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IN THE CONTEXT OF DOMESTIC VIOLENCE

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A LONGITUDINAL EXAMINATION OF EMOTION REGULATION ACROSS EARLY DEVELOPMENT: INFANT ATTACHMENT AND MATERNAL PARENTING IN THE CONTEXT OF DOMESTIC VIOLENCE

By

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ABSTRACT

A LONGITUDINAL EXAMINATION OF EMOTION REGULATION ACROSS EARLY DEVELOPMENT: INFANT ATTACHMENT AND MATERNAL PARENTING IN THE CONTEXT OF DOMESTIC VIOLENCE

By

Carolyn Joy Dayton

Many clinical disorders can be understood as fundamentally related to deficits in the capacity for emotion regulation (Mullin & Hinshaw, 2007). Attachment theory argues that regulation strategies develop within the context of the primary attachment relationship in early childhood (Bowlby, 1969/1982). In addition, exogenous factors such as trauma exposure may also influence the development of regulatory capacities (Osofsky, 1999). Exposure to domestic violence (DV) may be particularly influential in that it directly threatens the child's wellbeing while simultaneously threatening the young child's most important regulatory mechanism: the attachment figure.

In a sample of heterogeneous-for-risk families relative to SES and DV, this study examined the influence of infant attachment, cumulative DV exposure and concurrently-assessed parenting behaviors on the emotional self-regulation and externalizing and internalizing behaviors of four-year-old children. Compared to the securely attached group, children with ambivalent attachment histories demonstrated higher levels of dysregulation and engaged in increased levels of other-focused regulatory strategies that were both ineffective and developmentally regressed. Results were broadly consistent with prior findings demonstrating the effects of infant attachment on preschool regulation capacities at the dichotomous (secure/insecure) level of analysis (Gilliom, et al., 2002). These results add to this literature by examining these constructs at the typological level.

Contrary to predictions, neither infant attachment nor child self-regulation capacities influenced child psychopathology. It is argued that the concurrent assessment of child regulation and psychopathology may have influenced these results. Specifically, it may be that deficits in self regulation only begin to influence externalizing and internalizing behaviors as they interact with negative social feedback over time.

Consistent with prior work, maternal DV exposure negatively influenced positive parenting (Levendosky & Graham-Bermann, 2000). The current study contributes to the literature by examining the influence of cumulative DV across early parenting. In contrast, child DV exposure did not directly influence child outcomes. A possible indirect influence of DV on child outcomes via its impact on maternal parenting is hypothesized.

Finally, proximal positive parenting negatively influenced child externalizing behaviors. In contrast, parenting did not influence child internalizing behaviors or child regulatory capacities. Maternal preoccupation with the violence may be associated with a diminished capacity of the DV-exposed women to attend to and report the subtle signs of internalizing behaviors. In addition, the lack of association between parenting and child regulatory capacities is understood as possibly related to the transitional nature of parenting during the preschool period. Parenting may be transitioning to accommodate the child's increased psychosocial skills such that earlier parenting is more influential on the child's internalized strategies for emotional self-regulation.

To my family.

My mother who loved me first.
My father who believed in me always.
My sister who brings me joy.
My husband who holds my heart.
My niece and nephew whose love feeds my soul.
My son who is my world.

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

A Longitudinal Examination of Emotion Regulation across Early Development: Infant Attachment and Maternal Parenting in the Context of Domestic Violence

INTRODUCTION

The capacity for emotion regulation has been described as central to healthy psychological functioning in both child and adult populations (Bradley, 2000; Gross, 2007). Relatedly, the theoretical relationship between emotional dysregulation in early development and the development of psychopathology has recently received increased empirical attention (Eisenberg et al., 2001; Hill, Degnan, Calkins, & Keane, 2006; Lewis et al., 2008). Indeed, the most prevalent forms of psychopathology can generally be subsumed under the higher order categories of internalizing and externalizing behaviors (Lahey et al., 2008), and are increasingly being described as directly related to deficits in the capacity for emotion regulation (Campbell-Sills & Barlow, 2007; Mullin & Hinshaw, 2007).

Two of the primary theoretical orientations that have informed the exploration of child regulation capacities beginning during the infancy period are the temperament and attachment fields. Both of these literatures argue for causative links between early infant regulation processes and subsequent self-regulation abilities later in child and adult development (Calkins, 2004; Cassidy, 1994; Crittenden, 1995; Gunnar, Mangelsdorf, Larson, & Hertsgaard, 1989; Rothbart, Posner, & Kieras, 2006; Seifer, 2000). While empirical investigations examining the influence of early child temperament on later regulatory and psychosocial functioning have been widely reported (for a review see Nigg, 2006), the link between early attachment experiences and later child regulation

capacity has received almost no empirical attention (Calkins, 2004). The current study fills this empirical gap by investigating the relationship between infant attachment strategy and later capacities for emotional self-regulation during the preschool period. In addition, the influence of self-regulatory deficits on the development of externalizing and internalizing behavioral symptoms is explored.

The present review examines the constructs of emotion and emotion regulation from a multi-disciplinary and multi-modal (e.g., emotional, behavioral, cognitive) perspective. The human emotional system, as well as the processes that regulate it, are understood to be complex and dynamic. Consequently, definitional consensus both across and within disciplines has been somewhat elusive. In a recent inter-disciplinary integration, Gross and Thompson (2007) defined *emotion* as an integrated multisystem response to a person-situation transaction that both compels the attention of an individual and to which the person ascribes particular meaning. Further, *emotion regulation* is understood to occur when a person shifts from a dysregulated emotional state (the 'multisystem response') to a regulated state, regardless of the process that facilitates this shift. This process, for example, is evident from the beginning of life, when a newborn cries due to hunger, is fed a bottle, and stops crying; the caretaker's intervention results in the infant moving from a dysregulated to a regulated emotional state. In contrast, the process of emotional *self*-regulation does not become possible until later in development (Rothbart et al., 2006; Sroufe, Egeland, Carlson, & Collins, 2005) As defined in this review, and described in greater detail in chapter one, the definition of emotional *self*-regulation involves the ability to: 1) perceive emotionally-salient stimuli, 2) adapt or adjust one's reactions to emotionally-salient contextual stimuli such that, 3) one's

experiences and behaviors are modified when necessary to meet one's goals. This process can include both conscious (deliberate) and unconscious (automatic, learned) responses to internal (cognitive) and external (environmental) stimuli. The emergence and development of emotional self-regulatory capacities unfolds over the course of early childhood. For example, there are discrete self-regulatory behaviors (e.g., gaze shifting) that become available in infants as young as three to four months of age (Rothbart et al., 2006). However, as described later in this review, a coordinated, integrated and internalized system of emotional self-regulation does not become consolidated until children reach preschool age (e.g., 3.5 to 4.5 years) (Kopp, 1989; Sroufe et al., 2005).

Fundamentally a theory of emotion regulation (Schore, 2003), attachment theory posits that early interactions with the primary caretakers(s) are internalized in the young child through the formation of working models that are learned during infancy and, over time, come to guide automatic behaviors (Bowlby, 1969/1982; Main, Kaplan, & Cassidy, 1985; P. Zimmermann, 1999). Initially driven by the infant's instinctual fear of separation from the caretaker, attachment theory argues that, by the first year of life, the infant has developed emotional and behavioral regulation strategies that are based on repeated experiences with the caretaker and are designed to keep the caretaker physically close (Ainsworth, 1993). In early infancy, when the child becomes upset, he or she requires actual physical proximity to the caregiver in order for emotion regulation to occur. That is, although temperamental qualities are evident at birth that result in differential thresholds for becoming dysregulated (e.g., "fussy" versus "calm" babies), the very young infant is not yet capable of independently adjusting his or her reactions to meet his or her goals. Over time, as development unfolds, regulation capacity and

regulatory strategies are thought to become internal personality characteristics (e.g., schemas, templates, representations, or working models) of the developing child such that they can be described as emotional *self*-regulation strategies. Thus, the attachment behaviors that were initially driven by the infant's fear of separation from the caretaker are ultimately consolidated into an internalized and unconscious template of emotion regulation that is generalized to other relationships and situations (Bowlby, 1969/1982). In this way, the regulation of emotion moves increasingly from a parent-mediated process (e.g., the mother physically comforts the crying newborn) to a child-controlled process (e.g., the child distracts herself by playing with a toy when her mother leaves the room) over the course of development (Kopp, 1989; Sroufe, 1995). Developed, in part, within the context of the child's attachment relationship(s) during infancy, the child's regulation strategy manifests in a more complex manner later in development; a process that becomes consolidated during the preschool years (e.g., approximately 3.5 to 4.5 years of age). This capacity emerges in the preschool-aged child partly as a function of the growing ability for attentional control and cognitive functioning (Crittenden, 1995; Kopp, 1989; Rueda, Posner, & Rothbart, 2005; Sroufe et al., 2005).

While early secure attachment is believed to be important to the healthy social-emotional development of the young child, many other factors are also influential. That is, consistent with the framework of developmental psychopathology, a secure attachment relationship is understood here as one important and proximal characteristic which contributes to adaptive regulation capacities in the young child (Greenberg, 1999). However, it is primarily the confluence of multiple risk and protective factors which best predicts to child social-emotional outcomes (Sameroff, Lewis, & Miller, 2000). During

early childhood development, environmental factors that influence the primary caretaker's parenting capacities are likely to be especially influential on child development outcomes.

In light of this, the current study examined regulatory capacities in a sample of mothers and children, many of whom have been exposed to domestic violence (DV) across the first 4 years of the child's life. During the infancy and early childhood periods of development, trauma perpetrated toward a child's attachment figure is likely to have unique and enduring social-emotional effects due to the centrality of this relationship to the child's early growth and development (Lieberman & Amaya-Jackson, 2005; Osofsky, 2004). Specifically, in the case of DV, the child is exposed to danger that can be expected to activate his or her need for physical proximity to their caregiver, and yet, the caregiver's physical integrity is being actively threatened. In addition, maternal parenting is likely to be negatively influenced by the violence perpetrated against her (Levendosky & Graham-Bermann, 2001a), thereby further compromising the child's development of healthy and adaptive regulatory capacities (Davies & Cummings, 1994).

The current study examined the relationship between an infant's attachment category with the mother at one year of age, and the child's later capacity for emotional self-regulation during the preschool period, using a longitudinal design in a sample of heterogeneous-for-risk children (e.g., relative to DV exposure and SES). Drawing from an established coding scheme, emotional self-regulation was measured using observer-rated behavioral coding of regulatory behaviors in a laboratory environment when the child was four years of age (Whipple, Denburg, & Davies, 1993; Whipple, Fitzgerald, & Zucker, 1995). The relationship between the child's observer-rated regulatory capacities

and parent-rated behavioral reports of externalizing and internalizing symptomatology was also examined (Achenbach, 1991). In addition, the influence of DV exposure and current parenting behaviors on the child's regulatory capacities and behavioral symptoms of psychopathology was examined.

This study is unique in that it examined the direct influence of infant attachment category on the child's later, observer-rated capacity for emotional self-regulation. Although this relationship has been clearly hypothesized within the theoretical literature (Bowlby, 1969/1982; Calkins, 2004; Guttmann-Steinmetz & Crowell, 2006), it had not been directly, empirically examined. Importantly, although the two organized insecure attachment categories have been theoretically hypothesized to influence differential regulatory strategies (over- versus under-controlled), this hypothesized relationship does not suggest that insecure attachment should necessarily result in later psychopathology (Guttmann-Steinmetz & Crowell, 2006). Instead, from a developmental psychopathology framework, insecure attachment is thought to function as a risk factor for later psychopathology in the context of other environmental risk factors. This study examined these relationships in a sample of mothers and children, many of whom are at further psychosocial risk for regulatory deficits due to their exposure to DV and lower SES. The potential influences of DV on the child's regulatory capacities and on the mother's parenting behaviors have been well-described within the theoretical literature (Davies & Cummings, 1994; Levendosky & Graham-Bermann, 2001a; Lieberman & Amaya-Jackson, 2005; Osofsky, 2004). However, while the influence of DV on parenting behaviors had been previously examined empirically, the hypothesized relationship between DV exposure and child regulatory capacities had not. Finally, the current study

examined the mediating influence of regulation deficits on the relationship of infant attachment strategy and later symptoms of child psychopathology. In examining the relationship between child regulatory capacity and psychopathology this study adds to the growing number of empirical studies that have recently begun to examine this relationship (Hill et al., 2006; Stieben et al., 2007). By furthering an understanding of the development of regulatory capacities across the first four years of life, as well as their influence on the development of child psychopathology, this study facilitates a richer theoretical and clinical formulation of how these processes unfold in the lives of DV-exposed young children. In addition to contributing to the empirical literature, results from this study may help to guide future prevention and intervention efforts aimed at reducing the impact of DV on the lives of infants and young children (Graham-Bermann, Lynch, Banyard, DeVoe, & Halabu, 2007; Shavers, Levendosky, Dubay, Basu, & Jenei, 2005).

The current literature review is organized into chapters. Chapter One reviews the theoretical and empirical work examining the structure and function of human emotions and emotion regulation. Chapter Two describes the foundation of the current study which proposes to examine the influence of early attachment experiences on later child regulation capacities during the preschool period. In this chapter attachment theory and its relation to the etiology of emotional self-regulation is reviewed. Chapter Three summarizes the extant research examining the influence of early attachment history on later child regulation capacities and psychopathology. Chapter Four reviews the literature examining the influence of DV exposure on both child regulatory capacities and maternal parenting behaviors. In addition, the influence of concurrently assessed parenting

behaviors on child regulatory capacities is also reviewed. Chapter Five presents the hypotheses and rationale of the current study. Chapter Six describes the methodology of the study. Chapter Seven presents the results of the analyses, and Chapter Eight discusses these results, draws conclusions, and outlines the clinical and research implications of the findings.

CHAPTER 1

EMOTIONS AND EMOTIONAL SELF-REGULATION

The current study was concerned with investigating the developmental pathways leading to emotional self-regulation capacities in a heterogeneous-for-risk sample of preschool aged children. The constructs of emotion, emotion regulation and emotional self-regulation are complex in nature and comprehensive definitions require a multidisciplinary theoretical approach. The following review summarizes the leading theories which have informed current conceptualizations. Following this, Chapter Two outlines the developmental trajectory of the primary attachment relationship on the capacity for emotion self-regulation across the first four years of the child's life.

Emotions: Central to Human Survival and Experience

An understanding of the regulation of emotion hinges on a clear conceptualization of the construct of emotion itself. In fact, since William James' seminal paper, *What is an emotion?* (James, 1884), psychologists have been struggling to understand, define, and study this construct. From an evolutionary perspective, it is clear that emotions are adaptive in promoting the survival of the species (Darwin, 1872/1965; LeDoux, 1996). The well-documented 'fight, flight or freeze' responses, for example, are dependent both on the ability to perceive a dangerous stimulus (e.g. a functioning sensory system) as well as the elicitation of the emotional experience of fear to cue the organism to react (Cannon, 1929; Gray, 1988). Indeed, attachment theory is based on the importance of the evolutionary adaptability of emotions. That is, the ability to experience and express feelings of distress on the part of the infant (e.g. crying) serves an adaptive and protective role in cueing the mother to feel a sense of fear for her offspring. In response to this

feeling, she is compelled to seek contact with, and thereby protect, her infant. Hoeksma and colleagues (2004) have stated that the emotional system, "is inherent in the process of promoting and maintaining life, and is always poised to prevent the loss of physical and psychological integrity" (p. 355). However, despite the fundamental importance of emotions in promoting human survival, definitional agreement across disciplines remains elusive.

While disagreements persist, a review of the literature suggests that emotions are best understood as dynamic processes which are rooted in the neurobiological makeup of human beings and are interrelated with cognitive and behavioral processes (Cole, Martin, & Dennis, 2004). In his work on fear reactions, LeDoux (1996; 2000) has argued for a two-pronged approach to conceptualizing human emotions. Using primarily animal models, LeDoux and his colleagues and contemporaries have used relatively simple methodologies that employ basic behavioral strategies such as pairing methods to condition a fear response to an otherwise neutral stimulus (for reviews see, LeDoux, 2000; Maren, 2001). The biological and neurological implications of these responses are then examined using established surgical techniques in order to identify the brain structures that are associated with the animal's behavioral and physiological responses. Due to their simplicity and the reduced ethical constraints of work with animals versus humans, these studies have yielded valid and reliable results that have been replicated by other research teams. Subsequent to the identification of these neurological processes in animals, more complicated methodologies have been employed with human populations using methods such as fMRI imaging in order to begin to examine these processes in humans (e.g., LaBar, Gatenby, Gore, LeDoux, & Phelps, 1998).

Based on this body of research, LeDoux has argued that, in the case of fear, emotions can be understood as being manifest at two levels. The first level can be described as "bottom-up" in that it involves an immediate fear reaction that is processed outside of consciousness by the amygdala and is not subject to voluntary control. This process is not mediated by cognition and represents neurological mechanisms which evolved relatively early in humans. An example is the immediate urge to freeze or run at the sight of a snake. This urge is relatively automatic and does not require higher levels of mental processing to take place before a person responds physiologically and even behaviorally. Research with human populations has provided consistent support for the role of the amygdala in responding to the detection of emotionally salient (especially negative) stimuli (for a review see Phillips, Drevets, Rauch, & Lane, 2003). In particular, methodological approaches that utilize functional neuroimaging procedures to examine increases in blood flow and activation within amygdala have corroborated findings from work with animals and have also yielded valid, reliable and well-replicated results.

Unlike the primary emotional response of the amygdala, the second fear reaction mechanism proposed by LeDoux (1996; 2000) is closely tied to higher cognitive functioning and is hypothesized as being processed in the neocortex (e.g., "top-down"). LeDoux has argued that this process is under voluntary control, is tied to executive functioning abilities and is influenced by a person's recollections of past experiences. Thus, for example, the secondary fear reaction to seeing a snake may include the realization that one is in danger, the experience or 'feeling' of fear, followed by the cognitive processing of what one should do when one encounters a snake. Research with human subjects has recently begun to support this second part of LeDoux's model. For

example, using f MRI methodology, Phan and colleagues (Phan et al., 2005) exposed adult participants (n=14) to pictures of aversive and arousing stimuli (e.g., pictures of burn victims) and, in alternating conditions, asked participants to either suppress or maintain their emotional response to the pictures. The visual stimuli utilized in this study had been validated in prior research and were standardized with respect to their presentation to the subjects. Subjects were screened to insure that their vision was normal and that they did not endorse current or historical symptoms of psychiatric or neurologic illness. To facilitate the *suppress* condition participants were initially taught how to use the technique of cognitive reappraisal of the stimulus in order to regulate their negative emotional reaction (e.g., imagining that the burn victim was just an actor wearing makeup). In this way, researchers documented changes in neurological functioning during the process of emotion regulation. In support of LeDoux's hypothesis, results demonstrated that exposure to the negative stimuli across both conditions evoked immediate activation of the amygdala. In addition, during the *suppress* condition several frontal regions of the brain were recruited in the effort to regulate (e.g., reappraise) the negative stimuli and the cognitive reappraisal strategy was effective in reducing the associated negative affect. Consistent with these findings, the cognitive behavioral therapy (CBT) literature has demonstrated that negative emotional reactions to both environmental stimuli and internal cognitions can be modified by the use of cognitive reappraisal/restructuring and can then result in different reactions when one encounters that stimulus (external or internal) in the future (e.g., David-Ferdon & Kaslow, 2008).

Within the clinical psychology literature, the syndrome of alexithymia also provides a useful example of LeDoux's proposed dichotomy. Krystal (1988) has described

alexithymia as a condition wherein a person is experiencing the neurobiological correlates (primary emotion functioning) of a given emotion but is utterly unable to cognitively process that emotion (secondary functioning). These individuals can describe physical signs within their body (e.g. the awareness that tears are coming out of their eyes) but they are unable to cognitively identify a feeling state and, therefore, have no way of understanding, articulating, or controlling it. Alexithymic individuals may have the capacity to respond in a physiologically congruent manner to a situation (e.g. crying at a funeral) but their ability to cognitively process their feelings in a way that allows them to internally make sense of them or to articulate their emotional experience is absent. As a result, their ability to integrate the physiological and cognitive aspects of their emotional experiences is impaired and their reactions to emotionally disturbing stimuli tend to be processed as physiological (somatisized) manifestations but not as conscious affective states. In this way, alexithymia essentially could represent a regressed psychological state in adult populations which is presumably similar to the emotional experiences of an infant. That is, at least on a physiological, but not necessarily a fully conscious level, the person perceives the stimulus (e.g., hears that someone has died), and reacts to it in a manner that is congruent with the situation (e.g., cries). However, the person cannot cognitively integrate or understand the relationship between the stimulus and their physiological reaction to it.

Growing empirical evidence has examined the alexithymic patient's inability to cognitively process physiologic emotional reactions (Luminet, Rime, Bagby, & Taylor, 2004; Wearden, Cook, & Vaughan-Jones, 2003). For example, results from one study revealed that, in response to a sad movie, adults who received elevated scores on a

measure of alexithymia demonstrated elevated heart rates (Luminet et al., 2004). However, self-report evaluations of their cognitive and affective processing of the movie content revealed that they experienced the movie as less negative and less important than other subjects and tended to think about (ruminate) the movie less than others. Thus, while their primary emotion processing was elevated, their secondary functioning was incongruent with their physiological response. This study utilized a standardized, well-validated, self-report measure of alexithymia in addition to measures of physiological reactions (e.g., heart rated, blood pressure) that were continuously recorded using computer technology. Participants were recruited from classes for senior citizens (mean age = 63.6). Thus, while the methodology utilized in this study was well-controlled, results may not generalize to other, younger, groups of adults.

Within the child development literature, Cole and colleagues (Cole et al., 2004) have summarized several common assumptions about the definition of emotion shared by most theorists and researchers in this area. First, and consistent with neo-Darwinian theory, emotions are assumed to be biologically-based and adaptive from an evolutionary perspective. Secondly, they constitute an appraisal system which allows for constant monitoring of the environment with the goal of cueing rapid context-specific reactions to changing situations and circumstances. They have described emotions as, "appraisal-action readiness stances, a fluid and complex progression of orienting toward the ongoing stream of experience" (p 320). In this way, for example, the experience of positive emotions would be expected to cue the individual to continue their current behaviors whereas negative emotions would likely lead to strategies designed to effect situational change. Finally, they argued that emotion is best understood as a dynamic process that,

although it is always operating, does not always reach the level of conscious awareness (e.g. as in the individual with alexithymia).

Hoeksma and colleagues (2004) have articulated a similar theoretical approach to understanding human emotional systems as dynamic in nature. Citing the research which demonstrates that the emotional system is rooted in the neurological structures of the brain, they proposed that the positive and negative feedback loops (labeled *emotion circuits* by LeDoux, 2000) which result from the reciprocal projections of these neurological structures function constantly in order to facilitate continuous and dynamic changes within the emotional system. Similar to the arguments made by Cole and colleagues (2004), Hoeksma and colleagues (2004) argued that the healthy functioning of this system results in the ability to perceive and appraise situations in terms of the degree to which they promote the person's goals (e.g. the goal to stay safe and not suffer a snake bite). In addition, Hoeksma and colleagues (2004) identified the construct of *feelings* as distinct from emotions. Similar to LeDoux's model, they defined feelings as involving higher order cognitive processing and serving the role of monitoring the dynamic and ever-changing emotional system. They argued that feelings are, "the private mental experience of emotions" (p. 355). Their model predicts that feelings are somewhat idiosyncratic to each individual and that they allow individuals to make cognitive sense of the dynamic, neurologically-based, and constantly operating emotional system.

