EARLY MOTHER-CHILD ATTACHMENT QUALITY, ITS ANTECEDENTS, AND CONSEQUENCES: TESTING PROCESS-ORIENTED MODELS

by

JIHYOUNG KIM

(Under the Direction of K.A.S. Wickrama)

ABSTRACT

The current study aimed to explore the mechanisms of how maternal employment status influences the mother-child attachment quality and how these early childhood experiences operate and are related to later social adjustment. With this aim, this dissertation developed and tested two process models with a sample of 1,364 families from the NICHD Study of Early Child Care and Youth Development. The first study examined a conditional process model linking maternal employment status during the first year of a child’s life and subsequent attachment quality. Results revealed that mothers’ working status continued to influence later attachment quality through two interrelated mediating mechanisms—depressive symptoms and maternal sensitivity. Also, mothers’ attitudes toward maternal employment moderated the effects of working status on depressive symptoms. The second study examined an integrated model of self-regulation and hostile attributional bias as intrapersonal processes linking attachment security and children’s later social adjustment. Results indicated that early attachment relationships influenced children’s later social adjustment through the developmental continuity of self-regulation and further via time lagged effects from self-regulation to hostile attributional bias.
INDEX WORDS: Maternal employment, Depressive symptoms, Sensitivity, Attitudes, Attachment quality, Self-regulation, Hostile attributional bias, Social adjustment
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DEDICATION

I dedicate this dissertation to my parents who always love, support, and encourage me.
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CHAPTER 1

GENERAL INTRODUCTION

Background

Since Bowlby (1973, 1982) introduced his groundbreaking ideas on mother–child emotional bonds, attachment theory has been one of the most important and empirically grounded conceptual frameworks for understanding a child’s developmental trajectories of subsequent adaptation (Brumariu & Kerns, 2010; De Klyen & Greenberg, 2008; Fearon, Bakermans-Kranenburg, van IJzendoorn, Lapsley, & Roisman, 2010; Weinfield, Sroufe, Egeland, & Carlson, 2008). According to attachment theory, the quality of the child-primary caregiver attachment refers to the degree of confidence the infant has in the responsiveness of the primary caregiver, as reflected in the infant’s comfort in exploration and ease of settling with that caregiver (Schaffer & Emerson, 1964; Weinfield et al., 2008). Securely attached children who have readily available, responsive, and reliable attachment figures are assumed to develop a representation of the self as acceptable and others as trustworthy. In contrast, infants with insecure attachment who have inconsistent or unresponsive attachment figures are assumed to develop a view of self and others as unworthy (Pietromonaco & Barrett, 2000).

Different types of attachment qualities have been associated with future adaptive and maladaptive developmental outcomes (Kochanska & Kim, 2013). Generally, a large body of empirical studies has consistently documented that children with secure attachment, relative to their insecure counterparts, tend to show better social adjustments such as fewer behavioral problems (Greenberg et al., 1991; Pianta & Egeland, 1994), better social competence (Elicker,
Englund, & Sroufe, 1992), and cognitive functioning (Fearon & Belsky, 2004; van IJzendoorn, Dijkstra, & Bus, 1995; Shaver & Mikulincer, 2002). However, important questions concerning possible mechanisms that may account for the link between early attachment and a child’s social adjustment and the factors that may contribute to secure attachment have not yet been fully explored.

Ecological theory postulates that behavior patterns develop within a complex hierarchy of environmental forces from the individual and family levels to the social network (Bronfenbrenner, 1979). Bronfenbrenner (1982) further included proximal processes (i.e., interpersonal relationship in immediate environment) connecting between context and individual outcomes. Applying this perspective to the mother-child attachment relationship, contexts surrounding mothers do not exert their influence directly on children’s later adjustment; rather, they carry forward through the children’s experience with their mothers. Informed by ecological perspective (Bronfenbrenner, 1979) and attachment theory (Ainsworth, 1967; Bowlby, 1969), this dissertation focuses on how the quality of early mother-child attachment, as a core developmental interpersonal experience, connects contextual factors with children’s social adjustment. With this emphasis, this dissertation tests the process models of how maternal employment as the social context influences the mother-child attachment quality and how these early childhood experiences operate and are related to later social adjustment.

Literature Review and Significance

A central tenet of Bowlby’s attachment theory is that the early child-caregiver relationship provides a foundation for achieving social competence in later relationships (Bowlby, 1973; Cicchetti, Cummings, Greenberg, & Marvin, 1990; Sroufe, Carlson, Levy, & Egeland, 1999). A child’s attachment behaviors (such as crying, vocalizing, approaching, and
following) are aimed at seeking and maintaining proximity to a primary caregiver, usually the mother. These behaviors are derived from an innate need for protection from physical and psychological threats and for alleviation of distress (Bowlby, 1969). During development, a child attains a greater variety of ways of achieving proximity to his/her mother, and these attachment behaviors are organized into an attachment behavioral system (Cassidy, 2008). Interactions with significant others who are available in times of distress or are sensitive and responsive to a child’s needs facilitate the optimal function of the attachment behavioral system and promote the formation of secure attachments. These early experiences with mothers are stored within a well-organized representational structure and then expanded and internalized to construct expectations about the self and others (Bowlby, 1980a; Bretherton, 1990; Collins & Read, 1994). Accordingly, secure attached children develop internal working models of the self as acceptable, valued, and competent, and others as trustworthy and cooperative (Pietromonaco & Barrett, 2000).

The notion of internal working models (IWMs) has been the basis for understanding the mechanism linking early experiences to later social adjustment. However, IWMs are conceptual metaphors rather than well-defined theoretical constructs (Thompson, 2008). Indeed, internalized processes of developmental continuity from early attachment quality to later social adjustment involve other theoretical approaches (Brethorton, 1992; Carlson et al., 2004). Several researchers have suggested examining social-information processing patterns as explanatory processes to link the quality of early attachment to children’s later social adjustment (e.g., Mikulincer, Shaver, & Pereg, 2003; Sroufe, Egeland, Carlson, & Collins, 2005). According to social information processing models, children engage in multiple social information processing activities (i.e., encoding of external and internal cues, interpretations and mental representations of those cues, clarification or selection of a goal, response access or construction, and response
decision) before enacting competent social behaviors. During the first two steps, encoding and interpretation of social cues, children use their personalized mental representations gained through past experiences as guides for interpreting and understanding the present social situation. This perspective is consonant with Bowlby’s use of information-processing theories to explain the stability of internal working models (Bowlby, 1980a). According to his explanation, early patterns of action and thought, which emerge from repeated interactions with attachment figures guide selective attention and interpretations of meaning in cues in a new situation, and these patterns become habitual and automatic, consequently contributing to the stability of IWMs. Thus, it is assumed that children with positive internal working models formed through secure attachment relationships with their mothers would attribute benign intent to peers, whereas those with negative internal working models may attribute hostile intent in ambiguous social situations.

However, only a few studies have been conducted on the association between attachment and hostile attributional bias, and the results were mixed (Augustine, 2011; Suess, Grossmann, & Sroufe, 1992; Ziv, Oppenheim, & Sagi-Schwartz, 2004). This may be due to the use of different methods or may imply the existence of other possible mechanisms for explaining developmental continuity. Specifically, given that IWMs are likely to change with children’s representational advances (Thompson, 2008), a longitudinal design with repeated assessments is essential for clearly showing the representational capacity of IWMs. Also, it is important to acknowledge that relationship representations cannot fully account for the developmental continuity from early attachment quality to later social adjustment (Koolen, Poorthuis, & Aken, 2012). Several studies suggested that self-regulation, which refers to the exercise of control over oneself, especially with regard to bringing the self into line with preferred standards, is a key mechanism linking early mother-child relationships to social adjustment (Cooper et al., 1998; Drake, Belsky, &
Fearon, 2014; Eisenberg et al., 2001; Fonagy & Target, 2002). For example, Drake and Belsky (2014) showed that emotional and behavioral self-regulation emerged from a legacy of secure attachment mediated the effect of attachment on school performance.

The interrelationships among attachment, self-regulation, attributonal bias, and later social adjustment are well depicted in the Lemerise and Arsenio’s revised model of social information processing (2000). According to this model, children enter into a social situation with their attachment security history, and their skills at regulating emotions influence what is noticed and the meanings attributed to the situations. Based on the existing research that emphasizes the need for an integrated model to examine the mechanisms of early mother-child attachment quality, this dissertation examines the combined intrapersonal processes (self regulation and hostile attributonal bias) in the link between early attachment and later social competence.

With the topic about the consequences of variation in the quality of early attachment, another important idea guiding attachment theory is individual differences in mother-child attachment—why some children develop secure attachments to their primary caregivers, whereas others establish insecure relationships. Ainsworth, who formulated the concept of maternal sensitivity to infant signals through Ganda (1963) and Baltimore’s (1967) data of mother-infant interactions (Bretherton, 1992), found that babies of sensitive and responsive mothers tended to be securely attached, whereas babies of less sensitive and responsive mothers were more likely to be classified as insecure. Numerous empirical studies on the predictors of secure attachment supported that the degree of mothers’ sensitiveness in response to their infants’ signals and early parenting, such as mutuality and synchrony, are strongly associated with a secure attachment bond (Bigelow et al., 2010; De Wolff & van IJzendoorn, 1997; McElwain et al., 2006).
Researchers have further extended the antecedents of attachment quality with an emphasis on social-contextual factors. Socioeconomic status, occupational stressors, maternal mental health, marital relationships, and social support have been examined as distal determinants of attachment quality in that they exert most of their effects through the proximal processes (e.g., Belsky, Rosenberg, & Crnic, 1995; Harrison & Ungerer, 2002; NICHD 1997a).

Despite abundant research on correlates of secure and insecure attachment, several key gaps remain in our understanding. First, most studies have focused primarily on the direct or additive effects of proximal and distal sources on attachment quality rather than examining the underlying processes of the interrelationship between contextual factors and secure attachment (i.e., how and when the given effect occurs). Given that contextual factors are contingent on societal changes, attention to maternal employment in infancy, which has dramatically increased over the past few decades, can add new evidence to the antecedents of attachment quality.

An increased maternal employment rate may have a chain effect on the proximal factors of attachment quality, where one’s experience tends to lead to another. Specifically, employment may have positive or negative effects on mothers’ mental health in that it can act either as a burden or as a buffer against childcare stress. It is well established that mothers’ mental health has a crucial role in their caregiving behaviors (Petterson & Albers, 2001). Also, mothers’ employment may lead to a change in the time spent with their infants, which may in turn influence their caregiving behaviors and attachment quality (Huston, 2002). Furthermore, previous literature on maternal employment highlights that job-related factors such as work conditions and employers’ perceptions on work involve the mediating processes through which employment relates to parenting (Hoffman, 1989; Perry-Jenkins, Smith, Goldberg, & Logan,
Few studies, however, have addressed the conditions and mechanisms linking maternal employment and attachment quality in one model.

Overall, the main goal of this dissertation is to address the gaps in research on early mother-child attachment quality and its antecedents and consequences by adopting a process-oriented approach. Specifically, as shown in the comprehensive conceptual model (Figure 1), maternal employment status as a key contextual factor is expected to influence mother-infant attachment quality through meditational processes including job-related moderators, depressive symptoms, and maternal sensitivity. In turn, mother-infant attachment quality is expected to influence later social adjustment through the mediating mechanism of self regulation and hostile attributional bias.

Attachment at 36 months is included in this model based on the evidence which indicates that 1) the final building blocks of mother-child bonding are achieved between 24 and 36 months with the accomplishment of self and object consistency (Bowlby 1940a; Lawrence, 2014), and 2) later attachment assessments carry greater predictive strength than earlier ones (Fearon et al., 2010; McCartney et al., 2004, Drake et al., 2014). By identifying the process of what factors contribute to the quality of early mother-child relationship and how these early life experiences carry forward to later development, the findings of this dissertation provide not only the knowledge of developmental trajectories but also practical implications for the design of early preventive interventions.

Research Plan

In order to effectively examine the serial associations with early attachment quality, this dissertation contains two studies. Figure 1 shows the conceptual model to be tested in two separate studies. The first study investigates a conditional process model in which the maternal
employment status influences attachment quality. Specifically, maternal employment status influences attachment quality through its effects on maternal sensitivity. Also, maternal employment status is assumed to influence depressive symptoms, which in turn affect maternal sensitivity. Job-related factors are expected to influence the direct and indirect effects of employment status on maternal sensitivity. The second study models self-regulation and hostile attribution bias as potential mechanisms linking early attachment quality and social adjustment. The first study focuses on the first three years of life as it is a sensitive period for attachment to be established (Bowlby, 1982), and the second study focuses on middle childhood as an optimal time to test for the associations between early attachment quality and social adjustment, since during this period, the demands of social skills and the centrality of peers increase (Berndt, 2004; Hartup, 1999).

To unveil the intervening processes in non-experimental studies, the prospective research design and repeated assessments using longitudinal data are essential (Cole & Maxwell, 2003; Hoyle & Robinson, 2004). This dissertation utilizes a nationally representative longitudinal study, the NICHD Study of Early Child Care and Youth Development (NICHD SECCYD). The NICHD SECCYD data are well-suited for these analyses because they contain dense assessments of study variables that track the change of maternal employment and the development of children over time. Also, they provide extensive information on family and child characteristics that are included as covariates in both models.
Figure 1. A Process Model of Maternal Employment Status, Attachment Quality, and Later Social Adjustment
A CONDITIONAL PROCESS MODEL LINKING MATERNAL EMPLOYMENT STATUS
AND ATTACHMENT QUALITY

Introduction

During the past few decades, labor force participation among mothers with infants has increased dramatically in the United States. Specifically, the employment rate of mothers with children under one year old has steadily increased from 21% in 1968 to over 50% in every year since 1986, and it finally reached 57% in 2014 (U.S. Bureau of Labor Statistics, 2014). This change in maternal employment rates has spurred a substantial body of research on mothers’ labor force participation and its associations with children’s development. An abundance of research has focused on its effects on the establishment of secure attachment as early trusting relationships with mothers promote later adaptation in various development domains including emotional regulation, behavioral problems, and social competence in later relationships (Brumariu & Kerns, 2010; DeKlyen & Greenberg, 2008; Fearon, Bakermans-Kranenburg, van Ijzendoorn, Lapsley, & Roisman, 2010; Thompson, 2008; Weinfield, Sroufe, Egeland, & Carlson, 2008).

Close proximity between a mother and her infant is important in the development of secure attachment. Bowlby (1982) argued that infants’ biological tendency to seek proximity to the mother when distressed functions for their survival and adaptation. However, mothers’ employment itself may reduce physical proximity and the time spent with their infants, which in
turn may interrupt the development of a secure attachment relationship. Consequently, many studies examined the use of nonmaternal care in the early years as a proxy of maternal employment (Huston & Aronson, 2005). The results have been largely inconsistent, with some studies showing no relation between maternal employment and the quality of infants’ attachment to their mothers (Chase-Lansdale & Owen, 1987; Easterbrooks & Goldberg, 1985; Owen, Easterbrooks, Chase-Lansdale, & Goldberg, 1984), while others found that infants with employed mothers were more likely to be insecurely attached (Schwartz, 1983; Vaughn et al., 1980). The NICHD study of Early Child Care found no significant association between nonmaternal care and attachment security both at 15 months and 36 months, but the children whose mothers rated low in sensitivity and who experienced extensive child care were more likely to show insecure attachment at both 15 months and 3 years of age (NICHD ECCRN, 1997a, 2001).

