

THE ROLES OF ATTACHMENT STYLE & MATERNAL DEPRESSION IN
THE DEVELOPMENT OF CHILDHOOD DEPRESSION

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Abstract

This study aimed to determine how stable parent ratings of their infant's temperament/attachment style is across one year of development and establish if there is a specific pathway that leads to child depression and or internalizing and externalizing behaviors originating with maternal depression or insecure attachment styles between the infant and their mothers. The data for this study was collected as part of a multisite, randomized trial of Hawaii's Healthy Start Program (HSP) (Duggan et al., 2004). The Hawaii Healthy Start Program (HSP) is a home visiting program targeted at families at-risk of child abuse and neglect. The racial and ethnic characteristics for total participants are as follows: 12% identified as White, 9 % identified as Asian, 13% identified as Pacific Islander, 20% identified as Filipino, 20% identified as Native Hawaiian, 27% identified as Black/ Multiracial (Duggan et al. 1999). The mean age for participating mothers was 23.4 ($SD = 5.8$) and 68% of the families had incomes below the poverty line (Duggan et al., 1999). The following measures were used in the present study: The Bate's Attachment Scale, The Center for Epidemiological Studies Depression Scale (CES-D), The Child Behavioral Checklist (CBCL), and The Children's Depression Inventory (CDI). Unlike the majority of literature, the present findings suggest that maternal depression and attachment issues during the first year of life served as only a very modest risk for future child internalizing symptoms. Similar to the findings regarding child depression, relations between parent and teacher rated externalizing symptoms, maternal depression, and attachment were fairly small. Only for parent rated externalizing symptoms there was a small association between externalizing score and maternal depression and a small association between parent rating of externalizing behaviors and parent ratings of child attachment.

Keywords: *child depression, child externalizing behaviors, maternal depression, attachment*

Chapter I: Introduction

Child depression is a significant public health concern. Mental health is fundamental for overall health and well-being (National Research Council and Institute of Medicine, 2009). Mental health diagnoses are chronic health conditions that can develop and last throughout the lifespan of an individual (Marchand, Hock, & Widaman, 2002). Without early diagnosis, intervention, and treatment, children with mental health disorders such as depression can have problems at home, in school, and struggle to form social relationships (Seifer, 2014). These issues can interfere with healthy development and can continue into adolescence and adulthood (Sroufe, 2005). Mental health diagnoses affect many children and families. Boys and girls of all ages, ethnic and racial backgrounds, and all regions of the United States experience mental disorders like depression. According to the National Research Council and Institute of Medicine report (2009) it is estimated that one out of five children in the United States experience a mental disorder in a given year and up to 247 billion dollars are spent each year on childhood mental health diagnoses. The impact of child depression on children, families, and communities, child depression is an important public health concern in the United States (National Research Council and Institute of Medicine, 2009).

Two important precursors of child depression are maternal attachment and maternal depression although the mechanisms by which they may impact the child remain poorly understood (Atkinson, 2000; Bernard, Meade, & Dozier, 2013; Badovinac, 2018). We examine the relations among maternal depression, attachment and child depression to determine the sequence and causal patterns of their interrelations. Furthermore, maternal depression has been researched for decades and shown to have negative impact on children's development, and this is especially true during the time period that involves transitioning into elementary school

(Cummings and Davis, 1994). For example, during this transitional period, children of mothers with depressive symptoms have been found to perform more poorly in regard to academic achievement, exhibit more internalizing and externalizing problems, and experience more difficulties in their social interactions with their peers when compared to children of non-depressed mothers (Campbell et al. 2007; Greenberg et al. 1999).

Attachment

Attachment theory states that infants are biologically subjected to developing a close bond with their primary caregivers as a tactic to guarantee that their basic needs are met (Ainsworth, 1978; Bowlby, 1969). The bond that is formed between infant and caregiver is known as an attachment style and characterizes the caregiver's ability to provide for and meet the needs of the child (Ainsworth, 1978; Bowlby, 1969). The attachment style is formed by the consistent pattern of a caregiver and their child in a stressful environment. Forming the most positive attachment style, a secure attachment, occurs when a caregiver reliably recognizes and responds appropriately to their child's distress signals (Ainsworth, 1978; De Wolf & Van Ijzendoorn, 1997; Bernard, 2013). Through a secure attachment, infants know they can depend on their caregiver to comfort and support them (Ainsworth, 1978; Bowlby, 1969). A secure attachment relationship between parent and child, allows the child to develop skills to explore the world and manage their own emotional functioning (Madigan, Atkinson, Laurin, & Benoit, 2013). Children without a secure attachment style have been shown to be predisposed to the development of emotional problems and depressive symptoms. Attachment theory (Bowlby, 1969) provides a framework for how individual tendencies within close relationships may act as a risk factor for the development of depression (Bifulco, Moran, Ball, & Lillie, 2002). A wealth of research has linked attachment insecurity to depressive symptomology.

An important potential source of influence on a child's capacity for emotional intimacy and maturity in relationships is based on the way their primary caregivers or parents represent or demonstrate their own close relationships (Zajac, Bookhout, Hubbard, Carlson, & Dozier, 2020). These representations of relationships have been thoroughly studied through the framework of attachment theory. The concepts that differentiate insecure attachment styles from secure attachment comes down to issues related to emotional sensitivity and maturity in relationships (Zajac, 2020). Secure individuals embody emotional openness, the ability to reflect on their own emotional responses, and incorporating that information into their decisions and behaviors (Ainsworth, 1978; Zajac, 2020). Alternatively, insecure attachment styles are expressed through emotional avoidance, dismissing styles, increased emotional reactivity particularly with negative emotions, and being easily overwhelmed (Ainsworth, 1978; Zajac, 2020). Emotional responses for insecure attachment styles, are typically are not integrated into the individual's wider experience which reduces the possibility of coming to mature conclusions related to interpersonal problems or interactions (Ainsworth, 1978; Zajac, 2020). For a very young child, the relationship with a primary caregiver, most often though not exclusively a mother, lays an important psychological foundation for later flourishing (Ainsworth, 1978; Zajac, 2020). Successful attachment and bonding in the first two years of life predicts healthy later development on a range of fronts, from mental health to educational skills (Ainsworth, 1978; Zajac, 2020). When bonding and attachment prove difficult, child development is affected (Ainsworth, 1978; Zajac, 2020). One of the biggest risk factors for successful bonding and attachment is poor mental health on the part of the primary caregiver (Atkinson, Paglia, Coolbear, Niccols, Parker, Guger, 2000). In particular, a parent who is depressed may find it more difficult to engage, connect, and bond with a baby or toddler (Atkinson, 2000). Given that

mothers remain most likely to be the primary caregiver, maternal depression can therefore be an important risk factor for early child development (Atkinson, 2000). An estimated one in ten children experience a depressed mother in a given year, and between 10 and 20 percent of new mothers experience lasting depression after delivery (World Health Organization, 2018).

Maternal Depression

Mothers may experience depression during pregnancy (prenatal depression), as well as within the first few months after a child is born (postpartum depression), both of which may affect a child's development (Badovinac, Martin, Guerin-Marion, O'Neill, Riddell, Bureau, & Spiegel, 2018). During pregnancy, depressed mothers produce stress chemicals that might reduce fetal growth, increase the risk of premature labor, and increase the risk of autoimmune health problems after birth (Atkinson, 2000; Badovinac, 2018). Additionally, living with a depressed mother affects a child's stress response system, increasing a child's risk of producing higher and more fluctuating levels of stress chemicals and increasing the risk of hypertension (Atkinson, 2000; Badovinac, 2018). Further, maternal depression greatly influences the quality of mother-infant interactions and attachment, which, as discussed above, greatly impact healthy development (Atkinson, 2000; Badovinac, 2018). While maternal depression varies in its chronicity and scope, it is generally characterized by sadness, irritability, anxiety, loss of energy, loss of interest in caring for oneself and others, as well as a host of other symptoms (Atkinson, 2000; Badovinac, 2018). These characteristics of maternal depression can affect the ways that mothers interact with their young children and influence children's experiences and physiological development (Atkinson, 2000; Badovinac, 2018). Depression can raise stress hormones to toxic levels and, alongside other symptoms discussed above, making it more difficult for mothers to be sensitive and responsive to their young child's signals (Atkinson,

2000; Badovinac, 2018). Depression can also deprive mothers from the energy, focus, and patience necessary to having quality interactions and relationships with their children (Atkinson, 2000; Badovinac, 2018).

Maternal depression has been shown to be a powerful risk factor in the development of childhood psychopathology (Downey & Coyne, 1990). Preschool and school-aged children of mothers with depression demonstrate elevated rates of depressive symptoms when compared to children with non-depressed mothers (Downey & Coyne, 1990; Gelfand & Teti, 1990), even after the level of maternal depressive symptoms alleviate (Billings & Moos, 1985; Lee & Gotlib, 1991). A mother who demonstrates difficulty with regulation of negative emotions can face barriers in regard to their ability to identify and respond appropriately to their child's emotions and behaviors - a task that is important for sensitive caregiving (Downey & Coyne, 1990; Lovejoy, Graczyk, O'Hare, & Neuman, 2000). Children and infants with depressed mothers have significantly higher rates not only for developing mood disorders but also for developing other internalizing and externalizing problems (Goodman 2007). These children are also at higher risk for having difficulties in emotional development when compared to children whose mothers are not depressed (Goodman 2007). Elevated rates of depression, other internalizing problems, and conduct problems have been noted since the earliest studies on infants with depressed mothers (Welner et al. 1977). Children of depressed mothers may have heightened negative emotionality and low positive emotionality, both of which may predispose them to the development of depression (Klein et al. 2009). Findings from longitudinal studies support the notion that children of mothers with more chronic depression have worse outcomes such as higher rates of insecure attachment (Campbell et al. 1995; Teti et al. 1995).

Child depression has become more common over the past several decades. The

prevalence of depression in children increases drastically from late childhood to adolescence. Many depressive symptoms originate between the ages of two and three years old (Shanahan, Copeland, Costello, & Angold, 2008; Cicchetti, Toth, 1998). Major Depressive Disorder (MDD) has become one of the most commonly diagnosed mood disorders for children in the United States (Merikangas, He, Brody, Fisher, Bourdon, & Koretz, 2010). During early childhood, two of the most important risk factors for the development of depression are attachment style and maternal depressive symptoms (Goodman 2007; National Research Council and Institute of Medicine 2009).

Maternal Depression and Insecure Attachment

Maternal mental health issues have been hypothesized to impact mother-child attachment by undermining a mother's ability to engage in sensitive caregiving, which is a crucial predictor of early attachment behaviors (De Wolf & Van Ijzendoorn, 1997). Early infancy and childhood insecure attachment has been consistently associated with unresponsive, rejecting, and insensitive parenting, which may be characteristic of depressed mothers (Teti & Nakagawa, 1990). Multiple studies with infants and mothers have reported associations between maternal depression status and early attachment security. Furthermore, these studies also found that there is an association between more severe and chronic depression and disorganized attachment behavior. A study conducted by Campbell, Cohn, Meyers, Ross, and Flanagan (1993) found infants with insecure attachment styles to be associated with mothers whose postpartum depression lasted beyond the first six months after the birth of their child.

Risk of Maternal Depression Unique to Internalizing or Externalizing Problems

In the United States, approximately 10 percent of mothers experience depression each year (Ertel et al., 2011), which can create a less than optimal home environment, as well as increasing the potential for a child's functioning and adjustment to be severely impacted (Goodman & Gotlib, 1999). A large body of research and literature demonstrates that children of depressed mothers are more likely to have insecure attachment, poor emotion regulation, poor cognitive and language functioning, higher rates of academic failure, increased levels of internalizing and externalizing problems, decreased social competence, and having less relationships with peers (Cicchetti et al. 1998; Cummings and Davis 1994; Goodman 2007; Zahn-Waxler et al. 1990). Another study researched the impact of maternal depression on children's internalizing and externalizing problems for a period of five years with over 1,800 participants (Mesman, Edge, McKelvey, Pemberton, & Holmes, 2017). They assessed for maternal depression during pre-school years and for child internalizing and externalizing behaviors during fifth grade (Mesman, 2017). Mesman (2017) found that clinical levels of internalizing problems were best predicted by maternal depression symptoms whereas maternal substance abuse best predicted externalizing behaviors. Children were found to be twice as likely to have internalizing behavior problems or depressive symptoms when their mothers' demonstrated elevated depressive symptoms compared to non-depressed mothers (Mesman, 2017). In another study, researchers concluded that 30 percent of children with mothers that have histories of substance abuse, mental illness, and trauma had clinically significant internalizing and or externalizing behavior problems (Van De Mark et al., 2005). In an additional similar study, researchers found that the presence of both child internalizing and externalizing symptoms increased as maternal depressive symptoms increased (Whitaker et al., 2006).