Taken together, these various conceptualizations are broadly consistent with the inter-disciplinary integration recently provided by Gross and Thompson (2007), who defined emotion as, "A person-situation transaction that compels attention, has particular meaning to an individual, and gives rise to a coordinated yet flexible multisystem

response to the ongoing person-situation transaction" (p. 5). In other words, the 'response' must be related to an event, either internal or external, and is experienced by the person as meaningful in some way. In the next section, the construct of the regulation of emotion (e.g., regulation of the 'response') will be examined.

The Regulation of Emotion: Definitions and Developmental Considerations

Like emotions, emotional regulation processes also serve basic and adaptive goals of the individual. As children move into the preschool years (e.g., 3.5 – 4.5 years of age), behaviors reflecting emotional dysregulation, which are generally tolerated by the social environment during the infancy and toddler periods, become the targets of social intervention (Sroufe et al., 2005). To a much greater degree than toddlers, preschool-aged children are both expected and capable of controlling their emotions in the service of their own, and society's goals.

Related to the continued debate over the nature, structure and function of emotions, agreement about the definition of emotion regulation has also been elusive even within the child development literature. Further, the constructs of emotion and emotion regulation are often used interchangeably and have proven difficult to disentangle both theoretically and empirically (Cole et al., 2004). In their attempt to differentiate these constructs, Hoeksma and colleagues (2004) have used signal and system theory as an organizing framework. They described the difference between emotion and emotion regulation as similar to the difference between a physical dynamic system and the mechanism by which that system is controlled. Using this heuristic, they outlined three defining elements of emotion regulation. The first involves the conditions necessary to trigger active control of the system. In the case of emotions, regulation

becomes necessary when the child's feeling state (e.g., an infant's fear that mother has left the room) signals that the set goal of the emotional system, which is defined as maintaining physical and psychological integrity, is discordant with the current situation. For example, the fact that the mother is physically absent is likely to result in upset feelings on the part of the infant or toddler and thus, to be divergent from the set goal of the emotional system. The second element of emotion regulation involves the goal of the regulation process itself. Here the goal of emotion regulation is defined as returning the emotional system to a state of relative equilibrium (e.g., a reduction in the feeling of fear). Finally, the process of emotion regulation is achieved by altering the input into the emotional system. In the case of the infant or toddler left alone in the room this can be accomplished, for example, by diverting her attention to some other activity (e.g., playing with a toy) or actively seeking to reconnect with the mother (e.g., calling for her mother to return), or, in the case of a preschool aged or older child, by using a cognitive strategy such as remembering that her mother always comes back when she has to leave for a short period (e.g., using a form of *reappraisal*).

In a recent review, Cole, Martin and Dennis (2004) provided an important distinction between emotion and emotion regulation. They argued that emotions "infuse experience with meaning. . . Emotion allows us to evaluate steadily and quickly whether it is in our interest to stay in the chair and to act instantly if we need to escape through the door. Emotion regulation helps us stay in the chair even when we feel compelled to escape" (p. 318). They suggested that the term *emotion regulation* applies both to the process of actively attempting to regulate one's emotional state and to the process

whereby an activated emotion (e.g., happiness) serves to regulate other systems (e.g., memory, learning) in an automatic (e.g., non-effortful) manner.

In contrast to this broad definition, Eisenberg and Spinrad (2004) have argued for a more narrow view of emotion regulation. In their view the term *emotion regulation* as used in child psychology research should be confined to the process of emotion as regulated and not to the process of emotion as a regulator. In addition, they have used the term *emotion-related self-regulation* to highlight the fact that this construct refers to the ongoing modulation of the emotional and physiological state of the individual as well as to the modulation of overt behaviors that are related to emotional experience including behaviors that are intended to influence the social context in an effort to regulate emotion. These authors defined *emotion-related self-regulation* as:

> The process of initiating, avoiding, inhibiting, maintaining, or modulating the occurrence, form, intensity or duration of internal feeling states, emotion-related physiological, attentional processes, motivational states, and/or the behavioral concomitants of emotion in the service of accomplishing affect-related biological or social adaptation or achieving individual goals. (p. 338)

This formulation is critical in the distinction it makes between emotion regulation and emotional self-regulation. That is, the construct of emotion regulation does not necessarily specify the way in which emotion is regulated. For example, environmental factors that are completely beyond the person's control can, nevertheless, result in a shift from a dysregulated to a regulated state (e.g., a tornado watch is called off and the person relaxes). However, most systems of emotion regulation that are proposed and discussed within the child development literature refer to an active process on the part of the

individual child or adult. This process may be or become unconscious over the course of time as with internal working models that are based on attachment experiences. They are not, however, accidental processes. That is, whereas emotion regulation refers only to the shift from a dysregulated to a regulated emotional state, emotional self-regulation refers to a process (conscious or unconscious) that is active on the part of the individual.

Eisenberg's (2002) conceptualization of emotional self-regulation was based, in part, on basic tenets of attachment theory (Bowlby, 1969/1982) as well as the influential work of Block and Block (1980) within the personality literature. To date, attachment theory's most important contribution to investigations of emotional self-regulation involves a theoretical description of the ways in which early relationship experiences lead to basic patterns of emotion regulation in the infant and young child through the formation of internal working models. Due to the centrality of the attachment construct within the current investigation, the relationship between attachment and emotional self-regulation is more fully explored in chapter two.

While they were less interested in the etiology of regulation capacities, Block and Block (1980), in their influential work on this topic, examined the personality development of young children. These investigators conducted comprehensive assessments of a sample of primarily Caucasian, middle- to upper-class, children beginning at three years of age and continuing across the subsequent four years of their development. Subjects were recruited at two university nursery schools. They reported an 80% retention rate across this four year period. Individual assessments as well as parent interviews with both the mothers and fathers of these children were obtained. In addition, multiple well-validated measures of child functioning were included in the protocol,

including measures of intelligence and receptive and expressive language (e.g., WPPSI, PPVT). In addition, qualitative measures were developed and used that tapped both teacher and parent report of child functioning. In addition, the fact that these children were available for evaluation on a daily basis facilitated the collection of a wide range of observational data. Overall, these researchers conducted comprehensive evaluations of multiple domains of child functioning.

In their synthesis of the results of this study, Block and Block (1980) argued that the existing personality systems of individuals can be understood as related to two basic ego structures: *ego control* and *ego resiliency*. *Ego control* represents the person's modal level of "impulse control and modulation" (p. 41). Within this model, two subtypes of exaggerated ego control tendencies were identified. At one end of the spectrum are *overcontrolled* individuals who, irrespective of social context, tend to be emotionally and behaviorally constrained and inhibited. On the other end, *undercontrolled* individuals tend to be extremely behaviorally impulsive and to express their emotions in a manner that demonstrates a high level of emotional lability. These investigators argued that, "extreme placement at either end of the ego-control continuum implies a constancy in mode of behavior that, given a varying world, can be expected to be adaptively dysfunctional" (p. 44). Therefore, within non-clinical samples the majority of individuals would be expected to fall somewhere within the mid-range of this continuum and demonstrate ego-control tendencies which reflect relative levels of over- or under-control.

The concept of *ego resiliency*, in comparison, describes an individual's capacity to dynamically modify their modal level of ego-control in order to adapt to changes

within the environmental context. Thus, the construct of *ego-resiliency* is most suggestive of the capacity for healthy psychosocial functioning and is very similar to Eisenberg's current conceptualization of emotion-related self-regulation. In fact, Eisenberg and colleagues (Eisenberg et al., 2001) have argued explicitly that children who are *well-regulated* are neither over- nor under-controlled. Instead, consistent with the notion of ego-resiliency these authors argued that the capacity for emotional self-regulation involves the ability to adapt to contextual and situational changes in environment in a flexible and spontaneous manner and to alter one's reactions when appropriate. Sroufe and colleagues (Sroufe et al., 2005) have argued that this capacity becomes available when children reach preschool age which they define as emergent at 3.5 years of age and fully consolidated by 4.5 years of age. At this point cognitive, attentional, and language abilities are sufficiently developed to support the child's own self-regulation of her emotional system (Kopp, 1989). The developmental process of emotional self-regulation as it manifests in the preschool period will be more fully described in chapter three.

In addition, Eisenberg (2002) contended that emotion-related self-regulation is best understood as a dichotomous construct that includes both *involuntary* (reactive or impulsive; but not inactive/accidental) as well as *voluntary* regulation. Although she did not reference his work, this model is reminiscent of LeDoux and colleagues' (LeDoux, 1996, 2000; Sotres-Bayon, Bush, & LeDoux, 2004) conceptualization of emotion as involving two levels of neurological activation; primary emotional functioning controlled by the amygdala (e.g., involuntary emotional control) and secondary functioning mediated by the neocortex (e.g., voluntary emotional control). Eisenberg described *voluntary control* as overlapping with Rothbart and Bates' (1998) notion of effortful

control: "the ability to inhibit a dominant response to perform a subdominant response" (p. 137). However, Eisenberg's definition was somewhat broader in scope as compared to Rothbart's. While both included attentional regulation and inhibitory control (in the service of a goal), Eisenberg's conceptualization included the ability to engage in undesired behaviors to attain a desired goal (e.g., cleaning one's room to earn an allowance). Consistent with LeDoux's formulation, Eisenberg (2002) drew on work by Posner and DiGirolamo (2000) who have argued that the frontal structures in the cortex are related to voluntary control, just as they are to executive functioning. Further, she argued that involuntary (e.g., reactive, impulsive) control is associated with subcortical systems such as the amygdala and reflect temperament constructs (which she defines as based in physiological processes) such as fearful avoidance.

Although Eisenberg (2002) contended that her conceptualization of emotion-related self-regulation was based, in part, on attachment theory, attachment theory does not specify *types* of emotion regulation beyond the emotionally deactivated (avoidant; overcontrolled) and emotionally hyper-activated (ambivalent; undercontrolled) categories (described in Chapter 2). However, because voluntary control does not become fully consolidated until the preschool years (Kopp, 1989), it is likely that the infant's early attachment experiences are related in part to reactive processes that are dependent on the physiological makeup of the child such as the child's temperamental characteristics (Belsky & Rovine, 1987; Calkins & Fox, 1992; Mangelsdorf, Gunnar, Kestenbaum, Lang, & Andreas, 1990; Seifer, 2000; Sroufe, 1985; vandenBoom, 1994). For example, Rothbart and colleagues (Rothbart et al., 2006) have demonstrated that infants as young as 4 months of age are capable of both deliberate and automated forms of self-regulation

through behaviors such as attentional shifting, oral stimulation and respiratory changes. They argued that, "mechanisms used early [in infancy] to cope with negative emotion may later be transferred to the control of cognition and behavior. (p. 341). These individual self-regulation behaviors have been identified in early infancy and have been demonstrated to be related to measurements of child temperament (Rothbart, Ellis, Rueda, & Posner, 2003).

As the child matures, cognitive processes (e.g., attentional regulation, executive functioning) become increasingly sophisticated and lead to a more fully consolidated system of self control abilities that can be used in the service of maintaining an emotional set goal (e.g., felt security, excited exploration of a toy). As is described in the next chapter, this process does not necessarily require conscious awareness. That is, internalized representations are hypothesized to influence behavior even though they are not conscious (N. L. Collins & Read, 1994). As described by Kopp (1989), this proposed evolution of the child's growing and changing capacity for emotional self-regulation is consistent with theories of development that have described the existence of latent constructs (e.g., regulatory abilities) as manifesting differently at different developmental stages.

Emotional Self-Regulation: A Summary and Formulation

In sum, there are disagreements both across and within disciplines about the structure and function of human emotions and the definitions of emotion regulation and emotional self-regulation. Consistent with Eisenberg and Spinrad's (2004) definition, there appears to be an important distinction between emotion regulation and emotional

self-regulation. A synthesis of the extant literature suggests the following requisite abilities and definition of the process of emotional self-regulation:

First, it is clear that emotions can be elicited either by external (e.g., environmental) or internal (e.g., cognitive) stimuli and that the stimuli may manifest either consciously or unconsciously to elicit an emotional reaction (Gross & Thompson, 2007). Thus, the capacity to experience emotions requires that the individual posses either a functioning sensory system or a functioning cognitive system.

Secondly, the individual must have the ability to detect emotion-salient stimuli, although the detection process need not be conscious. For example, alexithymic individuals appear to meet this criterion due to the fact that their physiologic responses are generally congruent with external stimuli (e.g., crying at a funeral), even though their abilities to understand, articulate and cognitively process the stimulus are impaired or absent. Furthermore, clinical examples of detection deficiencies reinforce this point. For example, individuals who do not detect danger when it is present (e.g., some individuals with autism), are exhibiting an underdeveloped ability to detect emotion-salient stimuli. In contrast, individuals who demonstrate a hypersensitive reaction to environmental stimuli (e.g., individuals suffering from certain phobias and some forms of obsessive compulsive disorders) react with fear to innocuous stimuli. In each of these cases, the "appraisal-action readiness stance" described by Cole and colleagues (Cole et al., 2004), is misattuned resulting in either the under- or over-appraisal of emotion-salient information.

A third point involves responses to emotional stimuli and returns to the two-pronged approach described by both LeDoux (1996; 2000) and Eisenberg (2002).

Specifically, individuals are thought to react in one of two ways to the emotion-salient stimuli they detect. The first involves a physiological reaction that initially occurs outside of conscious awareness and appears to be processed by the amygdala (e.g., seeing a snake results in physiologic arousal). The second involves a learned response reaction based on the individual's lived experiences (e.g., hearing a favorite piece of music and experiencing positive feelings). This too, may be processed outside of conscious awareness but is likely processed in more recently developed areas of the cortex such as the frontal regions (Phan et al., 2005).

Subsequent to detection and response, the process of emotional self-regulation, per se, involves the modification of one's emotional reactions in the service of one's goals (Eisenberg, 2002). This process can occur on a conscious or unconscious level and can involve both active and automatic processes. For example, Rothbart and Bates' (1998) notion of effortful control: "the ability to inhibit a dominant response to perform a subdominant response" (p. 137), described a voluntary, active regulation process. An example of this process is a child's capacity to hold a small candy on the tongue for a period of time without eating it in an effort to win a bigger prize (Murray & Kochanska, 2002). A further example of a conscious emotional regulation process involves cognitive techniques that teach individuals to stop particular thoughts (e.g., self deprecating thoughts) that are leading to painful emotional responses such as depression or anxiety (Beck, 1995). Each of these processes relies heavily on the person's capacity for executive functioning. In contrast, attachment theory, more fully described in the next chapter, posits the existence of unconscious regulation strategies that develop over the course of early infancy based on repeated experience with a primary caretaker and

become automatic templates from which the person understands and reacts to their interpersonal environment.

Finally, based on the developmental trajectory that is described in the next chapter, the emotion regulation strategies that were developed in the context of early attachment experiences become more fully consolidated during the preschool period. At this point in development, due to the more mature cognitive and attentional capacities of the preschool-aged child, these regulation strategies are sufficiently internalized and integrated across the domains of cognition, emotion and behavior such that they are active within a range of social and interpersonal contexts and can be labeled emotional *self*-regulation strategies. That is, the ways in which the child has been learning to think, feel and behave in the context of the attachment relationship become the template from which he or she approaches future experiences and relationships.

Measurement of Emotional Self-Regulation in the Current Study

The measurement of child behaviors and developmental constructs within longitudinal investigations of child development must be adapted at each assessment point in order to adequately assess the changing capacities of the developing child. In light of this, the current investigation measured the child's regulatory processes during infancy in the context of the mother-child relationship (e.g., within the attachment paradigm). Subsequently, the child's emotional self-regulation abilities and strategies were measured during the preschool period apart from the physical presence of the mother. Using their emotional self-regulation systems, children were expected to react to stressful situations differentially based on their early (attachment) experiences with emotion regulation as well as their exposure to traumatic events (e.g., DV) and their

exposure to proximal maternal parenting behaviors (e.g., sensitivity, discipline). It was hypothesized that well-regulated children would evince mid-levels of regulatory capacities. That is, in the context of a stressful situation (e.g., measured during a mother-child separation sequence in an unfamiliar laboratory setting), they were not expected to be markedly over- or under-regulated.

Finally, the influence of these emotion regulatory capacities and deficits on the development of internalizing and externalizing behavioral symptoms was also examined. Specifically, it was expected that, in the context of other psychosocial stressors (DV, SES, insensitive parenting), children who had developed emotion regulation strategies that involved over-control of their emotional experiences (e.g., a "shut-down" emotional system stemming from an earlier avoidant attachment with the primary caregiver) would demonstrate higher levels of internalizing behavioral symptoms. In addition, children who had developed emotion regulation strategies that involved under-control of their emotional experiences (e.g., a "ramped up" emotional regulation and expression style stemming from an earlier ambivalent attachment with the primary caregiver) were expected to demonstrate higher levels of externalizing behavioral symptoms.

CHAPTER 2

ATTACHMENT AND THE DEVELOPMENTAL ETIOLOGY OF EMOTION REGULATION

Originally developed by John Bowlby (1969/1982), attachment theory, along with the empirical investigations it has generated over the last four decades, has been a primary contributor to current theoretical and clinical conceptualizations of emotion regulation throughout the lifespan (N. L. Collins & Read, 1994). Attachment theory posits that the capacity for emotional self-regulation develops in the context of early relationships and is internalized by the developing child through internal representations (e.g., working models) such that the child's regulatory system eventually becomes a relatively stable personality characteristic of the individual.

Drawing on the psychoanalytic, general systems, cognitive and ethological theories of his day, Bowlby emphasized the importance of the primary caretaker (usually the mother) to the survival and healthy social-emotional development of the infant and young child (Bowlby, 1969/1982, 1980). The theory emphasized the fact that human infants, relative even to other mammals, exist for an extended period of time in a state of utter dependency wherein proximity to a caretaker is essential for physical survival and psychological health (Simpson, 1999). A contemporary of Bowlby coming from the *object-relations* tradition, Winnicott underscored this point when he proclaimed, "There is no such thing as a baby" (Winnicott, 1965). With this provocative declaration he sought to emphasize the fact that a human infant will simply not survive without the care and ministrations of an older caretaker. From this perspective, then, the development of

the capacity for emotional self-regulation in humans is fundamentally a relational process.

In this way, the association between early relational experiences and the later ability to regulate one's own emotions and behaviors was central to Bowlby's attachment theory. The theory was informed by his work with delinquent teenage boys who, today, would be described as demonstrating extreme externalizing behaviors suggestive of a DSM-IV (American Psychiatric Association, 1994) conduct disorder or antisocial personality disorder diagnosis (Bowlby, 1944). Bowlby argued that disrupted early relationship experiences could partly account for the delinquent (externalizing) behaviors these boys were demonstrating. Developed in the context of his study of child psychopathology as well as ethology and evolutionary theory, Bowlby's attachment theory held that human infants and young children must remain in close physical proximity to an adult caretaker in order to physically survive and for psychological health (e.g. security, emotion regulation) to develop. Working within this theoretical perspective, Sroufe and Waters (1977) later introduced the term *felt security*, emphasizing the need for the psychological availability of the caretaker to the infant and young child within an organized attachment system in this process. In other words, beyond simple physical proximity, the caretaker must remain *psychologically* available and responsive to the infant's needs in order for the infant to experience a sense of safety and security which will allow for exploration of the environment and normal developmental growth to occur. From this perspective, the adult, through her presence and responsiveness to the infant in a relational context, provides the physical and psychological structure the infant needs to experience a sense of physio-emotional

regulation and safety (Bowlby, 1969/1982; Fonagy, Gergely, Jurist, & Target, 2004; Schore, 2003; Weinfield, Sroufe, Egeland, & Carlson, 1999). In fact, in the earliest weeks and months of life, the infant requires an adult caretaker to help regulate even the most basic of physiological processes including body temperature, hunger/satiation states and, as some research has suggested, even heart and respiratory rates (Small, 1998).

As the infant progresses developmentally, the primary caretaker becomes critical in assisting the infant in the regulation of states and processes beyond basic survival needs (Cassidy, 1999; Fuendeling, 1998; Sroufe, 1995; Stern, 1985). While the *set goal* of proximity to or access to the caretaker remains the same, infants develop and employ diverse strategies based on their increasing repertoires of cognitive and behavioral abilities to attain this goal. In this way securely attached infants and young children use their caretakers as a means by which to regulate their own emotions and feelings of safety. For example, upon hearing a loud, unfamiliar noise, a pre-crawling infant may cry and wave her arms in the direction of the mother whereas a walking infant will likely walk toward the mother in order to attain physical and psychological closeness and protection from her. Both behaviors serve the same set goal of proximity attainment to the mother, but each child uses the most efficient strategy she has available to achieve that goal. Furthermore, in each case the infant is actively using the mother to alleviate the dysregulating experience of feeling frightened. Physical closeness with the mother helps to bring the child back into a state of emotional equilibrium.

As development unfolds, the securely-attached child internalizes these regulation strategies and therefore becomes increasingly capable of the capacity for emotional self-regulation even when the mother is not present. That is, the initial ability of the parent to

regulate the infant's emotional states (e.g., soothing her when she cries, etc.) becomes internalized as the capacity for emotional self-regulation in the older child. In fact, as the child matures, the comforting presence of the caregiver allows securely attached children to engage in and explore their environment (Bowlby, 1988). In the process of exploration, the child is likely to encounter situations wherein she can, in effect, practice her self-regulation skills (Burgess, Marshall, Rubin, & Fox, 2003). There will inevitably be times, for example, when the child can not immediately connect with (e.g., run to, look at) the mother. In these situations, the child will be required to make an attempt to employ her own emotional self-regulatory abilities. If the stressor is of sufficient intensity that the child is unable to self-regulate, increased attempts to return to the caretaker will likely ensue. However, if the stressor is less intense and the child finds herself capable of self-regulation, she will begin to gain confidence in her own abilities. Beyond the consideration of these developmental differences in attaining a set-goal, however, attachment theory also explicates differential sub-types of attachment relationships which are essentially emotion regulation strategies that have developed within the context of the caregiver-infant relationship. Specifically, as infants gain interpersonal experience with their primary caretaker, they learn that certain behaviors are effective in keeping the mother close, whereas other behaviors tend to be ineffective. As described below, and consistent with the work done by Block and Block (1980), the two insecure organized strategies involve either a strategy of inhibiting (overcontrolling) or amplifying (undercontrolling) one's expressions of emotional upset. Further, these attachment strategies (categories) have been shown to occur cross-culturally (vanIJzendoorn & Sagi, 1999).

Attachment theory owes its status as an empirically-based theory to Mary Ainsworth (Ainsworth, Blehar, Waters, & Wall, 1978). A contemporary of Bowlby, Ainsworth essentially operationalized the study of attachment relationships with the development of the *strange situation* protocol (SSP, Ainsworth et al., 1978). Based on her naturalistic observations of mother-infant dyads in Uganda (Ainsworth, 1967), she hypothesized that in the context of an increasingly stressful situation, the infant's attachment strategy would be activated to ensure that proximity to the caretaker, and consequently, feelings of security, would be maintained. In her laboratory observations of the SSP, Ainsworth documented three distinct and organized strategies exhibited by one-year old, white, middle-class, American infants; one secure type and two anxious types: avoidant and ambivalent. Of equal, if not greater importance to attachment theory and empirical work in this area was the naturalistic observation of maternal behavior Ainsworth conducted in the home environments of these families. While her sample size linking laboratory and home behavior was small (n = 23), her thorough documentation of maternal behavior in the home environment suggested the mechanism through which the infant's attachment strategy developed. What emerged from these data was a striking relationship between infant attachment strategy as observed in the laboratory and maternal caretaking behavior as manifest in the home environment (Ainsworth et al., 1978). These data demonstrated that parenting *mattered*, and it mattered because the infant's emotional regulation strategy with regard to the mother seemed to be based directly on the infant's relationship history with the mother. By one year of age the infant had developed an integrated emotional, cognitive and behavioral regulation strategy in order to effectively make and maintain a relationship with the mother. More recently,

Mikulincer, Shaver and Pereg (2003), have described attachment as, "the systematic pattern of relations and expectations, emotions and behavior that results from internalization of a particular history of attachment experiences and consequent reliance on a particular attachment-related strategy of affect regulation" (p. 79).