Ainsworth and her colleagues were the first to examine the relation between mother-infant interaction patterns and attachment security (Ainsworth, Blehar, Waters, & Wall, 1978; De Wolff & van IJzendoorn, 1997). In their intensive observational data on mother-infant interaction patterns at home from Baltimore, they found that how sensitively, appropriately, and promptly mothers responded to their infants’ signals was strongly related to attachment security. A large body of research supports and replicates Ainsworth’s initial work on the association of maternal sensitivity and a secure attachment relationship. For example, mothers of securely attached children were more responsive to their infants’ vocalizations and distress signals (Belsky, Rovine, & Taylor, 1984) and more involved with their infants (Lyons-Ruth, Connell, Zoll, & Stahl, 1987). Studies on the relation between employment and maternal sensitivity indicate that employed
mothers who had less time to spend with their infants were less likely to respond sensitively to their infants’ needs than unemployed mothers (Belsky, 2001; Hoffman & Youngblade, 1999).

Maternal employment may influence maternal sensitivity through its effects on their mental health. The first year of life as a transitional period is often accompanied by psychological distress as it brings new responsibilities and burdens (Brenda & Bonnie, 2009; Huston & Holmes, 2004; Keeton, Perry-Jenkins, & Sayer, 2008). Specifically, the birth of a child requires significant adaptation of integrating a new member into an established family structure and thus, it may increase the family workload. These stressful aspects may be exacerbated for working mothers who need to find a balance between the demands of a job and responsibilities as parents. Alternatively, employment can be beneficial in that working mothers are likely to have more social networks and emotional support compared with stay-at-home mothers (Kahn & Cuthbertson, 1998; Kim & Wickrama, 2014). Regarding the association of mothers’ mental health and their interaction with their children, previous studies have thoroughly documented that mothers’ depressive symptoms play a crucial role in their parenting behavior (Campbell, Cohn, & Meyers, 1995; Conger, Patterson, & Ge, 1995; Herrera, Reissland, & Shepherd, 2004; Petterson & Albers, 2001).

Taken together, the links between maternal employment in the first year of a child’s life and later attachment quality are not simply correlated; instead, the links are indirect, mediated through the mothers’ psychosocial attributes and their caregiving. Furthermore, the observed inconsistencies regarding on the effects of maternal employment indicate that employment per se may not be a sufficient condition for the development of insecure attachments (Hoffman, 1989; Stifter et al., 1993). Numerous studies have documented that high levels of job strain, such as
low autonomy and high time pressure, increase depression and anxiety (O’Connor, O’Connor, White, & Bundred, 2000; Mausner-Dorsch & Eaton, 2000). Also, several researchers demonstrated that parents who reported greater job autonomy and work complexity provided more positive home environments such as more warmth and cognitive stimulation for their children (Menaghan & Parcel, 1991; Parcel & Menaghan, 1993; Whitback et al., 1997). Along with these structural aspects of job nature, it has been suggested that mothers’ feelings about their employment moderates the effects of employment (Hock, 1980; Hoffman, 1984). Repetti et al. (1989) in their review article concluded that employment improved the physical and mental health both of unmarried women and married women who had positive attitudes toward their employment.

To summarize, the main focus of the present study is to elucidate the underlying processes linking maternal employment during the first year and later attachment quality. Figure 1.1 outlines the theoretical process model, beginning with mothers’ employment status. This model proposes that mothers’ employment would affect attachment quality through two interrelated mediating mechanisms: depressive symptoms and maternal sensitivity. Also, this study assumes that the effects of maternal employment on depressive symptoms and maternal sensitivity can differ by the function of job-related factors such as job autonomy and mothers’ attitude toward their employment. Until now, most extant research has addressed employment as a static feature (including full- and part-time) at a specific time; however, mothers may exhibit substantial movement into and out of the labor force, especially in the period surrounding birth (Hynes & Clarkberg, 2005). The current study focuses on the temporal aspect of mothers’ employment status by taking into account the consistency and the transition of employment over
the first year. To examine the independent influence of maternal employment status on the processes to attachment quality, an extensive set of demographic, maternal, and child characteristics (e.g., maternal age and education, family income, child gender, child ethnicity, birth order of the child) that are likely to influence mother’s employment transition and its outcomes were included as covariates in the model (Baum, 2003; Belsky & Eggebeen, 1991; Waldfogel et al., 2002).

Literature Review

Employment status, Maternal Sensitivity, and Attachment Quality

According to attachment theory, interactions with a sensitive and responsive attachment figure, usually mother, contributes to the development of a secure attachment relationship (Ainsworth, Blehar, Waters, & Wall, 1978; Bowlby, 1982). Numerous studies have emphasized the importance of early caregiving including prompt responsiveness to a child’s distress, appropriate stimulation, warmth, and positive involvement (Del Carmen, Pedersen, Huffman, & Bryant, 1993; Feldstein, Crown, Beebe, & Jaffe, 1993; Leyendecker, Lamb, Fracasso, Scholmerich, & Larson, 1997). For example, Mills-Koonce et al. (2007) reported that mothers of securely attached children at 12 months were more sensitive to their children at 6 months in terms of demonstrating more child-centered interactions, fewer expressions of negative affect, and high levels of responsiveness to the child’s gestures, facial expressions, and signals than mothers of avoidant children. Using the data from the NICHD Study of Early Child Care, McElwain and Booth-LaForce (2006) reported that mothers’ greater sensitivity to children’s distress at 6 months was associated with increased odds of the child being classified as securely attached at 12 months.
Attachment theory maintains that the extensive hours of separation between a mother and her infant may reduce the opportunities for the mother to learn her child's behavioral patterns and to develop appropriate reciprocal interactions (Huston & Aronson, 2005). Indeed, much research investigating maternal employment and children’s developmental outcomes postulates that mothers’ employment leads to a less sensitive mother-child relationship mostly due to structural constraints such as reduced time and proximity with their children (Belsky, 2001; Hoffman & Youngblade, 1999; Vaughn et al., 1980). Empirical results across the studies, however, seem to be inconsistent; for example, analyses of the NICHD Study of Early Child Care showed that mothers of children who spent extensive hours in child care were less sensitive than mothers of children who spent fewer hours in child care, although the effects attenuated after age 3 (NICHD Early Child Care Research Network, 1999). Also, analysis of the data from the Canadian National Longitudinal Survey of Children and Youth showed that maternal employment during the previous year, especially full-time employment, was related to care by nonrelatives, longer hours in school settings, fewer positive mother-child interactions, and less reading with parents at ages 2 and 4 (Nomaguchi, 2006). On the other hand, some empirical studies showed that employed mothers are more interactive and sensitive toward their children. Crockenberg and Litman (1991) found that employed mothers used less power assertion with their children and mothers who worked longer hours used more guidance and were more responsive to their children in both settings. Huston and Aronson (2005) provided clearer evidence on the association between maternal employment, time with their infants, and maternal sensitivity using time-use diaries. Their findings revealed that even if employment reduced time with infants,
employed mothers compensated for time by increasing time with their infant on the weekend and sacrificing household tasks and leisure activities.

In light of the extant research, the current study expects that mothers’ employment status influences early attachment quality through its impact on maternal sensitivity. By the reason of the inconclusive evidence on the effects of employment on maternal sensitivity, the current study does not make any specific assumptions about whether employment has positive or negative effects on sensitivity.

Employment Status, Depressive Symptoms, and Maternal Sensitivity

Much of the debate on the impact of employment upon mental health has been from the theoretical perspectives of role theory. According to the role strain perspective, multiple roles may create more stress due to role overload, and this may be particularly true for women who have to cope with motherhood and also with employment (Gjerdingen, Froberg, Chaloner, & McGovern, 1993; Presser, 2003). Feldman, Sussman, and Zigler (2004) found that shorter maternity leave was related to higher maternal depression, lower parental preoccupation with the baby, and more negative views of how the birth affected marital quality and self-esteem. Similarly, more than 15 weeks’ leave from work after childbirth was associated with low levels of depression, and anxiety at 7 months postpartum (McGovern et al., 1997). In contrast, the enhancement perspective contends that maternal employment may act as a buffer against mental distress, providing additional resources and outlets that relieve stress of caregiving (Kahn & Cuthbertson, 1998). For example, Hoffman and Youngblade (1998) found that in families with low socio-economic status, stay-at-home mothers obtained higher depressive mood scores than
employed mothers, and the depressive mood mediated their higher scores on permissive parenting and partially mediated their higher scores on authoritarian parenting.

Previous studies adopting both self-report and observation of parenting have thoroughly documented the effects of mothers’ mental health on early interaction experiences with the child. For example, mothers with depressive symptoms were noted to exhibit behavioral deficits, including difficulties attending to a child’s needs, responding effectively, and maintaining high levels of involvement (Lovejoy et al., 2000; Murray & Cooper, 1997; Paulson, Dauber, & Leiferman, 2006). Similarly, Papp et al. (2005) reported that maternal psychological distress including anxiety, hostility, and depression was associated with negative parenting in terms of parental acceptance and psychological autonomy. More recently, Foster, Garber, and Durlak (2008) found that mothers with depressive symptoms were more likely to be less responsive to child behavior and to communicate less effectively with their children than do non-depressed mothers. In this context, the current study hypothesizes that mothers’ employment would affect depressive symptoms and in turn would influence their sensitivity.

Moderation of Job Characteristics and Mothers’ Attitudes toward Employment

Many theoretical and empirical works on maternal employment provide supportive evidence of how the nature of the mother’s job such as autonomy, quality, and complexity affects how employment influences her and the interactions with her child. According to the Demand-Control-Support (DCS) model, work that is characterized by high demand, low control, and low workplace supports worsens workers’ mental health. For example, job autonomy and complexity in terms of the lack of repetitiveness and creativity in job duties were positively associated with healthy developmental outcomes for both employed mothers and their children.
(Parcel & Menahan, 1994). Karasek and Theorell (1990) found a positive connection between low autonomy and control or latitude in work and higher rates of physical illness, depression, and loss of self-esteem.

Previous studies also provide evidence concerning the work-parenting linkage. For example, Menaghan and Parcel (1991) demonstrated that parents who reported greater job autonomy and work complexity also provided more positive home environments for their children such as demonstrating more warmth and cognitive stimulation. Others have also found an association between job autonomy and the quality of parenting. Greater job autonomy was associated with less restrictive control by mothers (Mason, Cauce, Gonzales, Hiraga, & Grove, 1994), and parents with more complex and challenging jobs were also observed to use less harsh discipline and to be more warm and responsive (Greenberger, O’Neil, & Nagel, 1994). Similarly, Lerner and Galambos (1988) found that among employed mothers, those with higher role strain set more limits on their children. The current study examines job characteristics as a potential moderator of the specific effects between employment status and maternal sensitivity (i.e., job characteristics and depressive symptoms, and job characteristics and maternal sensitivity), focusing on the distinction between women who are in professional positions and women who are in nonprofessional positions. Specifically, this study hypothesizes that working in professional jobs would be less detrimental than working in nonprofessional jobs, because mothers in professional jobs would be more likely to be in work conditions involving challenges, high autonomy, and time flexibility to manage child and family needs.

Another potential moderating factor is mothers’ attitudes toward maternal employment. Empirical evidence suggests that the effects of maternal employment on mothers’ psychological
well-being and the quality of their interaction with children differ depending on how they interpret and value their employment. For example, Chang (2012) found that mothers employed during the 6 months after the child’s birth, those with positive attitudes about employment showed better psychological well-being. On the other hand, unemployed mothers who believed that maternal employment would have positive consequences on their children’s development were more likely to show a low level of psychological well-being and poor quality of mother-child relationship. Similarly, mothers’ child-related concerns (i.e. perceived quality of child care, beliefs about consequences of maternal employment for children, and perception of problem behaviors) predicted high levels of role strains and depression (Greenberger & O'Neil, 1990).

With regard to mother-child interactions, Gottfried et al. (1988) found that working mothers’ positive attitudes toward maternal employment and the dual roles of career and family were related to more positive family involvement, more maternal involvement with child, and more democratic rule regulation. Accordingly, the current study additionally hypothesizes that the effects of maternal employment may differ according to mothers’ beliefs and attitudes about maternal employment.

Most studies on maternal employment have focused on job conditions mostly related with structural constraints, and little attention has been paid to mothers’ attitudes toward employment. Given that the first year of a child’s life presents a transition to parenthood and the conflict between work and parenting demands are most prominent during this time, it is important to examine the role of mothers’ attitudes toward their employment in terms of its effects on their children.
Study Hypotheses

Collectively, maternal employment does not directly influence mother-child attachment quality; mothers’ psychological well-being and their caregiving may mediate the effects of maternal employment. Also, depending on the job characteristics and attitudes toward employment, maternal employment may enhance or worsen their well-being and interactions with their children. Whereas previous literature has focused on simplistic comparison between working and nonworking mothers or the impact of the use of non-maternal care, little is known about why and how maternal employment has positive or negative consequences. This study aims to fill the existing gap in research by examining the conditions and mechanisms through which employment status relates to attachment quality. Figure 1.1 depicts the theoretical model of the current study and its corresponding hypotheses are listed below.

1. Mothers’ employment status influences attachment quality through its effects on maternal sensitivity.

2. Mothers’ employment status influences their depressive symptoms, which in turn influence maternal sensitivity.

3. The effects of maternal employment on depressive symptoms and maternal sensitivity may differ according to occupation type and mothers’ attitudes toward maternal employment.
Figure 1.1. Theoretical Model Linking Employment Status to Attachment Quality

Employment Status
1. Consistent working
2. Transition to working
3. Multiple transitions
4. Transition to nonworking
5. Consistent nonworking

Occupation Type
Attitudes toward Employment

Depressive Symptoms

Maternal Sensitivity

Attachment Quality
Methods

Sample

The data for this study came from the NICHD Study of Early Child Care and Youth Development (NICHD SECCYD), a prospective longitudinal study. This study started in 1991 shortly after the participating children’s births, and continued until participating children were 15 years of age. Data were collected from 31 hospitals at 10 research sites across the United States and families were excluded from the sample if (a) the mother was under 18, (b) the mother was not conversant in English, (c) the family planned to move, (d) the child was hospitalized for more than 7 days after birth or had obvious disabilities, (e) the mother had a known or an acknowledged substance-abuse problem, or (f) the family lived at considerable distance from the site or in a location that posed a danger to home visitors. Finally, a total of 1,364 completed the 1-month enrollment interview and became participants in the phase 1 data collection. The current study used phase 1 data, which followed children from one month to three years old. When the child was 1 month of age, basic demographic information on the child and family was gathered. Maternal education varied; 10.2% of mothers had no high school degree, 21.2% of mothers had a high school degree or equivalent, 33.3% had attended some college, and 35.4% of mothers had a college degree or above. 76.7% of the mothers lived with a partner or spouse in the home. 79.8% of mothers were non-Hispanic European American, 12.8% were non-Hispanic African American, 4.5% were Hispanic, and 2.9% were more than one race or another race. Among child participants, about one-half of the children in the sample were boys (51.7%) and 45% were first-born children. The income-to-needs ratio at 1 month was 2.86, indicating that overall family income was, on average, 2.86 times that of the poverty level.
Measurement

Attachment quality. A modified Strange Situation procedure developed by the MacArthur Working Group on Attachment (Cassidy & Marvin and the MacArthur Working Group on Attachment, 1992) was used to assess attachment security at 36 months. This procedure took place in a laboratory playroom and consisted of five episodes: (a) a 3-min warm-up period, (b) a 3-min separation from mother, (c) a 3-min reunion with mother, (d) a 5-min separation, and (e) a second 3-min reunion. The child’s behavior during the assessment was classified as secure (B) or insecure (A, C, and D). Secure (B) children are able to resolve the stress of the separation and resume calm, comfortable interaction with the parent. Insecure-avoidant (A) children maintain extreme neutrality toward the parent, and even after reunion rarely express either positive or negative emotion toward the parent. Insecure-ambivalent (C) children show fussy, helpless, whiny, and/or resistant behavior toward the parent. They may seek contact, but find it unsatisfactory. Insecure controlling/ insecure-other (D) children are either controlling or show combinations of strategies, such as avoidance and ambivalence, or avoidance and controlling behavior, during the reunions. Since post hoc comparisons among the four attachment groups revealed the differences between the secure group and the various insecure groups on maternal sensitivity, but no differences emerged among the insecure group, I treated attachment security as a binary independent variable (secure vs. insecure attachment).

