

Study Limitations

Limitations of the Mind-Mindedness coding. Another way to think about the lack of significant findings can be related back to how we measured our variables of interest. No studies were found in the research literature that used representational measures of MM with a young, high-risk sample. Literature that exists on MM has used an observational measure in which raters also coded the appropriateness of the comments observed (Laranjo, Bernier, & Meins, 2008; Laranjo, Bernier, Meins, & Carlson, 2010; Meins & Fernyhough, 2010). There was no way to code for the appropriateness, or accuracy, of comments in the representational framework.

In the analysis done by Demers et al. (2010), the observational measure of maternal MM was used; the authors found that, on average, 5.49% (SD = 4.20) of comments adolescent mothers used when interacting with their children were mind-related; 8.63% (SD = 4.76) for adult mothers, on average, were mind-related. Using the representational measure in the current study, 29% of comments were mind-related. Information is not available as to whether this large of a discrepancy indicates whether or not observational and representational measures are assessing the same phenomena, or if representational measures should be expected to receive higher MM scores. For the sake of the present study, however, it serves as starting point to compare the present sample to prior research that has used observational measures.

The responses that mothers gave during the Time 3 research interview describing their children were recorded and transcribed into written text. As a result, another complicating factor for coding was a lack of audio and context to interpret the meaning of comments. For example, a mother may respond, "my baby is pretty good, she's just really cute." The text makes it difficult to determine if there are two quotations (pretty good and really cute) or three (pretty, good, and cute), and what their respective codes would be.

An additional limitation of the MM measure is that it has a floor effect at 0, for mothers who did not provide any description of their child when asked, or mothers who made no mind-related comments. The fact that mothers could not respond below a score of zero affects the distribution of scores.

Limitations of depression measures. Threats to validity exist on depression measures due to limitations of self-report data, as well as the fact that none of these measures can accurately indicate depressive symptoms. For example, Cicchetti and Toth (2009) explain that self-report measures provide limitations in assessing adolescent mental illness. Issues such as rapport with the interviewer, recent events, cultural stigma, and willingness to seek and accept help are all threats to the reliability of the depression variables.

In addition, given the variety of possibilities for documenting and reporting on mental health symptoms, it may be useful to create a composite variable on depression rather than looking at each measure individually in the future. The composite may include the continuous score on an individual measure, the chronicity of the depressive symptoms, as well as whether or not the

mother is receiving mental health services. It will be important in future analyses to take into consideration the receipt of mental health support as a potential protective factor and perhaps a source for collateral information on mental health symptoms given the limitations of self-report data.

Data Availability

Due to the nature of the services, participant attrition in both the program and evaluation were high. To be included in the study, participants had to have completed their Time 3 research interview prior to May 1, 2011. Because of this, our sample may not be entirely representative and may favor participants who have remained engaged in the evaluation. Participants were contacted for their Time 3 interview based on the amount of time it has been since their Time 2 interview. Some participants who were not included in the sample may not be included simply because not enough time has passed since their Time 2 interview. However, there may also be participants who completed a Time 2 interview, but interviewers have been unable to reach them for their Time 3 interview as of the May 1, 2011 deadline.

All participants in the sample had data on MM, and 115 of the 127 participants in the sample had depression data for both Time 1 and Time 2. Multiple Imputation, which would methodologically account for missing data, was not used in the present study because participants were only chosen if they had completed all of the research interviews, but may be necessary once the entire dataset is available from the entire sample of MHFE participants.

Summary and Future Thoughts

In the context of high rates of maternal depression among young mothers and understanding that those symptoms are inherently different in high-risk adolescent mothers than in their older counterparts (Schwarz & O'Sullivan, 2007), the present study sought to explore the link between depression and a relational construct, Mind-Mindedness (MM), which measures the degree to which mothers attribute meaning to their children's actions. Depression and MM share many effects related to attachment and child outcomes. High-risk young mothers have been found to have additional risk factors related to these two constructs, which underscores the need for further investigation into the mediating mechanisms on child outcomes and how programs can work to reduce cycles of intergenerational transmission of mental illness and relational difficulties.