In her groundbreaking work, Ainsworth and colleagues (1978) used both naturalistic and laboratory assessments of mothers and infants. Her naturalistic assessments included home observations of mother-child behaviors that spanned multiple hours of recorded observations. One limitation of these data is that Ainsworth was the first to conduct naturalistic observations of mother-infant interactions and thus, did not use standardized observer-rated measures. Although several, more current observer-rated measures of parenting sensitivity are based on her early work (e.g., Biringen, Robinson, & Emde, 2000) the home-visit portion of her study was never fully replicated.

In her early studies, Ainsworth and colleagues (Ainsworth et al., 1978) found that infants demonstrating a *secure* pattern of attachment exhibited their negative feelings openly and sought comfort from their mother following a stressful episode in the laboratory. Specifically, securely attached infants were distinguished from the two organized, insecure categories in that they 1) engaged in some form of contact (e.g., visual, verbal, or physical) with their mother upon reuniting with them and 2) were effectively comforted by that contact. In addition, once comforted, securely attached infants returned to exploratory play. In this way they openly and genuinely displayed their emotions and, by using an active process of seeking contact with their mothers, they used the mother in their efforts to regulate these emotions. In the home environment the mothers of these infants were judged to be sensitive and tender in their caretaking

interactions and were responsive to a wide variety of their infant's emotional displays. Their caretaking behaviors were contingently responsive and attuned to the expressed needs and desires of their infants. More recently, in their meta-analysis examining the association of maternal sensitivity and infant attachment security, DeWolff and van Ijzendoorn (1997) found a moderate positive association between these constructs (n=66 studies; r = .24). While these data supported the hypothesized relationship between maternal sensitivity and infant attachment, they also suggested that other important factors influence the child's early development of attachment-related behaviors. Relative to the manifestation of the secure attachment strategy, Mikulincer and colleagues (Mikulincer et al., 2003) have argued that, "Relatively secure individuals have learned that acknowledgment and display of distress elicit supportive responses from others. . [and that] . . their own actions are often able to reduce distress" (p. 83).

In contrast to the securely attached group, however, infants categorized as *anxious-avoidant* in Ainsworth and colleagues' original study (1978), demonstrated a striking pattern of affective deactivation in the laboratory wherein they appeared not to need the comfort of their mothers at all. They played independently and often seemed impervious to their mother's presence or absence. At home, the mothers of these infants tended to demonstrate a rejecting behavioral pattern, especially when their infants expressed negative affect. For example, their responses to their infant's crying included behaviors such as leaving the infant alone or expressing anger toward the infant. Additionally, they seemed to dislike and avoid physical contact with their infants. In the case of these dyads, the infants' behavioral strategies in the laboratory situation have more recently been described as an effort to maintain proximity to the mother by

deactivating their emotional responses due to their mother's inability to tolerate them (Magai, 1999). Thus, through their interactions with their mothers, these infants appeared to have learned that by inhibiting their outward emotional expressions, they were more likely to reach the set-goal of staying within close physical proximity to their mothers. Their emotional self-regulation strategy appeared to be organized around their experience of interacting with a behaviorally rejecting primary caretaker.

Alternatively, *anxious-ambivalent* infants in Ainsworth and colleagues' (1978) original study demonstrated a hyper-activating strategy in the laboratory setting wherein they desperately attempted to have contact with their mothers but were unable to be soothed by them once contact was achieved. At home the mothers of these infants tended to be inconsistent in providing sensitive caregiving and their interactions with their infants were not contingently based on the infants' cues. These infants have more recently been described as employing a hyper-vigilant strategy wherein they focus their attention exclusively on the mother at the expense of the ability to explore and enjoy the environment (Magai, 1999). Having been inconsistently responded to by their mothers, infants employing an ambivalent strategy appear unable to use their mother in an organizing or regulating manner but nevertheless are always attempting to elicit the warm response which is provided by the mother on an inconsistent basis (Main, 1995). This formulation is consistent with the known behavioral effects of a variable reinforcement schedule (Ferster & Skinner, 1957). That is, positive reinforcement of a behavior that is offered inconsistently tends to result in enduring behavioral patterns that are very difficult to extinguish. In this case, infants who have been positively reinforced for crying

behaviors on a variable schedule are likely to both intensify and continue these behaviors in an effort to achieve subsequent reinforcements.

A fourth attachment classification was later articulated by Main and Solomon (1986), and labeled *disorganized.* At the time of their investigations, the strange situation protocol had been empirically established as a valid and reliable measure. These authors initially examined attachment in groups of mothers with established trauma histories and found that the infants of these mothers often did not demonstrate an organized strategy at all, but instead displayed multiple bizarre and uncoordinated behaviors in response to a stressful situation (e.g. behavioral freezing, uncoordinated and conflicted attempts to gain proximity to the mother). Mothers of these infants have been found to display frightening behaviors such as producing unusual and bizarre vocalizations and displaying sudden intrusive and threatening physical movements into their child's personal space (Solomon & George, 1999). In addition, mothers of disorganized infants have also been found to display behaviors in which they seem to be themselves frightened by their infant's behaviors such as suddenly moving away from the infant in a fearful manner (Lyons-Ruth & Jacobvitz, 1999).

Throughout early development, these repeated experiences in the context of the primary attachment relationship(s) are thought to become internalized as *internal working models* within the child such that, over time, they become more stable characteristics of the child and can be observed outside of the primary attachment relationship(s) (Main et al., 1985). A child's working model of relationships incorporates both cognitive and affective components (Crittenden, 1990) and has historically been conceptualized as an internalized template of behavioral and affective expectations of self and other within

relationships. Over the course of early development in an ongoing and *dynamic* process, the child begins to construct an internal mental model of what to expect in the context of relationships. Once developed, internal working models are powerful psychological constructs in that they not only reflect lived experience but also serve as a template or schema from which to interpret the behaviors of others and to guide their own behavior.

Children with avoidant attachment histories come to expect rejection within the context of relationships and are likely to withdraw emotionally from social experiences and to play independently. Rather than seeking contact with other individuals (either children or adults), these children are likely to focus on engagement with their physical environment (e.g., exploring new toys, playing by themselves). Thus, they are thought to have adopted an internalizing, or overcontrolled emotional self-regulatory style. In addition, since their experiences of difficult emotions cannot be outwardly expressed, they are hypothesized to be at risk for internalizing disorders. That is, their withdrawn and deactivating *emotional* regulation style places them at risk for internalizing *behavioral* disorders.

In contrast, children with ambivalent attachment histories have the experience of being attended to on an inconsistent basis. They have learned to behave in an over-aroused, or undercontrolled manner in an attempt to garner the emotional warmth which has been offered inconsistently. This strategy takes a toll on their ability to fully explore their environment such that these children are likely to spend time clinging to adults and seeking attention through the forceful outward expression of their thoughts and feelings. Thus, the over-aroused and under-controlled emotional self-regulation strategies of these children are thought to put them at risk for externalizing behavioral symptoms

(Guttmann-Steinmetz & Crowell, 2006). Note that, by the preschool period of development, a child who has developed an undercontrolled self regulatory style is likely to self-regulate by seeking contact with others. That is, the preschool-aged child's 'other-seeking' behaviors are understood from the attachment perspective as reflecting their internalized emotional self-regulation strategy. This is fundamentally different from the newborn who is dependent on the caretaker for physical comfort in order for the process of emotional regulation (e.g., moving from a state of dysregulation to a state of regulation) to occur. The preschool-aged child's cognitive, attentional and behavioral systems are sufficiently developed such that they are able to engage in emotional self-regulation (conscious or unconscious). For some preschoolers this includes a pattern of eliciting the 'help' of others (parents, teachers, etc.) in order to self regulate. Notably, these behaviors in preschool-aged children (e.g., whining, crying, pleading) are often responded to by adults with anger and annoyance, thereby reinforcing the child's experience of never being fully satisfied within relational contexts.

In sum, as outlined here, the attachment strategy as measured in one-year-old children is understood as a manifestation of the child's internalized regulation strategy that has developed in the context of the infant's relationship with the primary caretaker. Attachment theory posits that, if this strategy does not undergo changes due to other environmental influences over the course of early childhood (e.g., exposure to traumatic events such as DV or changes in maternal levels of sensitivity), it will become an increasingly stable personality characteristic of the child. In the present study attachment was measured at 12 months of age using Ainsworth's SSP and associations with

preschool emotional self-regulation capacities and behavioral externalizing and internalizing symptoms were examined in a group of heterogeneous-for-risk children.

CHAPTER 3

EMOTIONAL SELF-REGULATION IN THE PRESCHOOL YEARS

As outlined in the previous chapter, emotion regulation during infancy is conceptualized from the perspective of attachment theory as a dyadic process in which the infant requires the physical presence of the caretaker(s) in order to achieve and maintain a sense of physiological and emotional equilibrium. Over time, these early relationships are internalized such that, beginning in the preschool period, the child's regulatory capacities become consolidated internal characteristics and, at this point in development, can be accurately described as emotional self-regulation strategies. Therefore, during the preschool period, the child's emotional self-regulation abilities can be measured outside of the dyadic relationship. Furthermore, one central thesis of this paper is that deficits in self-regulation capacities place children at risk for the development of externalizing and internalizing behavioral symptoms. The following review summarizes findings from the few empirical examinations of the relation between attachment, child regulation capacities and the behavioral symptoms of internalizing and externalizing disorders.

Attachment and Emotional Self-Regulation during the Preschool Period

While the theoretical links between attachment and subsequent emotional self-regulation capacity are clear and have been well-described, empirical investigations into this relationship using direct observations of child behaviors have been surprisingly rare. A few studies have examined associations among these constructs in the infancy and toddler periods (e.g., Kochanska, 2001). However, from an attachment perspective, regulation capacity during these developmental stages is still fundamentally a dyadic

construct. The preschool period, in contrast, heralds an important developmental shift with respect to the child's capacity for emotional self-regulation (Kopp, 1989; Sroufe et al., 2005). It is during this time that the child becomes more capable of regulation outside of the context of the dyadic relationship. In addition, it is during this stage of development in Western culture when an increasing degree of societal pressure for self regulation and control begins to be placed upon the child (Sroufe et al., 2005). Sroufe and colleagues (2005) have argued that as a result of these developmental and societal shifts, the measurement of child regulation capacities during the preschool period can be considered evidence for the internalization of the child's relationship history. They stated that, in the preschool period, "a new level of organization in the child apart from caregivers is apparent . . . [evinced by] the greater stability and stronger predictive power of individual variations from this time forward" (p. 121). They further stated that, "One reason behavior is more coherent at this time is that the child has more cognitively elaborated representations of self and others for guidance" (p. 121). Whereas the infant or toddler almost always requires that the caretaker be physically present in order to use them as a regulatory mechanism, the preschool-aged child has, to a much greater degree, internalized a sense of the caretaker such that the child is more often able to utilize self-regulatory strategies during times of stress and is no longer solely dependent on close physical proximity to the primary caretaker.

Consistent with this line of reasoning, the Minnesota longitudinal study (Sroufe et al., 2005), shed considerable light on the emergence of self-regulatory behaviors during the preschool period. In their recent compilation (Sroufe et al., 2005), these investigators reviewed three decades of empirical results from their study of attachment and

psychosocial risk in a high risk group of children and their families. Most relevant to the current study are their assessments of the relationship between infant attachment and preschool development. Specifically, when the children were 3½ years of age their ability to persevere in an extremely challenging task was measured. In this commonly used and standardized task, children were required to open a box in order to have access to several attractive toys to play with. The box was nearly impossible to open. Child behaviors during this task were coded using scales including agency, flexibility, withdrawal, creativity and ego control. Using cluster analysis methodology, children scoring similarly on these behavioral codes were created. Findings demonstrated that, of the children with secure infant attachment histories, 40% of them fell in the highest *competent* cluster group. In addition, none of the children with avoidant or resistant attachment histories fell in this group. Thus, the ability of these children to regulate their behaviors and emotions in the service of an extremely challenging goal was linked in theoretically consistent ways to their prior attachment classification.

Subsequently, when children reached the age of four and one-half to five years their ego-resiliency capacity as defined by Block and Block (1980) was assessed. Recall that this construct is similar to the current definition of emotional self-regulation as defined by Eisenberg and Spinrad (2004), and is consistent with the over- and under-regulated emotional strategies (avoidant, ambivalent) posited by attachment theory. Using composite variables based on behavioral responses to laboratory tasks as well as Q-sort data from preschool teachers, findings indicated that children who were securely attached at one year of age had significantly higher ego resiliency scores during the preschool period. That is, they were much more able to adapt their behaviors in a flexible

manner in the face of varying situational demands. While these data were illustrative in suggesting the relationship between early attachment and later self-regulation during the preschool years, the data were primarily reported at the dichotomous insecure/secure level of analysis and, consequently, a closer examination of the differences between the two insecure groups was not fully explicated (Sroufe et al., 2005).

In addition, despite their theoretical consistency, some of these data were never published in a peer-reviewed journal. Instead, they were described in the recent compilation from the Minnesota longitudinal study (Sroufe et al., 2005). In addition, important information about these data were not reported such as the number of clusters created from the box task and the total numbers of children within the different attachment categories. Thus, there is no way to fully evaluate the methodological strengths and weaknesses of these particular analyses.

Although other longitudinal projects have examined the continuity and change of attachment systems throughout the lifespan (Grossmann, Grossmann, & Waters, 2005), very few have examined the influence of early attachment on later observer-coded child regulation capacities. In one notable exception Gilliom and colleagues (Gilliom, Shaw, Beck, Schonberg, & Lukon, 2002) employed a longitudinal examination of the relationship between infant attachment classification and the expression and regulation of the specific emotion of anger. In addition, a second study examined the link between infant attachment and later emotional functioning in the context of peer interactions with an unknown peer among preschool children (Booth, Rose-Krasnor, & Rubin, 1991). Finally, two additional studies examined the constructs of attachment and emotion regulation in middle childhood. Similar to the methodology typically used in the

adolescent and adult attachment literature, the first study examined attachment status concurrently with emotion regulation (Contreras, Kerns, Weimer, Gentzler, & Tomich, 2000). It is therefore less relevant to the current investigation due to the lack of a longitudinal analysis. In contrast, the second study did utilize a longitudinal design to examine the relationship between infant attachment and later psychosomatic problems and found that child negative emotionality mediated this relationship (Hagekull & Bohlin, 2004). However, negative emotionality was measured through parent-report and defined as a temperament construct, making this study, too, less relevant to the current investigation.

In a study that directly informs the current work, Gilliom, and colleagues (Gilliom et al., 2002), examined infant attachment and later child expression and regulation of anger using a longitudinal design. As part of a broader study on antisocial development in lower SES boys, these investigators examined the influence of infant attachment security as measured in the SSP (Ainsworth et al., 1978) on anger control abilities in preschool-aged (3.5 years), disadvantaged boys (n=189). Regulatory strategies and expressed negative emotions were measured during a waiting task wherein the boys were required to wait for an undisclosed period of time to eat a cookie which their mother held while she filled out paperwork. Regulation strategies were coded in 10-sec intervals and included active *self distraction*, *passive waiting*, *information gathering*, *physical comfort seeking* and *focus on the object or on the waiting task itself* (e.g., commenting to their mother that this was taking a long time). Results from regression analyses demonstrated that attachment security (coded dichotomously as insecure or secure), was related to type of regulation strategy used such that securely attached boys used the strategies of *self-*

distraction, *waiting quietly* and *information gathering* more than insecurely attached boys. In addition, the use of these strategies was associated with subsequent decreases in expressed anger. The authors argued that these particular strategies reflect adaptive regulation because they involve a higher level of cognitive, attentional and behavioral sophistication that only becomes available during the preschool period. In comparison, the strategies of *comfort seeking* and *focusing on the aversive task* do not involve higher order regulatory skills. Instead, they keep the child preoccupied with the aversive experience or reflect an earlier stage of development wherein close physical proximity to the mother was necessary for effective regulation to occur. Thus, in this study, children who had been securely attached in infancy demonstrated an increased ability to use age-appropriate regulation strategies compared to children with histories of insecure attachment. Further, these strategies were effective; they were associated with decreases in expressed negative affect.

While this study is an important contribution to the literature documenting the influence of attachment security on anger regulation, it does have some significant limitations. Most importantly, the sample was comprised only of boys. An understanding of emotional self-regulation processes in boys is extremely important given, as the authors stated, the fact that boys are much more likely than girls to develop externalizing social-emotional disturbances such as conduct disorder during childhood. However, this particular study leaves an understanding of these processes in girls unexamined. Also, the laboratory paradigm included the presence of the mother in the room with the child. Although she was engaged in another task and, therefore, not necessarily engaging with the child, this design allowed the possibility for the child to use maternal contact as a

regulatory mechanism and, therefore, did not inform us as to what that child would have done instead, had the (presumed) primary attachment figure not been physically present. In addition, by examining the attachment construct at the dichotomous level of security versus insecurity, the analyses used in this study did not explicate the theoretical relationship between the two insecure attachment subtypes and the deactivated (over-controlled) versus the hyper-activated (under-controlled) emotional self-regulation classifications.

An area of further study related to the current work involves investigations of emotion expression and regulation in the context of peer interactions in school-aged children. This area has received significant attention in the literature (Contreras et al., 2000; Kerns, Klepac, & Cole, 1996; Wood, Emmerson, & Cowan, 2004). Often, however, attachment is measured concurrently with the dependent variable in these studies. In one notable exception using a preschool-aged sample, researchers used a longitudinal design to examine the association of attachment history and emotion regulation. In this study, Booth, Rose-Krasnor and Rubin (1991) examined the relation between secure versus insecure attachment as measured in the SSP when the children were 20 months of age (Ainsworth et al., 1978) and later social-emotional functioning when the children were preschool aged (4 years) within the context of a structured, laboratory, peer interaction protocol (n=62). The sample was comprised of a combination of children from two distinct longitudinal studies and was approximately evenly split between a high risk group (n=32) and a low-risk group (n=30). Social functioning with an unfamiliar, securely attached, same-gender peer was assessed using a structured play activity (e.g. the children were asked to build a house together) and via a novel toy

sharing procedure (e.g., the children were required to share an attractive toy). Child behaviors were coded from videotape and included expressed affect (positive, negative or neutral) as well as child goal attainment strategies such as the use of physical or verbal aggression and asking questions. ANOVA methodology revealed a main effect of security status on negative affect and aggressivity such that children who had been rated as insecurely attached with their mothers as infants were more likely to express negative affect during interchanges with peers and demonstrated higher levels of aggressivity in social interactions with peers. SES risk status did not moderate this relationship. Thus, while the dichotomously scored attachment variable did not allow for an explication of how the different insecure patterns may have affected these findings, the finding that insecurity in infancy was related to later negative affectivity was theoretically consistent. In addition, these analyses were confounded by the (empirically) unpredictable behaviors of the other child(ren) and the fact that child gender was not controlled. However, despite these constraints, the findings shed light on regulatory child outcomes, especially given the inclusion within the research design of the potentially stressful situation of interaction with an unknown peer.

In sum, although it is surprising given the rich theoretical literature in this area, there remains a paucity of empirical investigations examining the relationship between infant attachment strategy and later observer-rated emotional self-regulation during the preschool period. The studies that have been conducted have not explicated the relationship between attachment typology and regulatory outcomes. Instead, data from these studies are examined at the secure/insecure level of analysis. These data suggest that differences in preschool regulation capacity are related in theoretically consistent

ways to infant attachment security. However, examinations of these constructs at the typological level of analysis are needed to further clarify these relationships. In addition the investigations conducted to date have examined a relatively narrow range of emotional expressions and emotional self-regulation capacities (e.g., anger regulation). The current study extends these findings by examining child emotional self-regulation capacities that tap multiple elements of this construct such as a range of emotional expressions and the attentional as well as behavioral strategies children use in the service of emotional self-regulation. In addition, the present study examined these behaviors using a coding scheme which included positive and negative emotional expressions as well as behavioral and attentional regulation abilities.

Early Attachment and Later Psychopathology: Externalizing and Internalizing Behavioral Symptoms

As described herein, there are strong theoretical arguments for the proposed relationship between the infant's regulation style within the attachment relationship (e.g., attachment classification), and his or her later emotional self-regulation style. These differences, especially among the organized (e.g., A/B/C) categories, are likely to represent differences along a relatively normative spectrum. However, for some infants, extreme reliance on internal methods of regulation (e.g., avoidant, internalizing, overcontrolled) or external methods of regulation (e.g., ambivalent, externalizing, undercontrolled), especially in the context of other psychosocial stressors, may be sufficient to lead to later psychopathology in the form of internalizing or externalizing behavioral disorders. Due to the developmental and social shifts that occur during the preschool period, this may be an ideal time to begin to understand how early attachment

experiences may develop in terms of possible pathological outcomes in children. Specifically, the preschool period is unique not only in that children have increased cognitive and self-regulatory capacities, but also because it is the beginning point in development wherein children are expected to engage more fully in their social environments. For example, many children begin preschool at this age and, within cultural and religious groups, formal training (e.g., Sunday School) often begins. Consequently, social expectations for behavioral control increase dramatically during this period. Sroufe and colleagues (Sroufe et al., 2005) have defined the preschool period as emergent at approximately 3½ years of age and fully consolidated by age 4½ years. At this point in development the child is both capable of and expected to engage successfully in self-regulatory behaviors.

Very few studies have examined the hypothesized relationship between infant attachment strategy and later child internalizing and externalizing behaviors in young children. Results from the few studies that have explored these relationships have primarily found differences only when the data were dichotomized into secure/insecure or organized/disorganized group (Shaw, Keenan, Vondra, Delliquadri, & Giovannelli, 1997; Shaw, Owens, Vondra, Keenan, & Winslow, 1996). These findings appear to be based, in part, on the fact that low sample sizes did not provide the statistical power necessary for an examination at the typological level of analysis.

For example, Shaw and colleagues (Shaw et al., 1997; Shaw et al., 1996) reported on two separate sets of analyses examining the effect of infant attachment category on later child externalizing (study 1) and internalizing (study 2) behaviors. Their longitudinal sample (n=100) was comprised of low income families who had been

recruited at a social services office. Infant attachment was measured at 12 months with the SSP using a four-category coding system (A, B, C, D) and child internalizing and externalizing behaviors were examined using maternally reported CBCL measures for ages 4-16 (Achenbach, 1991) at five years of age. In the first study (Shaw et al., 1996), they examined the effects of early attachment on the broadband externalizing scale of the CBCL as well as the narrowband aggression scale of this measure (n=82 for the analyses in this study). Initial correlation analyses indicated that when attachment was dichotomized into disorganized (D) versus organized (A, B, C) groups it was significantly, positively correlated with both the externalizing (r=.24) and aggression (r =.34) scales such that children with disorganized (D) attachment classifications scored higher on these constructs. In addition, when the attachment variable was dichotomized into secure (B) and insecure (A, C, D) categories, insecurity was significantly, positively correlated with the aggression scale (r=.21). Child gender was not related to the outcome variables. In chi-square analyses the 4-category attachment variable was significant indicating that 60% of children with disorganized attachment histories received CBCL scores in the clinically elevated range on the aggression scale (clinical cut-off of $t \geq 63$). However, no significant effects were found in the chi-square analyses for externalizing behaviors. Similarly, in subsequent regression analyses, disorganized attachment was significant in predicting aggression scores but not externalizing scores.