In a review of literature, Goodman (2011) found that maternal depression was associated with their children demonstrating internalizing behaviors and lowered positive affect. In a meta-analysis by Connell and Goodman (2002), there was a meaningful effect size found between maternal depression and child internalizing behaviors, such as depression. In another meta-analysis, authors found that children were three times more likely to develop depression themselves if their mothers were depressed when compared to children whose mothers were not depressed (Sullivan et al., 2000). In regard to externalizing behaviors, two meta-analyses concluded that maternal depression was related to child externalizing behavior issues (Connell & Goodman, 2002; Goodman et al., 2011). Research has shown that more severe levels of chronic maternal depressive symptoms were simultaneously associated with higher levels of internalizing and externalizing behavior problems in 5-year-old children (Brennan et al., 2000). Connors-Burrow (2015) found that preschool aged children with mothers that demonstrated higher levels of depressive symptoms had notably higher levels of externalizing behavior problems when compared to other preschoolers whose mothers did not demonstrate any depressive symptoms.

Overall, there have been conflicting findings when trying to determine if maternal depression is a risk that is unique to internalizing or externalizing behaviors in children. Studies show maternal depression is linked to both child externalizing and internalizing problem behaviors (Sullivan et al., 2000; Mesman, 2017), but other studies find that other maternal risk factors are better predictors for child externalizing behaviors (Connors, 2015; Connell & Goodman, 2002; Goodman et al., 2011). In sum, there is evidence from multiple studies that suggests maternal depressive symptoms are associated with both internalizing and externalizing behaviors in young children.

Timing of Risk

A study conducted by Bagner (2010) found that maternal depression during a child's first year of life predicted internalizing behavior problems typically 5 years later. An additional sample of 5-year-old children, found that the children that had been exposed to maternal depression at any prior time-point in their life were more likely to experience depressive symptoms, feelings of hopelessness, negative mindsets, and lower self-esteem when compared to children that had never experienced maternal depression (Murray et al., 2001). Another study found that children with depressed parents can demonstrate social unresponsiveness, low activity, negative emotions, irritability, and hypersensitivity as early as the neonatal phase (Weissman et al., 1986; Zuckerman & Beardslee, 1987). Ghodsian, Zajicek, Wolkind (1984) found that the relation between child disturbance and maternal depression was not significant at 14 months but reached significance at 27 and 42 months of age. Longitudinal analyses conducted by Fielding (2000) indicated that maternal depression as early as 4 months post-partum was linked with child internalizing and externalizing behavior problems at 42 months. Other studies support increasing relations between maternal depression and child behavior problems as children get older (Goodman, 1999). Another research study found that the presence of maternal depression was correlated with 5–10-year-old children demonstrating lower levels of socio-emotional competence when compared to children of the same age who were not exposed to maternal depression (Goodman, Brogan, Lynch, Fielding 1993). Furthermore, Hops (1990) found child expression of dysphoria increased in 3- to 16-year-old children of depressed mothers but not for children of non-depressed mothers. In this same sample of families with depressed mothers, children of 11 years of age and older exhibited substantially higher levels of dysphoria and depressive symptoms compared with children under the age of 11. Field (1988) found that

infants of depressed mothers exhibit depressive and withdrawn styles across settings as young as 3 months of age.

In sum, there is conflicting evidence and literature about when is best to assess for internalizing and externalizing behaviors in children with depressed mothers, as well as when the strength of the risk is highest. However, the majority of studies suggest that maternal depression during any infant, toddler, and child stage of development predicts present and future risk for child internalizing symptoms.

Theories

Many theories have been offered to explain the relations amongst maternal depression, attachment, and child depression. These include but are not limited to the Developmental Theory of Risk, the Ecological Transactional Model, Ontogenic Development, Bandura's Social Learning Theory, and Attachment Theory. Each offers a unique perspective on these relations and are complementary in nature. For the purpose of this study, the author is informed by each of the listed theories that work in harmony together to explain how children develop depression.

Developmental Theory of Risk

The negative effects of maternal depression on children have been researched and discussed for years. Much of that research has focused on describing the negative outcomes children experience in regards to all areas of functioning. Given the abundance of literature ranging from infancy to adolescence, there is no doubt that children are negatively impacted by maternal depression. Infants with depressed mothers were found to be fussier, have more difficult temperaments, and be less securely attached to their mothers, when compared to infants of non-depressed mothers (Gotlib & Goodman, 1999). School-aged children with depressed

mothers were also found to be less socially competent, have lower self-esteem, and have higher rates of behavioral issues (Gotlib & Lee, 1996).

For some time, researchers only examined either children of depressed mothers in a single developmental period or in a large range of ages where potentially two or more separate developmental stages were included and confused (Goodman & Gotlib, 1999). An issue with this method of research is that when findings are concluded about one developmental stage of a child's life, they cannot be generalized to other developmental phases. Another important aspect to consider when looking at developmental theories related to maternal depression's impact on children is the timing of the child's first exposure to a depressive episode. The older a child is, the more likely they have matured, developed successful coping strategies, and will be less vulnerable to negative influences such as maternal depression (Compas, 1987).

Additionally, it is important to consider that depression within an adult population is typically not just a single occurrence and often times is chronic in nature (Depue & Monroe, 1986). Belsher & Costello (1988) states that over 80% of depressed patients have more than one depressive episode. Therefore, it is likely that children of depressed mothers may be exposed to more than one depressive episode. Maternal depression is also considered a risk factor for development issues within socio-emotional and cognitive contexts (Cummings & Davies, 1994). Infants repeatedly interact with their mothers and research demonstrates that depression can compromise a mother's abilities to engage with or respond appropriately to their infant (Hart, Field, Valle, & Pelaez-Nogueras, 1998). Depressed mothers have been found to generally show less attention to their infant's needs and are also poor examples for emotional regulation when compared to non-depressed mothers (Cummings & Davies, 1994). Field, Lang, Martinez, Yando, Pickens, & Bendell (1996) found that depressed mothers rated their children as having more

internalizing problems, specifically depression. Hammen et. al (1987) confirmed an increased risk of psychopathology in the children of depressed parents when compared to children with non-depressed parents.

Ecological Transactional Model

There can be a multitude of reasons or influences on why a child may develop depression, such as the impacts of biological, psychological, and social systems. It is important to examine how multiple forces like a child's environment, parent characteristics, and child characteristic can increase or decrease the likelihood that child will develop depression. An ecological transactional model accounts for multiple factors can lead to the onset of depression in children. According to this perspective, the proximity of a factor to a child, the more or less likely it will be to impact the emergence to depression. For example, a mother is a more proximal influence on a child than an aspect of the child's community is (Cicchetti & Toth, 1998). Thus, if a microsystem, the child's immediate environment, most typically the family, has negative characteristics such as depression, the more likely this will impact the child's well-being in an adverse way. Ontogenic development is defined as the factors within a person that may impact their ability to adapt (Cicchetti & Toth, 1998). Cicchetti & Toth (1998) stated that the ontogenic and microsystem levels of ecology have a heavier influence on a child due to the close proximity they typically hold.

Ontogenic development

Cicchetti & Toth (1998) detail four early stage salient developmental issues related to the depression: "(1) the development of homeostatic and physiological regulation, (2) affect differentiation and the modulation of attention and arousal, (3) the development of a secure

attachment relationship, and (4) the development of the self-system”(Cicchetti & Toth, 1998). Each of these categories sequentially becomes the most primary issue of importance as development ensues and holds lifelong importance in a child’s ability to resist the development of a depressive disorder. As each category ascends, a child must develop internal resources related to that time period’s developmental challenges in order for that child to be adaptive (Cicchetti & Toth, 1998).

According to Cicchetti & Toth (1998), the first few months of life, an infant must maintain homeostatic equilibrium of internal physiological states, which can be preserved by naturally occurring motor reflexes and also by having environmental support from the caregiver. Infants must be able to develop an ability to effectively communicate their needs to their caregivers, and caregivers must be able to read these signs from their child and respond appropriately. Researchers have investigated the differences in child homeostatic regulation specifically with depressed caregivers, where as early as the neonatal period, there have been difficulties. Difficulties have been defined as elevated levels of epinephrine and norepinephrine, struggling to self-quiet or soothe, decreased activity levels, increased negative affect, and attention problems, all of which are indicative of more difficult temperaments (Abrams, Field, Scafidi, & Prodromidis, 1995; Field, 1992; Sameroff, Seifer, & Zax, 1982). Furthermore, research has shown that even non-depressed mothers, who portrayed themselves temporarily as depressed, resulted in disruption of an infant’s ability to self-regulate and an increase in negative infant affectivity (Cohn & Tronick, 1983).

Literature has shown that there are three core characteristic patterns that may occur with depressed mothers: (1) withdrawn, unavailable, and under-stimulating pattern (2) a hostile-intrusive over-stimulating pattern; and (3) a positive pattern characterized by the absence of

depressed symptoms on maternal self-report inventories of depression (Cohn, Matias, Tronick, Lyons-Ruth, & Connell, 1986; Field, Healy, Goldstein, & Guthertz, 1990). Chon et. al (1986) also found that mothers who had a limited affect and decreased responsiveness to their infants needs resulted in increased infant distress. They also reported that maternal hostility and intrusiveness led to infants demonstrating avoidance.

A 1990 study conducted by Zahn-Waxler and Kochanska found that younger children with depressed mothers became overly upset when presented with imaginary situations relating to interpersonal conflict or tension and struggled with affect regulation. This study helps demonstrate the emerging difficulties coming out of infancy with affect regulation in children with depressed mothers, which may then contribute to the onset of depression as development continues. These studies demonstrate that maternal depression is a serious issue that has many implications for the mother as well as their child. According to the World Health Organization, maternal mental health issues have been named a major public health concern due to the increasingly common mental health diagnosis given to mothers during the pre-natal and post-natal periods, with depressive disorders being the most commonly diagnosed disorders for mothers (World Health Organization, 2018). It is easy to conclude that mothers that experience depression may have a more difficult time connecting with and forming a secure relationship their infant when compared to mothers without depression.

Bandura's Social Learning Theory

Albert Bandura's (1977) work has become basic to an understanding of how social forces influence individuals as well as small and large groups of people. From his early Bobo doll experiments, his work with phobias, to his recent work on self-efficacy, Bandura has developed

research that explains how people actively shape their own lives and those of others. Bandura discussed how people learn through observing other people's actions. For example, his Bobo doll experiment showed children watching adults aggressively beat up and interact with the Bobo doll. This study found that children reenacted what they saw the adults do to the Bobo doll (Bandura, 1961). Bandura also conducted an experiment where he had children watch the film of adults aggressively interacting with the Bobo doll and then instead of putting the children in a room with their own Bobo doll, he put them in a room with other children. He found that children who had watched the aggressive video prior to entering the playroom also became more violent in the way they played with the other children (Bandura, 1977). Bandura coined the term "modeling" to describe that when we watch people do something, we use that to inform our own behavior (Bandura, 1977). This research expands to a child with a depressed parent who chronically sees their caregiver demonstrate depressive symptoms.

The evidence on children's matching of their depressed mothers' dysphoric affect, behavior, and cognitions is consistent with social cognitive theory and as previously discussed, even stronger support comes from tests of Bandura's (1986) tenets regarding variables that should influence the likelihood of modeling occurring. A child may then begin demonstrating depressive symptoms themselves as well as interacting with others and their surroundings in a depressed manner, as modeled by their primary caregiver. Bandura states that behavior is learned through the process of observational learning and children will observe the people around them most often, primary caregivers, to learn how to behave (Bandura, 1977). Bandura stated that children will observe people they perceive as similar to themselves (the model) and then they take on or adopt those observed beliefs, behaviors, values, and attitudes of that model.

Attachment Theory

Attachment theory (Bowlby, 1973) offers a useful interpretative model for defining how experiences during early childhood can influence the development of maternal caregiving skills as well as child mental health concerns. Bowlby (1973) suggested that caregivers' internal working models (IWMs), derived from the relationship with their own attachment figures during infancy and childhood, could directly impact their ability to respond appropriately to their own children, which then can impact a child's mental health. There have been various studies completed in the last twenty years that focused on maternal attachment insecurity as a moderator variable on maternal depression and how that then impacts psycho-emotional development of children, as well as child mental health concerns (McMahon et al., 2015). These studies propose that mothers' IWMs moderate the effect of maternal depression on their own child's development (Reis and Grenyer, 2004; Stansfeld et al., 2008a; Niolu et al., 2010). A study completed by McHale (2007) found that one of the caregiver's demonstrating depressive symptoms is considered a risk factor for the quality of caregiving provided to a child. Overall, mothers' psychopathology, and maternal depression in particular, may affect the development of the child directly or indirectly (Gross et al., 2008; Cho et al., 2015).

Attachment theory (Ainsworth et al., 1978) introduced the concept of sensitive responsiveness to assess a mother's ability to intuitively identify and respond to the signals of her child's needs with compassion and empathy. Numerous studies found that depressed mothers may be confused by the emotional reactions of their child and then unable to distinguish between their own personal emotions and those of their child (Koren-Karie et al., 2002; Quitmann et al., 2011; Beebe and Lachmann, 2014). This concern may be recurrent and chronic, thus negatively impacting a mother's caregiving attitudes and behaviors (Agostini et al., 2014; De Campora et al., 2014).