Despite a lack of significant findings on the relation between depression and MM and the influence of home-visiting, the present study serves as an initial exploration of representational MM and depression in a sample that has not received much attention in the research literature. Given the limitations in the representational coding framework and the lack of data availability for depression measures at Time 3, the link between mood and maternal representations in this sample deserves continued exploration before accepting the fact that a relation does not exist.

The present study sheds light on limitations of the measures, methodological issues that became apparent, and can offer suggestions for research going further in the field. Of important note is that Healthy Families

Massachusetts, and most home-visiting programs, are not geared towards impacting the way that participants think about their children. Changing behavior is a common goal of parenting programs, but changing attitudes and beliefs often is not. We cannot expect them to affect change in an area that was not intended, however, making an effort to understand potential direct impacts is important in understanding best practices and program effects.

Work related to best practices in early intervention programs is increasingly more important as time and finances are limited in many social service programs. The ability to assess, identify, and combat multiple risk factors that face children and families is a step towards ending cycles of violence, poverty, and abuse. We know that MM is linked to parent-child attachment security and maternal sensitivity, both of which are linked to child maltreatment (Demers et al., 2010; Meins, 1999; Oppenheim, Vando et al., 2007), which increases interest in understanding the pathways for how these constructs interact.

In light of economic conditions and a push for budget cutbacks and decreased spending on social services, it becomes increasingly important to evaluate programs for effectiveness as well as to explore within subgroups of the population for policy and program implementation recommendations. The current study sought to shed light on the potentially moderating effect that a program may have on a serious social concern, depression, and a newly researched variable linked to parent-child outcomes, Mind-Mindedness, which is a measure of a mother's ability to attribute meaning to her child's behaviors. The results should be interpreted within the context of the constraints of the current

project, and as a tool for evaluating the constructs and sample as the evaluation continues to evolve.

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Table 1

Summary Table of Variables Used for each Construct and Time Point of Measurement

Construct	Measure	Variable	Time Point
Depression	CES-D	CES-D Summed	Time 1
		CES-D Categorical	Time 2
		CES-D Summed	Time 1
		CES-D Categorical	Time 2
		Average CES-D	Time 1 and 2
		CES-D Chronicity	Time 1 and 2
Maternal Representations	Mind-Mindedness	Representational MM Codes	Time 3
Home-Visiting	MHFE Participation	HVS or RIO	Continuous
	Interview Data	Any home visiting	Continuous
Parenting Attitudes	AAPI	Empathy – AAPI	Time 1
		Belief in Corporal Punishment – AAPI	Time 1
		Oppressing Power & Independence - AAPI	Time 1

Table 2

Descriptive Statistics Comparing Thesis Sample to MHFE Sample

	Thesis Sample	MHFE Sample (N=567)
Self-Report Parenting/Pregnancy Status at Intake	Pregnant=57% Parenting=43%	Pregnant=66% Parenting=34%
Mother age at enrollment	M=18.50	M=18.66
Self-Report Ethnicity		
Black	21%	18%
White	37%	47%
Hispanic	33%	25%
Multiracial	11%	6%
Other	0%	4%

Table 3

Descriptive Statistics of Mind-Mindedness and Depression Variables

	N	Mean	Minimum	Maximum	SD
Total Quotations	127	9.7874	.00	32.00	6.54245
% MM	127	28.9701	.00	80.00	20.19278
% Behavioral	127	47.6288	.00	100.00	23.55528
% General	127	17.1020	.00	66.67	16.39795
% Physical	127	4.6199	.00	100.00	13.55795
CESD T1 Sum	125	15.10	0	54	11.455
CESD T1 Categorical	125	1.38	1	2	.486
CESD T2 Sum	117	13.3590	.00	49.00	10.83215
CESD T2 Categorical	117	1.3504	1.00	2.00	.47916
CESD Chronicity	115	.7304	.00	2.00	.78720
CESD Averaged	116	14.1638	.00	41.50	9.31590
Valid N (listwise)	115				

Table 4

Percentage of Participants Scoring above the Clinical Cut-off on the CES-D in Each Timepoint

	No Depression	T1 Only Depression	T2 Only Depression	T1 & T2 Depression
Percentages	43%	17%	13%	19%

Table 5

Linear Regression Output Showing the Lack of Significant Results in the Link between Depression and Mind-Mindedness (n=113).