The second study (Shaw et al., 1997) examined infant attachment and later internalizing behaviors (n=86). The broadband internalizing scale, as well as the narrowband withdrawal and depression/anxiety scales was used to assess these domains. Initial correlation analyses indicated that when attachment was dichotomized into

disorganized (D) versus organized (A, B, C) groups it was significantly, positively correlated with the withdrawal (r=.28) and internalizing (r =.21) scores such that children with D classifications scored higher on these constructs. However, when the attachment variable was dichotomized into secure (B) and insecure (A, C, D) categories, it was not significantly correlated with the outcome variables. In addition, child gender was not significantly correlated with any of the outcome variables. Regression analyses revealed that the disorganized (D) attachment category had a significant positive effect on the broadband internalizing scale, as well as the withdrawal scale. In addition, a finding relevant to the current analysis was that child exposure to parental conflict was also a significant predictor of the internalizing and withdrawal scale scores. No effects of these constructs were found for the depression/anxiety scale.

Overall, these results suggested that, in this high risk sample, a history of disorganized attachment was associated with both internalizing and externalizing behaviors in young children. The effect of the disorganized category on children's behaviors was most frequently found to be significant. However, there was some evidence that the organized insecure classifications also had an effect evidenced by the significant findings when attachment was dichotomized into secure versus insecure categories. In addition, exposure to parental conflict also accounted for unique variance in the prediction of internalizing behaviors suggesting that early exposure to conflict between the primary attachment figure(s) influenced the child's later development of symptoms of psychopathology. While these studies offer a significant contribution to the longitudinal examination of these constructs in a high risk group of children, they were nevertheless limited by sample size. In addition, possibly due to the small sample size,

the attachment construct was dichotomized in these analyses such that an understanding of the influence of particular attachment classifications was not explicated.

In another, recent, longitudinal examination, Vondra and colleagues (Vondra, Shaw, Swearingen, Cohen, & Owens, 2001) also examined infant attachment history in relation to child externalizing and internalizing behaviors in the preschool period (3½ years). This sample was considerably larger and included 223 mother-child dyads. Participants were drawn from a low-income, urban population, and were recruited from a local social services agency. Attachment classifications were tested and coded in the SSP at three time points: 12, 18 and 24 months. At the first two time periods, attachment category was rated using an A/B/C/D categorical system. At 24 months Crittenden's Preschool Assessment of Attachment (PAA, Crittenden, 1994) was used to measure child attachment. This system yields a secure (B) category as well as two organized insecure strategies (A, defensive and C, coercive). In addition, three atypical categories are included in this system: Defended/Coercive (AC), Anxious Depressed (AD), and Disorganized (D). Composite scores were calculated for attachment category at all time periods which yielded a value for the frequency of each attachment category (A, B, C and D/atypical) for each child (e.g., a child who was securely attached at each of the three time points would have a score of three for the B category and a score of zero in each of the other categories). Correlations with outcome variables yielded significance for externalizing behaviors for both the securely attached (B; $r = -.29$) and disorganized (D/atypical; $r=.21$) children. In subsequent regression analyses both externalizing and internalizing scores were regressed on the 24-month attachment score and on a combined 12/18 month attachment score (computed as described above) in separate analyses. When

both scores were entered into the regression, only the 24-month attachment score was found to significantly predict externalizing and internalizing behaviors and accounted for 11 and 8 percent of the variance, respectively. That is, 12/18 month attachment scores did not predict to the outcome variables above and beyond the 24 month scores. At 24 months, scores on the externalizing scale were predicted by scores for each insecure classification (A, C, Atypical). However, scores for internalizing problems were predicted only by the atypical classification. Thus, while the secure and disorganized categories provided the most robust predictions to later child psychopathology in this sample, there was also evidence that the organized insecure categories (A, C, Atypical) were predictive of externalizing behaviors. The larger sample size used in this study, compared to most other studies that have examined these constructs, may account for the significant findings in their analyses using all of the typological categories.

In a further study that informs the current work, Lyons-Ruth and colleagues (Lyons-Ruth, Easterbrooks, & Cibelli, 1997) examined the relationship between infant attachment as measured by the SSP and later internalizing and externalizing behaviors at age seven years as measured by mother- and teacher-rated CBCL/TRF in a sample of low SES children and their families (n=50). The sample was a subset of an intervention study (n=76) within which the attrition rate was relatively high (n=26). In addition, only three children were classified during the SSP as having an ambivalent attachment and, due to the low cell size of this group, these children were not included in the analyses. In regression analyses avoidant attachment predicted to teacher-rated, but not to mother-rated, CBCL/TRF internalizing scores. That is, children who were avoidantly attached as infants received increased teacher-rated internalizing scores on the TRF. However, prior

attachment did not predict to clinical cut-off levels of internalizing behaviors. In addition, infant attachment category was associated with clinical levels of teacher-rated but not mother-rated CBCL externalizing scores. The fact that the attrition rate in the original longitudinal sample was so high and the lack of a group of ambivalently attached children in the analyses suggest that this study was, overall, somewhat methodologically weak.

Overall, there have been very few examinations of the longitudinal effects of attachment classifications as measured during infancy and later child externalizing and internalizing behavioral functioning during the preschool and early childhood periods in high risk groups of children. The studies reviewed here have markedly mixed results. Disorganized attachment was most consistently related to child behavioral outcomes. However, there was evidence that the organized insecure strategies also held predictive power. In fact, in the one study with a larger sample size, infant attachment as rated categorically (versus dichotomously) was significantly related to later child symptoms of psychopathology (Vondra et al., 2001). This suggests that with increased statistical power, categorical analyses are possible and potentially fruitful. In addition, these studies consistently defined high-risk status as low SES. The question as to whether these relationships would continue to be significant in groups experiencing other risk factors such as family violence was left unanswered.

The present study examined the influence of early attachment on later externalizing and internalizing behaviors in the child's daily environment as measured by maternal report on the CBCL (Achenbach, 1991). The current sample was comprised of a heterogeneous-for-risk group of women and children, many of whom were relatively low in reported SES. In addition, approximately half of the women endorsed DV exposure

when they were initially recruited into the longitudinal study (during their pregnancy with the study child), and approximately 70% of the women reported DV exposure at some point across the four years of data collection. Consistent with a developmental psychopathology framework, the present analyses examined the influence of early attachment on later child regulation strategies in the context of other risk factors in the child's life.

The Mediating Role of Child Regulation in the Relation of Infant Attachment and Child Externalizing and Internalizing Symptoms

Rubin and Burgess (2002) have stated, "The inability to regulate one's emotions and, relatedly, to control one's behavioral impulses places the child 'at risk' for psychological dysfunction" (p. 388). However, while a child may indeed be *at risk* for dysfunction as a result of insecure attachment (regulation) strategies, this does not imply that pathological behavioral responses will necessarily develop. In other words, while differences in emotion regulation strategies in the *laboratory* environment may be related in theoretically consistent ways to earlier attachment strategies, they do not necessarily reflect pathological (dysfunctional) processes as they manifest in the child's *daily living experiences*. Children with organized insecure attachment strategies may be more or less regulated in a short laboratory procedure but these behavioral observations cannot fully reflect the child's overall functioning on a daily basis in the context of naturally shifting psychosocial stress levels. As Shaw and colleagues (Shaw et al., 1997) have described, "the functionalist view of emotionality implicitly suggests that emotional experience is defined through transactions with the environment" (p. 1761). The current study examined the hypothesis that, once developed in the context of the early attachment

relationship, and in combination with psychosocial risk factors (e.g., DV and concurrent parenting), deficits within the child's emotional self-regulatory capacities would make it more likely that behavioral symptoms of internalizing and externalizing disorders will develop.

More than 20 years ago in an explication and empirical investigation of the influence of attachment relationships on child development, Erickson, Sroufe, & Byron (1985) stated that,

> Disturbances of the attachment relationship are the main cause of psychopathology characterized by chronic anxiety or distrust, placing children doubly at risk. First, they render the child less able to cope with later adverse experiences, and, second, they increase the likelihood that the child will behave in such a way as to bring about more adverse experiences. (p. 148)

This description aptly highlights the transactional nature of child development wherein children are both *influenced by* and have *an influence on*, people in their interpersonal environments (Sameroff, 1993). However, in the time since these early writings by Erickson and colleagues from the Minnesota study (Erickson et al., 1985), there has been significant change in the ways in which child development is understood (Greenberg, 1999). Currently, one of the main tenets of developmental psychopathology is that pathological developmental outcomes such as excessive externalizing and internalizing behaviors are the product of multiple factors including child factors (temperament, physical health and illness), relationship history (attachment, loss), and environmental factors (poverty, family violence, community violence). In contrast to their earlier statement, Sroufe and colleagues (Sroufe et al., 2005) have more recently stated that,

"disturbance is created by the interplay of multiple factors operating over time, and links between antecedent conditions and disturbance are probabilistic and nonlinear" (p. 239). The implication here is that development is comprised of both continuities and lawful discontinuities and is best understood and predicted by the interaction of risk and protective factors (Belsky, Fish, & Isabella, 1991). Similarly, Keller and colleagues (Keller, Spieker, & Gilchrist, 2005) have argued that the child's ability to adapt to changing environmental demands is determined by the combination of past attachment history and present circumstances. In fact, existing data on the relationship between early attachment history and later child psychopathology supports this hypothesis.

Specifically, while investigations of this relationship in high-risk samples of children have found associations between early attachment security and later psychopathology, investigations with low-risk groups of children have generally failed to find associations between these constructs (for a review see Greenberg, 1999). Thus, as predicted by tenets of developmental psychopathology, it appears to be the interplay of risk and protective factors that best predicts child outcomes. One risk factor in isolation, as with an organized insecure attachment strategy in a low risk environment, is unlikely to predict well to later psychopathological outcomes.

As described above, the current study examined the influence of infant attachment on both child emotional self-regulation capacities and symptoms child externalizing and internalizing behaviors. In addition, there is now growing evidence that a child's emotion regulation capacities may influence their propensity to develop symptoms of both externalizing and internalizing disorders (Campbell-Sills & Barlow, 2007; Mullin & Hinshaw, 2007). Thus, the current study investigated whether a child's emotional self-

regulation capacities mediated the relationship between infant attachment and later symptoms of behavioral disorders. Further, consistent with the tenets of developmental psychopathology, the present mediating model was examined in the context of other psychosocial risk and protective factors. Specifically, the influence of DV exposure and concurrent parenting behaviors were examined, as described in detail in Chapter 4.

CHAPTER 4

INFLUENCING DEVELOPMENTAL PATHWAYS: THE IMPACT OF DOMESTIC VIOLENCE AND PARENTING BEHAVIORS

As argued here, attachment is understood as the foundation for the child's early ability to regulate emotions. However, as outlined by the developmental psychopathology framework, it is primarily the interplay of risk and protective factors within a child's life which best predicts social-emotional outcomes. Further, as these factors ebb and flow throughout the lives of children, their developmental pathways can be expected to shift. In light of this, the current investigation examined the influence of a) DV exposure and b) current maternal parenting behaviors, on the relationship between early infant attachment category and later child regulation capacities and behavioral symptoms of internalizing and externalizing disorders. It was expected that increases in DV exposure would be negatively related to the child's emotion regulation capacity and positively associated with increased levels of both internalizing and externalizing behaviors. In addition, positive parenting behaviors were expected to be positively associated with increased child emotion regulation capacities and negatively associated with symptoms of internalizing and externalizing disorders.

The Influence of Violence within the Home on Early Development

Over the last several years, the effects of DV exposure on later social-emotional outcomes in children have increasingly been the focus of empirical investigations (Jaffee, Moffitt, Caspi, Taylor, & Arseneault, 2002). However, definitions as to what constitutes DV vary within the literature. Early definitions focused exclusively on physical abuse (Pynoos & Eth, 1986). More recently, the influence of verbal and psychological abuse

has been integrated into conceptualizations of DV (Morewitz, 2004). Fantuzzo and Mohr (1999) have argued for a comprehensive definition that includes the following elements: "A pattern of assaultive and coercive behaviors, including physical, sexual, and psychological attacks, as well as economic coercion, that adults or adolescents use against their intimate partners" (p. 22). Based on these prior definitions, DV is defined here as comprised of the following elements: 1) intentionality on the part of the perpetrator (e.g., not accidental), 2) that involves an attempt to harm, control, or manipulate the victim, 3) using psychological, verbal, or physical means that are, 4) perpetrated within the context of a romantic relationship. A romantic relationship is defined as a relationship between two adolescent or adult individuals that includes sexual feelings or behaviors by both partners and is, or has been, consensual in nature over the course of the relationship.

Due to their exposure to this type of violence, children living in homes where DV is perpetrated are at higher risk for the development of a wide variety of psychosocial problems including both externalizing and internalizing behaviors (Jaffee et al., 2002). Investigations of the influence of DV on the psychosocial development of *older* children and adolescents have increased in recent years (Jaffee et al., 2002). Empirical examinations of the influence of DV during *early* development, however, have been less prevalent. In addition, studies which examine these constructs within longitudinal analyses have been even less common.

Trauma theory, with its emphasis on the predictable cognitive, affective and physiological human responses to traumatic events, is helpful in understanding the ubiquitous influence trauma exposure has on the emotional regulation capacities of

individuals across the lifespan (Herman, 1992). In the case of children, however, exposure to violence within the home can be further understood from a developmental and, specifically, an attachment perspective (Davies & Cummings, 1994). Attachment theory posits that, children, and especially young children, depend on their caretakers for assistance in regulating their affective and physiological states. Consequently, exposure to violence in the home among infants and young children has the dual impact of directly threatening the child's wellbeing while simultaneously threatening the young child's most important regulatory mechanism – the attachment figure. Due to these direct and indirect effects on the regulation capacities of young children, DV exposure is likely to have unique effects on a child's ability to self-regulate.

As outlined by attachment theory, early child development, in particular, is an especially vulnerable developmental stage that has important effects on subsequent developmental outcomes. The Diagnostic Classification of Mental Health and Developmental Disorders of Infancy and Early Childhood (National-Center-for-Clinical-Infant-Programs, 1994), has defined a traumatic stressor as the young child's "direct experience, witnessing, or confrontation with an event or events that involve actual or threatened death or serious injury to the child or others, or a threat to the psychological or physical integrity of the child or others" (p. 19). In addition, research within the biobehavioral literature is beginning to document the physiological impact that exposure to early trauma has on young children (Mohr & Fantuzzo, 2000; Saltzman, Holden, & Holahan, 2005). Thus, it is likely that exposure to violence involving one of the child's attachment figures in the home environment of young children will have unique and powerful effects on their psychosocial and physiological functioning.

Beyond the effect of threats to the primary attachment figure, Davies and Cummings (Davies & Cummings, 1994) have argued that threats to the marital dyad itself are disruptive to child development. This is especially salient for children when the conflict is intense and unresolved as in the case of DV. In what they have termed the *emotional security hypothesis* (ESH), they asserted that children hold a vested interest in the continued maintenance of the marital relationship and that exposure to unresolved marital conflict results in an increase in their feelings of emotional insecurity. Furthermore, they argued that repeated child exposure to marital discord results in the development of behavioral and emotional responses as a way of both protecting themselves and intervening in the situation to reduce the discord. Within this framework, children are thought to be affected by marital conflict (including DV) in three primary ways: 1) their ability for emotional self-regulation is negatively affected by the overwhelming experience of threats to both the primary attachment figure and threats of dissolution of the marital relationship, 2) these threats to their emotional security serve as motivators to attempt to influence their parents' behaviors, and 3) a reduction in emotional security negatively influences both their cognitive appraisals and their representational models of their parents and family. This model suggests that the influence of DV exposure will have unique effects on a child's regulation capacities due, in part, to the influence it has on the child's internal representations of their parents.

Examinations of the influence of traumatic events on behavioral responses in early infancy have suggested that infants as young as three months of age demonstrate behavioral responses to trauma exposure consistent with Davies and Cummings' (1994) ESH model (Gaensbauer, 1995; Scheeringa & Gaensbauer, 2000; Scheeringa, Zeanah,

Drell, & Larrieu, 1995). In addition, two recent studies that have used subsamples of the longitudinal sample under investigation in this study, have found effects of DV exposure on infant behaviors that are consistent with this model. Specifically, using ANOVA methodology, DeJonghe and colleagues (DeJonghe, Bogat, Levendosky, Eye, & Davidson, 2005) found that, compared to non-exposed infants, one-year-old infants who had been exposed to DV demonstrated heightened levels of observer-rated *facial* distress in response to an experimenter simulated telephone argument when the infants were alone in an unfamiliar room with the experimenter (n=89). These results suggested that DV exposure during the first year of life may have served to heighten an infant's emotional, attentional and behavioral sensitivity to adult conflict. However, no effects of infant *postural* distress were detected, suggesting that behavioral manifestations of DV exposure in infancy may be difficult to measure, especially given the dyadic nature of emotion regulation during this period. For example, because their mothers were not present in the room, these infants did not have an attachment figure to physically orient to during the argument. This may account for the lack of findings with regard to *postural* responses. In addition, the sample represents a relatively small subset of the entire longitudinal study. These authors reported that many infants did not complete this procedure due to maternal resistance to the necessary separation. It is possible that the mothers who did not agree to the separation were sensitively attuned to their infant's developmental inability for emotional self-regulation during this task and refused participation on this basis. In other words, these mothers may have been appropriately protecting their children and, consequently, the infants of these sensitive mothers are not included in the analyses, thereby biasing the results. The current study examined the

regulatory capacities of preschool-aged children who are developmentally capable of emotional self-regulation using the entire longitudinal sample (3 cases from the longitudinal sample were excluded because they did not participate in any of the waves of data collection examined here; FIML estimation was employed on the rest of the longitudinal sample, $n = 203$).

In a second study drawing from the current sample (n=48), Bogat and colleagues (Bogat, DeJonghe, Levendosky, Davidson, & vonEye, 2006) found that mothers' self-reports of their own trauma symptoms resulting from DV exposure predicted infant trauma symptoms, but only for infants who had witnessed severe levels of violence. Infants who witnessed milder forms of DV were less affected by their mother's resultant trauma symptoms. These results suggested that, in the face of more extreme levels of abuse, the mother's own pathology influenced the infant's ability to cope with the trauma to a greater degree. The sample used in this study is also small relative to the larger longitudinal sample and suggests that participant self-selection bias may have influenced the results. Inclusion criteria for this study were based on maternal reports of infant DV exposure as defined by the mother's report that the infant had *witnessed* the DV. It is possible that mothers may have minimized their child's direct exposure to abuse. In fact, it may be that mothers who were most sensitive to their child's experiences were the most likely to be aware of, and therefore report, that their children were directly exposed to the DV in the home. Alternatively, it may be that only the mothers of children who were exposed to relatively higher levels of DV reported their children as being exposed. In either case, reporter bias may be a factor in these results.

Findings from both of these studies are relevant to the current investigation in that it is possible that these early behavioral symptoms of infant trauma may be precursors to later behavioral and psychosocial problems in older children such as externalizing and internalizing behaviors which are typically not measured until the preschool and early childhood years. In addition, the current study examined DV longitudinally over the course of development; that is, across the four year period from birth to age four. Thus, the fact that infant trauma symptoms have been noted in some of the children within this sample has direct bearing on the current investigation.

Later in child development, the effects of child DV exposure have frequently been measured using the CBCL externalizing and internalizing subscales. In the few studies that have examined these constructs in preschool samples, results are contradictory with respect to the influence of DV exposure on child behavior problems. This may be due, in part, to the diverse sample characteristics of these studies (e.g., clinical vs. community samples) and to relatively low sample sizes in most of the studies. For example, in a community sample of women experiencing DV over the course of the previous year and their children (n=62), Levendosky and colleagues (Levendosky, Huth-Bocks, Semel, & Shapiro, 2002) found that preschool children (aged three to five years) exhibited elevated levels of externalizing behaviors as measured by the CBCL. They reported that 42% of the sample had T-scores of at least 60 and that 29% of the sample had scores within the clinical range. However, children's scores on the internalizing scale were not elevated. Child participants in this study were selected based on current DV exposure; the influence of past exposure was not assessed. Consequently, some children who may have

experienced high levels of DV in the past were not included in the analyses. The current study examined DV exposure over a three year period of time.

A second study by the same researchers (Levendosky, Huth-Bocks, Shapiro, & Semel, 2003) examined both maternally rated child behavior problems in four-year-old children using the externalizing and internalizing subscales of the CBCL as well as observer rated child behaviors in a semi-structured, mother-child play activity (n=103). The direct observation of these behaviors was an important strength of this study and is similar to the methodology proposed in the current study. Results demonstrated that higher levels of DV were related to observer ratings of increased negative and decreased positive child behaviors during the mother-child play activity. However, in contrast to findings from their previous study, DV was not associated with increases in either externalizing or internalizing behaviors.

Additionally, in a recent examination of these constructs using a clinical sample of preschool children who had been exposed to DV (n=85), Lieberman and colleagues (Lieberman, VanHorn, & Ozer, 2005), found that, while the mean CBCL total problem score fell below the clinical cut-off ($t \geq 70$), CBCL scores were significantly positively correlated with increasing levels of DV exposure ($r = .29$). This finding is consistent with the findings by Bogat and colleagues (Bogat et al., 2006) which indicated that more extreme levels of DV are predictive of psychological symptomatology. However, Lieberman and colleagues found that when maternal life stress, mother-child relationship quality and maternal PTSD symptoms were controlled in a regression analysis, child DV exposure failed to predict to child behavior problems. Thus, while correlation analyses suggested that there was a relationship between DV exposure and child behavioral

problems, this relationship was not significant when other contextual and environmental variables were controlled. In addition, although the authors described their sample as a *preschool* sample, child participants actually ranged in age from 25 to 59 months. Developmentally, the manifestations of psychosocial problems in 2-year-old children and 5-year-old children are likely to be quite different. Further, the CBCL for four to 18 year old children was used in this study for all children, calling into question the validity of the ratings for the two and three year old subjects. Consequently, it is unclear as to whether examinations of these relationships within a more controlled age range, using valid measures, would have yielded different results.

In sum, Davies and Cummings (1994) have argued that due to its influence on both the attachment relationship and the child's relationship to the parental dyad, marital conflict has a unique influence on a child's capacity for emotional regulation. In the case of DV, children are exposed to conflict which is, by definition, not resolved in a psychologically healthy manner. In addition, analyses with subsets of the current sample have demonstrated that children show elevated behavioral signs as a result of DV exposure when compared to children who have not been exposed to DV or have experienced relatively lower levels of exposure. Further, Davies and Cummings (1994) have argued that DV exposure in early childhood will significantly influence a child's representation of the primary attachment figure (usually the mother) as well as the representation of the marital dyad. Given that the internalized attachment strategy is thought to guide a child's emotional self-regulation capacities during the preschool period, in the current study it was hypothesized that DV exposure would be negatively

associated with the emotional self-regulation capacities of young children and positively associated with their behavioral symptoms of internalizing and externalizing behaviors.

The Influence of Proximal Parenting Behaviors on Child Outcomes

As outlined by attachment theory, the mother's parenting behaviors are critical to the young child's social emotional development due to their effects on the attachment strategy of the infant. Moreover, the importance of parenting to child development does not end in infancy; parenting behaviors influence development across the lifespan (Bornstein, 2002). In fact, in one recent study, Belsky and Fearon (2002) found that, when examined in the context of attachment history and parenting behaviors, parenting behaviors which were more proximal to child outcome measurements predicted better to later child social emotional functioning than early attachment history. In the present study, current positive parenting was expected to be positively associated with child regulation capacities and negatively associated with behavioral symptoms of externalizing and internalizing disorders at four years of age.