Furthermore, a multitude of studies have shown that maternal depression in combination with an insecure attachment style, can negatively impact the quality of mother-child interaction (Field, 2010). Several models and empirical studies have determined that the impact of maternal mental health on a child's emotional development does not occur in a single direction but rather the impact should be viewed as a result of the interactions between the mother and child (Herwig et al., 2004; Hoffman et al., 2006; Beebe and Lachmann, 2014; McCullough and Shaffer, 2014). Research published by Tronick (2005) discussed a model where the mother-child dyad is seen as an effective communication system, where mutual regulations occur. The system has a goal of developing a "conscious dyadic state" which may influence a child's emotional and social development. Tronick (2005) states that depressed mothers may not be able to understand their child's affective communications and then fail to accommodate those. Negative affects then become chronic between the mother and child, which then solidifies the negative affect within the child. The child then has negative interactions with their mother, which then the mother reciprocates, thus leading to sustained negative emotions. Research has shown that depressed mothers are often not as capable of communicating positively, sharing positive emotions, and they become more susceptible to their infant's distress, when compared to non-depressed mothers (Goodman et al., 2011; Beebe and Lachmann, 2014). A depressed mother tends to deter from interacting with her child, which may cause the child to not be able to experience aspects of the mother-child relationship that are crucial for their own personality development. Furthermore, the mother may interact negatively with the child due to the child's avoidant behaviors, because it may contribute to the mother's feelings of not being wanted by their child, which in turn may result in amplifying the mother's depressive symptoms (Stansbury and Sigman, 2000; Cole et al., 2004). Children from non-depressed mothers, generally have emotions and behaviors that are

characterized as responsive, assertive, and animated when compared to children of depressed mothers (Tambelli et al., 2010). Depressed mothers often describe their child as being introverted and having lethargic energy (Terrone and Santona, 2013). Specifically, intrusive mothers' children often avoid making eye contact with their mother and don't cry often (Terrone and Santona, 2013). Children of withdrawn mothers tend to argue and show elevated levels of distress, demonstrating that withdrawn behaviors have a negative effect (Tambelli et al., 2010). As children of depressed mother's get older, they may demonstrate sadness, hostility, aggression, anger, and be withdrawn, which then confirms the negative expectations a depressed mother has about her child's behavior (Stansbury and Sigman, 2000; Cole et al., 2004; Weissman et al., 2006; Simonelli et al., 2008; Goodman et al., 2011; Cho et al., 2015).

In Combination

Overall, these theories are complementary in nature and thus are combined to inform this study. The Developmental Theory of Risk highlights how children who have depressed parents often develop depression themselves or struggle in different developmental aspects. This correlates with Bandura's Social Learning Theory in the sense that children may mimic what is modeled to them, such as depressive symptoms of a parent. These symptoms and developmental issues that children may develop based on being raised by a depressed parent can also be explained by Attachment Theory because parents who are depressed are less likely to be attentive to a child's needs. This negative parent/child interaction can lead to a child developing an insecure attachment style, which then can lead to depressive symptoms and other additional issues. Furthermore, these theories also correlate with the Ecological Transactional Model as it also discusses how the proximity of a factor to a child can determine if the child is more or less likely to develop depression. For example, a mother is a more proximal influence on a child than

an aspect of the child's community is (Cicchetti & Toth, 1998). Ontogenic Development demonstrates how depressed mothers can impact their infant's affect regulation abilities, which may then contribute to the onset of childhood depression as development continues. All of these theories demonstrate how children can develop complications and depression of their own when raised by a depressed parent. Some of these theories also demonstrate how mothers who experience depression can have a difficult time connecting with their infant and responding to their needs.

The Gap in the Literature

Evidence suggests that both maternal depression and insecure attachment style can precede the development of depression and externalizing problems in children, but it is still unclear if they are independent contributors or if they build off of one another. A second related issue of understanding the role attachment in child depression is how it contributes to depression risk. One important covariate is maternal depression. These parallel constructs of maternal depression and insecure attachment are both known precursors to depression, but the sequence is not known. For instance, attachment issues may precede and cause maternal depression, which in turn makes mothers less able to support healthy child development and lead to child depression. Alternately, maternal depression may precede and disrupt attachment, which then leads to child depression. Due to the harmonic nature of the theories described above, this study is informed by a collaboration of the theories to explain how children develop depression. By intervening early, we increase the likelihood that children of depressed mothers will grow into healthy, capable, fully contributing members of society.

Research Questions

This study's aims were to (1) determine the stability of parent ratings of their infant's temperament/attachment style across one year of development in this sample, and (2) determine whether maternal depression and insecure attachment styles are part of a common pathway to child depressive symptoms and child externalizing behaviors.

The following specific hypotheses related to aim 1:

Hypothesis: We predicted that parent ratings of their child's temperament/attachment style would remain stable over one year of development. Given that attachment theory predicts attachment patterns to be stable over time, we expect moderate to high correlations of each attachment score with itself across 1 to 2 years of age.

The following specific hypotheses related to aim 2:

Hypothesis: We predicted that maternal depression when the child was one-year-old would positively predict poor attachment when the child was two, and poor attachment would in turn predict child depressive and externalizing symptoms in early elementary school. More specifically, we expected that attachment score, at Age 2 would mediate the relations between maternal depression at Age 1 and child depression and externalizing symptoms in Grade 2.

Chapter II: Review of Literature

Relevant context and background information will be provided in this chapter. The first portion of this chapter will discuss attachment literature and how that impacts a child's socio-emotional functioning. Then an overview of how maternal depression can impact a child will be explored, which will lead into a detailed description of the Healthy Start Program. Finally, the purpose of this research will be outlined.

Attachment

Attachment theory states that infants are biologically subjected to developing a close bond with their primary caregivers as a tactic to guarantee that their basic needs are met (Ainsworth, 1978; Bowlby, 1969). The bond that is formed between infant and caregiver is known as an attachment style and characterizes the caregiver's ability to provide for and meet the needs of the child (Ainsworth, 1978; Bowlby, 1969). The attachment style is formed by the consistent pattern of a caregiver and their child in a stressful environment. Forming the most positive attachment style, a secure attachment, occurs when a caregiver reliably recognizes and responds appropriately to their child's distress signals (Ainsworth, 1978; De Wolf & Van Ijzendoorn, 1997). Through a secure attachment, infants know they can depend on their caregiver to comfort and support them (Ainsworth, 1978; Bowlby, 1969). Additionally, a secure attachment relationship between a parent and child, allows the child to develop skills to explore the world and manage their own emotional functioning (Madigan, Atkinson, Laurin, & Benoit, 2013).

An important component of early childhood is for the child to form a secure attachment with their primary caregiver (Sroufe, 1988). Literature shows that early insecure attachment styles are indicative of internalizing issues arising later in the child's life (Sroufe, Carlson, Levy, & Egeland, 1999). Attachment theory explains that attachment styles between the parent and child can drastically influence a child's ongoing capability of coping and handling external stressors (Carlson & Sroufe, 1995). From a positive perspective, children with secure attachment styles are capable of expressing their emotions to their parents in a positive and appropriate manner, to which the parent then responds in a safe and comforting way, allowing the child to have a safe base for exploring and interacting with the world (Ainsworth, Blehar, Waters, & Wall, 1978; Dozier & Kobak, 1992). Children with secure attachments are able to effectively

express their needs to their caregivers and trust that those needs will be met (Munson, McMahon, & Spieker 2001). Additionally, securely attached children are able to seek help from others when needed, be aware of their emotions and the needs that come along with such emotions, and utilize resources can lead them to have stronger emotional regulation skills (Murray, Halligan, Adams, Patterson, & Goodyer, 2006). Securely attached children also tend to be able to cope with changes and challenges that arise in healthy manners (Carlson & Sroufe, 1995). Research shows that having adaptive coping skills are helpful in the prevention of developing depression (Schneider, Atkinson, & Tardif, 2000). Being able to develop and use emotion regulation skills is also influenced by early attachment style and then attachment style contributes to the risk of the development of depression (Carlson & Sroufe, 1995). Secure attachment styles also have been shown to increase a child's ability to recognize their emotional and behavioral reactions when confronted with difficult or stressful events (Kobak & Cole 1994).

Insecure attachment styles have been shown to contribute to a child not having appropriate emotional regulation skills and a decreased ability to ask for help when needed (Munson, McMahon, & Spieker, 2001). Insecure attachment between children and their parents also has been shown to lead to depression originating in early childhood and throughout adulthood (Sroufe, Egeland, & Kreutzer, 1990). Furthermore, Carlson and Sroufe (1995) found that infants with an avoidant attachment style, who have been rejected by their primary caregivers, tend to minimize their negative emotions and suppress any emotional expression (Carlson & Sroufe, 1995). Infants with ambivalent attachment styles often maximize their emotional expression in order to gain attention from their parents who typically were inconsistent with their responses or feedback to their child (Carlson & Sroufe, 1995).

Research has indicated that when a child develops an insecure attachment with their caregiver it can contribute to the development of dysfunctional thoughts and behaviors around their own self-efficacy and social relationships (Carlson & Sroufe, 1995; Cassidy & Kobak, 1988; Kobak & Sceery, 1988). Attachment theory states that early experiences between a child and their caregiver help shape the way a child interprets the world and future experiences. Depressed children typically have ways of thinking and processing that are distorted in nature, which can lead to increased depressive symptoms related to early-childhood insecure attachment (Sroufe, 1995). Research has also shown that attachment style is reflective of the quality of parental care given to a child (Carlson & Sroufe, 1995). Children who have insecure attachment styles have typically experienced rejection of their requests from their parents and have parents who became increasingly inaccessible and indifferent towards their child (Carlson & Sroufe, 1995).

Children who had secure attachments had parents who typically gave consistent responses, met their child's needs, and provided appropriate levels of attention to their child. Barglow, Contreras, Kavesh, and Vaughn (1998) found that parents who gave consistent responses to their child, had children who were less likely to demonstrate characteristics of hyper-vigilance and internalize their distress. Additionally, Barglow et al. found that children tended to view themselves as unworthy and helpless when they did not receive appropriate levels of attention from their caregivers. Insecure attachment styles have been shown to decrease a child's confidence to explore environments that are new and unfamiliar as well as increase a child's level of fear and passiveness (Barglow et al., 1998). In addition to having an insecure attachment style between parent and child, maternal depression has also been shown to

contribute to the development of internalizing issues, externalizing behaviors, and depression in children.

Maternal Depression

Studies have shown that maternal depression can contribute to and be increased by having an infant with a difficult temperament (Block & Block, 1980; Posner & Rothbart, 2000; Rothbart & Bates, 1998). Furthermore, an increased level of maternal depression has been shown to be highly associated with children developing depression themselves (Block & Block, 1980; Posner & Rothbart, 2000; Rothbart & Bates, 1998). Infants that display more difficult temperaments can predict child depression indirectly through maternal depression (Rothbart & Bates, 2006).

Parents are also more likely to doubt their own abilities to be an effective and good parent when they have an infant with a difficult temperament, otherwise known as reduced parenting self-efficacy (Cutrona & Troutman, 1986). Parents with low parenting self-efficacy and children with difficult temperaments were found to experience higher levels of frustration and feelings of failure when compared to parents who had easier infants with more pleasant temperaments (Rothbart, Derryberry, & Posner, 1994). Low parenting self-efficacy has been shown to lead to increased stress levels associated with parenting which contributes to a mother's risk of developing depression (Rothbart, Ahadi, Hershey, & Fisher, 2001). Mothers who develop depression have an increased likelihood to stop trying to bond emotionally or form secure attachments with their children (Rothbart, et al., 2001). Child depression is predicted when mothers do not establish a secure attachment with their child and exhibit higher levels of maternal depression (Rothbart, et al., 2001).

Research done by Stephens, Dulberg and Joubert (1994) shows that depression tends to

amass within families and be passed down to future generations. The development and continuance of child depression has been linked to maternal depression (Field, Hernandez-Reif & Diego, 2006). A study with depressed mothers, conducted by Kaplan et al. found that 9% of depressed mothers experienced significant depressive symptoms within the first year after they gave birth to their children (Kaplan, Bachorowski, & Zarlengo-Strouse, 1999). The initial two years after giving birth are a crucial time period for maternal depression to impact child emotional development (Hammen & Rudolph, 1996). Research found that within two to three years after giving birth, many mothers reported experiencing increased stress levels. This study also found that depressed mothers tend to display significantly more negative emotions and a decreased ability to tolerate stress than non-depressed mothers (Rothbart & Bates, 2006). Rothbart and Bates (2006) found that maternal depression was associated with mothers over-reporting temperamental difficulties of their children and describing their children as difficult to soothe when compared to mothers without depression. A meta-analysis done by Burbach and Borduin (1986) found the prevalence of child depression to range from 7% to 13% when the child had depressed parents when compared to a community sample where the prevalence rate was less than 2%.