Employment Status. To capture employment consistency in the first year of life, five employment status groups were created using data from home visits and telephone interviews at 3, 6, 9, and 12 months (Appendix A). If mothers respond with “employed” to the employment status question at all time points, they are classified as the “consistent working” group (referred
as the CS_WK; this group is set as a reference group). If mothers respond with “nonemployed” to the employment status question at all time points, they are classified as the “consistent non-working” group (CS_NWK). Three transition groups (i.e., transition to non-working, transition to working, and multiple transitions) are created contingent on the previous employment status. For example, if the mothers respond with “employed” at 3 months, and “nonemployed” at the rest of the time points or if the mothers respond “employed” both at birth and at 6 months and “nonemployed” at the rest of the time points (i.e., 9 and 12 months), they are categorized as the “transition to nonworking” group (WK_NWK). Similarly, if the mothers respond with “nonemployed” at 3 months, and “employed” at the rest of the time points or if the mothers respond with “nonemployed” both at 3 months and at 6 months and “employed” at the rest of the time points (i.e., 9 and 12 months), they are categorized as the “transition to working” group (NWK_WK). Mothers who report the changes in employment status more than two times during the study period are classified as multiple transition group (ML_TS).

*Maternal Sensitivity.* The rating of maternal sensitivity at 24 months was derived from assessments conducted of mother and child interactions (NICHD ECCRN, 1999; Vandell, 1979). These assessments were videotaped in semi-structured 15-minute observations. In the first 7-minute, mothers were asked to play with their infants and were told that they could use any toy or object available in the home or none at all; for the remaining 8-min, mothers were given a standard set of toys they could use in play. These toys included a rattle with faces, a small activity center, a ball with raised animal forms, a rolling toy, a rattle with various parts, a book of shapes and faces, and a stuffed animal. The videotapes were then scored by teams of five or six coders who were blinded as to other information about the families. The maternal sensitivity
score was formed from the sum of sensitivity to non-distress, intrusiveness (reverse scored), and positive regard, reflecting the extent to which maternal behavior and interaction are appropriate to the child’s age and sensitive to the child’s needs. Each variable has a range of 1 to 4, yielding a total score ranged from 3 to 12, with higher scores indicating high levels of sensitivity (Appendix B). Cronbach’s alpha for the maternal sensitivity composites was .70.

Depressive Symptoms. Maternal depressive symptoms at 15 months were measured using the Center for Epidemiological Studies Depression Scale (CES-D; Radloff, 1977), a widely used measure of depressive symptoms for non-clinical samples. Mothers rate the frequency of 20 symptoms during the past week, such as “I was bothered by things that usually don’t bother me,” “I felt that everything I did was an effort,” “I talked less than usual” (Appendix C). Response categories are "rarely or none of the time (less than 1 day)" , "some or a little of the time (1-2 days)" , "occasionally or a moderate amount of time (3-4 days)" , and "most or all of the time (5-7 days). Total scores range from 0 to 60, with a score of 16 suggesting potential referral for further assessment. This scale showed good reliability in this sample (α = .90).

Moderators: Attitudes toward Maternal Employment and Occupation Type. Mothers’ attitude toward maternal employment was assessed with six items adapted from the scale, “Beliefs about the Consequences of Maternal Employment for Children” (BACMEC; Greenberger, Goldberg, Crawford, & Granger, 1988). Item content concerns mothers’ beliefs on the cost of maternal employment to children’s development (e.g., “working mothers are more likely to have children with psychological problems than mothers who do not work outside the home,” “young children learn more if their mothers stay at home with them,” and “children whose mothers work suffer because their mothers are not there when they need them” (Appendix
D). Total scores ranged from 6 to 36, with the higher scores reflecting the higher cost of employment. Alpha reliability for this study was .88. The occupation of the job the mother held at 1 month after child’s birth is coded into four major occupational categories following the definitions used by Census Bureau in its Current Population Survey: managers and professionals; technical, sales and administrative support; service; and operators, fabricators, and laborers (Appendix E). These categories were regrouped to distinguish women in professional versus nonprofessional occupations in accordance with criteria suggested by previous research (Brooks-Gunn, Han, & Jane, 2010). The professional category includes professional or managerial jobs. The nonprofessional category includes all other occupations (i.e., technical, sales, or administrative support, service, or operator, fabricator, or laborer jobs). Information on these moderators was derived from the data collected at 1 month after childbirth because the data collected then is potentially endogenous (influenced by the working status) and also because not all women have data on these variables one month postbirth.

Control variables: Maternal education, age, ethnicity, depression at 1 month and marital status, family income-to-needs ratio, child sex, and birth order. To examine the independent influence of maternal working status on the process to attachment quality, other distal factors (demographic, maternal, and child characteristics) were included as covariates. At 1-month interview, mothers reported their age and ethnicity, and the number of years of schooling they had. In assessing maternal marital status, mothers were asked whether “they were currently living with a spouse,” “living with a partner,” “single” or “other (separated, divorced, or widowed).” Also, a mother’s depressive symptoms at 1 month was controlled because this is a potentially important family background factor (Brooks-Gunn, Han, & Jane, 2010) and not
determined by a mother’s employment transition. Maternal depressive symptoms at 1 month were assessed using CES-D Scale as detailed above and were significantly correlated with 15-month depressive symptoms at the .0001 levels (.45). Income-to-needs ratio was computed as family income at 1 month divided by the appropriate poverty threshold determined by the U.S. Census (U.S. Department of Labor, 1994) for each household size and number of children less than 1 year of age. Thus, higher scores in this ratio indicate greater financial resources in the household. Child gender and birth order collected at 1 month interview during home visits were also controlled. To strengthen the causal interpretations regarding depressive symptoms at 15 months and maternal sensitivity at 24 months, 15-month maternal sensitivity was controlled. The procedure and coding for maternal sensitivity at 15 months are the same as those for maternal sensitivity at 24 months. Cronbach's alpha for the maternal sensitivity composite was .74.

Analysis plan

Preliminary analyses using SPSS (version 19) examined descriptive statistics for and correlations between study variables within the full sample. The hypothesized process model was estimated in Mplus (version 7). To accommodate attachment quality as a binary outcome variable (secure vs. insecure), logit modeling was used under maximum likelihood estimation (Muthén & Muthén, 1998–2011). For justification of the final mediation model, I tested statistical comparisons of different models that are subsets of the final conceptual model (Figure 1), using likelihood ratio tests (LRTs). LRTs are calculated by taking twice the positive difference in the two log-likelihood, $(2(\log \text{likelihood of less restrictive model}) - (\log \text{likelihood of more restrictive model}))$ and the result statistic has chi square distribution (Allison, 2012). If this difference is statistically significant, then the less restrictive model (the one with more
variables) is said to fit the data significantly better than the more restrictive model (the one with less variables).

After testing the mediating process model, I examined the moderating effects of attitudes toward maternal employment and occupation type in the mediating pathways from employment status to maternal sensitivity (i.e., employment status to depressive symptoms and employment status to maternal sensitivity). First, the centered continuous scores of the attitudes toward employment, employment status, and their interactions were entered in the model to test the moderating effects of mothers’ perceptions of the cost of their employment to their children. Given the significant difference of the attitudes toward employment by occupation type, I tested for moderation by attitudes toward employment in a multiple-group model, comparing professional and nonprofessional jobs. Chi-square difference tests were used to infer if any hypothesized path was significantly different across the two groups. One by one, a structural path was constrained to be equal for nonprofessional and professional groups and then compared with a model without that constraint. If the equality constraint worsened the overall model fit (i.e., a significant increase in the $\chi^2$), it indicates that the two paths differed across professional and nonprofessional groups. All the analyses included demographic, maternal, and child characteristics above as control variables. Missing data were managed using FIML (full-information maximum likelihood (i.e., Maximum likelihood estimation), which uses all the available data to estimate the parameter estimates of a model.
Results

Preliminary analyses

Table 1.1 presents the means and standard deviations for the demographic and study variables by employment status and indicates whether differences across groups are statistically significant; additionally, as a post-hoc test of ANOVA, Tukey's HSD (honest significant difference) test was performed to determine which groups differ, but the results were not shown in the table. The number of consistent working mothers (reference group), who continued to work over the first year of their child’s life, counted for 36.3% (495). The ratio of mothers who experienced transitions in their working status during the first year was almost 28%. Specifically, transition to working group (NWK_WK) counted for 17.3% (236), transition to nonworking group (WK_NWK) was 4.8% (66), and multiple transition group (ML_TS) was 6.2% (84). The number of consistent nonworking mothers counted for 19.8% (270).

The descriptive results point to some differences across five employment status groups. Mothers in the consistent working group were significantly more educated and were older, compared with the other four groups. Also, they were significantly less depressed at 1 month postbirth, compared with non-working mothers, including CS_NWK and WK_NWK. The consistent working group showed higher levels of income-to-needs ratio at 1 month postbirth than the other groups, but the difference between groups was not statistically significant. Mothers in CS_NWK group had significantly more children than other employment groups including NWK_WK and CS_WK. Non-Hispanic Whites accounted for the highest proportion of maternal ethnicity, followed by non-Hispanic African Americans in all five employment groups. A
majority of mothers in all five employment groups lived with their spouses in the home when their children were 1 month old.

With respect to study variables, consistent working mothers showed significantly lower levels of depressive symptoms at 15 months, compared with nonworking mothers (WK_NWK and CS_NWK). Similarly, consistent nonworking mothers showed significantly lower levels of maternal sensitivity both at 15 months and 24 months, compared with mothers in working groups (NWK_WK and CS_WK). More than one-half of the children in all five employment groups were categorized as having secure attachment. Mothers in the consistent working group were more likely to have positive attitude toward their employment outside the home (lower levels of cost of employment), compared with the other four employment groups. Also, the ratio of professional jobs to nonprofessional jobs was greatest in the transition to working group. Overall, the results imply that the mediating paths to attachment quality may differ depending on mothers’ employment status.
## Table 1.1. Demographic and Study Variables by Maternal Employment Status

<table>
<thead>
<tr>
<th>Study Variables</th>
<th>Consistent Working (n = 495)</th>
<th>Transition to Working (n = 236)</th>
<th>Transition to Nonworking (n = 66)</th>
<th>Consistent Nonworking (n = 270)</th>
<th>Multiple Transitions (n=84)</th>
<th>F statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Demographic measures</strong></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Maternal age</td>
<td>29.29 (4.78)</td>
<td>29.05 (5.43)</td>
<td>26.27 (5.50)</td>
<td>28.06 (6.18)</td>
<td>25.77 (6.10)</td>
<td>11.82***</td>
</tr>
<tr>
<td>Maternal education</td>
<td>14.87 (2.26)</td>
<td>14.70 (2.39)</td>
<td>14.06 (2.29)</td>
<td>13.64 (2.57)</td>
<td>13.85 (2.84)</td>
<td>13.91***</td>
</tr>
<tr>
<td>Income-to-needs ratio</td>
<td>3.11 (2.63)</td>
<td>3.05 (2.55)</td>
<td>2.53 (2.11)</td>
<td>2.96 (2.95)</td>
<td>2.53 (2.26)</td>
<td>1.35</td>
</tr>
<tr>
<td>DS at 1m</td>
<td>9.65 (8.18)</td>
<td>11.26 (9.12)</td>
<td>12.85 (9.38)</td>
<td>12.89 (9.73)</td>
<td>12.17 (7.68)</td>
<td>7.18***</td>
</tr>
<tr>
<td>Child birth order</td>
<td>1.71 (.84)</td>
<td>1.78 (.92)</td>
<td>1.70 (.89)</td>
<td>2.03 (.97)</td>
<td>1.75 (.98)</td>
<td>6.04***</td>
</tr>
<tr>
<td>Maternal ethnicity</td>
<td>n (%): 426 (86.06%)</td>
<td>186 (78.81%)</td>
<td>54 (81.82%)</td>
<td>208 (77.04%)</td>
<td>68 (80.95%)</td>
<td></td>
</tr>
<tr>
<td>- Non-Hispanic White</td>
<td>39 (7.88%)</td>
<td>30 (12.71%)</td>
<td>10 (15.15%)</td>
<td>43 (15.93%)</td>
<td>10 (11.90%)</td>
<td></td>
</tr>
<tr>
<td>- Non-Hispanic African American</td>
<td>16 (3.23%)</td>
<td>15 (6.36%)</td>
<td>1 (1.52%)</td>
<td>7 (2.59%)</td>
<td>3 (3.57%)</td>
<td></td>
</tr>
<tr>
<td>- Other</td>
<td>14 (2.83%)</td>
<td>5 (2.12%)</td>
<td>1 (1.52%)</td>
<td>12 (4.44%)</td>
<td>3 (3.57%)</td>
<td></td>
</tr>
<tr>
<td>Marital status</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Married</td>
<td>422 (85.25%)</td>
<td>197 (83.47%)</td>
<td>48 (72.73%)</td>
<td>192 (71.38%)</td>
<td>59 (70.24%)</td>
<td></td>
</tr>
<tr>
<td>- Partnered</td>
<td>29 (5.86%)</td>
<td>19 (8.05%)</td>
<td>6 (9.09%)</td>
<td>25 (9.29%)</td>
<td>12 (14.29%)</td>
<td></td>
</tr>
<tr>
<td>- Single</td>
<td>38 (7.68%)</td>
<td>17 (7.20%)</td>
<td>10 (15.15%)</td>
<td>47 (17.47%)</td>
<td>12 (14.29%)</td>
<td></td>
</tr>
<tr>
<td>- Other</td>
<td>6 (1.21%)</td>
<td>3 (1.27%)</td>
<td>2 (3.03%)</td>
<td>5 (1.86%)</td>
<td>1 (1.19%)</td>
<td></td>
</tr>
<tr>
<td>Child sex (male) (n/%)</td>
<td>256 (51.72%)</td>
<td>125 (52.97%)</td>
<td>34 (51.52%)</td>
<td>130 (48.15%)</td>
<td>46 (54.76%)</td>
<td></td>
</tr>
<tr>
<td><strong>Study measures</strong></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>DS at 15m</td>
<td>8.22 (7.70)</td>
<td>7.92 (6.57)</td>
<td>11.11 (9.15)</td>
<td>9.08 (8.16)</td>
<td>9.81 (8.46)</td>
<td>3.95**</td>
</tr>
<tr>
<td>MS at 15m</td>
<td>9.64 (1.50)</td>
<td>9.56 (1.53)</td>
<td>9.25 (1.87)</td>
<td>9.10 (1.80)</td>
<td>9.20 (1.85)</td>
<td>5.66***</td>
</tr>
<tr>
<td>MS at 24m</td>
<td>9.65 (1.65)</td>
<td>9.51 (1.64)</td>
<td>9.27 (1.81)</td>
<td>8.85 (1.86)</td>
<td>9.29 (1.55)</td>
<td>9.31***</td>
</tr>
<tr>
<td>Attachment at 35m (Secure) (n/%)</td>
<td>286 (64.41%)</td>
<td>132 (61.68%)</td>
<td>33 (55.93%)</td>
<td>139 (58.16%)</td>
<td>54 (69.23%)</td>
<td></td>
</tr>
<tr>
<td>Cost of employment</td>
<td>16.61 (4.88)</td>
<td>18.10 (5.48)</td>
<td>19.59 (4.37)</td>
<td>20.49 (4.93)</td>
<td>19.93 (4.94)</td>
<td>30.47***</td>
</tr>
<tr>
<td>Occupation (Professional) (n/%)</td>
<td>189 (38.97%)</td>
<td>94 (44.98%)</td>
<td>11 (18.03%)</td>
<td>29 (21.80%)</td>
<td>23 (32.39%)</td>
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</tr>
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</table>

* p < .05. ** p < .01. *** p < .001
Table 1.2 presents the bivariate correlations among study variables in the hypothesized model. As expected, mother’s depressive symptoms at 15 months was significantly and negatively correlated with maternal sensitivity both at 15 months and 36 months ($r = -0.19, p < 0.01$, and $r = -0.20, p < 0.01$, respectively) and maternal sensitivity at 15 months was significantly associated ($p < 0.01$) with 24-month maternal sensitivity ($r = 0.40$). As expected, secure attachment quality was negatively associated with depressive symptoms ($r = -0.08, p < 0.01$) and positively associated with maternal sensitivity both at 15 and 24 months ($r = 0.10, p < 0.01$, and $r = 0.20, p < 0.01$, respectively). Mothers’ attitudes toward maternal employment were negatively associated with occupation type ($r = -0.16, p < 0.01$) which indicates that mothers in nonprofessional group were more likely to have negative attitudes toward employment.