The notion that *good* or *optimal* parenting will have positive effects on children's development is widely accepted (Bornstein, 2002). As described in this review, attachment theory argues that the caretaker's parenting behaviors become internalized in the child such that, over time, they become an increasingly stable feature of the child's personality. Other theoretical approaches, too, have described the critical nature of parenting to child development. Social learning theory, for example, posits that children learn to behave in a manner that is consistent with their observations of parental behaviors (Bandura & Walters, 1963). In this case, parents who exhibit high levels of externalizing behaviors, for instance, are thought to put their children at risk for similar

kinds of behavioral difficulties. From many different theoretical perspectives it is clear that parenting matters to a child's development. *Optimal* parenting behaviors, however, are by no means defined similarly across differing developmental periods (e.g., infancy vs. preschool). Neither is there complete agreement across disciplines or theoretical orientations about how best to understand, define and operationalize parenting constructs. This review highlights two conceptualizations of parenting that have been presented in the literature.

One of the most widely cited conceptualizations of parenting behaviors comes from Baumrind (1971). Developed using a sample of preschool-aged children, this investigator carefully and exhaustively examined the behaviors of Caucasian children and their parents using a multi-method approach which included observational as well as parent report techniques. She conceptualized parenting as the interaction of two primary dimensions of parenting which included a warmth/responsiveness dimension and a control/demandingness dimension. The first dimension included parenting behaviors which ranged from warm and sensitive to cold and hostile. The second dimension included power-oriented parenting behaviors which ranged from firm control to lack of supervision and neglect. In combination, these dimensions yielded four primary parenting constructs which have subsequently been the focus of much developmental research (for a review see Rubin & Burgess, 2002). These included: Authoritative parenting (high on warmth and control), Authoritarian parenting (low warmth, high control), Indulgent-Permissive parenting (high warmth, low control), and Indifferent-Uninvolved parenting (low warmth, low control). This conceptualization of parenting is essentially a trait theory which identifies a categorical taxonomy of parenting, not unlike theories of temperament

or personality as applied to the psychological makeup of individuals. In their review and meta-analysis, Holden and Miller (1999) have argued that the conceptualization of parenting as a stable trait has been too readily accepted, and not empirically challenged within the child development and parenting literatures. They stated that,

> Another example of the proclivity of researchers to adopt a stable view of parenting is the prominence of the trait approach to parenting. This orientation toward similarity in child rearing has been so central to conceptions of child rearing that it may have precluded reviews on the topic; we were unable to locate any. . . . the issue of stability and change has long been recognized by developmental psychologists to be the core issue of the discipline. However, that discussion has been limited to only one side of the developing dyad – the children. (p. 224)

Coming from a family systems perspective, Cusinato (1998) outlined a more dimensional and fluid conceptualization of parenting that included three essential parenting factors that apply to parental behaviors across child development. These included *warmth*, *control* and *consistency*. Each of these factors was viewed as a continuous construct such that numerous combinations are possible. Citing the work of Rollins and Thomas (1979), Cusinato conceptualized *warmth* broadly as the overall balance of supportive vs. non-supportive behaviors within the parent-child relationship. In addition, again based on earlier work by Rollins and Thomas (1979), he described the construct of *control* as including subcomponents of *frequency* and *style*. Within this model, parents who were high in terms of their control *frequency,* for example, would tend to intervene and, at the extreme, interfere with their children's behaviors frequently.

At the other extreme, parents who were extremely low on this factor, for example, would be expected to demonstrate negligent behaviors. In contrast, parental *style* of control reflected the ways in which a parent may intervene with respect to child behaviors. Thus, style of control could range from coercive behaviors to egalitarian, reason-based attempts to alter the child's behaviors. Finally, the construct of *consistency* was related to the degree to which the parent's demands and evaluations of the child's behaviors were internally consistent. That is, the degree to which the parents' overt communications to the child were consistent with their underlying beliefs and intentions.

While both the conceptualizations of Baumrind (1971) and Cusinato (1998) captured important basic elements of parenting as manifest over the course of childhood, it is equally true that, due to the nature of child development, parenting behaviors and strategies must shift over time if they are to be effective. Reasoning with an infant, for example, has no chance of success, whereas reasoning with a preschool-aged child may be an appropriate strategy. Further, it is likely that the parents' own constellations of strengths and weaknesses will influence their parenting skills differently at each different stage of development. In light of this, Holden and Miller (1999) have made important distinctions between the concepts of *absolute stability* (e.g., does a parent hug their child with same frequency during the preschool period and the adolescent period), and the concept of *relative stability* which reflects the degree to which the parent's relative position in relation to other parents with respect to a given behavior remains constant. In fact, in their meta-analysis of 87 longitudinal studies of parenting, they found evidence for both stability and instability in parenting behaviors. In general, their data suggested that there is evidence for relative stability but not absolute stability over time. In addition,

they found that parenting behaviors tended to be more stable as assessed across time with older children as compared to infants and young children. These data suggested that parenting behaviors were more likely to shift early in development than they were later in development. In a subsequent study using the NICHD Study of Early Child Care (SECC) dataset (n=1,364), Dallaire and Weinraub (2005) examined parenting behaviors in a relatively low-risk group of parents and replicated both of these results. That is, they found evidence for relative parenting stability across time. In addition, consistent with Holden and Miller's (1999) results, they also found that stability in parenting behaviors was much more likely with older children than with younger children (e.g., more stability from four to six years versus from two to four years).

Furthermore, in a recent study which also used the NICHD SECC dataset, Belsky and Fearon (2002) sought to investigate the relative influence of attachment and maternal sensitivity on child psychosocial outcomes. Attachment security was measured at 15 months and maternal sensitivity, as well as maternal levels of social and family stress, was measured at 15 and 24 months. When children were three years of age, multiple psychosocial outcomes including the CBCL for two to 3-year olds were measured. As predicted, their analyses revealed that children with insecure attachment histories whose mothers were insensitive at 24 months had the lowest scores on measures of psychosocial health and functioning, and children with secure attachment histories whose mothers were later rated as sensitive had the highest scores. In addition, children with secure attachment histories at 15 months whose mothers were insensitive at 24 months scored lower on measures of psychosocial functioning compared to children with insecure attachment histories whose mothers were sensitive later in development. This suggested

that more proximal parenting behaviors were highly predictive of child outcomes, and could even overcome early insecure attachment histories in some cases. That is, proximal parenting that was insensitive appeared to have a dysregulating effect on the psychosocial functioning of young children even in the context of a secure attachment history. This finding lends support to the current hypothesis that concurrently assessed parenting behaviors would significantly influence child outcomes and would account for additional variance in the model beyond the influence of infant attachment. While this prediction is broadly consistent with Belsky and Fearon's (2002) findings, it is also notable that, in their study, effects on behavior problems as measured by the CBCL did not reach statistical significance when SES was controlled. A further finding indicated that there was a direct effect of maternal psychosocial stress on maternal sensitivity such that changes in sensitivity from 15-month to the 24-month evaluations were predicted by either more or less maternal stress. This last finding is especially relevant to the current investigation given that within the present sample some of the mothers were experiencing elevated levels of psychosocial stress due to DV exposure and other psychosocial risk factors (e.g., poverty, living in dangerous neighborhoods). Thus, it was predicted that at the four year evaluation of parenting behaviors in the current study, many of the mothers in the study would be experiencing high levels of environmental stress, and that this stress may influence their parenting abilities in negative ways.

While some of the original work examining the influence of parenting behaviors on child behavior was conducted with preschool samples (Baumrind, 1971), subsequent studies have focused primarily on either the infancy/toddler period of development or on child outcomes in samples of school-aged children. In fact, in the five-volume

compilation of parenting topics edited by Bornstein (2002), there are separate chapters for the infancy (birth to approximately 12 months), toddlerhood (approximately 12 months to approximately 36 months), and middle childhood (5 to 12 years) periods. However, there is no chapter that reviews parenting during the preschool period. Presumably, this deficit is related to the relative paucity of research on preschool-aged children in the extant empirical literature.

As reviewed previously in this paper, parenting during the infant and toddler periods of development has historically focused on the construct of maternal sensitivity and its influence on the formation of infant attachment strategies and internalized representations (Bowlby, 1969/1982; Bretherton & Munholland, 1999; DeWolff & Ijzendoorn, 1997; Main et al., 1985). In contrast, parenting during the middle childhood period has focused on parenting behaviors such as those outlined by both Baumrind and Cusinato (Baumrind, 1971; Cusinato, 1998). Given the transitional nature of the preschool period, optimal parenting during this stage of development is likely best understood as a combination of the parenting behaviors that are involved during both the infant/toddler period and the middle childhood periods. As described earlier in this paper, children during this stage of development begin to be capable of emotional *self*-regulation (Kopp, 1989; Sroufe et al., 2005). Their regulatory capacities are no longer totally dependent upon the presence of the attachment figure as they were earlier in development. Concurrent with this shift, societal norms begin to require self-regulation behaviors from the child outside of the dyadic context. However, due to its transitional nature, it is likely that children during this period will need to return occasionally to dyadic regulation strategies – especially when attempts at the developing skills of self-

regulation fail them. Thus, it is likely that parenting sensitivity as well as factors such as parental control (e.g., the use of positive discipline strategies) will all influence the preschool child's ability for regulation during this period. Parenting which is highly positive (as defined as a combination of parenting skills from the earlier and later periods) is likely to have regulating effects on child behaviors, whereas parenting which does not include positive elements (e.g., sensitivity, warmth, appropriate control) is likely to have dysregulating effects.

Consistent with these predictions, the few studies which have examined these constructs within preschool samples, have found that parenting behaviors are associated with the psychosocial and regulatory functioning of these children (Deater-Deckard et al., 2001; Javo, Ronning, Heyerdahl, & Rudmin, 2004; Keown & Woodward, 2006). For instance, Keown and Woodward (2006) assessed parenting behaviors using a multi-method approach similar to the current study. They assessed maternal parenting through the use of maternal self-report of parenting behaviors as well as observer-coded maternal parenting behaviors during a videotaped mother-child interaction segment. Children in this sample included a group of four-year-old, Caucasian boys with pervasive hyperactivity (n=33) as well as a group of comparison boys (n=34) in New Zealand. Results revealed that mothers of boys in the hyperactive group self-reported higher levels of lax parenting and higher tendencies to overreact with anger to child misbehaviors when compared to the comparison group. In addition, during the videotaped segment, mothers of boys in the hyperactive group were less responsive and less mutually focused with their sons. Causality of effect can not be implied by these data. However, they do suggest that parenting behaviors are associated with child regulation capacity during the

preschool period. In addition, a Norwegian study (Javo et al., 2004) examined parenting behaviors as well as child externalizing and internalizing behaviors in a sample of 191 preschool-aged children. Effects of parenting behaviors on child outcomes were found for girls only. They found that parental cuddling behaviors were negatively correlated with both internalizing and externalizing behaviors. In addition, physical punishment was positively correlated with both internalizing and externalizing behaviors and parental teasing was positively correlated with externalizing problems. This study also suggested an association with parenting behaviors and child regulation capacities, although this association was evident for girls only. Finally, in an examination of parenting and child outcome variables in a preschool sample, one research group found differences in maternal behaviors of mothers of identical twins (n=62 pairs) (Deater-Deckard et al., 2001). Psychosocial outcomes of the children were differentially related to their mother's parenting behaviors with them. Twins who received higher levels of supportive parenting and lower levels of punitive parenting were rated as having higher levels of positive mood and prosocial behavior, and lower levels of negative mood and behavior problems.

In sum, from an attachment perspective, parenting is thought to influence child behaviors through its influence on the child's internal representational models (Main et al., 1985; P. Zimmermann, 1999). This process is understood as being most salient during the early years of development and has been shown empirically to be related to the mother's overall ability to provide sensitive caretaking (DeWolff & Ijzendoorn, 1997). Beginning in the preschool years, parenting has been understood as involving several, more complex dimensions beyond sensitivity (Baumrind, 1971). For example, parenting during the early childhood period that includes high levels of responsiveness and

appropriate parental control (e.g., discipline) has been associated with positive child psychosocial outcomes (Rubin & Burgess, 2002). In fact, attachment theory would predict that, even in the context of an insecure attachment history, positive and responsive parenting during the preschool period could have a positive influence of the child's internalized representational models and, consequently, on the child's capacity for self-regulation.

Parenting during this period can also be understood from a social learning theory perspective (Bandura, 1977) wherein, through the observation of the parent's style of responsive or non-responsive parenting behaviors, the child learns to respond in kind. From either theoretical perspective it is likely that the experience of proximal positive parenting is likely to positively influence the child's ability for emotional self-regulation. This study examined the influence of current maternal parenting behaviors on child self-regulation capacities and behavioral symptoms of internalizing and externalizing behaviors. Parenting behaviors were measured using a multimethod design that combined direct observation of maternal behaviors and maternal self-reported parenting behaviors. The influence of DV on parenting behaviors was also examined and is reviewed in the following section.

The Impact of Domestic Violence on Parenting Behaviors

The impact of DV on a mother's ability to parent her children has increasingly been explored in the empirical literature (Levendosky & Graham-Bermann, 2001a). DV may influence parenting behaviors due to the potentially enduring effects of trauma on the basic psychosocial functioning of the woman. In addition, the impact of trauma suffered at the hands of an intimate partner is likely to be uniquely damaging.

Levendosky and Graham-Bermann (2001a) have argued that, "Trauma perpetrated by another person, as opposed to experiencing severe illness or natural disasters, is simultaneously a psychological, physiological and relational event (p. 29)." In addition to the relational element inherent in DV, trauma theory, as outlined by Herman (1992), distinguishes between the effects of acute traumatic exposure versus chronic exposure. She argued that chronic exposure exacts an additional toll on the woman's psychosocial functioning and often results in additional symptoms such as somatic disorders, depression and dissociation. This increased vulnerability to psychosocial stress is likely to negatively influence a woman's ability to parent effectively.

Empirical examinations of this hypothesis, however, have largely been limited by small samples, usually of school-aged children, and results have been mixed. In one of the larger studies of this relationship, McCloskey, Figueredo, and Koss (1995) examined a cross-sectional sample of 365 mothers of school-aged children (6 – 12 years of age) using self- and child-report methodology. They found that DV exposed mothers reported using less warmth with their children compared to non exposed women. In addition, children's perceptions of parental warmth and nurturance were negatively correlated with DV but were not predictive of child mental health outcomes. The use of child-report as the measure of parenting behaviors (e.g., warmth, nurturance) in this study, however, raises concerns about reporter bias. Specifically, the ability of children to accurately report past events has been contested within the child abuse literature due to evidence suggesting that children's ability to remember and report the behaviors of others may be unreliable (Ceci, Kulkofsky, Klemfuss, Sweeney, & Bruck, 2007).

More recently, using maternal self-report, Margolin and Gordis (2003), found that increases in DV in combination with increases in other life stressors were associated with increases in harsh and abusive parenting. However, similar to the study by McCloskey and colleagues (McCloskey et al., 1995), one important limitation of this study was that observer-rated measures were not included in the study design. Evidence from qualitative studies has suggested that mothers may experience feelings of remorse about exposing their children to DV (DeVoe & Smith, 2002). This may result in their propensity to underreport child exposure to DV as well as their own use of harsh discipline with their children. Thus, research using observer-rated measures of parent and child behavioral functioning is necessary to confirm these prior findings.

In one study using observer-report methodology, Holden and Ritchie (1991), reported findings suggesting that some women may be able to maintain positive parenting behaviors even in the context of abuse (Holden & Ritchie, 1991; Levendosky & Graham-Bermann, 2000) In a sample of 37 mothers living in DV shelters and 37 community matched mothers, these investigators failed to find a direct effect of DV status on several domains of observer-rated parenting including physical affection and punishment. These researchers did, however, report group differences in the effect of parenting stress on maternal demonstrations of physical affection. Specifically, they found that battered women, unlike non-battered women, did not demonstrate higher levels of physical affection in response to lower levels of self-reported parenting stress. That is, battered women demonstrated similar levels of physical affection (e.g., warmth) toward their children regardless of whether they were experiencing high or low levels of parenting stress. In explaining this finding, the authors hypothesized that mothers experiencing DV

may have demonstrated a kind of pseudo-warmth toward their children which was designed to alleviate the mother's anxiety but was not likely to be beneficial to the children. They argued that whereas the capacity to demonstrate genuine warmth is likely tied to levels of stress in a mother's life and consequently the psychological resources the mother has available, "pseudo-warmth" does not require the availability of such resources and therefore is unaffected by parenting stress level. An alternative explanation of this finding, however, may be that the coding system utilized by these researchers failed to capture "warmth" and, instead, captured a different construct. In that case, a revision of their coding scheme, or the use of an established coding scheme, may have yielded different results.

To date, the majority of the literature documenting the relation between DV and parenting behavior has used maternal self-report data as the primary parenting measure. More recently researchers have begun to use established behavioral observation measures in an effort to obtain a more objective assessment of parenting outcomes in DV populations (Levendosky & Graham-Bermann, 2000). In one study using this methodology, Levendosky and Graham-Bermann (2000) coded mother-child interactions in 95 families with latency-aged children using an established coding scheme. In contrast to the results reported by Holden and Ritchie (Holden & Ritchie, 1991), they found that battered women demonstrated significantly less warmth during a semi-structured interaction task than their non-battered counterparts.

The current study examined the influence of DV on maternal parenting behaviors using observer-rated parenting data that were coded using an established coding scheme that has been previously reported in peer reviewed publications (Whipple et al., 1995).

Consistent with trauma theory, it was expected that increases in maternal exposure to DV would result in decreases in positive parenting behaviors. The cumulative effects of DV were measured over the course of the first four years of the child's life.

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CHAPTER 5

HYPOTHESES AND RATIONALE

Using a heterogeneous-for-risk sample of children, this study examined the main effect of infant attachment category on child emotional self-regulation capacities and behavioral symptoms of internalizing and externalizing disorders in preschool-aged children using a longitudinal, prospective research design. In contrast to previous work in this area that has focused on specific emotions, this study assessed a broad range of emotions including positive affect, sadness and anger. It was hypothesized that infant attachment strategy would predict to later emotional self-regulation capacities when children were four years of age in the context of a laboratory setting and that these behaviors would mediate the influence of infant attachment on child internalizing and externalizing behaviors.

Although it was originally formulated in the context of her early observations of relatively impoverished mother-infant dyads in Uganda (Ainsworth, 1967), Ainsworth's American studies testing the validity and reliability of the Strange Situation Procedure were based exclusively on middle-class, Caucasian samples of mothers and infants (Ainsworth et al., 1978). Subsequent studies, including the longitudinal study by Sroufe and colleagues (Sroufe et al., 2005) have examined this construct using economically disadvantaged and minority samples. However, given recent evidence suggesting that exposure to violence has unique and specific effects on early child development (Bogat et al., 2006; DeJonghe et al., 2005), research examining the construct of attachment classification and emotion regulation in children exposed to DV is an important next step within this area of research. In addition, recent work in the area of early parenting has

suggested that proximal parenting behaviors may be more influential than previous attachment history on child psychosocial outcomes (Belsky & Fearon, 2002). Therefore, the present study examined the influence of the mother's current parenting behaviors on these two child outcomes as well.

The emotional self-regulation capacities of preschool children were captured in the laboratory setting using observer-rated coding methodology. Children in this study participated in the SSP at two time points: when they were one year and four years of age. Their emotional self-regulation capacities were measured during their participation in the SSP when they were four years of age. Only the SSP segments in which the mother was not present in the room with the child were used to measure the child's emotional self-regulation. The methodological strategy of using SSP segments to code discrete child behaviors (versus attachment category) has been described previously within the child development literature (Anan & Barnett, 1999; Calkins & Fox, 1992; Dickstein, Thompson, Estes, Malkin, & Lamb, 1984; Frodi & Thompson, 1985; Ganiban, Barnett, & Ciccetti, 2000). In addition, behavioral symptoms of internalizing and externalizing disorders were measured using maternal report methodology (e.g., Child Behavior Checklist; CBCL). Specific hypotheses are described below. Figure 1 represents the hypothesized study model.

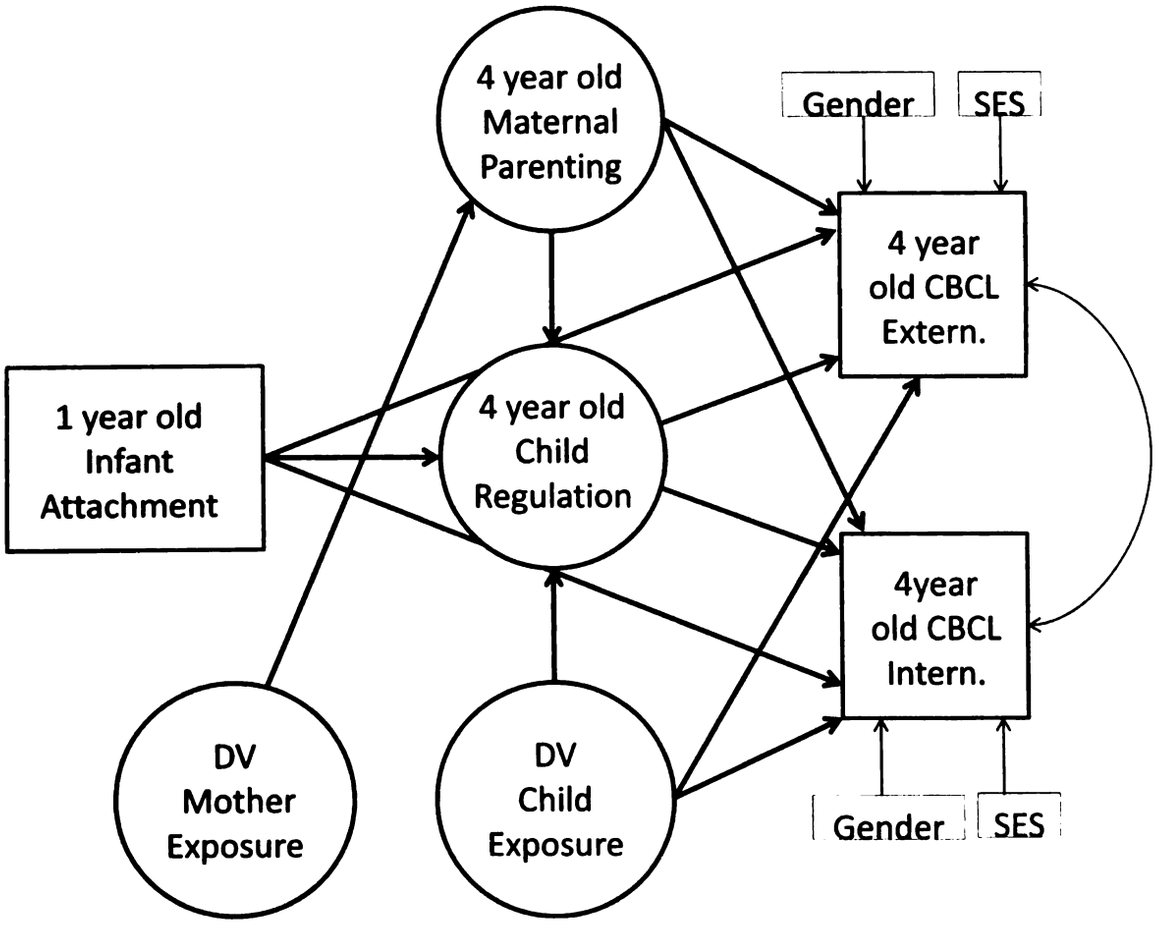

Figure 1: Study Model

Hypotheses

It is clear that attachment theory and the research it has generated has influenced our understanding of the development of emotion regulation processes (Main et al., 1985; Sroufe et al., 2005; Vondra et al., 2001; P. Zimmermann, 1999). Attachment research has taken a lifespan perspective in that the literature reflects the application of attachment measures in every age-group of human development (Cassidy & Shaver, 1999). While the adult attachment literature has experienced a dramatic increase in empirical work, however, the examination of emotional self-regulation as it relates to attachment

categories in children, has experienced relatively less growth. Additionally, prior to the current study, there were no studies which comprehensively examined the longitudinal effects of early attachment classification on later regulation capacities in preschool-aged children. Therefore, the present study contributes to this area of research by explicating this relationship in a heterogeneous-for-risk sample of children using a longitudinal dataset which included infant attachment category measured at one year of age as well as an observer-rated measure of child regulation and a parent-rated measure of child externalizing and internalizing behaviors at four years of age. Analyses were conducted using the 3-category attachment classification systems. Hypotheses one through five were tested within the full SEM model. Hypotheses six and seven represent separate sets of analyses, as described below.