Depressed mothers were found to demonstrate a general dissatisfaction for life and found to be less available to their children (Murray, Halligan, Adams, Patterson, & Goodyer, 2006). Further studies found that depressed mothers are less likely to respond to and meet their child's needs and may also reject crucial interactions with their child (Downey & Coyne, 1990). Hammen, Burge, and Adrian (1991) found that mothers with higher levels of depression were observed to be irritable, less patient, and withdrawn when interacting with their child. Mothers with depression also did not provide an adequate amount of stimulation for their infants and

appeared distant from their child (Goodman & Gotlib, 2002). Additionally, some mothers with depression who were experiencing frustration would engage in emotional overreactions which then may postulate excessive levels of stimulation for their infants (Goodman & Gotlib, 2002).

A (1998) study was done with a group of three to six month old babies and depressed mothers. This study examined and compared the depressed mothers and children with non-depressed mothers and infants, which found that the depressed mothers presented with less positive behaviors such as not immediately responding to their child's needs, not establishing a regular sleep and feeding routine, and not showing positive affect (Field et al., 1998). Fields et al. (1998) also found that depressed mothers and their infants would demonstrate a depressed interaction with strangers. Infants of the depressed mothers were shown to have learned depressed mannerisms demonstrated in social interactions by their mothers and then mimic that with other people, also known as learned helplessness. In a subsequent study, Fields (2006) showed that the interactions between depressed mothers and their children were characterized by less affection and less emotion than non-depressed mothers and their children.

Another factor that impacts parent and child interactions is parenting stress. Parenting stress is defined as stress related to the demands of being a parent felt by the parent (Abidin, 1995; Abidin, Jenkins, & McGaughey, 1992). Between the ages of infancy and toddlerhood, parenting stress is predictive of later childhood internalizing problems including depression (Ashford, Smit, Lier, Cuijpers, & Koot, 2008). Ashford et al. (2008) found that increased levels of parenting stress around children between the ages of four and five predicted internalizing behaviors in those children at age eleven. Anthony et al. (2005) found that parenting stress was associated with internalizing problems for preschoolers. The two main factors of how parenting stress can impact a child's internalizing issues are parent distress and dysfunctional interactions

between a child and their parent. Parenting stress tends to lead to parents expressing significant emotional and behavioral distress, such as frequent and overwhelming worries, trepidation about their child's well-being and safety, feeling incompetent as a parent, feeling a lack of freedom, and a lack of social support (Abidin, 1992; Abidin, 1995; Deater-Deckard & Scarr, 1996; Hudson & Rapee, 2002). A study conducted by Mcloyd (1990) demonstrated that parental distress led to parents becoming more authoritarian in their parenting style and less affectionate to their children when compared to parents with much less distress. Furthermore, a study by Abidin (1995) revealed that parents with higher levels of parenting distress viewed their interactions with their child as discouraging and or isolating in nature. Parents who are experiencing higher levels of stress also were found to be less "warm" or caring to their children and increasingly unsupportive and insensitive (Cummings & Davies, 1999). Fitting with these studies, child depressive symptoms may be a result of having distressed parents who are unable to form a secure attachment and emotional bond with their child, in addition to the parents holding negative beliefs about their child (Abidin, 1995). Parents with increased levels of stress were found to view their children as not meeting their expectations and experiencing disappointment towards their child (Grant et al., 2003). Unpleasant parent-child interactions in combination with parent expectations not being met may contribute to the development of depressive symptoms in children (Abidin, 1995).

Externalizing Behaviors

The importance of examining externalizing behaviors in this study is because research shows that early externalizing problems can also predict the development and risk of child depression. During early childhood, children learn important social skills such as regulation of emotion, appropriate behavior, and expression of emotion. Literature shows that yelling, cussing,

pinching and other mild to moderate aggressive behaviors are common amongst younger children (Loeber, 1990; Tremblay et al., 2004). Children need efficient interventions to learn how to understand the consequences of their aggressive behaviors and to ultimately develop healthier alternatives to those behaviors. Without effective interventions, externalizing problems and child depressive symptoms may develop (Blake & Hamrin, 2007). Not being able to effectively regulate emotion has been linked with aggressive behaviors during early childhood (Blake & Hamrin, 2007). Children that have a difficult time managing their own emotions are more likely to not regulate negative behaviors and are less able to express empathy to others (Shields & Cicchetti, 1998). Children who have externalizing problems are more likely to obtain negative peer evaluations, be excluded in school, and then as a result internalize their distress (Hoglund, Lalonde, & Leadbeater, 2008). Externalizing behaviors are likely to be demonstrated by children who are labeled as or perceived as “bullies.” Van Lier and Koot (2010) found that children who were seen as “bullies” had an increased risk of developing internalizing problems than their peers. Children who have demonstrated externalizing behaviors may experience difficulties in making friends and maintaining friendships, thus leading to feelings of isolation, loneliness, and sadness.

Healthy Start Program

The dataset used in the current study is from the Hawaii Healthy Start Program (HSP). HSP is based on Henry Kempe’s lay therapy program and the work of Selma Frailberg. The goal of HSP is to identify families who have a lack of parenting skills and or knowledge, a lack of good parenting role models, and are experiencing daily stressors that can lead to abusive and neglectful parenting (Duggan et al., 1999). Interventions like HSP have been documented to improve parenting outcomes. For example, Healthy Families, a version of HSP in Alaska, found

children in families that had received this treatment had more favorable development and behavioral outcomes at two years of age (Caldera et al., 2007). Their mothers also had greater parenting self-efficacy, and their families were more likely to use center-based parenting services. Furthermore, fewer of the families that received treatment had home environments that were observed to be poor for child learning. The impact of this intervention was deemed to be greater for those with lower baseline risk. There was no conclusive evidence that efficacy increased with higher dose of service (Caldera et al., 2007). A variety of measures have been collected to evaluate the impact of HSP and has generated many research studies.

Initial data collection occurred with families that were recruited from November 1994 through December 1995 and were followed for three consecutive years. This evaluation involved six HSP sites serving geographically defined areas on the island of Oahu. All of the sites were on the same island to minimize the cost of monitoring fieldwork. The sites were operated by three community agencies with each agency responsible for two sites. Early Identification (EID) staff identified families based on the usual HSP criteria. Families were eligible to be in the study if they lived in the target community, were not already known to Child Protective Services, the mother understood English well enough to be interviewed without a translator, and if the family's HSP site was accepting new referrals (Duggan et al., 1999). Each family only had one child enrolled in the program. Overall, there were 373 families in the HSP group, 270 in the main control group, and 41 in the testing control group. Further details about recruitment and the original sample can be found in Duggan et al. (1999).

A rigorous evaluation of the program found no positive effects on maternal life skills, well- and injured-child health care, social support, substance use, child development, home learning environment, parent-child interactions or child maltreatment. However, significant

differences were found in the program implementation at the various agencies. That is, there were agency-specific positive program effects on parent-child interaction, child development, maternal confidence in adult relationships and partner violence (Duggan et al. 1999). The program did not prevent child abuse or increase use of nonviolent discipline, but it was modestly successful at preventing neglect (Duggan, et al., 2002). Although many of the participants had malleable parental risk factors for child abuse, program staff often failed to recognize these factors and link the parents to relevant resources. As a result, the intervention did not reduce any risk factors for participants (Duggan et al., 2003). Intervention parents were less likely to use mild forms of physical discipline than control mothers. However, treatment and control mothers were equally likely to use severe forms of physical discipline (Duggan et al., 2007). One agency did see improvement in maternal mental health of mothers enrolled in the program. Furthermore, there was a reduction in problem maternal alcohol use and repeated incidents of physical aggression between partners for families receiving 75% or more of the expected home visits while enrolled in HSP (Duggan, et al., 2003).

Purpose of this Research

This study aimed to (1) determine how stable parent ratings of their infant's temperament/attachment style is across one year of development, and (2) establish if there is a specific pathway that leads to child depression and or internalizing and externalizing behaviors originating with maternal depression or insecure attachment styles between the infant and their mothers.

Chapter III: Methods

The data for this study was collected as part of a multisite, randomized trial of Hawaii's Healthy Start Program (HSP) (Duggan et al., 2004). The Hawaii Healthy Start Program (HSP) is a home visiting program targeted at families at-risk of child abuse and neglect. The HSP has two parts: (1) population-based screening and assessment to identify families at-risk of child abuse and neglect; and (2) home visiting of identified at-risk families. Overall analyses found no intervention effects. All participants were followed as a longitudinal developmental sample. Data are collected by structural interview and individual assessments.

Participants & Sampling

Data for this study was collected in Oahu, Hawaii between November 1994 and December 1995 from families from six Healthy Start Program sites. Each site was owned and operated by local community agencies, and participating families were identified through HSP protocol labeling them as at-risk. In order to qualify as at-risk, HSP staff reviewed the mothers' medical records and if there were not enough information in medical records, researchers would conduct interviews with the mothers using Kempe's (1976) Family Stress Checklist. Kempe's Family Stress Checklist includes factors like parental substance use, mental health concerns, domestic violence, unrealistic expectations of a child, etc. Families were excluded if they were already involved with Child Protective Services (CPS). Requirements for participation included the mother understanding English enough to not need a translator and if the families' HSP site was accepting new referrals. Data were collected from families yearly from birth through the child's third grade year in elementary school. Data was collected through developmental testing of children, home observations, structured parent interviews, and reviewing relevant records.

Over the three-year follow up time period, 89% of families completed at least two interviews and 81% completed all three of the interviews (Duggan et al. 2004).

Overall, 897 families met this criterion (Duggan et al., 1999) with 684 families providing consent. Participants were randomized into the following three groups: the HSP intervention group (373 families), the testing control group (41 families), and the main control group (270 families). The racial and ethnic characteristics for the HSP intervention group was 34% and the control group was 33%. In the intervention group 10 % of participants identified as Pacific Islander/Native Hawaiian, and in the control group 14% identified as White. Both the intervention and control groups had 28% Asian or Filipino, and 27% in the intervention group and 26% in the control group identified no primary ethnicity or identified as unknown (Duggan et al. 1999) (See Table 1). The mean age for participating mothers was 23.4 ($SD = 5.8$) and 60% of the families had incomes below the poverty line (Duggan et al., 1999).

For this study we used all data for treatment and control participants because the original study (Duggan et al., 1999) did not find a treatment effect, therefore the treatment did not appear to differentially impact the development of children in the two conditions. Furthermore, we controlled for treatment condition in the analyses.

Demographic Information

HSP collected information on multiple demographic factors for the participants including the infant/child, mothers/caregivers, and the family unit overall. Early Identification (EID) workers collected part of the demographic information including reviewing medical records surrounding new births of infants to identify at-risk families in relation to child abuse and neglect. Areas that EID workers collected information are as follows: parents not married,

unemployed partner, inadequate income, unstable housing, lack of telephone, less than high school education, inadequate emergency contacts, marital or family problems, history of abortions, abortion unsuccessfully sought or attempted, adoption sought, history of substance abuse, history of psychiatric care, history of depression, and inadequate prenatal care (Dungan et al., 1999).

Measures

Bates Attachment Scale

The HSP administered to mothers the Bate's Attachment Scale that was derived from the Infant Characteristics Questionnaire (ICQ), comprised of 20 Likert scale ratings of their infant's temperament. Questions on this scale included "How well does your baby adapt to new experiences?", "On the average, how much attention does your baby require, other than for caregiving (feeding, diaper changes, etc.)?", and "How persistent is your baby in trying to get your attention when you are busy?". This measure was administered at two different time points in the HSP. However, since this measure is derived from the ICQ, there is no other literature on the 20-question scale that was used for measuring attachment and infant temperament in the HSP study. There is little to no evidence that the scale used has any solid evidence of validity or that it measures what it says it does. More information on the Infant Character Questionnaire is as follows: The Infant Character Questionnaire (ICQ) was used to evaluate an infant's temperament (Bates, Freeland, & Lounsbury, 1979). The measure is administered to parents or primary caregivers who are asked to rate their infants' behaviors on a 7-point scale from 1 (optimal temperamental trait) to 7 (difficult temperament trait). The ICQ contains 24 items to classify infant temperaments into four different categories: fussy-difficult (e.g., fussy or crying overall), unadaptable (e.g., reactions to new places or stimuli), dull (e.g., smiling and happy noises), and

unpredictable (e.g., hunger or sleeping being erratic). Questions on this scale include “How many times per day, on average, does he/she get fussy and irritable—for either short or long periods of time?”, “How changeable is his/her mood?”, and “When left alone, does he/she play well by him/herself?”.

Much research has been conducted evaluating the reliability and validity of ICQ. Bates and Freeland (1979) found that the ICQ had good reliability and validity within their study with 322 pairs of mothers and infants between the ages of four and six months. The test-retest reliability ranges from .47 to .70. Research has found that the internal consistency of the four categories of temperament ranges from .39 to .79. The convergent validity between father’s reported ICQ score and mother’s reported ICQ score ranges from .38 to .61. Furthermore, the fussy-difficult subscale has demonstrated good convergent validity with home objective observation data ($r=.22$). We used Bates temperament scores when children were Aged 1 and 2.