Table 1.2. Bivariate Correlations Among Study Variables

<table>
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<tr>
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<th>1</th>
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<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Depressive Symptoms at 15m</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Maternal Sensitivity at 15m</td>
<td>-.19**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Maternal Sensitivity at 24m</td>
<td>-.20**</td>
<td>.40**</td>
<td></td>
<td></td>
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<tr>
<td>4. Attachment Quality at 36m</td>
<td>-.08**</td>
<td>.10**</td>
<td>.20**</td>
<td></td>
<td></td>
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<tr>
<td>5. Negative Attitudes toward Employment</td>
<td>.14**</td>
<td>-.04</td>
<td>-.06*</td>
<td>-.02</td>
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<td></td>
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<tr>
<td>6. Occupation Type</td>
<td>-.18**</td>
<td>.24**</td>
<td>.26**</td>
<td>.07*</td>
<td>-.16**</td>
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</tbody>
</table>

$p < 0.05$. **$p < 0.01$.

Testing the Hypothesized Model

Before examining the significance of the regression coefficients in the hypothesized model, to justify the process model shown in Figure 1.1, three nested models (model 1 with no
mediators, model 2 with depressive symptoms as a mediator, and model 3 as the full model with depressive symptoms and maternal sensitivity as mediators) were compared, using likelihood ratio tests (LRTs). The likelihood ratio test statistic comparing model 2 and model 1 was 34.53 with 13 degrees of freedom (significant at $p < 0.001$), indicating that the model with depressive symptoms as a mediator fits significantly better than the model without any mediators. The estimate of difference in the likelihood ratio between model 3 and model 2 was 48.268 with 22 degrees of freedom (significant at $p < 0.001$), providing evidence for the mediational role of maternal sensitivity. Therefore, as shown in Figure 1.1, my theoretical model was confirmed.

Figure 1.2 presents the path coefficients in the model. Consistent nonworking status significantly predicted higher levels of depressive symptoms ($\beta = .07, p < .05$) compared with the reference group. Also, it predicted significantly lower levels of maternal sensitivity ($\beta = -.13, p < .001$). Transition to nonworking status significantly predicted higher levels of depressive symptoms ($\beta = .07, p < .05$). Transition to working and multiple transition groups did not show any significant effects on mothers’ depressive symptoms and maternal sensitivity in reference to consistent employment status. Mothers’ depressive symptoms reliably predicted low levels of maternal sensitivity ($\beta = -.09, p < .01$), and this relationship held after controlling the previous maternal sensitivity level. These results showed that mothers’ non-employment status negatively influences their depressive symptoms which in turn adversely influence maternal sensitivity.

Also, higher levels of maternal sensitivity significantly predicted secure attachment quality ($\beta = .16, p < .001$). As shown in Table 1.3, the odds ratio of maternal sensitivity was 1.22, which indicated that a one unit increase in the sensitivity scale was associated with a 22.1% [$100 \times (1.221 - 1)$] increase in predicted odds of secure attachment. Interpreting this result in terms
of probabilities using the ratio of secure attachment to insecure attachment (.62) and the unstandardized coefficient of secure attachment on maternal sensitivity (.20), the probability of secure attachment was 0.048 \[.62(1-.62) \times .20\]. That is, the probability of secure attachment was .048 higher for a one unit increase on the sensitivity scale compared with insecure attachment. None of the direct paths from employment status, depressive symptoms at 15 months, and maternal sensitivity at 15 months to attachment quality was significant (see Table 1.3).
Figure 1.2. A Conditional Process Model Linking First Year Employment and Attachment Quality (n =1,364)

Note. Reference group is consistent working; Standardized coefficients are in parentheses; Demographic factors (i.e., maternal education, age, ethnicity, depression at 1 month and marital status, family income-to-needs ratio, child sex, and birth order) are controlled for the full model; Direct paths to attachment (i.e., employment status to attachment, depressive symptoms at 15months to attachment, and maternal sensitivity at 15 months to attachment) were not significant.

*p < .05. **p < .01. ***p < .001.
Table 1.3. Logistic Regression Predicting Attachment Security

<table>
<thead>
<tr>
<th>Predictors</th>
<th>Estimate</th>
<th>P Value</th>
<th>OR</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Transition to working</td>
<td>-.08</td>
<td>.662</td>
<td>.93</td>
<td>.65-1.31</td>
</tr>
<tr>
<td>2. Multiple transitions</td>
<td>.51</td>
<td>.077</td>
<td>1.67</td>
<td>.95-2.93</td>
</tr>
<tr>
<td>3. Transition to non-working</td>
<td>-.16</td>
<td>.580</td>
<td>.85</td>
<td>.48-1.51</td>
</tr>
<tr>
<td>4. Consistent non-working</td>
<td>.01</td>
<td>.970</td>
<td>1.01</td>
<td>.71-1.43</td>
</tr>
<tr>
<td>2. Depressive symptoms at 15m</td>
<td>-.01</td>
<td>.488</td>
<td>.99</td>
<td>.98-1.01</td>
</tr>
<tr>
<td>3. Maternal sensitivity at 15m</td>
<td>.01</td>
<td>.776</td>
<td>1.01</td>
<td>.93-1.11</td>
</tr>
<tr>
<td>4. Maternal sensitivity at 24m</td>
<td><strong>.20</strong>*</td>
<td><strong>.000</strong></td>
<td>1.22</td>
<td>1.12-1.33</td>
</tr>
</tbody>
</table>

*Note. CI = confidence interval for the odds ratio; Consistent working is the reference group; For logistic regression analyses, a confidence interval that spans the value of 1.0 indicates that the independent variable is not a meaningful predictor of the dependent variable.

**Testing Moderation Effect**

Next, I tested for moderating effects of maternal attitude toward employment and occupation type. It was expected that mothers’ employment would predict high levels of depressive symptoms and low levels of maternal sensitivity only among mothers who had beliefs that their employment would negatively influence their child’s development. Maternal attitudes toward employment significantly moderated the association between consistent nonworking status and depressive symptoms ($\beta = -.25, p < .05$). Results are displayed in Figure 1.3. If mothers had positive attitudes toward maternal employment, consistent nonworking status was associated with higher levels of depressive symptoms compared with consistent working status. In other words, if mothers had negative attitudes toward maternal employment, consistent working status was associated with higher levels of depressive symptoms compared with
consistent nonworking status. Further, we tested for moderation by mothers’ attitudes toward employment in a multiple group model comparing professional and nonprofessional groups. In both groups, no interactions between employment status and attitude toward employment were significant. Among the main effects (i.e., four different employment statuses in reference to consistent employment and cost of employment), only the cost of maternal employment predicted higher levels of depressive symptoms among nonprofessional groups ($\beta = .22, p < .001$), but it was unrelated to professional groups’ depressive symptoms ($\beta = .12, p < .125$). However, this difference was not statistically significant ($\Delta \chi^2 (1) = 2.56$). Overall, the results imply that mothers’ subjective beliefs about the consequences of their employment on their children rather than structural aspects of their jobs may be more important in determining the influence of employment status on their depressive symptoms. It should be however noted that mothers in the nonprofessional group were more likely to have negative attitudes toward their employment on the bivariate level.

![Figure 1.3. Moderating Effect of Attitudes toward Maternal Employment](image1.png)

Figure 1.3. Moderating Effect of Attitudes toward Maternal Employment
Discussion

The purpose of the current study was to examine how maternal employment status in the first year of a child’s life was carried forward, eventually influencing attachment quality. The results largely support the study’s proposition by showing that mothers’ working status continues to influence later attachment quality through two interrelated mediating mechanisms—depressive symptoms and maternal sensitivity. Also, mothers’ attitudes toward maternal employment moderated the effects of their employment status on depressive symptoms.

First, mothers who have not worked consistently and experienced transition to nonworking in the first year of their children’s lives showed higher levels of depressive symptoms when compared with the reference group (mother who have worked consistently), which in turn negatively influenced maternal sensitivity. Prior research in this area has shown inconsistent results; some studies reported employed mothers showed significantly better mental health than those that were nonemployed (Gold & Andres, 1978a; Gold & Andres, 1978b; Kessler & McRae, 1982), and others pointed out that the difficulty in juggling multiple roles caused more distress and negative parenting (Chase-Lansdale et al., 2003; Smith, Brooks-Gunn, Kohen, & McCarton, 2001). The findings of the current study seem to support the evidence of the beneficial effects of working, but the moderation result suggests a necessary condition for maintaining this assertion. Specifically, among mothers in the consistent working group, only those with positive attitudes toward employment (who believed that maternal employment was possibly advantageous to their children) had better psychological well-being. In other words, among mothers in the consistent nonworking group, only those with negative attitudes toward employment (who believed that maternal employment was possibly harmful to their children)
showed lower levels of depressive symptoms compared with consistent working mothers. These results were in line with previous findings demonstrating that the correspondence between what the mothers believe/expect and what they actually do may be important to the mothers’ psychological well-beings (Chang, 2013; Goldberg et al. 1992; Klein et al. 1998). For example, Hock and DeMeis (1990) reported that both working mothers and stay-at-home mothers reported greater psychological well-being when their preferences for employment or unemployment matched their current employment status. Taken together, these findings address that mothers’ attitudes about employment are an important factor for examining the effects of maternal employment on their mental health, especially in a transitional period.

It is noteworthy that the moderating effect of occupation type on the relation between employment status and depressive symptoms was not significant. This finding may be because that occupational category does not properly reflect job characteristics/conditions. It is possible that even though mothers work in the same particular occupation, their subjective experiences on their jobs can be different (Gorman, 2000). Perry-Jenkins et al. (2011) demonstrated that workers have a range of experiences in low-status occupations, suggesting that some employees in working-class jobs report high levels of autonomy on the job. The dichotomous approach, which assumes working-class jobs as low in complexity, autonomy, and control and higher social-class jobs as high in complexity, autonomy, and control, may not be enough to examine associations between job conditions and mental health. Relatedly, several researchers pointed out that more specific indicators of work experiences, such as interpersonal atmosphere and job autonomy rather than global job characteristics, may better predict the effects of work (Greenberger et al., 1994; Perry-Jenkins et al., 2000).
Also, this finding may indicate that to mothers in the transition to parenthood, child-related concerns are more important issues than general job conditions, even though they are related to each other to some extent. During infancy, children need extensive and direct care, thus mothers carry the greater load of child care and housework compared with when they are older. Therefore, examination of child care-related variables, such as maternal separation anxiety and perception of nonmaterial care use, would help to understand work and family challenges in the transition to parenthood. For example, Stifer et al. (1993) found employed mothers who reported high levels of separation anxiety at 5 months were more likely to exhibit intrusive behaviors toward their children at 10 months. Also, they found that infants of employed mothers with high separation anxiety would be more likely to develop avoidant attachments. Similarly, Harrison and Ungerer (2002) reported that mothers who expressed less anxiety about using nonfamily child care were more likely to have secure infants at 12 months.

Second, mothers in the consistent nonworking group showed significantly lower levels of maternal sensitivity compared with those in the consistent working group, and there were no moderation effects of attitudes toward employment and occupation type in this pathway. These results were inconsistent with prior research demonstrating the negative effects of working in the early period of a child’s life. For example, less than 12 weeks of maternity leave was associated with less knowledge about the infant at the transition to parenthood (Feldman et al., 2004). A great deal of literature investigating maternal employment implicitly or explicitly relies on the assumption that maternal employment leads to less sensitive mother–child relationships because it reduces mothers’ time with their children (Belsky, 2001; Desai et al., 1989; Hoffman & Youngblade, 1999). Also, extended hours of separation may disrupt mother and child
relationships, because mothers have fewer chances to learn their infants’ signals and to develop appropriate reciprocal interactions (Huston & Aronson, 2005).

The results of the current study, however, imply that working mothers, who spend relatively less time with their children compared with stay-at-home mothers, might show effective and intensive interactions during the limited time of a day. Crokenberg and Litman (1991) offer similar interpretations on their findings that mothers who worked longer hours used more guidance and were more responsive to their children. According to their explanation, employed mothers compensate for their absence from their children by avoiding conflict and increasing their responsiveness when they are with their children. Interestingly, moderation effects did not appear in the link between employment status and maternal sensitivity. Recalling that maternal attitudes toward employment moderated the effects of employment status on depressive symptoms, this result may imply that spillover from work to family is more significant in mood (depression in this study) rather than work experiences directly linked to parenting behaviors (Perry-Jenkins et al., 2000).

As expected, maternal sensitivity was significantly associated with secure attachment. This positive association accords with previous research, which indicated that mothers demonstrating higher levels of sensitivity in interactions with their infants, facilitate the development of attachment security for their children (Ainsworth et al., 1978; Del Carmen et al., 1993). For example, Gartstein and Iverson (2014) found that higher levels of maternal sensitivity reported by mothers when the infants were 4 months were significantly associated with secure attachment at 12 months. It is noteworthy that other direct pathways to attachment quality (i.e., employment status, depressive symptoms, and previous maternal sensitivity to attachment
quality) were not significant, which strengthens the process models linking employment status and attachment quality.

Studies on maternal employment and its effects on mothers and their children have shown conflicting findings. Results of the current study indicate that the link between employment status and the development of secure attachment is a complex process conditionally mediated by maternal depressive symptoms and mothers’ sensitivity toward their children. These findings suggest the need for examining the comprehensive processes beyond the simplistic comparison between working vs. nonworking. More importantly, the effects of employment depended on mothers’ beliefs about the consequences of maternal employment for children—working in the first year had positive effects only among the mothers who had positive attitudes toward employment. These findings highlight the need for considering job-related factors to investigating the influence of maternal employment. Most research on the psychological consequences of employment for mothers tended to examine working and nonworking mothers as homogeneous groups, without controlling for the influence of other variables. Future studies should extend the current study by including other possible intervening factors, including work commitment and maternal perceptions of child care arrangement.

The findings of the current study are noteworthy in that the model included an extensive set of demographic characteristics as covariates. The hypothesized relationships in the model were held after controlling for these demographic factors, suggesting that the processes linking employment status and attachment quality are not merely the result of a shared association with these other variables.
The current study is limited in several respects. It should be noted that moderating variables (i.e., occupation type and attitudes toward employment) were measured at 1 month after the child’s birth. In the preliminary analyses for the current study, occupation type showed high stability, and mothers’ attitudes toward maternal employment were moderately correlated with other related constructs, including work commitment, gain and strain from combining work and family, and work-family conflict until the study period ended, 36 months after childbirth. Based on these results, mothers’ beliefs and their job type could be used to moderate the link between employment status and attachment quality. Previous studies examining the effects of maternal employment status months using the data from the NICHD study of Early Child Care also used 1-month occupation type and mothers’ attitudes toward employment (Brooks-Gunn et al., 2010; Chang, 2013). As Chang (2013) pointed out, however, a longitudinal approach to examining the changes in mothers’ beliefs or their occupation types would help further clarify the interrelated relations among mothers’ employment status, their psychological well-being, and maternal sensitivity.