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	30.668	3.423		8.960	.000
Average CES-D Scores Across T1 and T2	-.084	.202	-.039	-.416	.678

Table 6

Regression Results Showing a Lack of Significant Findings for MM Regressed on Depression Measures, Controlling for T3 Mom & Baby Age

Depression Measure	Sum of Squares	df	Mean Square	F	Sig.
CES-D Sum Score T1 (n=119)					
Regression	1627	3	542	1.343	.264
Residual	47677	118	404		
Total	49304	121			
CES-D Categorical Score T1 (n=119)					
Regression	1633	3	544	1.348	.262
Residual	47671	118	404		
Total	49304	121			
CES-D Sum Score T2 (n=114)					
Regression	2388	3	796	2.023	.115
Residual	44460	113	393		
Total	46848	116			
CES-D Categorical Score T2 (n=114)					
Regression	2215	3	738	1.869	.139
Residual	44632	113	395		
Total	46848	116			
Chronicity – Times above CES-D Clinical Level (n=113)					
Regression	1648	3	549	1.424	.240
Residual	42833	111			

Total	44482	114			
Depression Measure	Sum of Squares	df	Mean Square	F	Sig.
Average CES-D across T1 and T2 (n=113)					
Regression	1882	3	627	1.573	.200
Residual	44690	112	399		
Total	46572	115			

Table 7

Univariate Regression Results Showing a Lack of Significant Findings for the Interaction of HVS and Depression Regressed on Mind-Mindedness, Controlling for Mother Age and Baby Age at T3 (n=109).

Tests of Between-Subjects Effects

Dependent Variable: % of MM Responses

Source		Type III Sum of Squares	df	Mean Square	F	Sig.
Intercept	Hypothesis	266.466	1	266.466	.673	.414
	Error	42506.702	107.300	396.148[a]		
MotherAge T3	Hypothesis	1481.703	1	1481.703	3.730	.056
	Error	42507.844	107	397.270[b]		
BabyAge T3	Hypothesis	259.669	1	259.669	.654	.421
	Error	42507.844	107	397.270[b]		
Depression chronicity	Hypothesis	85.809	2	42.905	3.495	.413
	Error	9.350	.762	12.277[c]		
HVSRIO – TreatmentControl	Hypothesis	138.990	1	138.990	4.109	.086
	Error	217.375	6.427	33.824[d]		
Depchronicity * HVSRIO	Hypothesis	38.991	2	19.496	.049	.952
	Error	42507.844	107	397.270[b]		

Table 8

ANOVA Table of the Effect of Home-Visiting Conditions on Mind-Mindedness Scores (n=122)

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	133.144	3	44.381	.104	.958
Within Groups	50745.209	119	426.430		
Total	50878.352	122			

Table 9

Mean Mind-Mindedness Scores for Each Home-Visiting Condition (n=123)

Home Visiting Group	Mean % of MM	N	Std. Deviation
HVS Only	29.75	50	19.85
HVS+other HV	27.08	18	24.35
RIO+other HV	29.74	12	19.56
RIO only, No HV	28.05	43	20.21
Total	28.77	123	20.42

Table 10

Correlation Matrix of AAPI Measures and Mind-Mindedness Measures

		AAPI Inappropriate Expectations	AAPI Lack of Empathy	AAPI Corporal Punishment	AAPI Reversing Roles	AAPI Oppressing Power & Independence
% of Mind-Related Responses	Pearson Correlation	.055	.103	.212*	.030	.140
	Sig. (2-tailed)	.555	.276	.022*	.746	.133
	N	116	114	116	117	116
% Behavioral Responses	Pearson Correlation	-.047	-071	-.189*	-.068	-.218*
	Sig. (2-tailed)	.615	.454	.042	.468	.019
	N	116	114	116	117	116
% General Responses	Pearson Correlation	-.064	-.020	-.001	.002	.006
	Sig. (2-tailed)	.498	.836	.988	.986	.949
	N	116	114	116	117	116
% Physical Responses	Pearson Correlation	-.040	-.046	-.107	.012	.181
	Sig. (2-tailed)	.671	.626	.252	.897	.052
	N	116	114	116	117	116

* Correlations at a $p<.05$ significance level