Center for Epidemiological Studies Depression Scale (CES-D)

The CES-D was utilized to measure maternal depression (Radloff, 1977). The CES-D is a self-report measure that assesses the rate of 20 different depressive symptoms occurring within the past week. Each of the 20 items are ranked on a scale of 0-3 and total scores range between 0 and 60. Having a score above 16 represented clinically significant depressive symptoms (Radloff, 1977). The CES-D has four categories it gauges to describe various clinical features of depression: depressed affect (e.g., “I felt sad”), positive affect (e.g., “I felt hopeful about the future”), interpersonal problems (e.g., “People were unfriendly”), and somatic complaints (e.g., “I could not get going”, “My sleep was restless”). The Cronbach's α coefficient for Depressed Affect was high, in the patient and reference group 0.87 and 0.88 respectively; Cronbach's α for Positive Affect was in the patient and reference group 0.75 and 0.76, respectively. In addition,

CES-D has displayed adequate validity (Schroevers et al., 2000). Radloff (1977) tested the convergence between CES-D and clinical ratings, as well as other well-recognized self-report measures of depression, in order to determine the construct validity. We used maternal CES-D scores when children were Aged 1 and 2.

Child Behavior Checklist – Parent and Teacher Ratings (CBCL)

In this study, parents and teachers completed the Child Behavioral Checklist (CBCL) to assess child externalizing behaviors. CBCL was developed in 1991 (Achenbach, 1991) to measure children's emotional and behavioral symptoms. Parents and teachers were asked to rate 118 items on their children's problem on a 3-point scale including 0 (not true in the past six months), 1 (somewhat or sometimes true), and 2 (very true or often true). The CBCL includes multiple domain-specific syndrome scales measuring different externalizing problems (Achenbach 1991; Chen et al. 1994). In this study, we used the teacher- and the parent-rated Externalizing scores in Grade 2. The Externalizing score is a sum of scores on Delinquent Behavior and Aggressive Behavior (Edelbrock and Costello 1988; Kasius et al. 1997; Kazdin and Heidish 1984; Eiraldi et al. 2000).

The CBCL has been widely used as a screening tool to distinguish children's clinical symptoms. There is strong evidence for the CBCL's psychometric properties, and numerous studies on both clinical and nonclinical populations have proven there is adequate reliability and validity for the CBCL (Achenbach, 1991). Research has also shown that the Externalizing scales are better measures of child emotional and conduct problems than the separate CBCL subscales (Gjone & Stevenson, 1997). The test-retest reliability of the Externalizing scales ranges from .93 to .97 (Achenbach & Edelbrock, 1983; Hinshaw, Han, Erhardt, & Huber, 1992). The validity of

CBCL has been extensively reported in studies with culturally diverse populations (Achenbach 1991a, 1991b)

Children's Depression Inventory (CDI)

HSP utilized the CDI (Kovacs, 1981) to measure a child's depressive symptoms and or internalizing behaviors in Grade 2. The CDI can be used for children ranging between the ages of 7 to 17 years old and assesses cognitive, affective, and behavioral symptoms of depression in youth through 27 items (Kovacs, 1992). The CDI has been widely used in clinical and research settings (Craighead, Smucker, Craighead, & Ilardi, 1998; Saylor, Finch, Spirito, & Bennett, 1984; Smucker, Craighead, Craighead, & Green, 1986). The CDI is a self-report measure that has the child rate statements on a scale of 0-2 that best characterizes themselves over the past two weeks. The five categories of the CDI examine Negative Mood, Interpersonal Problems, Ineffectiveness, Anhedonia, and Negative Self-esteem. Scores can be based on each category or calculations can be done for an overall total score (Kovacs, 1992). A cutoff score of 13 is recommended within a clinical sample and a higher cutoff (19) score can be used within a nonclinical sample (Kovacs, 1992).

To examine validity, a test-retest correlation was conducted, resulting with a range from .66 to .83 across 2 to 4 week intervals and range from .54 to .56 across 4 to 6 month intervals (Kovacs, 1992). Internal consistency was reported to range from .59 to .68 for the subscales of the CDI and the Cronbach's alpha was .86 for the total score in the normative sample in the US (Kovacs, 1992). Cronbach's alphas ranged from .59 to .66 for the subscales (Kovacs, 2003). In order to test the construct validity, Kovacs (2003) measured the difference of CDI scores on clinical normative samples. Results demonstrated that the total score of the CDI has a sensitivity

of 80% and a specificity of 84% in distinguishing children with depression disorders from children without depression disorder.

Procedure

Data Collection

As previously described, the HSP data was gathered in Hawaii with families initially recruited for approximately a year beginning in November of 1994 and subsequently followed through Grade 3 (Duggan et al., 1999).

Analytic Plan

To test hypothesis 1, that parent ratings of their child's temperament/attachment style will remain stable over one year of development, we calculated test-retest reliability values for each attachment factor, as well as with the total temperament score.

In order to test hypothesis 2, that poor attachment style between parent and child at Age 2 would mediate the relations between maternal depression at Age 1 and child depression and externalizing symptoms in Grade 2, we conducted a path analysis. A path analysis is utilized for determining whether a multivariate set of non-experimental data fits well with a causal model (Olobatuyi, 2006). A path analysis is based on a closed system of nested relationships among variables that are represented by a series of structured linear regression equations (Olobatuyi, 2006). Additionally, a path analysis follows the same set of assumptions as linear regression, as well as some additional restrictions that describe the allowable pattern of relations among variables (Olobatuyi, 2006). We conducted separated path analyses for child depressive symptoms and externalizing problems. We also tested the reverse path with maternal depression mediating the relations between temperament and child depression and externalizing problems.

Chapter IV: Results

Descriptive Statistics

All analyses were conducted using IBM SPSS (Statistical Package for the Social Sciences) Statistics 21. The overall means and standard deviations of all study variables (CES-D Age 1 and Age 2, Bates Total Score Age 1 and Age 2, Grade 2 and 3 CDI Score, Grade 3 Parent Rating CBCL, Grade 3 Teacher Rating CBCL) were examined (See Table 7). The mean for maternal depression on the CES-D at Age 1 was ($M=16.18$) and the standard deviation was ($SD=9.71$). The mean for maternal depression on the CES-D at Age 2 was ($M=14.39$) and the standard deviation was ($SD=9.36$). The mean on the measure of child temperament at Age 1 (Bates Temperament) was ($M=60.49$) and a standard deviation of ($SD = 13.86$). The mean on the measure of child temperament at Age 2 (Bates Temperament) was ($M=60.41$) and a standard deviation of ($SD = 14.08$). The mean for child depression (CDI) at Grade 2 was ($M=10.86$) and a standard deviation of ($SD = 7.44$). The mean for child depression (CDI) at Grade 3 was ($M=9.93$) and a standard deviation of ($SD = 7.08$). The mean for teacher rating of child externalizing behaviors (CBCL) at Grade 3 was ($M=49.85$) and a standard deviation of ($SD = 9.29$). The mean for parent rating of child externalizing behaviors (CBCL) at Grade 3 was ($M=48.65$) and a standard deviation of ($SD = 9.64$) (See Table 3 in the Appendix).

Correlations

Pearson point biserial correlations were calculated amongst the Bates subscales and maternal depression at Age 1 and Age 2, as well as the correlations among these measures with child depression and externalizing symptoms in 2nd and 3rd Grade.

At Age 1, with the exception of the Bates Unsociable subscale and the Bates Persistent subscale, all of the Bates subscales had small to strong statistically significant associations ($p <$

.001) (see Table 4 in the Appendix). For example, the Bates fussy and difficult scale and the Bates unadaptable scale had a medium association at Age 1 ($r = 0.45, p < .001$). The Bates Total Score at Age 1 had a medium to strong association with the Bates Total Score at Age 2 ($r = 0.47, p < .001$) (see Table 5 in the Appendix).

Age 1 maternal depression had a small association with the Bates total score at Age 1 ($r = 0.18, p < .001$) and Age 2 ($r < 0.17, p < .001$). Maternal depression at Age 2 had a small association with Bates total score at Age 2 ($r = 0.15, p < .001$). Age 1 maternal depression had a moderate association with Age 2 maternal depression ($r = 0.52, p < .001$) (See Table 6 in the Appendix)

Parent reported child depression scores in Grade 2 and Grade 3 were moderately correlated with one another ($r = .51, p < .001$), but there were no statistically significant associations among the Bates subscales and total scores and child depression scores ($p > .05$) (See Table 7 in the Appendix). On the other hand, maternal depression at Age 2 had a small association with parent report of child depression at Grade 2 ($r = 0.12, p < 0.05$) (See Table 8 in the Appendix). There was not a statistically significant association between child depression at Grade 3 and maternal depression in Age 1.

Maternal depression at Age 1 ($r = 0.15, p < 0.01$) and at Age 2 ($r = 0.15, p < 0.01$) had small associations with parent ratings of child externalizing behaviors in Grade 2. Maternal depression at Age 1 ($r = 0.15, p < 0.01$) and at Age 2 ($r = 0.12, p < 0.01$) had small associations with parent ratings of child externalizing behaviors in Grade 3. Maternal depression at Age 1 had a small association with teacher rating of child externalizing behaviors in Grade 2 ($r = 0.15, p < 0.01$). However, there were not statistically significant associations between maternal

depression at Age 1 and Age 2 with teacher rating of child externalizing behaviors in Grade 2 and Grade 3. (See Table 9 in the Appendix)

Lastly correlations were calculated with the Bates subscales at Age 1 and Age 2 with parent and teacher ratings of child externalizing behaviors in Grade 2. There were small associations between the Bates Total Score at Age 1 and 2 with parent rating of child externalizing behavior in Grade 2 ($r = 0.20, p < 0.01$; $r = 0.25, p < 0.01$; respectively). There were not statistically significant associations between the Bates Total Score at Age 1 and Age 2 with teacher ratings of child externalizing behaviors at either grade point (See Table 10 in the Appendix).

Regression Analyses

Assumptions. We plotted the residual versus predicted values for each regression equation and found evidence to support homoscedasticity (i.e., the shape of the plot and also the residual values were within 3). To examine autocorrelations, we calculated the Durbin-Watson statistic and found values ranging from 1.54 to 2.38, all well within the recommended ranges to meet the assumption of independent error terms. Multicollinearity was not a concern given the low to moderate correlations between predictors and outcome variables. Simple plots also supported linear relations among study variables. Finally, we found evidence of skewness in most study variables; we explored potential solutions to minimize skewness including log and reciprocal transformations but these attempts yielded little to no improvement in skewness. Given that regression is robust with regard to departures from non-normality and the potential for biased estimates in outcome transformations (e.g., Schmidt & Finan, 2017), we opted to retain the original data structure.

Path Analysis. Six path analyses were conducted to test hypothesis 2 that poor attachment at Age 2 mediated the relations between maternal depression at Age 1 and child depression and externalizing symptoms at Grade 2 as well as the competing reverse paths (from maternal depression to attachment and to youth symptoms). We ran the path analyses as a series of regression equations: (1) predictor variable to mediator [path a], (2) predictor and mediator to outcome [path b], and (3) predictor to outcome (path c). For final models depicted in Figures 1-6, we report standardized coefficients produced from steps 1 and 2 (i.e., with both predictor and mediators in the model). For any significant path a and b effects, we tested the significance of indirect effects using the Sobel test.

In the first path model examining attachment as a mediator of the maternal depression-child depression relations (Figure 1), maternal depression was a statistically significant predictor of the total attachment scores score ($p < .05$). One standard deviation increase on the maternal depression scale is associated with a 0.14 standardized increase on the Bates temperament. Additionally, maternal depression at Age 1 significantly predicted child depression in Grade 2 with Age 2 attachment in the model. However, Age 2 attachment did not predict Grade 2 depression. Therefore, the analysis did not provide evidence of mediation. The final linear regression model with both predictor and mediator had an R^2 of 0.01.

In the second path model examining maternal depression as mediator of the attachment-child depression relations (Figure 2), attachment at Age 2 significantly predicted maternal depression at Age 2 ($\beta = 0.13, p < .05$). However, neither attachment nor maternal depression predicted Grade 2 depression; thus no evidence of mediation was observed.

For the third path model (Figure 3) we examined if attachment mediated the link between maternal depression and parent-rated child externalizing behaviors. For the first path in the

model, maternal depression on the CES-D was found to be a statistically significant predictor of child attachment on the Bates Temperament score ($p < .05$). With both predictor and mediator in the model, Age 1 maternal depression ($\beta = 0.13$) and Age 2 attachment ($\beta = 0.23$) both predicted child depression in Grade 2. A follow-up Sobel test was significant, suggesting that attachment partially mediated the relations between maternal depression and externalizing behaviors.