The current study mainly focused on maternal variables in mother-child attachment quality. According to a family system perspective, the experiences of family members are interdependent and influence each other (Cox & Paley, 1997; Crouter et al., 1999). Therefore, it would be useful to examine several family factors that could involve the process of predicting attachment quality. This might includes father’s attitudes toward maternal employment or their support with childcare and a child’s temperament. Particularly, it has been suggested that attachment security is better predicted by examining a combination of maternal and child characteristics, than by focusing on individual characteristics in isolation (Mangelsdorf, Gunnar,
A number of longitudinal studies have shown that temperament had an indirect effect on the quality of the attachment relationship by inducing the changes in caregiving behavior. For example, children with difficult temperaments stimulated maladaptive parenting that led to their later developmental problems (Collins et al., 2000; Bradley & Corwym, 2008).

Despite these limitations, this study will make an important contribution by elucidating different mechanisms involved in the relationship between mothers’ employment status, their mental health, interactions with their infants, and attachment quality. Most research on maternal employment across the transition to parenthood has focused on the amount of time mothers spend with their infants or the amount of time children spend in non-maternal care, with little attention paid to the conditions of employment. The current study extended previous literature on maternal employment by suggesting a conditional process model, including both mediators and moderators. The results of the association between working mothers’ concerns on their children’s development and their mental health suggest employment policies that facilitate family friendly work environments especially during the first year of a child’s life. Given the chain effects from maternal mental health to attachment relationship, efforts to improve the work experiences of women with young children eventually contribute to positive child development beyond enhanced employee’ well-being.
CHAPTER 3
ATTACHMENT QUALITY AND CHILDREN’S LATER SOCIAL ADJUSTMENT:
MEDITATING ROLES OF SELF-REGULATION AND HOSTILE ATTRIBUTIONAL BIAS

Introduction

Questions concerning developmental continuity, specifically the extent to which early life experiences matter in shaping outcomes to how these early experiences carry forward in later development, has been the most vibrant and generative topic in developmental research (Roisman & Fraley, 2013; Thompson, 1999). Attachment theory has provided important conceptual frameworks for the exploration of intrapersonal mechanisms linking early mother-child attachment qualities and a child’s later social adjustment. Bowlby, in his first empirical study at the London Child Guidance Clinic, revealed the link between the history of early maternal deprivation and separation and children’s later maladjustment (Bowlby, 1944/2007). Building on the empirical evidence and concepts from other theoretical approaches, such as etiology, information processing, and psychoanalysts, he further formulated the basic tenets of attachment theory with the focus on the development of internal working models.

According to attachment theory, a child develops internal working models of the self, others, and his or her social environment based on attachment experiences with a primary caregiver, usually the mother (Bowlby, 1969). The child forms these cognitive mental representations based on the accessibility and responsiveness of his or her caregiver; these early experiences develop into interpretive filters through which children reconstruct their
understanding of new relationships and experiences in ways that are consistent with past experiences and expectations arising from secure or insecure attachments (Bowlby, 1980; Bretherton, 1990; Collins & Read, 1994). Securely attached children are confident in the availability of their caregivers and, consequently, form more positive internal working models of the self as acceptable, valued, and competent, and they also view others or environments as trustworthy and cooperative (Pietromonaco & Barrett, 2000; Weinfield, Sroufe, Egeland, & Carlson, 2008). In contrast, children with insecure attachment, who have not experienced the consistent availability of and comfort from their caregivers may view the self as unworthy and other people as negative, unreliable or unresponsive.

Congruent with the idea of internal working models (Bretherton & Munholland, 1999; Main, 1995; Main, Kaplan, & Cassidy, 1985), numerous studies have provided both short-term and long-term evidence of a broad range of the developmental benefits of secure attachment. For example, insecure attachment is associated with the presence of externalized problems, such as disruptive and aggressive behavior (Greenberg, Speltz, DeKlyen, & Endriga, 1991; Laible, Carlo, & Raffaelli, 2000) and internalizing problems, including anxiety and depressive moods (Allen, Moore, Kuperminc, & Bell, 1998; Groh, Roisman, van IJzendoorn, Bakermans-Kranenburg, & Fearon, 2012). Although the internal working models concept is the foundation for understanding how attachment processes influence later developmental outcomes, it is a conceptual framework rather than specific indicators; thus, questions on the nature and underlying process of working models still remain. In fact, many studies tend to rely on the working models’ function of providing post-hoc explanations rather than explicitly examining the mediating role of IWMs (Belsky & Cassidy, 1994; Thompson & Raikes, 2003).
Several researchers have suggested that attention needs to be paid to the theoretical intersection between internal working models, serving as individual schemas, and the social information processing model, highlighting latent mental structures, which guide the processing of future social cues (Brethorton & Munholland, 1999; McElwain, Booth-LaForce, Lansford, Wu, & Dyer, 2008; Mikulincer, Shaver, & Pereg, 2003; Sroufe, Egeland, Carlson, & Collins, 2005). A basic premise of social information processing models is that children’s understanding and interpretations of social situations influence their social adjustment. According to this model, children utilize their mental schemas of past experiences (e.g., early attachment to a primary caregiver or the experience of rejection by significant others) as a guide in the process of encoding and interpretations of social cues. A typical example of this mental structure is the internal working models in attachment theory (Crick & Dodge, 1994). That is, internal working models of others formed through secure attachment serve as scripts when children interpret social information as benign or hostile in new social situations. Securely attached children, who have positive internal working models, may make benign attributions about negative interpersonal events in which the intent of the other is ambiguous. In contrast, children with insecure attachments may be more likely to attribute hostile intentions to others (McElwain et al., 2008). Previous studies examining the associations between attachment quality and hostile attributional bias also suggested the internal working models as a key basis of this connection (Clark & Symons, 2009; Raikes & Thompson, 2008; Ziv, Oppenhein, & Sagi-Schwarz, 2004). Thus, it is reasonable to examine the children’s hostile attributional bias as an avenue to the function of internal working models.
It is also important to note that relationship representations cannot fully explain the developmental continuity and internal working models can be revised and modified with developmental and environmental changes. Given the tendency for the working model to assimilate new experiences, some distortion of incoming information is normal and unavoidable (Bretherton, 1992). However, when defensive exclusion of information from awareness interferes with the accommodation of internal working models to external events, the adequacy of internal working models can be challenged, which in turn can lead to problematic social behavior (Bowlby, 1980; Crick & Dodge, 1994). Considering that self-regulation is essential for transforming the inner responses into socially desirable behaviors and for broadening them into multiple cognitive and affective perspectives, which facilitate the understanding of others’ mental states (Vohs & Baumeister, 2004), this may involve the process of revision and extension of internal working models. Moreover, because self-regulation is shaped by attachment relationships (Cassidy, 1994) and children’s social adaptation happens through two complimentary processes, fitting new information into pre-existing cognitive schemas (assimilation) and taking new information and altering pre-existing schemas (accommodation) (Wadsworth, 2004), investigation of self regulation as additional mediums would increase the explained variance for social adjustment.

Lemerise and Arsenio (2000) proposed that attachment and self-regulation is a central predictor of children’s social information processing in their “integrated model of emotion processes and cognition in social information processing.” They suggested that past events, usually including the experience of early attachment to a caregiver and a child’s biological predisposition, are stored and internalized in the child’s database and influence social
information processing. Children’s self regulation skills to control, modify, and manage aspects of emotional reactivity and expressivity also involves what is noticed and the meaning attributed to the situation. While there has been an advance in attachment research beyond simply testing for a direct relationship between early attachment experiences and later development, comparatively less research has examined how internal working models develop and change over time, which may be crucial for probing the developmental continuity. This study specifically focuses on self regulation and attributional bias developed from early attachment relationships as channels of how IWMs function in children’s developmental outcomes. In accord with the notion that IWMs are developing representations that change over time with a child’s conceptual growth, attributional bias and self regulation are assessed across the multiple time points in linking early attachment to later developmental outcomes.

Overall, the purpose of the current study is to identify the underlying mechanism through which early attachment quality is associated with children’s later developmental outcomes. Specifically, this study hypothesizes that the mother-child attachment continues to have the potential to influence later social adjustment via self regulation and hostile attributional bias development pathways.

Literature Review

Attachment, Hostile Attributional Bias, and Social Adjustment

The Social Information Processing model has emerged with the aim of understanding children’s maladjustment especially individual difference in aggressive behaviors (e.g., Dodge, 1985, 1986; Dodge & Crick, 1990). This model describes six steps, which are involved with the process of how children enact competent or incompetent behaviors: attending and encoding of
social information, interpretation of social cues, clarification of a goal, identifying possible responses, deciding and selection of responses, and enacting behavior. Among these components, encoding and interpretation of social cues have implications for social adjustment. Specifically, a large body of studies has reported that hostile attributional bias, which refers to interpretive bias wherein individuals exhibit a tendency to interpret others' ambiguous behaviors as hostile, are related to aggressive behavior and problematic peer functioning (e.g., Dodge, Price, Bachorwsk, & Newman; Nasby, Hayden, & Depaulo, 1979; Webster-Stratton & Lindsay, 1999).

Interpretation bias may arise from processes including a filtered personalized mental representation of the situational cues and an inference about the perspectives of others in the situation. All of these processes may be influenced or guided by the child’s memory and stored representations of others. That is, children are thought to recall and apply their mental schemas of past events, such as early attachment to primary caregivers, to interpret external and internal cues in social situations. Reliance on these mental structures mostly occurs automatically and habitually and makes processing more efficient, especially when confronted with social stimuli that are ambiguous (Crick & Dodge, 1994). The function and the origin of social schemas in the social information processing are congruent with those of internal working models in attachment theory in that they guide attention and interpretation in a way that are consistent with their attachment relationship. On the basis of theory and evidence in the information processing literature, Bowlby proposed that working models, through repeated use, begin to function automatically, without conscious awareness (Bowlby, 1980; Bretherton, 1985, 1990; Main, Kaplan, & Cassidy, 1985).
Given the theoretical intersection between the influence of internal working models on children’s expectations for interpersonal interactions and hostile attributional bias on their interpretations on others’ intents, examining the development of hostile attributional bias would be an appropriate way to understand how internal working models influence later social adjustment. However, few studies investigating associations between attachment and hostile attribution biases have been conducted; also, the existing results are not consistent across the studies. For example, securely attached children in kindergarten and first grade were more likely to attribute benign motives to, and insecure children to infer hostile intent to, the story question concerning the motivations of peer story characteristics (Cassidy, Kirsh, Scolton, & Parke, 1996). Similarly, using the NICHD study of Early Child Care, Raikes and Thompson (2008) found a significant association between insecure attachment at 36 months and negative motivational attributions to peers as first graders. On the other hand, McElwain et al. (2008) showed that child-mother attachment security at 36 months did not predict 54-month hostile attributions, although attachment security was indirectly related to Grade 1 hostile attributions via mother-child affective mutuality.

These mixed results may be due to the different research design and may imply the existence of other possible mediators in linking attachment history and hostile attributional bias (e.g., emotional regulatory processes that are likely to be shaped by an attachment relationship, Cassidy, 1994). Also, as most children show the growth in the ability to understand others’ mental and emotional states with age (Dodge, 2006), the association between attachment and hostile attributional bias may differ between young children and older children. However, relatively few longitudinal studies were conducted in school age children. This study, utilizing
several assessments of attributional bias, hypothesizes that early attachment quality influences the development pathway of hostile attributional bias during middle childhood (grade 3 to 5), which in turn influences social adjustment.

Attachment, Self-Regulation, and Social Adjustment

Self-regulation, the capacity to control one’s affect and behavior deliberately, has particular importance for appropriate and adaptive social behavior during the school years (Eisenberg, Fabes, Murphy, Maszk, Smith, & Karbon, 1996). As children enter school, their adjustment depends in part on their ability to manage the emotional and regulatory demands of the classroom, including the regulation of impulse control and the suppression of aggressive or angry acts (Drake et al., 2014). The quality of his or her attachment relationship is a primary source for the development of a child’s emotional and behavioral self-regulation (Carlson & Sroufe, 1995; Thompson, 2008). Attachment researchers have indicated that caregivers act as external regulators of the infant’s affect and gradually aid the children to have self regulatory capacity (Grossmann & Grossmann, 1991; Hofer, 1995; Sroufe, 1996). The relation between attachment and the development of self-regulation can be fully understood in terms of the dynamic interplay of the attachment system with other behavioral systems.

According to Bowlby’s (1969) early work on attachment, secure attachment is formed by the dynamic equilibrium between the attachment behavioral system and caregiving system. The caregiving system, a subset of parenting behaviors to promote proximity and comfort when the caregiver perceives that the child is in real or potential danger (Cassidy, 2008), is relatively activated, when the child’s attachment behavioral system can be relatively deactivated. This means that a child’s attachment behaviors are not needed, because the caregiver has assumed the
responsibility of being available in times of distress or need and being sensitive to a child’s attachment needs. In contrast, if the caregiving system is not relatively activated, the child’s attachment behavioral system becomes activated for the needs of comfort and proximity. The attachment system was thus conceptualized as a homeostatic regulatory system, and it enables the child to respond flexibly to environmental changes while attempting to attain a goal. Repeated experiences with the optimal functioning of the attachment system, allow children to acquire more confidence in the effectiveness of their own resources for handling distress.

Furthermore, a consistent balance between caregiving and attachment systems contributes to the activation of the exploratory system (Bowbly, 1969/1982); when the comfort-providing function of the attachment system is operating successfully, the exploration system is activated. The framework that best captures the links between the attachment and behavioral systems is that of an infant’s use of an attachment figure as a secure base from which to explore (Ainsworth, 1972). The repeated experience of successful exploration of an environment following the attainment of secure attachment provides a child with greater opportunities to learn, take the initiative, cope with challenges independently, and internalize skills for self-regulation (Riksen-Walraven, Meij, van Roozendaal, & Koks, 1993).

The theoretical proposition that secure attachment facilitates a child’s effective self-regulation has been supported by numerous studies. Secure parent-child attachment was associated with inhibited toddlers’ lower cortisol reactivity in challenging situations (Nachmias, Gunnar, Mangelsdorf, Parritz, & Buss, 1996), more positive anger management strategies in preschoolers (Gilliom et al., 2002), and greater constructive coping with stress in middle childhood (Contreras, Kems, Weimer, Gentzler, & Tomich, 2000). In a longitudinal study over
the first three years, Kochanska (2001) reported that over time, insecurely attached children exhibited progressively greater fear, anger, and diminished joy, in standardized assessments compared with secure children. More recently, attachment at 36 months was found to be significantly associated with social self control at grade 1 when the growth of self regulation is initiated and continues until grade 5 (Drake et al., 2014).

It is well known that self-regulation plays a crucial role in social behavioral problems. This is because constructive social interactions are likely to be facilitated when children can modulate negative affect and behavior. Children, who are able to suppress an aggressive or angry act and impulsive response that are unacceptable, engage in more positive social interactions with either adults or peers compared to children who are highly aroused and unable to modulate negative emotions such as anger and frustration. The association of self regulation with social competence has been well examined in the literature. It is generally found that emotion regulation is associated with greater levels of socially competent behavior as measured by parents and teachers (Eisenberg, Fabes, Guthrie, & Reiser, 2000).

Specifically, children with high levels of emotion regulation have been found to have lower levels of negative arousal in peer interactions, instead displaying more socially competent responses (Fabes, et al., 1999). Also, controlling for family (e.g., maternal education and depression, and family income) and child variables (e.g., gender and temperament), affect-dysregulated children had more problematic cognitive, social, and behavioral outcomes at 54 months, kindergarten, and first grade (NICHD Early Child Care Research Network, 2004). More recently, Doan, Fuller-Rowell, and Evans (2012) examine longitudinal associations among maternal responsiveness, self-regulation in middle school, and behavioral adjustment in
adolescents. The results showed that children’s self regulatory abilities were strongly associated with externalizing behaviors and significantly mediated the influence of maternal responsiveness on externalizing behaviors. Thus, the current study hypothesizes that secure attachment predicts better self-regulation, which in turn influences social adjustment in terms of fewer behavioral problems and higher levels of social skills.