SEM Model: Hypotheses 1 - 5

Hypothesis 1: Infant attachment category will predict to the child's overall capacity for emotional self-regulation at 4 years of age in a laboratory environment. Attachment theory posits that children who over- or under-regulate their emotions are accommodating to a less sensitive parenting relationship. Thus, children who behave in either an over- or under- regulated manner are demonstrating a pattern of regulation which does not allow them to authentically experience and express their emotions. The child who over-regulates is thought to internalize feelings of distress such that they result in feelings such as sadness and shame which, while they are internally experienced as painful, are not outwardly expressed. In essence, these children have learned to rely on themselves for comfort and do not tend to actively seek comfort from others. Thus, in the current study, infant attachment category was expected to influence observer-rated child

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regulation capacities such that children who were avoidantly attached as infants would receive high positive regulation scores. The child who under-regulates (e.g., becomes dysregulated), in comparison, is thought to outwardly express strong emotions in a manner which does not allow for the capacity for self-soothing or self-regulation to develop. Instead, these children seek others to deal with their emotions but are never fully able to internalize a sense of self-care and soothing. In the current study, children who were ambivalently attached as infants were expected to have very low positive regulation scores. Children who are able to experience and express a wide range of emotional reactions can authentically engage in relationships without the need to alter their affects or behaviors inauthentically in order to meet the emotional needs of another person. Thus, children who were securely attached as infants were expected to receive mid-range scores of positive emotional self- regulation.

Hypothesis 2: Infant attachment category will predict to behavioral symptoms of internalizing and externalizing disorders at four years of age. Maternal ratings of children's externalizing and internalizing behaviors were expected to be related, in theoretically consistent ways, to the infant attachment categories. That is, children with secure attachment histories were expected to receive low CBCL scores on both the externalizing and internalizing scales. In addition, children with ambivalent attachment histories were expected to receive relatively higher scores on the externalizing CBCL scale due to the externalizing symptoms that characterized them as infants. Finally, children with avoidant attachment histories were expected to receive relatively higher scores on the internalizing CBCL scale due to the highly regulated style that characterized them as infants.

Hypothesis 3: Child regulatory capacities will mediate the relationship between infant attachment category and later child externalizing and internalizing behaviors. Given the growing evidence that child psychopathology is directly related to a child's capacity for emotion regulation (Mullin & Hinshaw, 2007), it was predicted that child emotional self-regulation would mediate the effect of infant attachment strategy on later child externalizing and internalizing symptoms. Children who were rated as under-regulated in the laboratory environment were expected to evince higher levels of externalizing behaviors whereas children who appeared over-regulated were expected to evince higher levels of internalizing behaviors.

Hypothesis 4: Exposure to DV will influence maternal parenting behaviors, child regulation capacities, and symptoms of externalizing and internalizing disorders. Examination of the emotional and behavioral sequelae of trauma exposure in children has been a recent focus in the child development literature (Osofsky, 2004). There is evidence that exposure to trauma may have a unique influence on the emotional and behavioral systems of the developing child relative to its influence on the more stable personality structure of the adult survivor. It was hypothesized that early DV exposure would influence later child regulation capacities in predictable and theoretically consistent ways such that increased DV exposure would lead to decreases in child self-regulation capacities and increases in externalizing and internalizing behaviors.

Exposure to DV has also been shown, in some studies, to influence maternal parenting behaviors (Levendosky & Graham-Bermann, 2001a; McCloskey et al., 1995), although other studies have failed to find these effects (Holden & Ritchie, 1991). Trauma theory predicts that exposure to DV will negatively influence many aspects of a mother's

psychosocial functioning, including her parenting (Herman, 1992; Levendosky & Graham-Bermann, 2001b). In the current study it was predicted that cumulative exposure to DV across the first four years of the child's life would negatively influence maternal parenting behaviors when the child is four years of age.

Hypothesis 5: Current maternal parenting behaviors will influence both child regulation capacities in the laboratory and symptoms of externalizing and internalizing disorders. Just as children's relationship representations and consequent regulation capacities may be malleable during early childhood if children are exposed to high levels of psychosocial stress, a parent's ability to parent effectively may be somewhat fluid during the early parenting period depending on her own life experiences (e.g., DV exposure, access to social support, etc.). These analyses examined whether the more proximal variable of current parenting behaviors would influence the child's regulation capacities and behavioral symptoms of externalizing and internalizing disorders beyond the effects of the early attachment relationship (which itself is based on early maternal parenting behaviors). Specifically, it was predicted that exposure to proximal positive parenting would be positively associated with child self-regulation capacities and negatively associated with symptoms of internalizing and externalizing behaviors.

Additional Analyses: Hypotheses 6 - 7

Hypothesis 6: The presence of DV in the home will moderate the relationship between infant attachment category and internalizing and externalizing behaviors. Tenets of developmental psychopathology and attachment theory predict that early attachment will predict to later symptoms of psychopathology in the presence of other risk factors. In the current study, it was predicted that children whose mothers reported DV exposure in

the home would evince higher levels of internalizing and externalizing behaviors in preschool, compared to children whose mothers did not endorse DV exposure.

Hypothesis 7: Infant attachment category will predict differentially to specific ***types*** of child regulation behaviors (e.g., self- versus other-focused behaviors). In the current study, one facet of preschoolers' emotional self-regulation strategies that will be explored involves the specific *types* of behaviors children engage in when they are attempting to cope with a stressful situation. It was expected that a child's behaviors within the stress-inducing SSP will vary based on his or her infant attachment category. Specifically, it was predicted that in the laboratory setting children who were avoidantly attached as infants would exhibit increased numbers of self-soothing techniques (e.g., self stimulation, talking to self) in the context of a stressful situation and would not outwardly express their feelings of distress. In contrast, it was predicted that children who were ambivalently attached as infants would exhibit increased numbers of other-directed regulation techniques (e.g., seeking contact with others). Finally, it was expected that children who held secure attachments as infants would be flexible in their use of behavioral regulation strategies and will be able to simultaneously use a balance of both self- and other-directed regulation techniques as needed to facilitate their emotional self-regulation. These children were expected to exhibit some signs of distress and dysregulation but also to utilize diverse mechanisms with which to calm themselves such that they were not expected to become utterly dysregulated.

CHAPTER 6

METHOD

Participants

Participants of the current study included 203 women and children participating in a longitudinal study examining child risk and protective factors in a group of mothers approximately half of whom reported exposure to DV at the time of recruitment. Women were initially recruited into the study when they were in their third trimester of pregnancy. Recruitment efforts included the posting of flyers at local public stores and agencies (e.g., laundromats, grocery stores, Head Start offices, etc.) and medical clinics (e.g., Obstetric/Gynecology clinics, public health clinics, etc.) in a medium-sized, Midwestern city and surrounding areas. Two versions of recruitment flyers were utilized. Initially flyers advertised a study about mother-infant relationships. Later, a more focused attempt was made to recruit women experiencing DV and consequently flyers were distributed that invited women to participate in a study about the experience of DV during pregnancy. Approximately 46% of women reported DV exposure when children were one year of age (see Table 5). As Table 5 indicates, by the time the children were four years of age, 70% of the women had experienced incidents of DV at some point over the course of the first four years of the child's life.

The current sample represents a sample of convenience. Pregnant adult women who were between 16 and 40 years of age and who responded to the flyers were invited to participate in the study. Potential participants were screened to insure that they had been involved in a romantic relationship for at least six weeks during the pregnancy and

that they were able to speak and understand English well enough to complete the questionnaires and participate in the interviews.

The longitudinal study, from which this sample is drawn, is comprised of 206 mother-child dyads. The longitudinal study began when the mothers were pregnant with the study child. Three of the mothers from the longitudinal sample withdrew from the study after the pregnancy interview and did not participate in any future waves of data collection. The current study uses data beginning when the children were one year of age (possible $n = 203$). For the purposes of the current study, the one-year wave of data collection will be labeled T1. This study will include data that have been collected at four time points: T1 was conducted when the children were one year of age; T2, T3 and T4 were conducted every year thereafter, around the date of the child's birthday. For the purposes of this study, missing data resulting from attrition within the longitudinal sample will be estimated using full information maximum likelihood (FIML) such that the current analyses will include 203 mother-child dyads. The current data meet the criteria for use of FIML including the criterion that missingness on the outcome variable (y) is not dependent on y itself (L. M. Collins, Schafer, & Kam, 2001). The FIML approach fits the model to all of the non-missing values for each observation and has all of the strengths of multiple imputation (MI) including maximizing power by using all of the participants in the analysis (Widaman, 2006). In addition, the *M-plus* program, which is used in these analyses, employs test statistics in FIML that are robust to non-normally distributed data (Allison, 2003; Muthen & Muthen, 2007).

Within the longitudinal sample ($n = 203$), child gender was approximately evenly split (males = 51%). Participants represented a range of cultural and ethnic groups,

educational backgrounds and occupations (see Tables 1 - 3). Participants also represented a range of socio-economic groups (see Table 4). At the time of recruitment into the study, approximately 40% of the women were married, 50% were never married, 4.5% were separated, 5% were divorced and 1 woman was widowed. Ninety-three percent of the families in the longitudinal sample resided in Eaton and Ingham counties. The demographic characteristics of the longitudinal sample were consistent with the census data in these counties at the time of recruitment.

	Caucasian / White	African American / Black	Latina	Multi-Racial	Other, Unknown or Missing
Mother	64.0%	25.1%	4.9%	3.9%	2.1%
Father	49.9%	34.7%	5.4%	5.0%	5.0%
Child	46.3%	24.6%	2.0%	23.6%	3.5%

Table 1: Ethnicity of Family Members – percentages (n = 203)

	Less than High School education	High School Education or GED	Some College, Associates Degree or Trade School Degree	BA or BS	Some Graduate school or Graduate Degree	Unknwn or Missing
Mother	16.3%	28.1%	39.4%	7.8%	5.4%	3.0%
Father	14.3%	36.0%	30.0%	10.3%	6.4%	3.0%

Table 2: Mother and Father Educational Achievement data – percentages (n = 203)

	menial service workers	unskilled workers	semi-skilled workers	skilled manual workers, craftsmen	clerical, sales
Mother	18.7%	18.3%	19.7%	10.4%	10.3%
Father	19.7%	13.8%	26.1%	11.3%	2.5%
	technicians, semi-professionals		small business owner	administrators, medium business owners	executives, large business owners
Mother	13.8%		3.9%	4.9%	0%
Father	7.9%		9.4%	5.4%	3.9%

Table 3: Mother and Father Occupation Data – percentages (n = 203)

	Income $\bar{x}$ (*sd*)	Median Income	Income Range	Household Size $\bar{x}$ (*sd*)	Household Size range
T1 – 1 yr olds (*n* = 189)	$2,201 ($1,752)	$1,500	$267 – $10,000	3.9 (1.4)	2 – 9
T2 – 2 yr olds (*n* = 186)	$2,487 ($2,199)	$2,000	0 - $18,000	4.0 (1.4)	2 – 9
T3 – 3 yr olds (*n* = 178)	$2,472 ($2,152)	$1,700	0 - $17,000	4.1 (1.5)	2 – 13
T4 – 4 yr olds (*n* = 177)	$2,552 ($1,987)	$1,950	$184 - $13,000	4.2 (1.6)	2 - 14
	% receiving public financial assistance	% receiving WIC	% receiving Food Stamps	% receiving Medicaid	
T1 – 1 yr olds (*n* = 189)	7.9%	57.1%	26.5%	59.8%	
T2 – 2 yr olds (*n* = 186)	10.2%	43.5%	31.2%	54.3%	
T3 – 3 yr olds (*n* = 178)	8.4%	43.8%	35.4%	56.2%	
T4 – 4 yr olds (*n* = 177)	2.3%	39.0%	35.0%	51.4%	

Table 4 – Socioeconomic Status Data by Wave of Data Collection: T1 – T4

T1 – 1 yr olds	T2 – 2 yr olds	T3 – 3 yr olds	T4 – 4 yr olds	% abused at some point over the 4 year time period
45.6%	51.0%	40.8%	46.1%	70.0%

Table 5 – Maternal Rates of DV Exposure by Year (% abused)

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Data were collected at four time points:

Time 1 (n = 189): Infant attachment category (SSP); DV exposure (SVAWS)

The average age of the mother at the one-year interview was 26.74 years (sd = 5.00; range =19.21 – 41.55), and the average age of the child was 1.10 years (sd = .11; range = .92 – 1.10).

Time 2 (n = 186): DV exposure (SVAWS)

The average age of the mother at the two-year interview was 27.70 years (sd = 5.04; range =20.19 - 42.50), and the average age of the child was 2.03 years (sd = .07; range = 1.77 – 2.40).

Time 3 (n = 178): DV exposure (SVAWS)

The average age of the mother at the three-year interview was 28.55 years (sd = 5.12; 21.21 –43.53), and the average age of the child was 3.01 years (sd = .08; range = 2.87 – 3.79).

Time 4 (n = 177): Observed child regulation behaviors (SSP separations); Parent report of child, Internalizing and externalizing behaviors (CBCL); Observed parenting behaviors (PCIT); DV exposure (SVAWS) ; Self report of parenting behaviors (PBC)

The average age of the mother at the four-year interview was 29.58 years (sd = 4.99; range =21.42 – 44.58), and the average age of the child was 4.04 years (sd = .12; range = 3.09 – 4.82).

Procedures

Initial Screening

Women contacted the project office to inquire about participating in the study. Initial contacts with potential research participants involved brief phone screenings that were conducted by trained research assistants. The screening included an assessment of the woman's age, pregnancy status, length of time with current romantic partner and DV status. Women were informed that the study was investigating women's relationships with the important people in their lives including partners, family members, and children. They were informed that if they chose to participate in the study they would be asked to talk about their thoughts and feelings about their relationships and their recent life events, including DV, and that they would be paid for their participation in the study.

Subsequent to the recruitment of approximately 50% of the sample, administration of the Conflict Tactics Scale (Straus, 1979) was implemented during the initial screening contact. This measure was used to exclude women who had not experienced DV during pregnancy in order to oversample women who were experiencing DV. During this phase of participant recruitment, potential participants were informed that they would be asked some questions about themselves and their relationships and that, in an effort to ensure that the study included a representative sample of women from the community, they may or may not be eligible to participate based on this information. A total of 161 women contacted the project office but were deemed ineligible to participate because they did not meet age, relationship status, or battering experience criteria. No demographic differences existed between the excluded women and the research participants.

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Retention Procedures

Participant retention efforts were initiated approximately one week after the infant's projected due date. Phone calls were made to the women to confirm each infant's date of birth. Subsequently and for the duration of the study, participants were contacted by mail every 90 days between interviews. Mail correspondence included a letter and a form which was completed by the participant with their current address, phone number, and names and numbers of friends or family members who could be contacted in the event that we could not reach the participant. A self-addressed and stamped envelope was included in this mailing. In addition, a contract with the US Post Office was established such that they generated and sent a postcard with current addresses for those participants who had moved and registered a new address. When participants did not return their information sheet within three weeks, they were contacted by phone. In the event that the participant could not be reached directly by phone, we contacted the friends and/or family members who had been identified by the participant for recontact purposes. Participants received ten dollars in monetary compensation for returning their information forms at each recontact time point.

Time 1: Mothers and Their One-Year Old Children

When their infants were approximately one year of age, women were contacted to schedule the Time 1 interview. Mothers and infants were interviewed at the laboratory. The Strange Situation Protocol (SSP) (Ainsworth et al., 1978) was administered at this time. In addition, the Severity of Violence Against Women Scales (SVAWS) (Marshall, 1992) were administered. Trained research assistants administered the maternal

interviews while the infants were cared for in a separate playroom. Women were paid $75.00 and given a baby gift worth $8.00 after completion of the Time 1 interview.

Time 2: Mothers and Their Two-Year Old Children

When their children were approximately two years of age, women were contacted to schedule the Time 2 interview. Children were not assessed directly during this wave of data collection. Mothers were interviewed by trained research assistants in the woman's home, in the project office or over the phone depending on the woman's preferences and her personal circumstances (e.g. women who had moved to another state were interviewed over the phone). The SVAWS was administered at this time (Marshall, 1992). Women were paid $75 after the completion of the Time 2 interview.

Time 3: Mothers and Their Three-Year Old Children

When their children were approximately three years of age, women were contacted to schedule the Time 2 interview. Children were not assessed directly during this wave of data collection. Mothers were interviewed by trained research assistants in the woman's home, in the project office or over the phone depending on the woman's preferences and her personal circumstances. The SVAWS was administered at this time (Marshall, 1992). Women were paid $90 after the completion of the Time 3 interview.

Time 4: Mothers and Their Four-Year Old Children

When their children were approximately four years of age, women were contacted to schedule the Time 4 interview. Mothers and infants were interviewed at the laboratory whenever possible. In a few cases, home visits were conducted at the mother's insistence. The Strange Situation Protocol (SSP) was administered at this time, as was the Parent Child Interaction Task (PCIT). In addition, the SVAWS (Marshall, 1992) and the Parent

Behavior Checklist (PBC) (Fox, 1994) were administered. The Child Behavior Checklist (CBCL) (Achenbach, 1991) was also administered to the mother at this time. Trained research assistants administered the maternal interviews while the children were cared for in a separate playroom. Women were paid $150 after the completion of the Time 4 interview.

Measures

Assessment of Attachment Category

Strange Situation Protocol (Ainsworth et al., 1978)

This is a 22-minute structured behavioral protocol wherein the mother and her one-year-old infant are observed interacting in an unfamiliar environment (the laboratory). There are eight episodes (described below), each designed to impose a small but gradually increasing degree of psychological stress on the dyad (see Table 5). The three mother-infant separations, in particular, are designed to activate the attachment system of the infant. Four 7-point scales including *proximity seeking*, *contact maintaining*, *avoidance*, and *resistance* and one 9-point scale capturing *infant disorganization* were coded based on observed infant behaviors (Ainsworth et al., 1978; Main & Solomon, 1990). Based on their behavioral patterns and responses to this protocol infants were coded into one of four categories: secure, ambivalent, avoidant and disorganized. A forced-choice A/B/C category was also assigned. The protocol was videotaped and tapes were coded by two professional social workers at the University of Washington who had received specific training and demonstrated reliability in coding SSP protocols. Reliability was calculated using 11% of the sample and 90% agreement was achieved on attachment classifications, yielding a kappa of .84 ($p<.001$). The Kappa

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statistic provides a chance-corrected index of categorical agreement (Cohen, 1968). Differences in classifications were resolved by conferencing.

There were a total of 177 SSP procedures administered in the current study. Thus, of the 189 families who otherwise completed this wave of data collection, there were 12 missing SSP administrations: 6 of the families lived out of state, 4 of the mothers had lost custody of their children, 1 mother refused to be videotaped and, in one case, data were lost due to technical errors that occurred in the videotaping process.

Data were coded at both the 4-category (A/B/C/D) and the 3-category (A/B/C) levels. For the 3-category coding system, a forced classification was used. Children in the disorganized group and children who had been coded as "unclassifiable" were assigned to one of the 3 categories. Of the children who were originally coded as disorganized (n=17), 3 received a forced classification within the Avoidant group, 10 were classified as Secure, and 4 were classified as Ambivalent. In addition, of the 9 infants who were originally in the unclassifiable group, 2 were classified as Secure and 7 were classified as Ambivalent. Sample sizes for the three-group categorization are reported in Table 6.

Episode	Duration	Description
1	1 minute	Parent & Infant are introduced to room by experimenter
2	3 minutes	Parent and Infant are alone in room
3	3 minutes	Stranger enters: sits quietly for 1 minute, engages mother for 1 minute, engages infant/child for 1 minute
4	3 minutes	Infant and Stranger alone in room
5	3 minutes	Mother returns, stranger leaves
6	3 minutes	Mother leaves infant alone in room
7	3 minutes	Stranger returns: Infant and Stranger alone in room
8	3 minutes	Mother returns, parent leaves

Table 6: Strange Situation Test Protocol

		One year (T1) Strange Situation **Forced Choice Classification**			
		Avoidant	Secure	Ambivalent	Total
Original Classification	Avoidant	31	0	0	31
	Secure	0	96	0	96
	Ambivalent	0	0	24	24
	Disorganized	3	10	4	17
	Unclassifiable	0	2	7	9
	Total	34	108	35	177

Table 7: Strange Situation Classifications – One-year old children

Assessment of Domestic Violence

Severity of Violence Against Women Scales – Maternal Exposure (SVAWS) (Marshall, 1992)

The SVAWS is a 46-item questionnaire designed to assess both violent behaviors and threats the woman has experienced from her partner(s). The scale is composed of nine categories of abuse including symbolic violence, threats of mild violence, threats of minor violence, threats of moderate violence, threats of serious violence, mild violence, minor violence, moderate violence, serious violence, and sexual violence. Examples of items include "destroyed something belonging to you," "punched you," and "demanded sex whether you wanted to or not." Respondents were instructed to rate their experiences of abuse on a 4-point scale ranging from "Never" to "Many Times." Scores were calculated for each woman during each wave of data collection. Scores were summed for women who reported exposure to abuse from multiple partners during the same one-year period, yielding a composite score for each woman for each year. In addition, a dichotomous DV variable was created for use in the moderation regression model (hypothesis 6), by conducting a median split of the data. High internal consistency (α =

.97) has been reported for the full scale (Huth-Bocks, Levendosky, & Semel, 2001). Analyses using Cronbach's alpha suggested high internal consistency across the four time periods in the current sample as well: Partner 1: $\alpha = .95$ at age 1, $\alpha = .95$ at age 2, $\alpha = .94$ at age 3, $\alpha = .94$ at age 4; Partner 2: $\alpha = .99$ at age 1, $\alpha = .97$ at age 2, $\alpha = .97$ at age 3, $\alpha = .96$ at age 4.

Severity of Violence Against Women Scales – Child Witnessing (SVAWS) (Marshall, 1992)

Following the administration of the SVAWS to the mother, each item for which she endorsed DV was followed up by asking her if her child had either visually witnessed or overheard that particular experience. Scores were calculated in an identical manner to the maternal experience of abuse; scores were summed and calculated for each child during each wave of data collection. Analyses using Cronbach's alpha suggested high internal consistency across the four time periods in the current sample: Partner 1: $\alpha = .97$ at age 1, $\alpha = .92$ at age 2, $\alpha = .90$ at age 3, $\alpha = .89$ at age 4; Partner 2: $\alpha = .85$ at age 1, $\alpha = .98$ at age 2, $\alpha = .93$ at age 3, $\alpha = .96$ at age 4.