On the fourth path model we examined maternal depression as a mediator of the attachment link with parent ratings of child externalizing behaviors (Figure 4). This model (Figure 4) found similar associations as the previous model (Figure 3). Child attachment predicted CES-D scores ($\beta = 0.13, p < .05$). In turn, Age 2 maternal depression predicted parent rated CBCL scores ($\beta = 0.13, p < .05$) and Age 1 attachment scores child temperament predicted parent rated CBCL scores ($\beta = 0.17, p < .05$). The follow-up Sobel test indicated that there was a significant indirect effect between Age 1 attachment and parent rated externalizing symptoms in Grade 2; this provided evidence that maternal depression partially mediated this link.

For the fifth path model we examined whether attachment mediated the relations between maternal depression and teacher ratings of child externalizing behaviors (Figure 5). As before, Age 1 maternal depression was a statistically significant predictor of attachment at Age 2 ($p < .05$). However, with both predictor and mediator in the model, maternal depression continued to have a significant direct effect on teacher-rated externalizing symptoms, whereas attachment was unrelated to these symptoms. Thus, no evidence of mediation was found.

Finally, the sixth path examined the reverse path from early attachment to maternal depression and teacher-rated child externalizing behaviors (Figure 6). Attachment predicted maternal depression ($\beta = 0.14, p < .05$). However, with both attachment and maternal

depression, the neither model predicted teacher rated externalizing symptoms. Thus, no evidence of mediation was found.

Chapter V: Discussion

The aim of the present study was to fill the gap in the literature on the pathway that leads to child depression/internalizing problems and externalizing behaviors that either originates with maternal depression or insecure attachment styles between a mother and their child. It also aimed to examine how stable a parent's rating of their child's attachment style/temperament is across one year of development. Prior research demonstrated inconsistent findings in establishing specific pathways to internalizing and externalizing behaviors in children.

Correlations

Many of the results from the correlations ranged between very small to moderate associations amongst variables. Correlations amongst the Bates subscales were small to strong in association with one another which is to be expected. Correlations between Age 1 and Age 2 of the Bates total scores were strong as well which suggests that parent ratings of the child's attachment is persistent between Age 1 and Age 2 of life. Surprisingly, there was only a small correlation between maternal depression, attachment, and child depression, which was unexpected when compared to the majority of prior literature. In a meta-analysis, authors found that children were three times more likely to develop depression themselves if their mothers were depressed when compared to children whose mothers were not depressed (Sullivan et al., 2000). When bonding and attachment prove difficult, child development is affected (Ainsworth, 1978; Zajac, 2020). One of the biggest risk factors for successful bonding and attachment is poor mental health on the part of the primary caregiver (Atkinson, Paglia, Coolbear, Niccols, Parker, Guger, 2000). In particular, a parent who is depressed finds it more difficult to engage, connect,

and bond with a baby or toddler (Atkinson, 2000). Given that mothers remain most likely to be the primary caregiver, maternal depression can therefore be an important risk factor for early child development (Atkinson, 2000).

Unlike this fairly large literature, the present findings suggest that maternal depression and attachment issues during the first year of life served as only a very modest risk for future child internalizing symptoms. One possibility for this discrepancy concerns the sample in the present study. Participants in the present study were all from Hawaii and the majority identified as Asian or Pacific Islander. The bulk of prior studies on maternal depression and attachment for child depression have been conducted on majority group samples in the mainland U.S. Thus, it is possible that cultural differences may influence the role of maternal depression and attachment on child development. Additionally, it is worth noting that the sample also presented a group of families with other pre-existing risk factors that allowed them to be eligible for a home visitation program. It may be that these other risk conditions muted the role of maternal depression or attachment either by limiting the variability of these problems relative to lower risk families or by overwhelming outcomes with bigger risk conditions. For instance, nearly all families had low economic means, and extensive research has documented the role of poverty in undermining youth development broadly. Finally, another explanation for the null to small findings on child depression concerns the age of development when depression was assessed. Depressive symptoms peak during early and mid-adolescence and are less common during the early elementary years. Thus, maternal risk and attachment may have different and strong relations with youth depression during later stages of development. Still, it is interesting and important to note that depressive symptoms during the early elementary years is a risk factor for a wide range

of negative youth outcomes later in development. Thus, identifying precursors to child depressive symptoms during the early elementary years has important prevention implications.

Similar to the findings regarding child depression, relations between parent and teacher rated externalizing symptoms, maternal depression, and attachment were fairly small. Only for parent rated externalizing symptoms there was a small association between externalizing score and maternal depression, and a small association between parent rating of externalizing behaviors and parent ratings of child attachment. It is important to note that these correlations were only observed for parent reported externalizing problems. Given maternal depression and attachment were both reported by the parent as well, the present study cannot rule out the possibility that these effects were partially or completely driven by source bias.

Path Analyses

Results from the path analyses found mostly insignificant findings in regards to mediation. Small but significant mediation effects were found with both maternal depression (See Figure 3 in the Appendix) and attachment (See Figure 4 in the Appendix) in predicting parent ratings of child externalizing behaviors. These effects may suggest reciprocal relations between maternal depression and attachment in predicting externalizing symptoms. Literature demonstrates that having an insecure attachment style may lead to children exhibiting strong reactions in order to get a response from their caregiver. In regard to externalizing behaviors, two meta-analyses concluded that maternal depression was related to child externalizing behavior issues (Connell & Goodman, 2002; Goodman et al., 2011). Research has shown that more severe levels of chronic maternal depressive symptoms were simultaneously associated with higher levels of internalizing and externalizing behavior problems in 5-year-old children (Brennan et al., 2000). Early infancy and childhood insecure attachment has been consistently associated with

unresponsive, rejecting, and insensitive parenting (Teti & Nakagawa, 1990), which may be characteristic of depressed mothers. Furthermore, literature also shows that when mothers are depressed, they may express less interest in interacting with their children, thus leading to a child developing an insecure attachment with their mother, and then learning that they must have strong behaviors in order to get their mother's attention. Maternal depression greatly influences the quality of mother-infant interactions and attachment, which greatly impact children's healthy development (Atkinson, 2000; Badovinac, 2018). A mother who demonstrates a difficulty with the regulation of negative emotions can face barriers in regards to their ability to identify and respond appropriately to their child's emotions and behaviors, a task that is important for sensitive caregiving (Downey & Coyne, 1990; Lovejoy, Graczyk, O'Hare, & Neuman, 2000). Children and infants with depressed mothers have significantly higher rates not only of developing mood disorders but also of other internalizing and externalizing problems, as well as difficulties in emotional development when compared to children whose mothers are not depressed (Goodman 2007). Even though there are small significant mediation effects, it is not enough to explain the emergence of externalizing behaviors. Other variables are needed to explain the externalizing behaviors, such as some of the at-risk characteristics of the home environment that qualified mother and child dyads for this study. Children may have seen domestic violence occur within their home in this particular sample which may have led to them demonstrating behaviors that are considered to be externalizing. Exposure to adult intimate partner violence has been associated with externalizing and internalizing behavior problems among children (Evans, Davies, & DiLillo, 2008; Holt, Buckley, & Whelan, 2008; Yates, Dodds, Sroufe, & Egeland, 2003). Another thing to note that may explain these findings is that this sample is unique in that it is made up of predominantly an Asian population from Hawaii. Thus,

attachment and maternal depression variables may have had different relations compared to other samples.

Limitations

One limitation of the present study concerned the measurement strategy for assessing attachment style. Research has shown that attachment is best measured through direct observation. However, observation is a costly method for experimenters to utilize so self-report type measures on attachment style have been developed and employed. One of these self-report measures is the Bates Attachment Scale, derived from Infant Characteristics Questionnaire (ICQ), comprised of twenty Likert scale ratings of their infant's temperament. However, the Bates Attachment Scale lacks strong psychometric evidence. Since this measure is derived from the ICQ, there is no other literature on the 20-question scale that was used for measuring attachment and infant temperament in the HSP study. Although the scale has face validity and functional utility, little evidence has been offered to support the technical adequacy of the measure. It should be noted that the scale did have high levels of inter-correlations and stability. An important future step would be to evaluate the scale and examine its factor structure given multiple dimensions it purports to measure that are consistent with attachment theory. Additionally, examining these scales relations with other similar variables would provide evidence of concurrent and discriminant validity as well as its temporal stability. Furthermore, the Healthy Start Program dataset used in the current study is from the Hawaii Healthy Start Program (HSP) and the goal of HSP is to identify at risk families. These families were described as demonstrating a lack of parenting skills and or knowledge, a lack of good parenting role models, and are experiencing daily stressors that can lead to abusive and neglectful parenting (Duggan et al., 1999). This data set utilizes a unique sample of participants from Hawaii (Asian

and or South Pacific ethnic backgrounds), so a factor analysis would be helpful to establish the psychometric properties of this scale with this specific population.

Another limitation is that all of the measures used were given by self-report. Self-report can only account for the information that the participant is willing to share with others. Some of the measures in this study covered more delicate issues such as mental health of a parent, parental relationship quality with their child, and their child's mental health and potential behavioral issues. It is possible that some parents may fear judgment or other consequences if they describe their mental health as poor or that their relationship with their child is difficult. Furthermore, a decent portion of participants in this sample spoke languages other than English and or did not obtain education beyond grade 12. These participant factors could have led to limited reading comprehension on self-report measures, which could cause the results from the measures being less accurate. Another limitation of self-report measures is response bias or social desirability bias. Parents who are more depressed may also view their child in a more negative way than a more neutral observer, and parents may also not want to disclose their own struggles with mental health or parenting.

Another possible limitation is that the original study only measured attachment from a mother's report. Both parents are considered attachment figures in attachment theory, and the child-father attachment is independent from the child-mother attachment. Mothers are commonly involved in caregiving and providing emotional refuge while fathers are typically involved in play and exploratory undertakings (Cabrera, Volling, & Barr, 2018). Recently studies have focused more attention towards the roles that fathers have in their child's development (Cabrera, Volling, & Barr, 2018). Attachment theory has been slower to emphasize the importance that both caregivers have on a child and how children can develop attachment to their fathers equally

as often as they develop attachment to their mother (Lucassen et al., 2011). If possible, future studies should incorporate both of the mothers and fathers ratings of child attachment style.

Lastly, the participants (mothers, child) were recruited by the Healthy Start Program which was created to help reduce and prevent child abuse. The program utilized the Family Stress Checklist (Kempe, 1976) to measure parents with poor mental health, occurrences of domestic violence, substance usage, parents having a history of abuse as children, and other high-risk characteristics (Duggan, McFarlane, Fuddy, Burrell, Higman, Windham, & Sia, 2004). Families that scored high on the Family Stress Checklist were deemed eligible to participate in the Healthy Start Program intervention. Therefore, mothers and children in this sample were from families that were described as high risk for abuse, neglect, and other negative home environment issues. Data and results from this particular sample may not be generalizable to the general population.

Conclusions

Child depression is an important and complicated topic. Despite limitations listed above and many insignificant findings, this study illuminates a need for future research. We know that maternal depression and insecure attachment styles both can contribute to negative child implications such as development of depression or externalizing behaviors. Most existing literature offers conflicting or inconclusive findings around the pathway to the development of child depression and externalizing behaviors resulting from maternal depression or insecure attachment relationships. If we can identify which factor leads to these negative child outcomes, we can better prepare for effective interventions. Furthermore, due to this study using parent ratings for maternal depression and attachment, which can lead to source bias, future research should focus on incorporating non-biased measures or outside neutral observers.