Mediation Roles of Self-Regulation and Hostile Attributional Bias

Social adjustment has generally been defined as the degree to which children get along with their peers, the degree to which they engage in adaptive, competent social behavior, and the extent to which they inhibit aggressive behavior (Crick & Dodge, 1994). Previous literature and empirical studies have repeatedly documented that both self-regulation and hostile attributional bias are key predictors of behavioral problems and social skills (Eisenberg et al., 2000; Gilliom et al., 2002; Godleski, & Ostrov, 2010). During the interpretation step of social information processing, children rely on latent mental structures to help guide their processing of social cues (Crick & Dodge, 1994). These knowledge structures are formed from previous experiences with caregivers and aid children in solving problems and making judgments quickly and efficiently, especially in the face of an ambiguous or complex social cue (Burks, Laird, Dodge, Pettit, & Bates, 1999; Crick & Dodge, 1994).

However, relying on an existing schema can make it difficult to see others’ mental and emotional states as well as alternative solutions. Self-regulation skills may involve deliberation so that good regulators may be more likely to consider the situations from multiple cognitive and affective perspectives (Saarni, 1999). This is consistent with Piaget’s discussion of children’s adaptation. According to this view, adaptation happens through the two complimentary and
simultaneous processes: “assimilation,” reinterpreting new experiences to fit into existing cognitive schemas, and “accommodation,” altering pre-existing schemas in order to fit in the new information (Piaget & Cook, 1952).

A growing body of research suggests an association between children’s self-regulation and hostile attributional bias. Lemerise and Arsenio (2000) noted that the intensity with which children experience emotions and their skills in regulating emotions influence what is noticed and the meaning attributed to the situation. Considering that self-regulatory ability requires overriding the predominant emotion, children with more self-regulatory competence may be better able to apply their understanding of others’ mental states in a manner that overrides their initial tendency to make hostile attributions. For example, children with lower self-control in third grade showed a greater initial hostile attributional bias at grade 3 and showed less decline in biases by grade 5 (Nelson & Perry, 2015). Similarly, research reported that children who showed reactive aggression have difficulty in controlling negative emotions, such as anger, and are more likely to attribute hostile intent in ambiguous situations (Dodge, 2006; Dodge & Pettit, 2003).

However, relatively few studies have included deficits in self regulation in investigations of social information processing mechanisms. Based on previous literature and empirical evidence, the current study examines the association between self regulation and hostile attribution bias processes as linking mechanisms of the attachment relationship to later social adjustment. Specifically, this study hypothesizes that attachment quality may indirectly influence the development of a hostile attributional bias through children’s self-regulatory abilities, which in turn has an impact on social adjustment.
Study Hypotheses

The process of development continuity from early attachment to later social adjustment is complex and can be fully understood in conjunction with several theoretical approaches (Bretherton, 1992; Carlson et al., 2004). Drawing from attachment theory and social information theory, the current study focuses on the relation between self-regulation and hostile attribution bias as mediating mechanisms between early attachment and later social adjustment. Further, to adequately test the intervening processes that serve as mechanisms of continuity, I employed a longitudinal design with repeated assessments of constructs, which allowed an analysis of causal nature and change/stability of study constructs (McElwain et al., 2008). By identifying the processes of how early life experiences carry forward to later development, the findings would provide not only the knowledge of developmental trajectories but also practical implications for the design of early preventive interventions. Figure 2.1 depicts the theoretical model of the current study and its corresponding hypotheses are listed below. Hypotheses 1 and 2 are about the “within domain mediation processes—the developmental pathway of self-regulation and hostile attribution, respectively,” and hypothesis 3 is about the “cross-domain mediation processes—the relation between self-regulation and hostile attributional bias over time.”

1. Early attachment quality is associated with later social adjustment (behavioral problems and social skills) through the continuity of self-regulation.
2. Early attachment quality is associated with later social adjustment through the continuity of hostile attributional bias.
3. Early attachment quality is associated with later social adjustment through the cross-domain lagged association from self-regulation to hostile attributional bias.
Figure 2.1. Theoretical Model Linking Attachment Quality and Social Adjustment.

Note. SR=Self Regulation; HAB=Hostile Attributional Bias.
Methods

Sample

The data used to evaluate the theoretical model come from the NICHD Study of Early Child Care and Youth Development (NICHD SECCYD). Detailed description of recruitment procedures of the NICHD SECCYD were discussed in the method section in the first study. I used the Phase 1 (one month to 36 months) and Phase III data (2nd through 6th grades) for the current study. The final sample consists of 1,364 families who were participants in the first study.

Descriptive characteristics of the sample are presented in Table 2.1. On average, mothers were 28.11 years old, had received 14.23 years of education, and 76.7% of the mothers lived with a partner or spouse in the home when their children were 1 month old. With respect to the mother’s ethnicity, 79.8% were non-Hispanic European American, 12.8% were non-Hispanic African American, 4.5% were Hispanic, and 2.9% were more than one race or another race. The average income-to-needs ratio across at 1, 6, 15, 24, and 36 months was 3.71, indicating that overall family income was, on average, 3.71 times that of the poverty level. About one-half of the children in the sample were boys (51.7%).

Measurement

Attachment Quality at 36 months. The procedure for assessing attachment quality at 36 months is the same as that described in the measurement section of the first paper.

Self-Regulation from 3rd to 5th grade. Mothers reported on children’s ability to demonstrate self-regulation using the self-control subscale of the Social Skills Rating System-Parent Form (Gresham & Elliott, 1990). This subscale consists of 10 items to measure emotional
and behavioral regulation that mostly emerge in conflict situations, including “Responds appropriately when hit/pushed by other child,” “Controls temper when arguing with other child,” “Responds appropriately to teasing from a friend,” “Avoids situations that result in trouble,” “Receives criticism well,” “Ends disagreements with you calmly,” “Controls temper/conflict situation with you,” “Cooperates with family member without being asked,” “Speaks in an appropriate tone of voice at home,” and “Politely refuses unreasonable requests” (Appendix F). The response levels for each item are 0= never, 1= sometimes, 2= very often, and the possible range of scores is from 0 to 20, with the higher scores reflecting a stronger affinity to demonstrate self control as perceived by the child’s mother. Cronbach’s alphas for the scale were .82, .83, and .81 at the third, forth, and fifth grade, respectively.

Hostile Attributional Biases from 3rd to 5th grade. At the third, fourth and fifth grades, children completed attribution questionnaire in a laboratory task designed to assess their intent attributions in response to socially ambiguous situations (Crick, 1995). Stories were used that describe provocation situations in which the intent of the provocateur is ambiguous. Three of the stories depicted instrumental provocation focusing on acts of potential overt aggression (i.e., my radio is broken by a peer, a peer spills milk all over my back, and a peer bumps me and my new shoes get muddy). Relational provocation stories were also administered, but given that the number and content of these stories varied across the three grades, only the instrumental provocation vignettes were included in the current analyses. For each story, the child indicated a reason for the provocation based on four choices (e.g., the radio wasn’t made well, breaking the radio was an accident, the kid who broke it was mad at you, and the kid who broke it was jealous of you). The child’s choice was then coded as hostile (1) or benign (0). Next, the child was asked
about the intent of the behavior (e.g., In this story, do you think the kid was trying to be mean or not trying to be mean?) which was coded as hostile (1) or benign (0) (Appendix G). A hostile intent score was computed as the mean of the six intermediate hostile intent-instrumental items from three stories. The possible scores range from 0 to 1, with higher scores indicating a higher likelihood to see the events as having hostile intent. The raw items used to create this score had an internal reliability (Cronbach’s α) of .77, .80 and .80 at the third, fourth and fifth grade, respectively.

Social adjustment (Behavior problems and Social Skills) at 6th grade. Classroom teachers reported children’s behavior problems with the Teacher’s Report Form (TRF; Achenbach, 1991) at sixth grade. The TRF, which is modeled on the CBCL/4-18, consists of 120 items, providing information on two broad domains of functioning, internalizing problems and externalizing behaviors. In this study, only externalizing scores were included in the analysis. Syndromes in the externalizing behaviors domain consist of delinquent behaviors (9 items) and aggressive behaviors (25 items). Examples of delinquent behaviors include “feels no guilt after misbehaving,” “hangs around other children who get into trouble,” “lies and cheats,” “prefers being with older kids,” “steals,” “swears,” “is tardy,” “is truant,” and “uses alcohol or drugs for non-medical purposes.” Examples of aggressive behaviors include “argues,” “is defiant,” “brags,” “shows cruelty,” “demands a lot of attention,” “destroys his/her own things,” “destroys property belonging to others,” “disobeys at school,” “disturbs other pupils,” “is jealous,” “fights,” “talks out of turn,” “attacks,” “disrupts,” “screams,” “shows off,” “is explosive,” “demands,” “is stubborn,” “threatens,” “suddenly changes in mood or feelings,” “talks too much,” “teases,” “has temper tantrums or hot temper, threatens,” and “is unusually loud.” Each item is rated on a
3-point scale: (0) not true of the child, (1) sometimes or somewhat true, and (2) very true or often true. Raw scores for teacher reports were converted into standard T-scores based on normative data for children of the same age. The possible range of scores for the Externalizing T-score is from 39 to 100 and the actual range of the scores is from 39 to 86. Higher scores indicate a greater affinity to display delinquent and aggressive behaviors. Cronbach’s alphas for the scale were .95 for 34 items of the Externalizing T-Score.

With regard to social skills, classroom teachers reported on children’s social skillfulness with peers. The social skills subscale contains seven items from the Teacher Checklist of Peer Relations (Coie & Dodge, 1988). The items pertain to children’s social skills with peers, including: “understands others’ feelings,” “is socially aware of what is happening in a situation,” “accurately interprets what a peer is trying to do,” “refrains from over-impulsive responding,” “generates many solutions to interpersonal problems,” and “is aware of the effects of his/her behaviors on others” (Appendix H). It was rated on a 5-point scale ranging from (1) very poor to (5) very good. Higher scores indicate high levels of social skills. Cronbach’s alpha for the scale was .95.

Control variables: Maternal age, Education, Ethnicity, and Marital status, and Family income-to-needs ratio. This study included an extensive set of demographic characteristics in the model. Since these demographic characteristics, including the mother’s age, education, ethnicity and marital status, and family income-to-needs ratio, have been identified as related to both attachment quality and child outcomes (Brooks-Gunn, Han, & Waldfogel, 2010; Fearon & Belsky, 2004; Moran et al., 2008; Aronson, & Huston, 2004), it is crucial to control them to estimate unbiased associations between attachment and child outcomes. At the 1-month
interview, mothers reported their age and ethnicity, and the number of years of schooling they had. In assessing maternal marital status, mothers were asked whether “they were currently living with a spouse,” “living with a partner,” “single” or “other (separated, divorced, or widowed).” Income-to-needs ratio was computed separately at 1, 6, 15, 24, and 36 months as family income divided by the poverty threshold determined by the U.S. Census (U.S. Department of Labor, 1994) for each household size and number of children less than 1 year of age. Thus, higher scores in this ratio indicate greater financial resources in the household. I used the average income-to-needs ratio across data collected from 1 to 36 months. The internal consistency (Cronbach’s alpha) of this composite scale was .93.

Analysis Plan

I first examined descriptive properties of study variables and their bivariate relations. Then, structural equation modeling with Mplus (version 7) was used to examine the proposed theoretical model. To evaluate the conceptual model, I used several model-fit indices including the Comparative Fit Index (CFI ≥ .95; Bentler & Bonett, 1980) and Root Mean Square Error of Approximation (RMSEA ≤ .06; Steiger & Lind, 1980). Missing data were managed using FIML (full-information maximum likelihood), which uses all the available data to estimate the parameter estimates of a model (Allison, 2003). FIML offers less biased estimates compared with other methods such as listwise deletion (Enders & Bandalos, 2001; Schafer & Graham, 2002). Additionally, for the evidence of temporal ordering between mediating constructs, self-regulation and hostile attributional bias across time, I compared three nested models. Model 1 addressed a non-interactive model which assumed only the contemporary associations between mediating constructs. Model 2 included time lagged effects only initiated from self regulation,
and model 3 incorporated successive reciprocal associations between the mediators. Based on previous studies on the relations between self-regulation and attributional bias, I expected that self regulation at a specific time predicts hostile attributional bias in the next year while controlling for the stable components of self regulation (support model 2). Model comparisons were tested using differences in $\Delta \chi^2$ of nested models (Bentler & Bonett, 1980).

RESULTS

Preliminary analyses

Preliminary analyses using SPSS, version 19 examined descriptive statistics for and correlations between study variables within the full sample. As shown in Table 2.1, 61.5% of mother-child participants showed secure attachment quality at 36 months. Mean scores of self regulation reported by children’s mothers and hostile attributional bias by children in laboratory tasks were similar across the middle childhood: for self regulation, 13.67 at third, 13.93 at fourth, and 13.89 at fifth grade and for hostile attributional bias .23 at third, .23 at fourth, and .29 at fifth grade. Overall, the average levels of self-regulation and hostile attributional bias were similar over time. Standard deviations for hostile attributional bias were greater than the means but their skewness ranging from 1.22 to 1.31 and kurtosis ranging from .08 to .77 fell within the acceptable range (below +1.5 and above -1.5) (Tabachnick & Fidell, 2013). In regard to children’s social adjustment at 6th grade, the average score of externalizing behavior was 50.16 from a range of 30 to 100 and the average score of social competence was 3.65 from a range 1 to 5.
All of the study variables were generally correlated in the expected directions at the bivariate level and were significant at $p < .01$ with the exception of the relationship between attachment quality and hostile attributional bias (Table 2.2). Specifically, attachment quality was positively correlated with self regulation at all three time points ($r = .11, .10,$ and $.10,$ respectively). It was expected that attachment quality would be negatively correlated with hostile attributional bias, but this was not supported. However, as expected, self regulation and hostile attributional bias showed significant and negative associations at third, fourth, and fifth grade, ranging from $r = -.08$ to $-.22$. Thus, I could infer that the influence of attachment on hostile attributional bias may be indirect through the self regulation variables. There were significant negative correlations in self regulation and in hostile attributional bias between all adjustment time points and also between cross-time points (i.e., third grade and fifth grade). Children’s externalizing behavior was negatively associated with attachment quality ($r = -.13$) and with self regulations at third, fourth, and fifth grade ($r = -.25, -.24,$ and $-.24,$ respectively), whereas social competence was positively associated with attachment quality ($r = .13$) and with self regulation at third, fourth, and fifth grade ($r = -.07, -.16, -.22,$ respectively). Hostile attributional bias at all three time points showed negative associations with social competence ($r = -.07, -.16, -.22,$ respectively), whereas they had positive associations with externalizing behavior ($r = .13, .16, 15,$ respectively).
<table>
<thead>
<tr>
<th>Measures</th>
<th>N</th>
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</thead>
<tbody>
<tr>
<td>Demographic measures</td>
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<td></td>
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<tr>
<td>Maternal age</td>
<td>1,364</td>
<td>28.11 (5.63)</td>
<td>18 ~ 46</td>
</tr>
<tr>
<td>Maternal education</td>
<td>1,363</td>
<td>14.23 (2.51)</td>
<td>7 ~ 21</td>
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<tr>
<td>Income-to-needs ratio</td>
<td>1,072</td>
<td>3.71 (2.70)</td>
<td>.15 ~ 18.76</td>
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<td>Marital status</td>
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<tr>
<td>- Married</td>
<td>1,044</td>
<td>(76.7)</td>
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</tr>
<tr>
<td>- Partnered</td>
<td>122</td>
<td>(8.9)</td>
<td></td>
</tr>
<tr>
<td>- Single</td>
<td>1,362</td>
<td>172 (13.6)</td>
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</tr>
<tr>
<td>- Other (Separated, Divorced, &amp; Widowed)</td>
<td>24</td>
<td>(1.8)</td>
<td></td>
</tr>
<tr>
<td>Mothers’ ethnicity</td>
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<tr>
<td>- Non-Hispanic White</td>
<td>1,089</td>
<td>(79.8)</td>
<td></td>
</tr>
<tr>
<td>- Non-Hispanic African American</td>
<td>1,364</td>
<td>174 (12.8)</td>
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</tr>
<tr>
<td>- Hispanic</td>
<td>61</td>
<td>(4.5)</td>
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</tr>
<tr>
<td>- Other</td>
<td>40</td>
<td>(2.9)</td>
<td></td>
</tr>
<tr>
<td>Child sex (male)</td>
<td>1,364</td>
<td>705 (51.7)</td>
<td></td>
</tr>
<tr>
<td>Study measures (time point, source)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attachment (36 mon, observed, secure group)</td>
<td>1,140</td>
<td>701 (61.5)</td>
<td></td>
</tr>
<tr>
<td>Self regulation (Grade 3, mother)</td>
<td>1,027</td>
<td>13.67 (3.40)</td>
<td>0 ~20</td>
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<tr>
<td>Self regulation (Grade 4, mother)</td>
<td>1,020</td>
<td>13.93 (3.46)</td>
<td>0~20</td>
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<tr>
<td>Self regulation (Grade 5, mother)</td>
<td>1,020</td>
<td>13.89 (3.27)</td>
<td>4 ~20</td>
</tr>
<tr>
<td>Hostile attribution bias (Grade 3, observed)</td>
<td>1,016</td>
<td>.23 (.32)</td>
<td>0~1</td>
</tr>
<tr>
<td>Hostile attribution bias (Grade 4, observed)</td>
<td>1,020</td>
<td>.23 (.33)</td>
<td>0~1</td>
</tr>
<tr>
<td>Hostile attribution bias (Grade 5, observed)</td>
<td>1,006</td>
<td>.21 (.29)</td>
<td>0~1</td>
</tr>
<tr>
<td>Externalizing problems (Grade 6, teacher)</td>
<td>855</td>
<td>50.16 (9.12)</td>
<td>30~100</td>
</tr>
<tr>
<td>Social skills (Grade 6, teacher)</td>
<td>866</td>
<td>3.65 (.88)</td>
<td>1~5</td>
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Table 2.2. Bivariate Correlations Among Study Variables