Assessment of Parenting Behaviors

Parent-child interaction task, adapted (PCIT) (Eyberg & Robinson, 1982)

An adapted version of the PCI was utilized. This protocol involves the mother and child sitting next to each other at a table with a variety of toys and activities. The adapted protocol lasts a total of 14 minutes and is equally divided into two situations: child directed play and mother directed play. The coding scheme used to score these data was adapted from work done by Whipple and colleagues (Crandell, Fitzgerald, & Whipple, 1997; Whipple et al., 1993; Whipple et al., 1995) (see Appendix). This research team

based their coding system on work done by Belsky and colleagues (Belsky, Youngblade, Rovine, & Volling, 1991). In addition, the *sensitivity* scale was based on Biringen's *Emotional Availability Scales* (Biringen, 2000; Biringen et al., 2000). There are 7, 5-point, maternal scales which are scored in one-minute intervals: *positive affect and affection, negative affect and feedback, positive or neutral feedback, facilitates self-regulation, intrusive/overcontrolling, unresponsive/unavailable/undercontrolling,* and *sensitivity*. Scores for each domain were then averaged across all 7 one-minute segments for each of the two protocol situations. This yielded a mean score which was used as the final score for that domain. Thus, each case received a final average score for each domain (e.g., positive affect). In the current analysis, the 2 domain scales were then averaged, yielding one score for each code. The scale scores were then factor analyzed to create a latent, positive parenting variable.

Coders were undergraduate students who received intensive training by a lead graduate student and with assistance from the author of the current study (CD). Ongoing supervision was provided by the lead graduate student who served as the gold standard for reliability coding and each coder established and maintained reliability with this lead graduate student. Consistent with other published work in the field (Slade, Belsky, Aber, & Phelps, 1999), weighted kappas were calculated for each scale (Schuster, 2004). The Kappa statistic adjusts for chance agreement among coders (Cohen, 1968). Altman (1991) identified strength of agreement as Very Good for kappa values within the .81-1.0 range, Good within the .61-.80 range, and Moderate within the .41-.60 range. Kappa weights were assigned such that exact matches received a 1.0 weight, 1-point differences were weighted at .75, 2-point differences were weighted at .25, and remaining differences

received a 0 weight. Initial reliability was established between the lead graduate student and each of the four coders on a random selection of 15% of the tapes. After establishing initial reliability, double coding was conducted at regular intervals to minimize rater drift. Final weighted kappa values ranged from .60 to 1.0:

Scale	Coder 1	Coder 2
Positive Affect	.97	1.0
Negative Affect	.88	.95
Positive Feedback	1.0	1.0
Facilitates Self-Regulation	.76	.82
Intrusive	.60	.82
Unresponsive	.82	.85
Sensitivity	.89	.95

Table 8: Weighted Kappa Reliability Statistics for the Parenting Data

Parent Behavior Checklist, Discipline subscale (Fox, 1994).

This is a 100-item scale measuring mother's self reports of their parenting behaviors. The measure is comprised of three subscales: expectations, discipline, and nurturing. Responses were scored on a 4-point Likert scale ranging from "Almost Never/Never" to "Almost Always/Always." For the present study, the discipline (reverse coded such that higher scores reflect positive discipline) was used. The discipline subscale is comprised of 30 items (e.g., "I send my child to bed as a punishment."). High internal consistency has been reported for the full scale (α = .93) and for the discipline scale (α = .91) (Fox, 1994). Internal consistency for the discipline subscale used in the current sample was good (α = .86).

Assessment of Child Emotional Self-Regulation Capacities

Strange Situation Protocol (Ainsworth et al., 1978) – *Coding of Discrete Child Behaviors*

This is a 22-minute structured behavioral protocol wherein the mother and her four-year-old child are observed interacting in an unfamiliar environment (the laboratory). Identical to the one-year old protocol, there are eight episodes (described above), each designed to impose a small but gradually increasing degree of psychological stress on the dyad. The three mother-child separations, in particular, place stress on the regulatory capacity of the young child. Child behaviors during three of the 3-minute separation episodes of the SSP were coded. The episodes include the two child/stranger-together episodes in addition to the child-alone episode. Of the 177 families who participated in the T4 wave of data collection, 20 families were unable to complete the SSP, either because they lived out of state or they were unable to come to the laboratory session (in which case the collection of the remaining data was completed during a home visit or over the telephone). In addition, one child was unable to tolerate separations from his mother and, therefore, there were no separation segments available for coding. Thus, four-year-old SSP data were available for 156 families. Three segments were coded for each child, yielding a total of 468 segments.

Seven child scales were scored in three-minute intervals: *comfort/enthusiasm*, *anger/frustration*, *sadness*, *emotional lability*, *activity level*, *attentional regulation* and *self-regulation* (see Appendix). All scales were scored using a five-point, interval, anchored rating system. Scales were designed such that higher scores reflected higher levels of that particular construct and were adapted from several sources: *comfort/enthusiasm*, *anger/frustration* and *sadness* scales: (Miller, Gouley, Seifer, Dickstein, & Shields, 2004; Whipple et al., 1993; Whipple et al., 1995); *emotional lability* scale: (Clark, 1985, 1999); *activity level* scale: (Seifer, Sameroff, Dickstein,

Schiller, & Hayden, 2004); *attentional regulation* scale: (Clark, 1985, 1999); *self-regulation* scale: (Clark, 1985, 1999; Cole, Barrett, & Zahn-Waxler, 1992; Miller et al., 2004).

The first six scales captured specific elements of the child's behaviors and reactions in the stressful context. The seventh scale, *self-regulation*, was a more global score which captured the child's overall ability to regulate, irrespective of the way in which regulation was, or was not, achieved. For example, a child may have received a low score on self-regulation due to the fact that she was angry and pounding on the door for the entire segment, or, she may have received a low score because she sat in the chair and stared into space while whimpering quietly. In each case, the child was unable to remain regulated in the sense that she was unable to engage in any focused activity; both children would have received low scores on self-regulation. However, in the first case the child would have received high scores on anger and in the second case she would have received high scores on sadness. In the current analysis scale scores were factor analyzed to create a latent, positive child regulation variable.

In addition to the seven scales described above, five self-regulation *strategy* scales were also coded including: *contact seeking*, *attention to toy/self play*, *physical self stimulation*, *talk/sing to self*, and *attempts to leave room* (see Appendix). These scales were also scored using a five-point, interval, anchored rating system and were designed such that higher scores reflected higher levels of that particular construct. Conceptual work by Stansbury and colleagues (Stansbury & Sigman, 2000; L. K. Zimmermann & Stansbury, 2003) informed the creation of these codes in that these researchers have argued for the importance of assessing the discrete behaviors children use to regulate

their emotions in stressful situations. These investigators have assessed child regulation in the presence of the parent and their coding scheme assesses the broad domains of, *self-comforting, instrumental regulation, distraction* and *cognitive regulation.* However, the codes used in the present study were independently developed for the purposes of this study and are theoretically grounded in attachment theory which posits differential styles of self versus other behavior in children with differing attachment histories.

As with the observed parenting data described above, coders for this dataset were undergraduate students who received intensive training and ongoing supervision by a lead graduate student (in this case, C.D.) who served as the gold standard. Each coder established and maintained reliability with the lead graduate student and weighted kappas were calculated for each scale (Schuster, 2004). Consistent with the parenting data, kappa weights were assigned such that exact matches received a 1.0 weight, 1-point differences were weighted at .75, 2-point differences were weighted at .25, and remaining differences received a 0 weight. Initial reliability was established between the lead graduate student and each of the four coders on a random selection of 22% of the tapes. After establishing initial reliability, double coding was conducted at regular intervals to minimize rater drift. Final weighted kappa values ranged from .75 to 1.0:

Scale	Coder 1	Coder 2	Coder 3	Coder 4
comfort/enthusiasm	1.0	1.0	.96	1.0
anger/frustration	.77	.70	.90	.92
sadness	1.0	.93	.95	.95
emotional lability	1.0	1.0	1.0	1.0
activity level	.92	.93	.91	.86
attentional regulation	.91	1.0	.92	.93
self-regulation	1.0	1.0	1.0	.87
contact seeking	.79	.94	.82	.91
attention to toy/self play	.79	.85	.79	.90
physical self stimulation	1.0	1.0	.93	1.0
talk/sing to self	.78	.87	.75	.77
attempts to leave room	1.0	1.0	1.0	.92

Table 9: Weighted Kappa Reliability Statistics for the Child Regulation Data

Assessment of Child Externalizing and Internalizing Behaviors

Child Behavior Checklist (CBCL) – Mother Report Form (Achenbach, 1991)

This is a 112-item, parent-report instrument that measures the child's social and emotional functioning over the last six months. Eight subscales, two broad band subscales of internalizing and externalizing behaviors and a total problem behavior score were calculated. Participants rated behavioral descriptions of their child on a 3-point scale from "Not True" to "Very True or Often True." In the present analyses scores from the externalizing and internalizing subscales during the T4 (four year old children) wave of data collection were utilized. The T4 alpha for the full scale in the current sample is .92

CHAPTER 7

RESULTS

Preliminary Analyses

Initial examination of the data (e.g., distributions, descriptive statistics, ANOVAs.), as well as exploratory factor analyses (EFAs) were conducted using *SPSS*, version 15.0 (SPSS, 2006) . Confirmatory factor analyses (CFAs) and structural equation modeling (SEM) analyses were conducted using *M-plus*, version 4.1 (Muthen & Muthen, 2007). As described above, CFA and SEM analyses used full information maximum likelihood (FIML) estimation. See Tables 10, 11 and 12 for means, standard deviations and correlations of the variables under study. The income and discipline variables were standardized before inclusion in the analyses. The remaining variables were not standardized.

Observed Variables	$\bar{x}$	*sd*
T4 CBCL Internalizing	2.13	2.50
T4 CBCL Externalizing	8.16	5.95
T1 SVAWS Mother DV	6.32	15.41
T2 SVAWS Mother DV	4.88	12.91
T3 SVAWS Mother DV	3.09	9.01
T4 SVAWS Mother DV	3.61	10.50
T1 SVAWS Child DV	2.38	8.98
T2 SVAWS Child DV	2.01	7.17
T3 SVAWS Child DV	1.19	4.32
T4 SVAWS Child DV	1.43	4.90
Child Self Regulation Score	12.54	2.79
Child Attentional Regulation Score	10.25	2.45
Child Attention to Toy Score	13.51	2.40
Child Low Anger Score	11.85	1.95
Child Low Sadness Score	11.12	2.59
Child Emotional (non) Lability Score	10.41	2.44
Maternal Parenting Positive Affect & Attention	2.62	0.48
Maternal Parenting Positive or Neutral Feedback	2.28	0.29
Mother Facilitates Self Regulation	3.95	0.65
Maternal Parenting Sensitivity	3.34	0.62
Maternal Parenting Positive Discipline	111.02	7.31
Family Income	2551.98	1986.82

Table 10: Means and Standard Deviations of Observed Variables in SEM Model

Key to Table 11:

Internalizing (1), Externalizing (2), T1 DV Mother (3), T2 DV Mother (4), T3 DV Mother (5), T4 DV Mother (6), T1 DV Child (7), T2 DV Child (8), T3 DV Child (9), T4 DV Child (10), Child Self Regulation (11), Child Attentional Regulation (12), Child Toy or Self Play (13), Child Low Anger (14), Child Low Sad (15), Child Affective non-Lability (16), Mother Positive Affect (17), Mother Positive Feedback (18), Mother Facilitates Regulation (19), Mother Parenting Sensitivity (20), Mother Positive Discipline (21), Family Income (22)

	1	2	3	4	5	6	7	8	9	10
1	1.0									
2	.62*	1.0								
3	.04	.06	1.0							
4	.01	.02	.28*	1.0						
5	-.03	.06	.20*	.23*	1.0					
6	-.05	.00	.25*	.32*	.29*	1.0				
7	-.07	.00	.48*	.15*	.14	.14	1.0			
8	-.01	-.03	.33*	.76*	.29*	.25*	.23*	1.0		
9	-.04	.02	.19*	.23*	.84*	.31*	.15*	.39*	1.0	
10	-.09	-.02	.21*	.17*	.14	.82*	.10	.14	.16*	1.0
11	-.06	-.03	.04	-.05	.07	.02	.11	-.05	.04	-.06
12	.10	-.03	-.03	-.10	.07	-.06	.08	-.05	.02	-.11
13	-.07	-.07	-.02	-.07	.06	.00	.06	-.04	.02	-.05
14	.00	-.05	-.02	.01	.02	-.05	.08	-.06	-.04	-.15
15	-.09	-.06	-.02	-.10	-.12	-.03	.09	-.09	-.01	-.11
16	-.04	-.06	.01	-.02	.01	.00	.08	-.02	.02	-.12
17	-.20*	-.17*	-.09	-.19*	.04	-.01	.03	-.18*	.06	.08
18	-.16*	-.13	-.11	-.19*	.01	-.13	.00	-.15	.04	-.11
19	-.07	-.09	-.16*	-.27*	-.07	-.24*	.02	-.23*	-.05	-.21
20	-.13	-.20*	-.20*	-.25*	-.13	-.17*	-.09	-.24*	-.10	-.08
21	-.30*	-.41*	-.13	-.14	-.11	-.14	-.07	-.13	-.07	-.07
22	-.08	-.19*	-.10	-.10	-.09	-.04	-.06	-.05	-.06	-.03

Table 11: Correlation Table of Observed Continuous Variables

	11	12	13	14	15	16	17	18	19	20	21	22
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												
11	1.0											
12	.75*	1.0										
13	.89*	.72*	1.0									
14	.75*	.60*	.68*	1.0								
15	.84*	.61*	.78*	.69*	1.0							
16	.81*	.60*	.71*	.80*	.88*	1.0						
17	-.10	-.03	-.07	-.08	.04	.03	1.0					
18	.05	.04	.06	.08	.12	.12	.40*	1.0				
19	.12	.15	.14	.16*	.21*	.14	.44*	.53*	1.0			
20	.05	.01	.06	.08	.14	.10	.55*	.52*	.83*	1.0		
21	.05	-.07	.05	.00	.16*	.09	.18*	.20*	.21*	.30*	1.0	
22	.01	-.04	.00	.06	.03	.07	-.02	.20*	.12	.14	.24*	1.0

Table 11: (cont'd)

	CBCL		Maternal DV Exposure			
	Intern-alizing	Extern-alizing	T1 DV Mother	T2 DV Mother	T3 DV Mother	T4 DV Mother
Avoidant	.02	.08	.01	-.03	.00	-.08
Ambivalent	-.05	.03	-.08	-.03	.11	.11
Secure	.03	-.09	.05	.05	-.08	-.03

	Child DV Witnessing			
	T1 DV Child	T2 DV Child	T3 DV Child	T4 DV Child
Avoidant	.02	-.01	-.03	-.04
Ambivalent	-.07	.01	.10	.13
Secure	.04	.00	-.06	-.07

	Child Positive Regulation					
	Self Reg.	Attn. Reg.	Toy Play	Low Anger	Low Sad	non-Labil.
Avoidant	.05	.05	.07	.03	-.02	-.02
Ambivalent	-.19*	-.16	-.13	-.23*	-.22*	-.22*
Secure	.12	.09	.05	.17*	.20*	.20*

	Maternal Positive Parenting					SES
	Pos. Affect	Pos. Feed.	Fac. Reg.	Par. Sens.	Pos. Disc	Family Income
Avoidant	.04	.03	.05	.07	-.02	-.09
Ambivalent	.00	-.08	-.06	-.03	-.10	-.07
Secure	-.03	.04	.01	-.03	.10	.13

Table 12: Point Biserial Correlation Table of Observed Continuous Variables and Categorical Attachment Variables (dummy-coded)

Measurement Models

Initially, Exploratory Factor Analyses (EFSs) were conducted using Principal Component Analysis (PCA) with Varimax (orthogonal) rotation in *SPSS* to explore the factor structures of the proposed latent variables. PCA analyzes all of the variance in the observed variables. Scree plot solutions, an analysis of Eigenvalues, as well as theoretical tenets and prior empirical findings were used to determine the most mathematically and theoretically stable factor structure of each of the latent variables.

Subsequently, and prior to final structural model testing, CFA's were conducted in *M-plus*, using FIML, to confirm the factor structure of each latent variable. Residual covariances were freed, as needed, when this lead to a significantly better model fit. All CFA models were found to fit the data well, as determined by a nonsignificant chi-square value or a value that was less than two times the degrees of freedom, a root mean square error (RMSEA) value of less than .05 or a RMSEA value falling within the 90% confidence interval (CI), a Tucker-Lewis index (TFI) and Comparative Fit index (CFI) greater than .95.

Maternal Positive Parenting. The CFA for the 4-year old (T4) maternal parenting measurement model consisted of 5 indicator variables. Four of the indicators were from the observed parenting variables of the Parent Child Interaction Task (PCIT): *Positive Affect, Positive Feedback, Facilitation of Self-Regulation and Sensitivity.* In addition, the *Discipline* subscale of the Parent Behavior Checklist (PBC), was also an indicator of this latent factor. The *Discipline* variable was standardized before inclusion in the model. All variables were coded such that high levels of each construct indicated positive parenting (e.g., high levels of the discipline variable indicated that the mother engaged in positive

discipline techniques). Model fit was very good: X^2 = 10.84, *df*=5, *p*=.06: CFI=.98; TLI=.96; RMSEA=.08 (90% CI = .00 - .18), *p*=.42. All factor loadings were significant.

Child Emotional Regulation. The CFA for the 4-year old (T4) child regulation measurement model consisted of 6 indicator variables from the observed child regulation coding of the Strange Situation Protocol (SSP): *Self-Regulation/Organizational Capacities, Attentional Regulation, Emotional Lability, Sadness, Anger* and *Toy/Self Play.* All variables were coded such that high levels of each construct indicated that the child was emotionally and behaviorally regulated. The Emotional Lability, Sadness and Anger variables were recoded such that high levels were indicative of successful regulation (e.g., high levels of recoded anger indicated that the child did not demonstrate anger during the session). Model fit was very good: X^2 = 11.52, *df*=7, *p*=.12: CFI=1.0; TLI=.99; RMSEA=.06 (90% CI = .00 - .13), *p*=.31. All factor loadings were significant.

Cumulative Intimate Partner Violence – Mother Experience. The CFA for the maternal experience of Domestic Violence (DV) measurement model consisted of 4 indicator variables from T1 through T4 (the first 4 years of the child's life) of the Severity of Violence Against Women (SVAWS) measure. Thus, each indicator reflected the woman's scores from that year's SVAWS administration. Model fit was very good: X^2 = .56, *df*=2, *p*=.76: CFI=.1.0; TLI=1.1; RMSEA=.00 (90% CI = .00 - .10), *p*=.84. All factor loadings were significant.

Cumulative Intimate Partner Violence – Child Exposure. The CFA for the child exposure to DV measurement model consisted of the 4 indicator variables from T1 through T4 (the first 4 years of the child's life) of the mother's endorsement of items on the SVAWS that were directly observed by the child. Model fit was very good: X^2 = .77,

df=2, *p*=.68: CFI=1.0; TLI=1.1; RMSEA=.00 (90% CI = .00 - .11), *p*=.79. All factor loadings were significant.

Initial Exploration of the Relations of Main Effects Variables

Prior to final model testing, the attachment, child regulation and child externalizing/internalizing (CBCL) variables were explored with ANOVA methodology using SPSS. A PCA factor score for the regulation variables was derived using the six variables contained in the measurement model described above. As reported above, the PCA revealed a single factor model. This factor had an Eigenvalue of 4.71, and explained approximately 78% of the variance. Communalities ranged from .64 for *Attentional Regulation* to .90 for *Self-Regulation*. The factor score was computed in SPSS for these preliminary analyses using the regression method.

Infant Attachment Category and Child Regulation Score

3 Category SSP (A/B/C): An examination of the relation of the 3 category SSP variable and the child regulation score was conducted. The omnibus F was significant for child regulation [$F(2, 144) = 3.63$; $p = .03$]. A Bonferroni post-hoc analysis revealed that children who had been securely attached as infants were significantly better regulated than children who had been ambivalently attached as infants ($\bar{x}$ avoidant = .05, $\bar{x}$ secure = .10, $\bar{x}$ ambivalent = -.46). There were no significant differences between the Avoidant and Secure groups or between the Avoidant and Ambivalent groups. See figure 2.

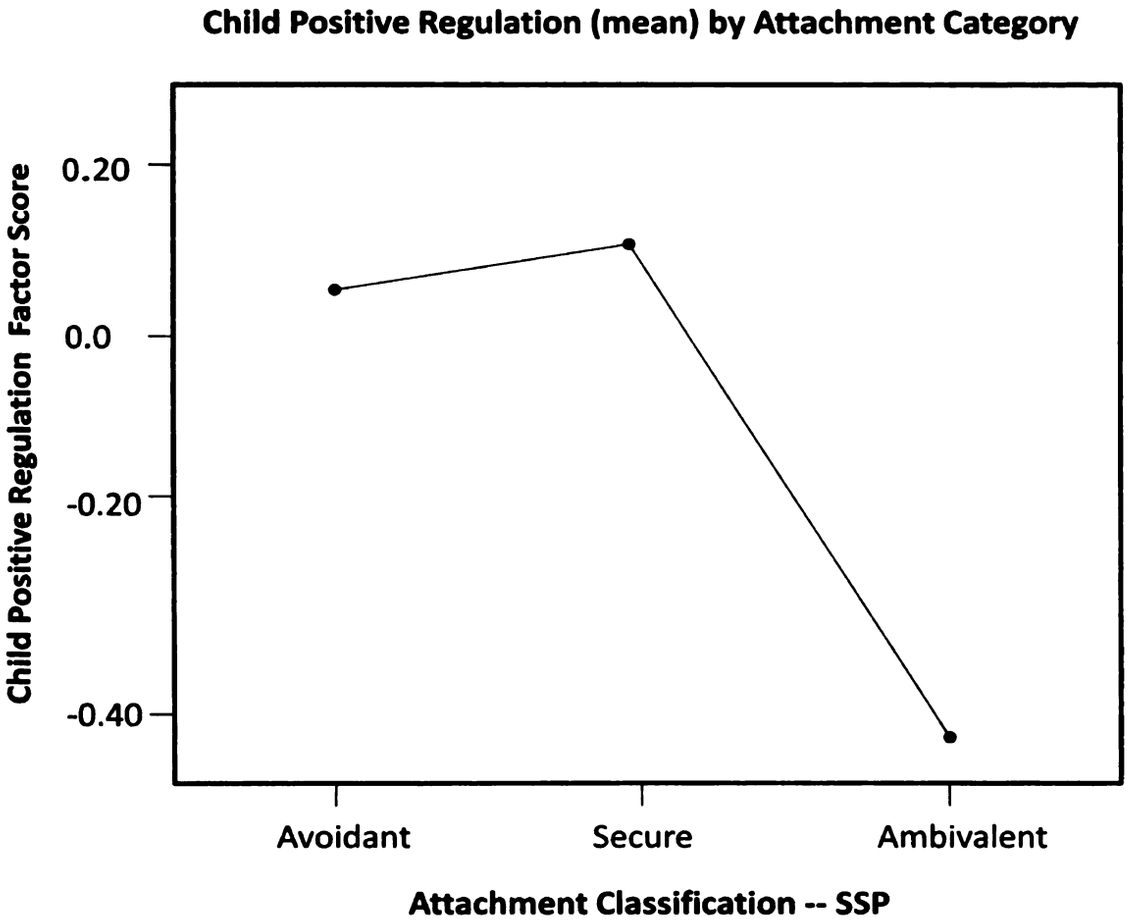


Figure 2: Child Positive Regulation (mean) by Attachment Category

Infant Attachment Category and Child Externalizing and Internalizing Scores

3 Category SSP (A/B/C) and **Externalizing**: An examination of the relation of the 3 category SSP variable and the CBCL externalizing score was conducted. The omnibus F was not significant for this model [$F(2, 161) = .78$; $p = .46$].