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Appendix

Table 1. *Participant Demographic Information*

	(n=688)		
	%	Mean	SD
Child's Gender			
Female	51		
Male	49		
Child's Race			
White	11.8		
Asian	8.8		
Pacific Islander	12.9		
Filipino	19.7		
Hawaiian	20.3		
Black/Multiracial	26.5		
Mother's Race			
Native American	0.1		
White	11.8		
Black	0.9		
Asian	8.8		
Pacific Islander	12.9		
Filipino	19.7		
Hawaiian	20.3		
Black/Multiracial	25.4		
Mother's Highest Education			
None	0.1		
8 th Grade	3.8		
9 th -11 th Grade	26.9		
12 th w/o diploma	2.3		
High School/GED	39.0		
Some College	25.0		
Associates Degree	1.3		
Bachelor's Degree	1.5		
Mother's Age		23.48	5.77
Mother Work in Last Year			
No	51.5		
Yes	48.5		
Language other than English			
No	71.6		
Yes	28.4		
Mother was Teen Mom			
No	68.9		
Yes	31.1		
Poverty Level			
Under	67.7		
Over	32.3		

Table 2. *Variable's Means and Standard Deviations*

	<i>M</i>	<i>SD</i>
CES-D TOTAL SCORE AGE 1	16.18	9.71
CES-D TOTAL SCORE AGE 2	14.39	9.36
BATES TOTAL SCORE AGE 1	60.49	13.86
BATES TOTAL SCORE AGE 2	60.41	14.08
GRADE 2 CDI TOTAL SCORE	10.86	7.44
GRADE 3 CDI TOTAL SCORE	9.93	7.08
GRADE 2 CBCL TEACHER	49.85	9.29
GRADE 2 CBCL PARENT	48.65	9.64

CDI- Children's Depression Inventory. CES-D: Center for Epidemiologic Studies Depression Scale. CBCL- Child Behavior Checklist

Table 3 *Correlations Among Bates Subscales at Year 1*

	1	2	3	4	5
1 Age 1 Bates Fussy and Difficult	--				
2 Age 1 Bates Unadaptable	0.45** <i>n</i> = 561	--			
3 Age 1 Bates Persistent	0.41** <i>n</i> = 561	0.17** <i>n</i> = 561	--		
4 Age 1 Bates Unsociable	0.33** <i>n</i> = 561	0.29** <i>n</i> = 561	0.13 <i>n</i> = 561	--	
5 Age 1 Bates Total	0.86** <i>n</i> = 561	0.70** <i>n</i> = 561	0.58** <i>n</i> = 561	0.53** <i>n</i> = 561	--

** indicates correlation was statistically significant with $p < 0.001$, * indicates correlation was statistically significant with $p < .0$

64 Table 4 *Correlations Among Bates Subscales at Age 1 and Age 2*

	1	2	3	4	5	6	7	8	9	10
1 Age 1 Bates Fussy and Difficult	--									
2 Age 1 Bates Unadaptable	0.45** <i>n</i> = 561	--								
3 Age 1 Bates Persistent	0.41** <i>n</i> = 561	0.17** <i>n</i> = 561	--							
4 Age 1 Bates Unsociable	0.33** <i>n</i> = 561	0.29** <i>n</i> = 561	0.13 <i>n</i> = 561	--						
5 Age 1 Bates Total	0.86** <i>n</i> = 561	0.70** <i>n</i> = 561	0.58** <i>n</i> = 561	0.53** <i>n</i> = 561	--					
6 Age 2 Bates Fussy and Difficult	0.47** <i>n</i> = 529	0.23** <i>n</i> = 529	0.29** <i>n</i> = 529	0.30** <i>n</i> = 529	0.47** <i>n</i> = 529	--				
7 Age 2 Bates Unadaptable	0.27** <i>n</i> = 528	0.32** <i>n</i> = 528	0.16** <i>n</i> = 528	0.28** <i>n</i> = 528	0.37** <i>n</i> = 528	0.43** <i>n</i> = 561	--			
8 Age 2 Bates Persistent	0.20** <i>n</i> = 530	0.06 <i>n</i> = 530	0.34** <i>n</i> = 530	0.14** <i>n</i> = 530	0.23** <i>n</i> = 530	0.52** <i>n</i> = 562	0.26** <i>n</i> = 561	--		
9 Age 2 Bates Unsociable	0.18** <i>n</i> = 530	0.23** <i>n</i> = 530	0.04 <i>n</i> = 530	0.34** <i>n</i> = 530	0.26** <i>n</i> = 530	0.31** <i>n</i> = 562	0.34** <i>n</i> = 561	0.10* <i>n</i> = 563	--	
10 Age 2 Bates Total	0.41** <i>n</i> = 527	0.30** <i>n</i> = 527	0.24** <i>n</i> = 527	0.34** <i>n</i> = 527	0.47** <i>n</i> = 527	.85** <i>n</i> = 560	0.65** <i>n</i> = 560	0.56** <i>n</i> = 560	0.50** <i>n</i> = 560	--

** indicates correlation was statistically significant with $p < 0.001$, * indicates correlation was statistically significant with $p < .0$

Table 5 Correlations Among Bates Subscales at Age 1 and Age 2 and Maternal Depression Age 1 and Age 2

	1	2	3	4	5	6	7	8	9	10	11	12
1 Age 1 CES-D	--											
2 Age 1 Bates Fussy and Difficult	.15** <i>n</i> = 556	--										
3 Age 1 Bates Unadaptable	0.11** <i>n</i> = 556	0.45** <i>n</i> = 561	--									
4 Age 1 Bates Persistent	0.08 <i>n</i> = 556	0.41** <i>n</i> = 561	0.17** <i>n</i> = 561	--								
5 Age 1 Bates Unsociable	0.17** <i>n</i> = 556	0.33** <i>n</i> = 561	0.29** <i>n</i> = 561	0.13** <i>n</i> = 561	--							
6 Age 1 Bates Total	0.18** <i>n</i> = 556	0.86** <i>n</i> = 561	0.70** <i>n</i> = 561	0.58** <i>n</i> = 561	0.53** <i>n</i> = 561	--						
7 Age 2 CES-D	0.52** <i>n</i> = 528	0.11** <i>n</i> = 531	0.08 <i>n</i> = 531	0.02 <i>n</i> = 531	0.16** <i>n</i> = 531	0.12** <i>n</i> = 531	--					
8 Age 2 Bates Fussy and Difficult	0.12** <i>n</i> = 525	0.47** <i>n</i> = 529	0.23** <i>n</i> = 529	0.29** <i>n</i> = 529	0.30** <i>n</i> = 529	0.47** <i>n</i> = 529	0.08 <i>n</i> = 561	--				
9 Age 2 Bates Unadaptable	0.11* <i>n</i> = 524	0.27** <i>n</i> = 528	0.32** <i>n</i> = 528	0.16** <i>n</i> = 528	0.28** <i>n</i> = 528	0.37** <i>n</i> = 528	0.10* <i>n</i> = 560	0.43** <i>n</i> = 561	--			
10 Age 2 Bates Persistent	0.09* <i>n</i> = 526	0.20** <i>n</i> = 530	0.06 <i>n</i> = 530	0.34** <i>n</i> = 530	0.14** <i>n</i> = 530	0.23** <i>n</i> = 530	0.01 <i>n</i> = 562	0.52** <i>n</i> = 562	0.26** <i>n</i> = 561	--		
11 Age 2 Bates Unsociable	0.09* <i>n</i> = 526	0.17** <i>n</i> = 530	0.23** <i>n</i> = 530	0.04 <i>n</i> = 530	0.34** <i>n</i> = 530	0.26 <i>n</i> = 530	0.13** <i>n</i> = 562	0.31** <i>n</i> = 562	0.34** <i>n</i> = 561	0.10* <i>n</i> = 563	--	
12 Age 2 Bates Total	0.17** <i>n</i> = 523	0.41** <i>n</i> = 527	0.30** <i>n</i> = 527	0.24** <i>n</i> = 527	0.34** <i>n</i> = 527	0.47** <i>n</i> = 527	0.15** <i>n</i> = 559	0.85** <i>n</i> = 560	0.65** <i>n</i> = 560	0.56** <i>n</i> = 560	0.50** <i>n</i> = 560	--

** indicates correlation was statistically significant with $p < 0.001$, * indicates correlation was statistically significant with $p < .05$.

CES-D: Center for Epidemiologic Studies Depression Scale

Table 6 *Correlations Among Bates Subscales at Age 1 and Age 2 and Child Depression in 2nd and 3rd Grade*

	1	2	3	4	5	6	7	8	9	10	11	12
1 Grade 2 CDI	--											
2 Age 1 Bates Fussy and Difficult	.01 <i>n</i> = 416	--										
3 Age 1 Bates Unadaptable	0.00 <i>n</i> = 416	0.45** <i>n</i> = 561	--									
4 Age 1 Bates Persistent	-0.01 <i>n</i> = 416	0.41** <i>n</i> = 561	0.17** <i>n</i> = 561	--								
5 Age 1 Bates Unsociable	0.05 <i>n</i> = 416	0.33** <i>n</i> = 561	0.29** <i>n</i> = 561	0.13** <i>n</i> = 561	--							
6 Age 1 Bates Total	0.02 <i>n</i> = 416	0.86** <i>n</i> = 561	0.70** <i>n</i> = 561	0.58** <i>n</i> = 561	0.53** <i>n</i> = 561	-						
7 Grade 3 CDI	0.51** <i>n</i> = 457	0.01 <i>n</i> = 428	0.07 <i>n</i> = 428	-0.00 <i>n</i> = 428	0.00 <i>n</i> = 428	0.01 <i>n</i> = 428	--					
8 Age 2 Bates Fussy and Difficult	-0.01 <i>n</i> = 424	0.47** <i>n</i> = 529	0.23** <i>n</i> = 529	0.29** <i>n</i> = 529	0.30** <i>n</i> = 529	0.47** <i>n</i> = 529	0.06 <i>n</i> = 437	--				
9 Age 2 Bates Unadaptable	-0.01 <i>n</i> = 423	0.27** <i>n</i> = 528	0.32** <i>n</i> = 528	0.16** <i>n</i> = 528	0.28** <i>n</i> = 528	0.37** <i>n</i> = 528	0.03 <i>n</i> = 436	0.43** <i>n</i> = 561	--			
10 Age 2 Bates Persistent	0.06 <i>n</i> = 425	0.20** <i>n</i> = 530	0.06 <i>n</i> = 530	0.34** <i>n</i> = 530	0.14** <i>n</i> = 530	0.26** <i>n</i> = 530	0.05 <i>n</i> = 438	0.52** <i>n</i> = 562	0.26** <i>n</i> = 561	--		
11 Age 2 Bates Unsociable	0.01 <i>n</i> = 425	0.17** <i>n</i> = 530	0.23** <i>n</i> = 530	0.04 <i>n</i> = 530	0.34** <i>n</i> = 530	0.23** <i>n</i> = 530	0.02 <i>n</i> = 438	0.31** <i>n</i> = 562	0.34** <i>n</i> = 561	0.10* <i>n</i> = 563	--	
12 Age 2 Bates Total	0.02 <i>n</i> = 422	0.41** <i>n</i> = 527	0.30** <i>n</i> = 527	0.24** <i>n</i> = 527	0.34** <i>n</i> = 527	0.47** <i>n</i> = 527	-.01 <i>n</i> = 435	.85** <i>n</i> = 560	0.65** <i>n</i> = 560	0.56** <i>n</i> = 560	0.50** <i>n</i> = 560	--

** indicates correlation was statistically significant with $p < 0.001$, * indicates correlation was statistically significant with $p < .05$.
 CDI- Children's Depression Inventory. CES-D: Center for Epidemiologic Studies Depression Scale

Table 7 *Correlations Among Child Depression in 2nd and 3rd Grade and Maternal Depression at Age 1 and Age 2*

	1	2	3	4
1 Grade 2 CDI	--			
2 Grade 3 CDI	0.51** <i>n</i> = 457	--		
3 Age 1 CES-D	0.12* <i>n</i> = 414	0.07 <i>n</i> = 426	--	
4 Age 2 CES-D	0.08 <i>n</i> = 425	0.06 <i>n</i> = 438	0.52** <i>n</i> = 528	--

** indicates correlation was statistically significant with $p < 0.001$, * indicates correlation was statistically significant with $p < .05$.
 CDI- Children's Depression Inventory. CES-D: Center for Epidemiologic Studies Depression Scale

Table 8 *Correlations Amongst Maternal Depression Age 1 & 2 and Parent/Teacher Ratings of Externalizing Behaviors in Grades 2 and 3*

	1	2	3	4	5	6
1 CES-D Age 1	--					
2 CES-D Age 2	0.52** <i>n</i> = 528	--				
3 Parent Rating CBCL Grade 2	0.15** <i>n</i> = 485	0.15** <i>n</i> = 500	--			
4 Teacher Rating CBCL Grade 2	0.15** <i>n</i> = 406	0.07 <i>n</i> = 419	0.26** <i>n</i> = 445	--		
5 Parent Rating CBCL Grade 3	0.15** <i>n</i> = 502	0.12** <i>n</i> = 513	0.67** <i>n</i> = 555	0.27** <i>n</i> = 443	--	
6 Teacher Rating CBCL Grade 3	0.09 <i>n</i> = 420	0.02 <i>n</i> = 430	0.30** <i>n</i> = 457	0.49** <i>n</i> = 438	0.33** <i>n</i> = 461	--

** indicates correlation was statistically significant with $p < 0.01$, * indicates correlation was statistically significant with $p < .05$

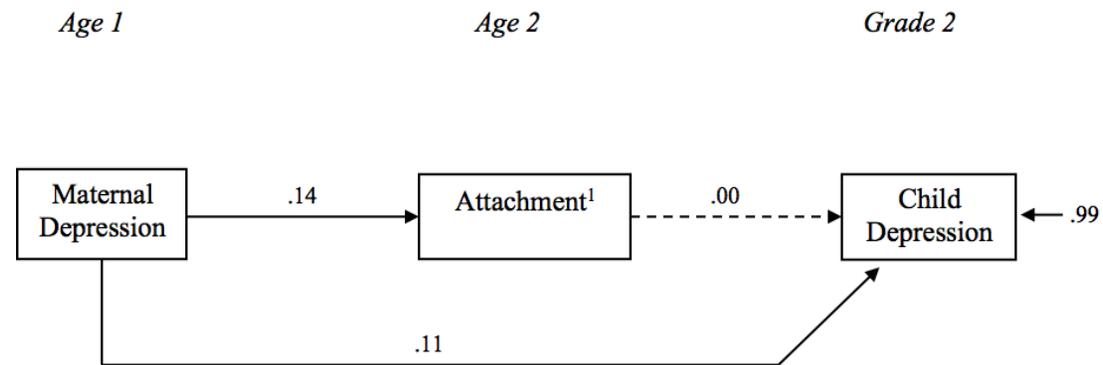
CES-D: Center for Epidemiologic Studies Depression Scale. CBCL- Child Behavior Checklist