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<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
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<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
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<tbody>
<tr>
<td>1. Attachment</td>
<td>–</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>2. Self regulation G3</td>
<td>.11**</td>
<td>–</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>3. Self regulation G4</td>
<td>.10**</td>
<td>.75**</td>
<td>–</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Self regulation G5</td>
<td>.10**</td>
<td>.70**</td>
<td>.74**</td>
<td>–</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Hostile attribution bias G3</td>
<td>.04</td>
<td>-.10**</td>
<td>-.09**</td>
<td>-.08*</td>
<td>–</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>6. Hostile attribution bias G4</td>
<td>-.02</td>
<td>-.19**</td>
<td>-.18**</td>
<td>-.16**</td>
<td>.34**</td>
<td>–</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Hostile attribution bias G5</td>
<td>-.02</td>
<td>-.20**</td>
<td>-.22**</td>
<td>-.20**</td>
<td>.30**</td>
<td>.43**</td>
<td>–</td>
<td></td>
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<tr>
<td>8. Externalizing problems G6</td>
<td>-.13**</td>
<td>-.25**</td>
<td>-.24**</td>
<td>-.24**</td>
<td>.13**</td>
<td>.16**</td>
<td>.15**</td>
<td>–</td>
<td></td>
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<tr>
<td>9. Social skills G6</td>
<td>.13**</td>
<td>.28**</td>
<td>.29**</td>
<td>.28**</td>
<td>-.07*</td>
<td>-.16**</td>
<td>-.22**</td>
<td>-.62**</td>
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</table>

*p < .05. **p < .01.

Testing the hypothesized model

Structural equation modeling analysis was performed to examine the proposed theoretical model. The original proposed model yielded a $\chi^2(18) = 153.181$ with acceptable values for all fit indices (i.e., RMSEA= .074, CFI= .952), before adding second-order stability paths (i.e., self regulation from grade 1 to grade 3 and hostile attributional bias from grade 1 to grade 3). However, when these paths were added, the model fit showed significant improvement in terms of a significantly decreased chi-square value ($\Delta\chi^2 = 133.524$ with $\Delta df = 2$), the higher CFI (.999), and the lower RMSEA (.013) than the original model. Thus, I added the second-order paths which allow variation in self regulation and hostile attributional bias at Grade 3 to directly reach Grade 5, regardless of the levels at Grade 4.
Next, I examined the differences in $\Delta \chi^2$ of nested models as the evidence for the
temporal ordering between self-regulation and hostile attributional bias across study time points. Model 1 addresses the non-interactive model with the contemporary associations between self-regulation and hostile attributional bias; Model 2 adds time lagged effects initiated from self regulation to hostile attributional bias; and Model 3 includes successive reciprocal associations between self regulation and hostile attributional bias. First, when M1 was compared with M2, $\chi^2$ decreased significantly by 40.059 ($p < .001$, $\Delta df = 2$), showing evidence for the temporal ordering from self-regulation to hostile attributional bias. Then, when M2 was compared with M3, $\chi^2$ difference was. 093 with $\Delta df = 2$. Based on the critical value of 5.991 with $\Delta df = 2$ at $p < .05$, this result indicates that M2 and M3 are not statistically different, thus M2, which is more parsimonious (simple) than M1, was selected as the final model (Figure 2.1). Other model fit indices also indicate that the final model represented the data well; CFI = .999, TLI = .994, RMSEA = .013.

My first hypothesis was that early attachment quality influenced later social adjustment through the continuity of self-regulation. As expected, Figure 2.2 showed that the effect of early attachment on later social adjustment was indirect through the self-regulation pathway. Specifically, attachment quality at 36 months was positively related to self-regulation at grade 3 ($\beta = .07$, $p < .05$) and the path coefficients from self-regulation at grade 3 to grade 4 ($\beta = .72$, $p < .001$) and grade 4 to grade 5 ($\beta = .49$, $p < .001$) revealed a high degree of stability in self regulation development. Furthermore, self-regulation at grade 3 had a positive association with self-regulation at grade 5 ($\beta = .32$, $p < .001$). Consistent with the hypothesis, self-regulation at grade 5 was significantly associated with social adjustment at grade 6 in terms of high levels of social skills ($\beta = .18$, $p < .001$) and fewer behavioral problems ($\beta = -.16$, $p < .001$).
The second hypothesis was that early attachment quality influenced later social adjustment through the continuity of hostile attributional bias. However, Figure 2.2 showed that early attachment quality was not associated with hostile attributional bias. With regard to the stability of hostile attributional bias over time, path coefficients from grade 3 to grade 4 ($\beta = .32, p < .001$), grade 4 to grade 5 ($\beta = .35, p < .001$), and the second order relation from grade 3 to grade 5 ($\beta = .17, p < .001$) revealed significant but relatively weak stability compared with the stability of self-regulation. These results may indicate that other potential factors influence the development path of children’s hostile attributional bias. Based on the previous research on the relationship between self-regulation and hostile attributional bias, I suggest self-regulation as a possible contributor to hostile attributional bias, as postulated in the next hypothesis.

The final hypothesis in the model was that early attachment quality would indirectly contribute to the development of hostile attributional bias through its effects on children’s self-regulation. As expected, self-regulation in specific time predicted hostile attributional bias in the next year while controlling for the stable components of self-regulation. This suggests that lagged self-regulation predict the residual changes in hostile attributional bias, independently of the developmental continuity of hostile attributional bias. Specifically, self-regulation at grade 3 was negatively associated with hostile attributional bias at grade 4 ($\beta = -.15, p < .001$) and self-regulation at grade 4 was negatively associated with hostile attributional bias at grade 5 ($\beta = -.11, p < .001$). In regard to the contemporary association between self-regulation and hostile attributional bias, it was significantly and negatively correlated only at grade 3 ($\beta = -.09, p < .01$). As expected, hostile attributional bias at grade 5 was significantly associated with social adjustment at grade 6 in terms of lower levels of social skills ($b = -.44, p < .001$) and more behavioral problems ($b = 2.60, p < .001$). Attachment quality also had direct effects on children’s
social adjustment: a significant positive effect on social skills ($\beta = .08, p < .05$) and a significant negative effect on behavioral problems ($\beta = -.08, p < .05$).

Overall, the results showed that early attachment quality exerted its influences on children’s later social adjustment through the continuity of self regulation (hypothesis 1) and through the cross-domain mediation paths from self-regulation to hostile attributional bias (hypothesis 3).
Figure 2.2. Process Model Linking Early Attachment Quality and Social Adjustment (n = 1364)

Note. SR=Self Regulation; HAB=Hostile Attributional Bias; Standardized coefficients are in parentheses; \( \chi^2/df = 1.23 \), RMSEA = .013, CFI = .999, TLI = .994; Early sociodemographic factors (i.e., maternal education and ethnicity, income to ratio, marital status) are controlled for full model. * \( p < .05 \). ** \( p < .01 \). *** \( p < .001 \).
Discussion

The purpose of the current study was to examine how an early attachment relationship with a mother was carried forward, eventually influencing a child’s later social adjustment. Previous literature has suggested several possible mechanisms that link attachment and later developmental outcomes, such as stress regulation, a developing brain, emotional development, and internal working models of the self, others, and the world (DeKlyen & Greenberg, 2008; Kochanska, 2001; Weinfield et al., 2008; Schore, 2001). Most empirical studies, however, focused on only one specific developmental aspect of attachment or relied on the explanatory breadth of internal working models. The current study extended previous studies by suggesting an integrated model of self-regulation and hostile attributional bias as intrapersonal processes through which attachment security was associated with children’s later social adjustment. The results largely support the study’s proposition by showing that early attachment experiences continue to influence later social adjustment through interrelated influences between developmental processes of self-regulation and hostile attributional bias. Specifically, it was hypothesized that secure attachment at 36 months would predict a child’s self regulatory capacity and its developmental continuity, in turn, would predict social adjustment by sixth grade. As expected, secure attachment was positively associated with self-regulation. This finding is consistent with several other studies demonstrating that secure attachment is related to greater self regulatory skills. Kochanska and her colleague (2009), in their study of the interplay between genes and early mother–child attachment in the development of self-regulation, found that children’s attachment security moderated the effect of 5-HTTLPR polymorphism (specifically, having a short allele), which was associated with a diminished self-regulatory capacity from the toddler stage to the preschool years. These results support the view that early
security provides a foundation and scaffolding for a child’s self-regulation (Hofer, 1994; Schore, 2001; Sroufe, 1996, 2005). Similarly, children with insecure-avoidant at 15 months or insecure-resistant attachment classifications at 36 months were more likely to be in an affect-dysregulated group at 24 months compared with those with secure attachment. (NICHD ECCRN, 2004).

Until now, research on the association between attachment and the construct of self-regulation has particularly focused on the period between early infancy and the beginning of the preschool years in which dramatic developments in emotional self-regulation occur (Calkins, 2004; Kochanska, 2001). Only a few studies extend the relationship between attachment and self-regulation beyond early childhood. For example, Kobak and Sceery (1988), using AAI (Adult Attachment Interview), found that adolescents classified as securely attached to their parents had increased emotional regulation assessed as ego resiliency, compared with the dismissive and preoccupied groups, which reflected more insecure attachments. Recent studies showed that self-control at fourth grade partially mediated the association between attachment security at 24 months and social skills at 15 years of age (Alviso, 2013). With these studies, the current study finding of the significant association between early attachment quality and self-regulation during the middle school years would give implications for extending the developmental period in attachment research.

It should be noted that the scale for assessing the self-regulatory capacity in the present study includes a number of emotional and also behavioral self regulations in peer contexts. As attachment processes are usually activated in emotionally evocative contexts and an attachment figure’s responsiveness and sensitiveness to a child’s emotional needs provide a critical context within which the child develops strategies of emotional regulation (Mikulincer et al., 2003; Sroufe & Waters, 1977), attachment theory has clear implications for the emergence of early
emotional self-regulation. However, self-regulation, which is generally defined as the capacity to voluntarily control/alter any of a person’s own inner states or responses (Vohs & Baumeister, 2004; Eisenberg & Spinrad, 2004) occurs on a number of different and interrelated levels (Eisenberg et al., 2001; Posner & Rothbart, 2000). The construct, therefore, is observed by physiological, attentional, emotional, behavioral, cognitive, and interpersonal or social processes (Calkins & Fox, 2002). Indeed, previous studies defined and measured self-regulation in a variety of ways such as emotional expression, the relationship between emotionality and regulation, attention, task persistence, and effortful control (Belsky, Fearon, & Bell, 2007; Drake et al., 2014; Eisenberg et al., 2001, Nelson & Perry, 2015; Shoda, Mischel, & Peake, 1990). Thus, the interpretation of the current study findings should be specific to emotional and behavioral aspects of self-regulation. Future studies that integrate multiple aspects of self-regulation would enhance the understanding of the multiple levels of child functioning that may be influenced by the early attachment processes.

Also, the developmental pathway of self-regulation showed stability across the middle school years. More importantly, the significant second-order stability path from self regulation at grade 3 to grade 5 revealed that the early established self regulatory capacity had an enduring effect regardless of its level at grade 4. Given the significant association between attachment and self-regulation at grade 3, this result addresses that early attachment quality plays an important role in the developmental continuity of self-regulation through its effects on early self-regulatory capacity. The critical role of secure attachment supports a central tenet of attachment theory—attachment as a behavioral system functions in a dynamic interplay with exploratory behavioral systems. According to this view, secure attachment children tend to use their mothers as a “secure base” from which to develop and maintain exploratory activities (Ainsworth, Bell,
&Stayton, 1971), and the repeated and successful experiences with exploration promote the
growth of autonomy and skills for self-regulation (Matas et al., 1978).

The positive association between self-regulation and social adjustment in terms of fewer
behavioral problems and higher levels of social skills accords with previous research, which
indicated that children’s ability to control their thoughts, emotions, impulses, and behaviors are
essential to achieve social goals in a socially appropriate and effective way (Eisenberg, Fabes,
Guthrie, & Reiser, 1997; Eisenberg, Michalik, et al., 2007; Moffitt et al., 2011; Vohs &
Baumeister, 2004). Contreras et al. (2000) found that emotional regulation, including arousal and
attention deployment, mediated the relationship between secure attachment and peer social
behavior. Overall, the findings of the current study suggest that self-regulation is a key
mechanism that accounts for attachment and later social adjustment links.

Second, this study also hypothesized that attachment at 36 months would predict hostile
attribution bias, and its developmental continuity, in turn, would predict social adjustment in 6th
grade. This hypothesis builds on the internal working models concept of attachment theory. That
is, internal working models emerge from repeated interactions with attachment figures and
influence the automatic processing of social attributions, such that a securely attached child who
had positive internal working models of others are less likely to attribute hostility to others’
actions. A few studies provide evidence of this theoretical link between an early attachment
relationship, internal working models, and children’s processing of social attributions; for
example, Suess, Grossman, and Sroufe (1992) found that an insecure-avoidant infant-mother
attachment at 12 and 18 months was associated with negative attributions of peer intent at age 5.
Similarly, securely attached children, aged 15 to 18 months, had more positive representations
about peer intent in ambiguous situations two years later than insecurely attached children did
(Cassidy, Kirsh, Scolton, & Parke, 1996). In the current study, however, attachment was not associated with children’s hostile attributional bias.