Table 9 Correlations Among Bates Subscales at Age 1 and Age 2 and Parent/Teacher Ratings of Externalizing Behaviors in Grade 2

		1	2	3	4	5	6	7	8	9	10	11	12
1	Parent Rating CBCL Grade 2	--											
2	Teacher Rating CBCL Grade 2	0.26** <i>n</i> = 445											
3	Age 1 Bates Fussy and Difficult	0.19** <i>n</i> = 488	0.09 <i>n</i> = 408	--									
4	Age 1 Bates Unadaptable	0.07 <i>n</i> = 488	-0.01 <i>n</i> = 408	0.45** <i>n</i> = 561	--								
5	Age 1 Bates Persistent	0.19** <i>n</i> = 488	0.11* <i>n</i> = 408	0.40** <i>n</i> = 561	0.17** <i>n</i> = 561	--							
6	Age 1 Bates Unsociable	0.06 <i>n</i> = 488	-0.05 <i>n</i> = 408	0.33** <i>n</i> = 561	0.29** <i>n</i> = 561	0.13** <i>n</i> = 561	-						
7	Age 1 Bates Total Score	0.20** <i>n</i> = 488	0.07 <i>n</i> = 408	0.88** <i>n</i> = 561	0.70** <i>n</i> = 561	0.61** <i>n</i> = 561	0.52** <i>n</i> = 561	--					
8	Age 2 Bates Total Score	0.25** <i>n</i> = 496	0.04 <i>n</i> = 417	0.43** <i>n</i> = 528	0.29** <i>n</i> = 528	0.31** <i>n</i> = 528	0.35** <i>n</i> = 528	0.50** <i>n</i> = 528	--				
9	Age 2 Bates Fussy and Difficult	0.23** <i>n</i> = 497	0.05 <i>n</i> = 418	0.47** <i>n</i> = 529	0.23** <i>n</i> = 529	0.29** <i>n</i> = 529	0.30** <i>n</i> = 529	0.48** <i>n</i> = 529	0.89** <i>n</i> = 561	--			
10	Age 2 Bates Unadaptable	0.11** <i>n</i> = 496	-0.06 <i>n</i> = 417	0.27** <i>n</i> = 528	0.32** <i>n</i> = 528	0.16** <i>n</i> = 528	0.28** <i>n</i> = 528	0.37** <i>n</i> = 529	0.71** <i>n</i> = 561	0.43** <i>n</i> = 562	--		
11	Age 2 Bates Persistent	0.25** <i>n</i> = 498	0.15** <i>n</i> = 419	0.20** <i>n</i> = 530	0.06 <i>n</i> = 530	0.34** <i>n</i> = 530	0.14** <i>n</i> = 530	0.26** <i>n</i> = 530	0.67** <i>n</i> = 561	0.52** <i>n</i> = 562	0.26** <i>n</i> = 561	--	
12	Age 2 Bates Unsociable	0.07 <i>n</i> = 498	-0.04 <i>n</i> = 419	0.17** <i>n</i> = 530	0.23** <i>n</i> = 530	0.04 <i>n</i> = 530	0.34** <i>n</i> = 530	0.26** <i>n</i> = 530	.49** <i>n</i> = 561	0.31** <i>n</i> = 562	0.34** <i>n</i> = 561	0.10* <i>n</i> = 563	--

** indicates correlation was statistically significant with $p < 0.01$, * indicates correlation was statistically significant with $p < .05$.

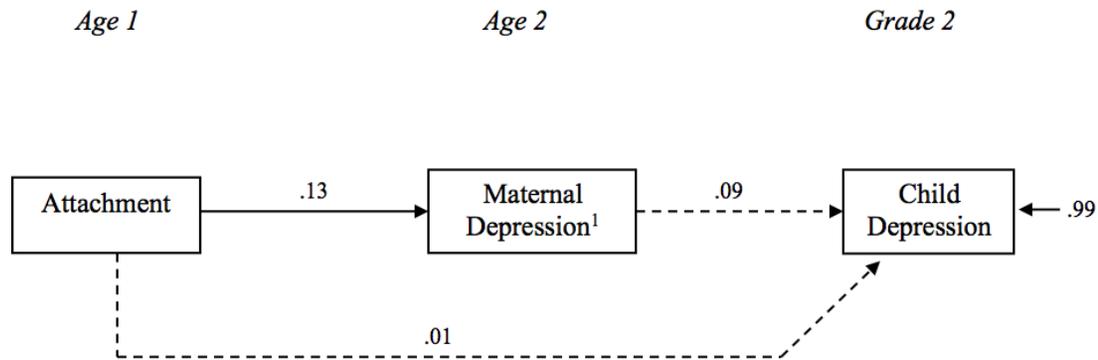
Figure 1. Path Model from Maternal Depression (Age 1) to Child Depression (Grade 2).



Note. Solid lines indicate significant effects ($p < .05$); dashed lines indicate non-significant effects.

¹ Attachment does not mediate maternal depression-child depression relations

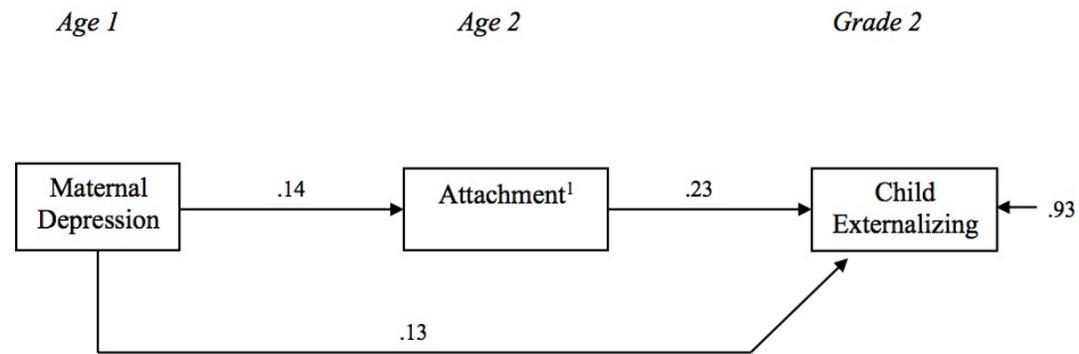
Figure 2. Path Model from Attachment (Age 1) to Child Depression (Grade 2).



Note. Solid lines indicate significant effects ($p < .05$); dashed lines indicate non-significant effects.

¹ Maternal depression does not mediate attachment-child depression relations

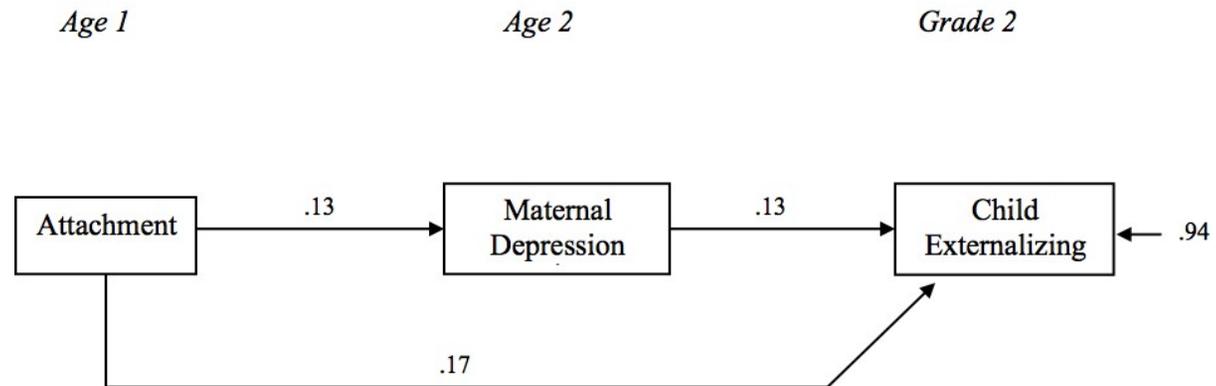
Figure 3. *Path Model from Maternal Depression (Age 1) to Parent-Rated Child Externalizing (Grade 2).*



Note. Solid lines indicate significant effects ($p < .05$); dashed lines indicate non-significant effects.

¹ Attachment partially mediates maternal depression-child depression relations (Indirect effect = .03; Sobel = 2.61, $p < .01$)

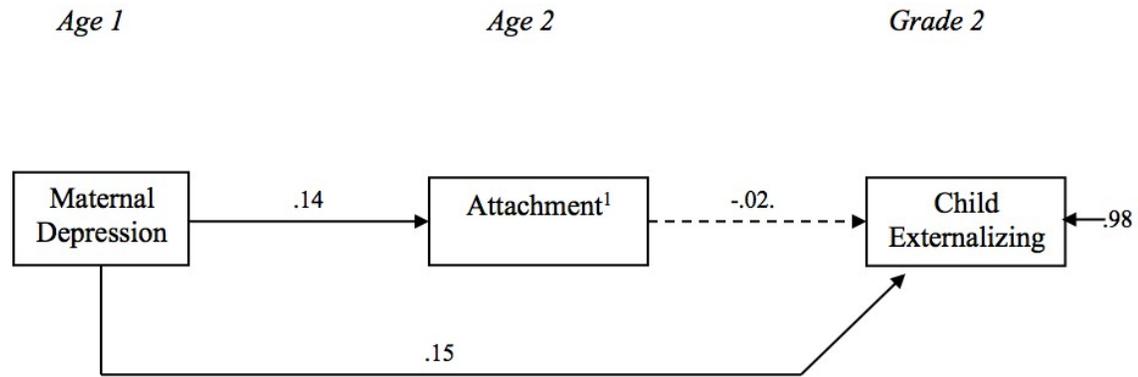
Figure 4. *Path Model from Attachment (Age 1) to Parent-Rated Child Externalizing (Grade 2).*



Note. Solid lines indicate significant effects ($p < .05$); dashed lines indicate non-significant effects.

¹ Maternal depression partially mediates attachment-child depression relations (Indirect effect = .02; Sobel = 2.05, $p < .05$)

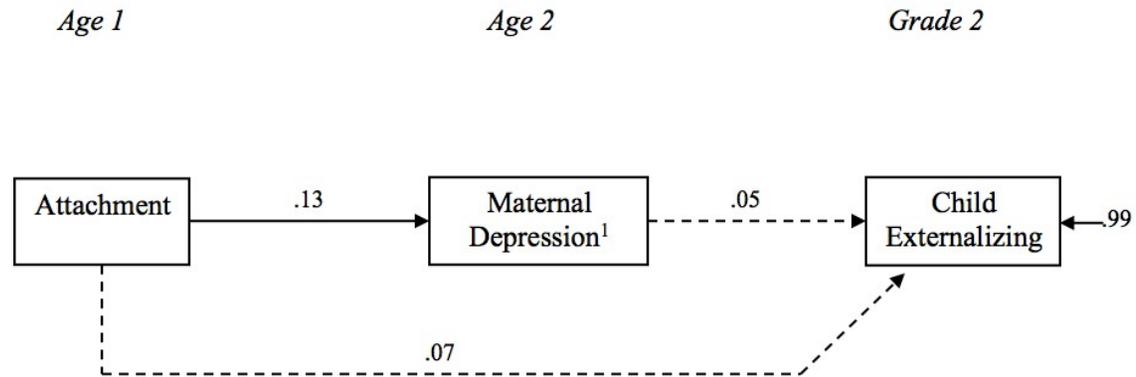
Figure 5. *Path Model from Maternal Depression (Age 1) to Teacher-Rated Child Externalizing (Grade 2).*



Note. Solid lines indicate significant effects ($p < .05$); dashed lines indicate non-significant effects.

¹ Attachment does not mediate maternal depression-child externalizing relations

Figure 6. *Path Model from Attachment (Age 1) to Teacher-Rated Externalizing (Grade 2).*



Note. Solid lines indicate significant effects ($p < .05$); dashed lines indicate non-significant effects.

¹ Maternal depression does not mediate attachment-child externalizing relations

VITA

Aly Savala was born and raised in Williamsburg Virginia on August 20, 1992. Aly attended Texas Tech University between 2010-2014 receiving her bachelor's degree in Psychology. Aly then went on to receive her master's degree in Counseling Psychology from the University of Louisville between 2014-2016. From 2016-2021, Aly attended the University of Missouri-Columbia to complete her doctoral degree in Counseling Psychology. She completed her pre-doctoral internship at the Student Counseling Center at Texas Tech University and accepted a job working for a private group practice in Houston, Texas. Aly is EMDR trained and has specialized in working with clients with trauma, addiction, and or attachment concerns.