There are several possible explanations for this finding. The first explanation may be associated with the conduct of the assessment of hostile attributional bias. Internal working models operate to information processing through a series of processes: internalizing early experiences with an attachment figure, storing these experiences in one’s long-term memory, and recalling and applying mental scripts to interpret the present social situation. It is important to note that these processes, through repeated use, function automatically, without conscious awareness (Bowlby, 1980). Use of conscious self-reporting, therefore, may not adequately assess the mechanisms of underlying working models. Relatedly, it is possible that internal working models formed in infancy and early childhood become more complex and sophisticated as children develop more abstract cognitive abilities (Bowlby, 1982). School-age children are more capable of understanding of potential discrepancies between emotional expressions and internal experiences (Gnepp & Hess, 1986; Saarni, 1979). Also, they are more adept at integrating complex cues regarding others’ emotions (Gnepp, 1989). Therefore, using more implicit measures to assess automatic activation of IWMs, such as neuroscience, neuroimaging techniques or physiological measure, would provide a strong basis for examining the function of internal working models.

Alternatively, this unexpected finding may indicate that other influences may involve children’s responses to the measures used to assess hostile attribution. That is, although internal working models of attachment may lead to more or less negative attributions of others’ intents in an automatic sense, there may be other intervening processes that influence a child’s actual response. Internal working models are generally assumed to have a stable attribute over time;
however, IWMs are also viewed as dynamic representations that can be updated, elaborated, or revised as one’s development and life circumstances change (Bowlby, 1973; Hazen & Shaver, 1987). Two conscious levels of mediums, inter-personal communication of model content and intra-personal self regulation of existing latent mental structure, can involve useful model revisions and extensions (Poetromonaco & Barrett, 2000). For example, McElwain et al. (2008) reported that early attachment quality was not directly associated with school age children’s hostile attributional bias; instead, it had indirect effects through emotional communication with a mother. That is, children who experienced greater attachment security with their mothers at 36 months tended to engage in more open emotional communication with mothers at 54 months. Open communication at 54 months, in turn, was associated with fewer hostile attributions in grade 1, which predicted a greater teacher-reported friendship quality in grade 3.

The current study suggested self-regulation as intra-personal mediums linking attachment quality and hostile attributional bias, and the findings supported this hypothesis. Previous studies support the claim that children who are well regulated have the ability to attenuate negative emotional responses to events, and may be more likely to consider contextual or other factors when evaluating intent. For example, among children with a greater tendency to make hostile attributions in grade 3, lower self-control in grade 3 was associated with greater initial hostile attributions bias and less decline in biases through grade 5 (Nelson & Perry, 2015). Castro, Merk, Koops, Veerman, and Bosch (2005) found that aggressive boys who reported more hostile attributions in response to videotaped vignettes concerning provocations by peers also reported more anger and less adaptive emotion regulation strategies than boys in the comparison group.

The aim of this study was to provide a conceptual framework in understanding the development continuity—how early life experience (early attachment experience with a mother)
has a long term influence on later social adjustment. Drawing on the internal working models concept of attachment theory and social information theory, the current study indicates that early attachment relationships influence children’s later social adjustment through the developmental continuity of self-regulation and further via time lagged effects from self-regulation to hostile attributional bias. These findings extend prior work on attachment and its developmental outcomes by suggesting the utility of a longitudinal mediating process model in investigating the long term influence of early life experiences.

Despite significant findings, several limitations should be mentioned. Model specification such as extension to later periods, replication with other samples, and testing alternative models to incorporate more complex mediating processes is critical in explaining and understanding enduring effects of early life experiences (Maruyama, 1998). The current study focused on the self-regulatory capacity and hostile attributional bias as key mechanisms linking early attachment and subsequent adaptation. However, early attachment quality was also directly associated with later social adjustment in the findings, and this indicates that there may be additional omitted variables accounting for the linkage between attachment and later social adjustment. For example, previous studies suggested the joint contribution of emotional reactivity and self-control on children’s social behavior (Bengtsson & Arvidsson, 2011; Eisenberg & Fabes, 1995; Eisenberg et al., 1996). That is, emotion regulation moderates the influence of emotional reactivity on social behavior such that high emotional reactivity is problematic only when children are low in regulatory abilities. Considering that a child’s interpretation itself can lead to the high levels of negative emotion (Crick & Ladd, 1993), including emotionality may produce reciprocal relationship with hostile attributional bias. In the current model, there were no effects from hostile attributional bias to self regulation. Relatedly, a
child’s temperament, whether he/she is easy or difficult to deal with, may involve the process of predicting social adjustment. Future work can extend the current model by including these other variables.

This study used mothers’ reports on children’s behavioral and emotional regulation to assess self-regulatory capacity. Advances in neurobiology revealed the connection between attachment relationships, infants’ early developing right hemisphere, and children’s coping capacities (Shore, 2001). Thus, exploration of how early experiences may shape the brain systems that control behavior provide a deeper understanding of the relationship between attachment and the development of self-regulation. Additionally, the results are based on a predominantly middle-class sample. The results are therefore generalized only to relatively stable and low-risk populations. Future research needs to consider measurement complications and a diverse SES sample.

The main goal of the current study was to investigate the developmental continuity utilizing repeated assessment of study constructs rather than to focus on the individual differences in development trajectories. However, there can be heterogeneity (individual difference) in the developmental trajectories. For example, most children maintain a decrease in hostile attributional bias during school years with increasing social cognitive awareness; some children may, however, have more difficulty in this process. Future research needs to examine the variability in developmental trajectories and how much early life experiences are responsible for this variance, using growth mixed modeling.

Despite these limitations, the current study has identified previously unexamined mediating mechanisms involved in the long term association between early attachment quality and later social adjustment. Further, inclusion of the large sample size and an extensive set of
demographic covariates in the model yield increased power and reliability to detect the mediating mechanisms. The working models concept has been the foundation for attachment research; however, the characteristics of working models tend to be general, and many of their core features such as the content, structure, and stability have yet to be fully explored (Pietromonaco & Barrett, 2000; Thompson, 2008). The current study addresses this gap by examining the development pathway of hostile attributional bias and self-regulation as working channels of internal working models. The significant association between self-regulation mostly focused on emotional and behavioral aspects, and hostile attributional bias suggests that further research should be conducted to examine affect-related processes that underlie working models.

Findings from the current study will be useful in intervention for school-age children’s social competence. The model results clearly showed that self-regulation played a key role in the association between attachment and later developmental outcomes including interpretation of social situations, behavioral problems, and social skills. This implies that attachment relationships facilitate the development of self-regulatory mechanisms, which in turn allow the children to achieve the capacity of coping with social situations and demands. Viewed from this perspective, providing adequate support in children’s earliest relationships would be an effective intervention strategy.
CHAPTER 4
CONCLUSION

Evidence for the long reach of early childhood experiences has been demonstrated over many years. Attachment theory has provided important concepts to understand developmental continuity, such that a child’s experience with sensitive and warm caregivers contributes to forming secure attachment and thereby promoting later competence and positive adaptation. This dissertation aims to move a step toward understanding the underlying mechanisms linking early experiences to later social adjustment. Guided by the ecological perspective, I examined the antecedents and consequences of early mother-child attachment quality adopting process-oriented models. From an ecological perspective emphasizing multilayered contexts in which development occurs, mothers’ employment status influences the quality of the interactions with their children which in turn influence their children’s development. Overall, the results of this dissertation support the ecological view that specific aspects of maternal employment influence maternal and child behavior, and the findings also address the importance of mother-child attachment quality connecting contextual factors and children’s social adjustment.

In the first study, I tested a conditional process model linking maternal employment to mother-child attachment quality. The results revealed mothers’ working status influenced later attachment quality through depressive symptoms and maternal sensitivity. Also, mothers’ attitude toward maternal employment moderated the effects of employment status on depressive symptoms. In a second study, I tested an integrated model of self-regulation and hostile attributional bias as intrapersonal processes through which attachment security was associated
with children’s later social adjustment. The results indicated that early attachment relationships influenced children’s later social adjustment through the developmental continuity of self-regulation and further via time lagged effects from self-regulation to hostile attributional bias. These findings suggest several strategies for intervening to prevent the development of externalizing behaviors and for promoting social skills. First, efforts to enhance maternal sensitivity should contribute to a secure attachment relationship. Such efforts could contribute to the prevention of problem behaviors and low social skills given evidence showing the effects of secure attachment on later children’s self regulation, which was directly associated with later social adjustment. The moderating effects of maternal attitudes toward employment on the association between employment status and mothers’ depressive symptoms suggest early intervention could be conducted by improving the work environment to relieve caregiving concerns or to balance childcare and work especially during the transition to parenthood. Also, the result that the self-regulation processes mediated effects of early attachment quality on later social adjustment suggests that direct efforts to improve children’s self regulatory capacity should also be considered. Given that self regulation was associated with less hostile attributional bias, the intervention to target increasing children’s self-regulatory capacity could be more effective.

Several limitations should be considered when interpreting this dissertation results. First, human development unfolds through complex and dynamic processes involving several environmental systems from micro to individual. The results of this dissertation do not intend to conclude that the influences of early childhood experiences on later development are deterministic; rather these results suggest one of the possible mechanisms of the child development pathway. Relatedly, the models tested do not prove the causal relationship between
variables without direct experimental manipulation, even though they used longitudinal data with repeated assessment. Despite these limitations, the findings are noteworthy in that the models were tested with a large sample size and included a comprehensive set of demographic factors as covariates. This dissertation will make an important contribution by elucidating different mechanisms involved in the relationship between mothers’ employment, early mother-child attachment quality, and children’s later social adjustment.
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Now I'd like to update our information on your employment. Last time we talked to you, you
(were not/were) employed. What is your work situation now?

Are you working for pay now? Yes
No
APPENDIX B

MATERNAL SENSITIVITY RATINGS

24-Month Lab Visits Mother/Child Interaction Mother Ratings

1. Sensitivity/responsivity
2. Intrusiveness
3. Detachment/disengagement
4. Stimulation of development
5. Positive regard for the child
6. Negative regard for the child
7. Flatness of affect

Response format:

1 = Not at all characteristic
2 = Minimally characteristic
3 = Moderately characteristic
4 = Highly characteristic
5 = No opportunity to observe

Maternal Sensitivity Composite:

Sensitivity/responsivity + (- intrusiveness) + positive regard for the child
APPENDIX C

DEPRESSIVE SYMPTOMS QUESTIONNAIRE

The 20 statements below describe how people sometimes feel about themselves. Please answer all questions. THERE ARE NO RIGHT OR WRONG ANSWERS. Give your honest opinions and feelings. Please fill in the box that indicates how often you have felt this way during the past week.

1 - Rarely or none of the time (less than once a week)
2 - Some or all of the time (1-2 days a week)
3 - Occasionally or a moderate amount of time (3-4 days a week)
4 - Most or all of the time (5-7 days a week)

____________________________

1. I was bothered by things that usually don't bother me.
2. I felt that everything I did was an effort.
3. I felt I was just as good as other people.
4. I had trouble keeping my mind on what I was doing.
5. I felt sad.
6. I felt fearful.
7. I felt lonely.
8. I had crying spells.
9. I talked less than usual.
10. My sleep was restless.
11. I enjoyed life.

12. I felt that I could not shake off the blues even with the help of my family/friends.

13. I thought my life had been a failure.

14. I was happy.

15. I could not get "going"

16. I felt hopeful about the future.

17. People were unfriendly to me.

18. I did not feel like eating; my appetite was poor.

19. I felt depressed.

20. I felt that people dislike me.
APPENDIX D

ATTITUDES TOWARD MATERNAL EMPLOYMENT QUESTIONNAIRE

This questionnaire is designed to learn more about what people think happens to children if their mothers work full time outside the home. We want to know what parents think about this. Please fill in the number that indicates how strongly you agree or disagree with each statement.

1. Children are less likely to form a warm and secure relationship with a mother who is working full time.

2. Working mothers are more likely to have children with psychological problems than mothers who do not work outside the home.

3. Young children learn more if their mothers stay at home with them.

4. Children whose mothers work are more likely to be left alone and exposed to dangerous situations.

5. Children do better in school if their mothers are not working full time outside the home.

6. Children whose mothers work suffer because their mothers are not there when they need them.

Response format:

1- Disagree very strongly
2- Disagree strongly
3- Disagree
4- Agree
5- Agree strongly
6- Agree very strongly
APPENDIX E

OCCUPATION TYPE QUESTIONNAIRE

What kind of (business/organization) is that?

RECORD TYPE OF PRODUCT, PRIMARY ACTIVITY, OR NATURE OF BUSINESS

Job 1: ________________________________ Job 2: _________________________________

CODE OCCUPATION ACCORDING TO MOTHER’S RESPONSE, USING OCCUPATION CODING DEFINITIONS. VERIFY WITH MOTHER AS NEEDED.

1 Executive, administrative, or managerial

2 Professional

3 Technician or related support

4 Sales

5 Administrative support or clerical

6 Private household

7 Protective service

8 Service

9 Farm operation or management

10 Mechanic or repairer; construction or other trade

11 Machine operator, assembler, or inspector

12 Transportation or material moving

13 Handler, equipment cleaner, helper, or laborer
APPENDIX F

SELF-REGULATION QUESTIONNAIRE

Read each item and think about your child’s present behavior. Decide how often your child does the behavior described.

1. Politely refuses unreasonable requests from others.
2. Responds appropriately to teasing from friends or relatives of his or her own age.
3. Responds appropriately when hit or pushed by other children.
4. Avoids situations that are likely to result in trouble.
5. Controls temper in conflict situations with you.
6. Ends disagreements with you calmly.
7. Speaks in an appropriate tone of voice at home.
8. Controls temper when arguing with other children.
9. Compromise in conflict situations by changing own ideas to reach agreement.
10. Receives criticism well.

Response format:

0- Never
1- Sometimes
2- Very often
APPENDIX G
HOSTILE ATTRIBUTIONAL BIAS INTERVIEW

STORY 1: RADIO STORY

Imagine that you brought your new radio to school today. You saved up your allowance to buy the radio and you want to show it to the other kids at school. You let another kid play with it for a few minutes while you go get a drink of water. When you get back, you realize that the kid has broken your radio.

1. Why did the kid break your radio? Remember to circle the letter for your answer.

   A. The radio wasn’t made well.
   B. It was an accident.
   C. The kid was mad at you.
   D. The kid was jealous of you.

2. In this story, do you think the kid was

   A. Trying to be mean.
   B. Not trying to be mean.
STORY 2: MILK STORY

Imagine that you are sitting at the lunch table at school, eating lunch. You look up and see another kid coming over to your table with a carton of milk. You turn around to eat your lunch, and the next thing that happens is that the kid spills milk all over your back. The milk gets your shirt all wet.

1. Why did the kid spill milk all over your back?
   A. The kid slipped on something.
   B. The kid just does stupid things like that to you.
   C. The kid wanted to make fun of you.
   D. The kid wasn’t looking where (he/she) was going.

2. In this story, do you think the kid was
   A. Trying to be mean.
   B. Not trying to be mean.
STORY 3: SHOES STORY

Imagine that you are walking to school and you’re wearing your new shoes. You really like your new shoes and this is the first day you have worn them. Suddenly, you are bumped from behind by another kid. You stumble and fall into a mud puddle and your new shoes get muddy.

1. Why did the kid bump you from behind?
   A. The kid was being mean.
   B. The kid was fooling around and pushed too hard by accident.
   C. The kid was running down the street and didn’t see you.
   D. The kid was trying to push you down.

2. In this story, do you think the kid was
   A. Trying to be mean.
   B. Not trying to be mean.
APPENDIX H

SOCIAL SKILLS QUESTIONNAIRE

Please evaluate the child’s performance in the following academic areas, using the scale below.

How good is the child at these skills?

1. Understands others’ feelings
2. Is socially aware of what is happening in a situation
3. Accurately interprets what a peer is trying to do
4. Refrains from over-impulsive responding
5. Generates many solutions to interpersonal problems
6. Generates good quality solutions to interpersonal problems
7. Is aware of the effects of his/her behavior on others

Response format:

1- Very poor
2- Somewhat poor
3- Average
4- Good
5- Very good