3 Category SSP (A/B/C) and **Internalizing**: An examination of the relation of the 3 category SSP variable and the CBCL internalizing score was conducted. The omnibus F was not significant for this model [$F(2, 161) = .22$; $p = .81$].

In summary, the 3 category SSP variable distinguished between the later child regulation scores of the Secure and Ambivalent groups. However, it was not predictive of later child externalizing or internalizing behaviors.

Hypotheses 1 – 5: SEM: Full Structural Model: Test of the proposed relations between the predictors of infant attachment classification, child self-regulation capacities, DV exposure and parenting behaviors to the outcomes of child internalizing and externalizing behaviors

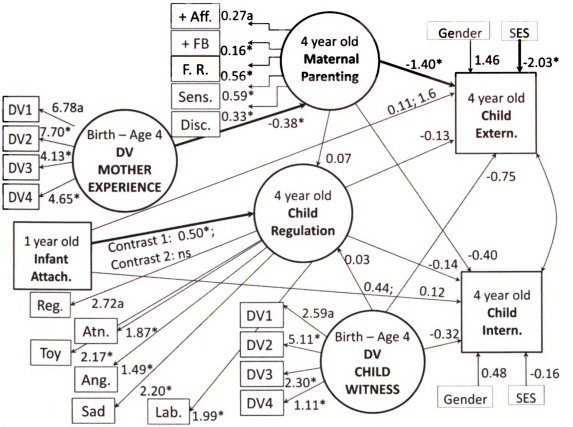
The full structural model included 23 observed variable indicators and 4 latent variables (see Figure 3). All analyses were conducted using the raw data, from which the means and covariance matrix of the indicators were analyzed (Muthen & Muthen, 2007). Consistent with the CFA analyses described above, all indicator variables for each of the latent variables loaded significantly onto that variable in the full model. Modifications were made to the model based on theoretical considerations and model testing results. In addition, due to the reported associations of income (Wadsworth & Achenbach, 2005) and gender (Rescorla et al., 2007) with externalizing and internalizing behaviors these variables were controlled in these analyses. The income variable was standardized prior to inclusion in the full model. In the current longitudinal sample, the covariance coverage of the data was very good, ranging from .73 to .93 for the observed variables in the model. In addition, the covariance values were within the expected range.

The infant attachment variable (SSP) was coded using contrast codes that were based, in part, on the results of the preliminary ANOVA analyses reported above. The first contrast variable examined the difference between the mean of the combined secure

and avoidant groups (coded at 1/3 each) and the ambivalent group (coded at -2/3). The second contrast variable examined the difference between the secure (coded at 1/2) and avoidant (coded at -1/2) groups.

The resultant structural model was found to fit the data well (see figure 3). Although it was significant, X^2 was well below two times the degrees of freedom of the model (X^2=295, df=240, p<.05). In addition RMSEA=.03 (90% CI = .02 - .05), p = .99, CFI = .97, and TLI = .97. Four of the paths in the model were significant:

1. The first contrast code was significant in the model, the second was not. This indicated that, A) the combined group of children from the secure and avoidant infant attachment classifications received higher emotion regulation scores than children who were ambivalently attached; and B) that there was no significant difference between the secure and avoidant groups;
2. Mothers who reported higher cumulative experiences of DV exposure tended to receive lower positive parenting scores with their four-year-old children;
3. Mothers who exhibited lower levels of positive parenting had children who received higher externalizing scores on the CBCL;
4. Children from lower income families tended to receive higher scores on the externalizing subscale of the CBCL.



[a]Fixed Estimate;

*p < .05. All factor loadings and path coefficients are standardized values. Significant paths are represented by bold black lines.

Figure 3: Full Structural Model

Hypothesis 6: Testing the hypothesized moderating role of DV in the relation between infant attachment category and preschool symptoms of externalizing and internalizing behaviors.

Hierarchical linear regression methodology was utilized to test this hypothesis. Two separate regressions were conducted; one for the internalizing and one for the externalizing outcome variables. DV was dichotomized using a median split. In addition, two (e.g., k-1) dummy variables for the infant SSP (attachment category) data were created, using the secure group as the reference group. Interaction terms were created by multiplying the dichotomized DV variable with each of the dummy variables. The model included the first attachment dummy variable (avoidant = 1), the second attachment dummy variable (ambivalent = 1), the dichotomized DV variable, followed by the first, and then the second, interaction variables.

The regression model for *externalizing* behaviors was significant overall (F (5,158) = 3.04, $p < .05$). However, the only significant variable in the model was the dichotomous DV variable (ß= .21; p<.05). The regression model for *internalizing* behaviors was not significant (F (5,158) = 0.40, *ns*).

Hypothesis 7: Testing the proposed relation of infant attachment category to later child use of specific regulatory ***behaviors*** (e.g., self-oriented versus other-oriented)

Principal Component Analysis

A Principal Component Analyses (PCA) with Varimax (orthogonal) rotation was conducted in *SPSS*, version 15.0 (SPSS, 2006), to explore the factor structure of the regulatory behavioral codes: *Self Stimulation, Talk/Sing to Self, Attention to Toy/Self*

Play, Contact Seeking and Attempts to Leave Room. Scree plot solutions, an analysis of Eigenvalues, as well as theoretical tenets and prior empirical findings were used to determine the most mathematically and theoretically stable factor structure.

The resultant model suggested 2 factors: Factor 1 included the *Contact Seeking* and *Attempts to Leave Room* variables (Eigenvalue = 1.56) and was labeled the Other-Focused Regulation factor; Factor 2 included the *Self Stimulation* and *Talk/Sing to Self* variables (Eigenvalue = 1.27) and was labeled Self-Focused Regulation. *Attention to Toy/Self Play* did not load well onto either of these factors. Together, these factors accounted for approximately 70% of the variance. Communalities ranged from .52 to .87. The factor scores were computed in SPSS using the regression method.

ANOVA: Analyses of Infant Attachment Category and Self and Other Factor Scores

The Self-Focused and Other-Focused regulatory behavior factors of the 4-year old children were explored in relation to their prior infant attachment category using ANOVA methodology in SPSS.

Other-Focused Regulation Factor. An examination of the relation of the 3 category SSP variable and the Other-Focused Regulation factor score was conducted. The omnibus F was significant [$F(2, 144) = 7.26$; $p = .001$]. A Bonferroni post-hoc analysis revealed that children who had been ambivalently attached as infants had significantly higher Other-Focused regulation behaviors than children who had been securely attached as infants ($\bar{x}$ ambivalent = .60, $\bar{x}$ secure = -.19, $\bar{x}$ avoidant = .02). Although there was not a significant difference between the Avoidant and Ambivalent groups, there was a trend in the data in the expected direction (p=.078; Ambivalent higher on Other-Focus than Avoidant). See figure 4.

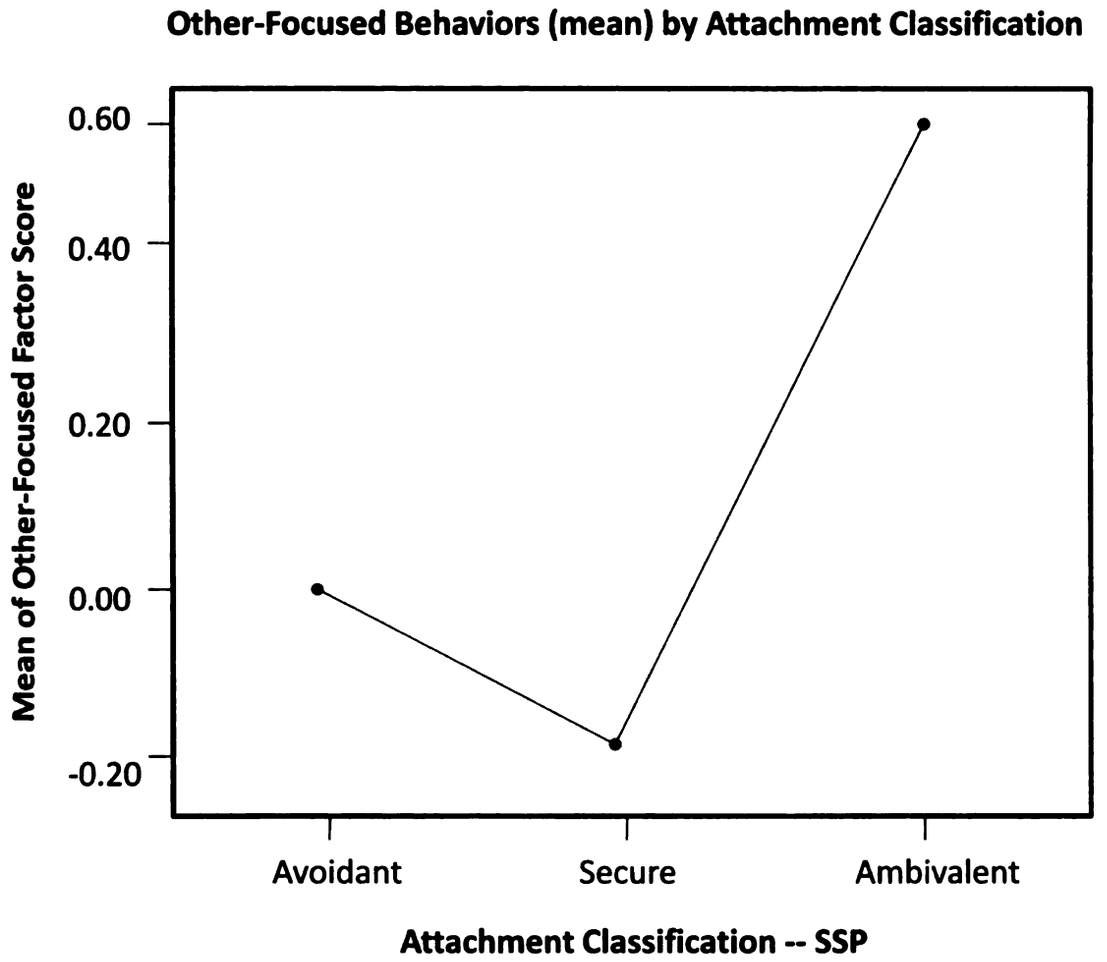


Figure 4: Other-Focused Behaviors (mean) by Attachment Classification

Self-Focused Regulation Factor. An examination of the relation of the 3 category SSP variable and the Self-Focused Regulation factor score was conducted. The omnibus F was not significant [$F(2, 144) = .70$; $p = .50$].

In sum, when examined at the 3 category level, children with prior ambivalent infant attachment classifications tended to demonstrate significantly higher levels of Other-Focused regulatory behaviors compared with the secure group during separations from their mother in a laboratory environment. In addition, there was a trend suggesting

that the Ambivalent group may also evince higher Other-Focused behaviors compared with the Avoidant group. The model for Self-Focused regulatory behaviors was not significant, suggesting that there are no differences between the attachment groups relative to their use of Self-Focused regulatory behaviors.

Post-hoc Analyses

There is currently debate within the literature about whether or not parental report of child witnessing of DV truly captures the extent to which DV in the home influences child outcomes. For instance, in a recent meta-analysis of child DV exposure (n=118 studies), Kitzmann, and colleagues (Kitzmann, Gaylord, Holt, & Kenny, 2003) identified the subset of studies which measured direct assessment of children's *witnessing* (usually by maternal report) of the DV versus those that used the broader definition of *exposure*. Results demonstrated that witnessing the violence did not moderate the relationship between DV presence in the home and later child social-emotional outcomes. They interpret these results as suggesting that violence perpetrated within the home environment of children results in child exposure.

Consequently, post-hoc analyses in the current study were undertaken to examine the possible differential effects of maternal experience of DV versus maternal report of child witnessing of DV on the outcome variables. The results of these analyses indicated that replacing the child witnessing DV variable with the maternal experience of DV variable did not improve model fit.

CHAPTER 8

DISCUSSION

The current study examined the influence of infant attachment on later child self-regulation capacities and psychopathology in a sample of children and their mothers who were heterogeneous for risk relative to domestic violence (DV) status and SES. The hypothesized mediating role of child regulatory capacities on the relationship between infant attachment and child psychopathology (e.g., internalizing and externalizing) was also examined. The SEM model fit the data well; three of the hypothesized paths and one of the covariates (SES) were significant. The hypothesized moderating effect of DV exposure on the relationship between infant attachment category and later symptoms of internalizing and externalizing behaviors in preschool was also examined using regression methodology and, overall, did not fit the data well. In addition, the influence of infant attachment on the differential expression of specific regulatory behaviors (e.g., self- versus other-focused) in preschool-aged children was examined using ANOVA methodology, yielding significant effects with regard to other-focused regulation behaviors.

Results from these analyses are discussed in terms of three main groups of findings. First, results suggested that maternal-infant attachment classification was related in theoretically consistent ways to overall child regulatory capacities as well as to the specific types of regulatory behaviors that the children used (e.g., self- vs. other-focused). In contrast, and contrary to predictions, neither infant attachment nor concurrently-assessed child self-regulation capacities were found to influence child externalizing and internalizing behaviors and DV was not a moderator of this

relationship. Secondly, the influence of DV on the mother's parenting, the child's self-regulation capacities and behavioral outcomes were tested. Results suggested that cumulative maternal exposure to DV had a negative influence on positive parenting behaviors. However, cumulative child DV exposure did not influence child self-regulation capacities or behavioral symptoms of internalizing or externalizing behaviors in this sample. Thirdly, proximal maternal parenting influenced child externalizing behaviors but not internalizing behaviors or child self-regulatory capacities.

The Influence of Infant Attachment on Preschool Self-Regulation and Psychopathology

One of the primary tenets of attachment theory as outlined by Bowlby (1969/1982) is that the infant's emotional system is shaped in fundamental ways by the developing parent-infant relationship. The internalization of this early relationship is thought to become generalized over the course of development such that it becomes a stable personality characteristic of the individual. This process becomes consolidated during the preschool period of development at which point it can be understood as the child's internalized style of emotional self-regulation (Kopp, 1989). However, there have been very few empirical examinations of the relationship between early attachment and child regulatory capacities, and the existing studies have examined discrete emotions such as anger regulation, generally at the dichotomous (secure/insecure) level of analysis (e.g., Gilliom et al., 2002). The current study, therefore, contributes to our understanding of the longitudinal effects of infant attachment on the development of emotional self-regulation and behavioral outcomes across early child development by examining this relationship at the typological level using a measure of child emotional self-regulation that is

comprised of multiple indicators of regulation including attentional and emotional regulation, expression of negative emotions and emotional lability.

The findings reported here suggested that the child's emotional self-regulation capacities, as measured within a stress-inducing laboratory paradigm, are related to his or her maternal-infant attachment relationship. Specifically, compared to children with secure attachment histories, children who were ambivalently attached as infants were less well-regulated as preschoolers, and demonstrated increased use of other-directed forms of self-regulation (e.g., contact seeking). In infancy, ambivalently attached children can generally be distinguished from the other two organized attachment groups, in part, by their demonstration of high levels of dysregulation and negative affect expressed within the context of their primary attachment relationship (Ainsworth et al., 1978; Magai, 1999). These children continuously seek contact with their caretakers but are rarely able to be effectively soothed by them. Mothers of ambivalently attached infants tend to be inconsistent in their provision of sensitive caretaking, thus providing a variable reinforcement schedule of the infant's dysregulated (upset) emotional expressions that serves to strengthen the intensity and frequency of these expressions.

In early infancy the use of other-seeking behaviors (e.g., crying, fussing), is adaptive in that it generally serves to elicit the attention of the caretaker. However, as children mature, social expectations for emotional and behavioral self-regulation increase. In the current sample, children with secure attachment histories appeared to have met these developmental expectations. However, children with ambivalent attachment histories were both dysregulated and overly reliant on developmentally regressed behavioral regulation strategies. Given that the behavior of these children is

incongruent with social expectations, it is likely that their emotional self-regulation strategies (e.g., crying, whining, clinging to adults), will elicit feelings of annoyance and anger on the part of their adult caretakers (e.g., preschool teachers, daycare providers, etc.). It is furthermore possible that, if these interpersonal transactions continue over time, these children may be at increased risk for negative psychosocial outcomes in the future.

In addition to their theoretical consistency, the present results are also broadly consistent with the few empirical studies that have examined the influence of early attachment on child regulatory capacities in preschool. For example, using a dichotomous attachment variable (secure/insecure), Gilliom and colleagues (Gilliom et al., 2002) found that, compared with the secure group, children with insecure attachment histories tended to demonstrate other-directed self-regulatory behaviors in the context of a frustrating waiting task. In comparison, children with secure attachment histories tended to use more sophisticated self-regulatory skills such as self distraction (e.g., playing with a toy). The current study adds to these findings by examining these behaviors at the three-category level of attachment. The results reported here suggest that there are differences in the use of other-focused self-regulatory behaviors between the secure and ambivalent groups, but not between the secure and avoidant groups. In addition, a trend in the data suggested that there may also be differences between the avoidant and ambivalent groups along this dimension such that the ambivalent group evinced higher rates of other-focused behaviors. Thus, when analyzed at the three category level, it appears that the secure and avoidant groups may use significantly fewer other-focused emotional self-regulation behaviors compared with the ambivalent group. This finding stresses the importance of analyzing these data at the typological, versus the dichotomous level.

Further, it suggests the possibility that, in the case of the data reported by Gilliom and colleagues (Gilliom et al., 2002), the finding that the insecure group demonstrated higher rates of other-focused behaviors may have been driven by the variance accounted for by the ambivalent group.

With regard to the group of children who were securely attached as infants, the current finding that they demonstrated positive regulation capacities is also broadly consistent with other studies that have examined these constructs. For example, using a dichotomous attachment variable (secure/insecure), Sroufe and colleagues (Sroufe et al., 2005) found that children who were securely attached as infants remained emotionally regulated even in the face of an extremely challenging and frustrating task, whereas the children with insecure attachment histories did not. In addition, in comparison with the insecure group, the children with secure attachment histories were better able to adapt their emotional and behavioral reactions in a flexible and more sophisticated manner when faced with environmental challenges. That is, their ego resiliency, as defined by Block and Block (1980), was found to be more sophisticated compared to children with insecure attachment histories. Furthermore, the current study found that the variable that captured the child's propensity to engage in play behaviors (e.g., "toy or self play") during the stressful episode loaded onto the positive child emotional self-regulation factor and not, as was originally hypothesized, onto the self-focused behavioral factor. This is consistent with the results reported by Gilliom and colleagues (Gilliom et al., 2002), in that they found that children with secure attachment histories tended to engage in increased rates of toy play in a (usually successful) attempt to cope with a frustrating waiting task. Thus, it appears that children with secure attachment histories are able to

more flexibly adapt their emotional self-regulatory strategies in a manner that allows them to remain emotionally regulated, whether that involves playing with the available toys or continuing to work to solve a difficult task. This flexibility presumably allows them to more effectively use the resources that are available in a given environment or situation in order to remain regulated. In the context of changing environments that provide different kinds of resources (e.g., home, preschool, social situations), their ability to flexibly adapt their emotional self-regulatory strategies may provide them with a distinct advantage in overall psycho-social adaptation and development in comparison with the ambivalent group.

Despite differences in emotional self-regulation capacities between the secure and ambivalent groups in the present study, no differences were evident between the secure and avoidant or the ambivalent and avoidant groups. Furthermore, contrary to the original hypothesis, ANOVA analysis revealed that the children with secure attachment histories did not demonstrate a mid level of regulatory capacities in the laboratory assessment. In fact, within the full SEM analysis, no differences were evident between the secure and avoidant groups in terms of their self regulatory capacities and the combined mean of these groups was found to be significantly different from that of the ambivalent group, suggesting that both the secure and avoidant groups of children are capable of relatively effective emotional self-regulation in stressful situations for short periods of time (e.g., 3 minute segments). This suggests that the development of either an avoidant or a secure attachment relationship during infancy may result in the capacity for emotional self-regulation during the preschool period. This is consistent with prior research that has demonstrated poorer psychosocial outcomes for the ambivalent group compared with

both the avoidant and secure groups (for a review see, Greenberg, 1999). It also suggests that children with secure attachment histories do not demonstrate a mid-range level of regulatory capacities but, instead, are able to maintain high levels of emotional self-regulation during short separations from their parent. Children at this age are often expected to separate from their parents and function independently within larger social contexts such as preschool environments. Usually, however, this expectation is applied to environments that are familiar to the child. Thus, a child may cry when separating from their parent the first day or two of preschool but, over time, the child is expected to acclimate to the new environment. The current study hypothesized that separation for a short period of time in an *unfamiliar* environment, would elicit a mid-range level of regulatory capacities in preschool aged children with secure attachment histories. These results suggest that this was not the case and that, at least during short separations, these children are capable of high levels of emotional self-regulation in unfamiliar environments.

This finding calls into question basic tenets of attachment theory which argue that differences in behavioral regulation capacities are inherently linked to differential styles of attachment relationships in infancy (Bowlby, 1969/1982). That is, the finding that both Avoidantly and Securely attached infants ultimately develop adaptive regulatory capacities later in development suggests an alternative hypothesis of the etiology of these behaviors. Specifically, as early investigators of child temperament have contended, it is possible that the infant behaviors which are observed in the SSP may be indicators of infant temperamental qualities and not linked, necessarily, to the mother-infant attachment relationship (Belsky & Rovine, 1987). Future research that tracks both

temperamental characteristics and indicators of the mother-child relationship at regular intervals over the course of early development is necessary to fully explore this hypothesis.

Alternative explanations are also possible. Specifically, the finding that children with avoidant attachment histories were well regulated is theoretically consistent. However, although it was not measured in this study, prior investigations of the physiological functioning and regulation of infants in the SSP has demonstrated that infants who are avoidantly attached do, in fact, evince elevated biological signs of stress during the separation episodes (e.g., vagal tone, cortisol levels), even though they appear behaviorally to be calm and well-regulated (e.g., Hill-Soderlund et al., 2008). Thus, it is possible that there are physiological differences across the secure and avoidant groups in terms of their emotional self-regulation in preschool even though they appear, behaviorally, to be quite similar. Future research is necessary to explore this possibility.

Although there were theoretically consistent findings in the relationship between infant attachment and later child emotional self-regulation capacities, neither of these variables predicted symptoms of psychopathology (e.g., internalizing and externalizing behaviors) in preschool children in the current study. Thus, these data suggest that early attachment experiences that are presumed to be based on the relationship(s) with the primary caretaker(s), do not influence psychopathology in later development. This finding is important given the existing evidence that temperamental qualities in children have been shown to be associated with symptoms of psychopathology (Nigg, 2006). Therefore, whether or not infant behaviors within the SSP are indicative of relationship qualities or of temperamental characteristics, the current data suggest that the attachment

categories that are derived from these behaviors are not predictive of later child externalizing and internalizing behaviors in the same ways that child temperamental qualities are.

However, developmental psychopathology holds that it is the confluence of risk and protective factors that best predicts to social-emotional outcomes such as symptoms of psychopathology (Sameroff et al., 2000). Consistent with this framework, infant attachment (as well as infant temperament) is understood as one factor within a child's broader psychosocial context that may influence later development. That is, while attachment theory predicts the internalization of differential styles of emotional self-regulation based on early attachment experiences, these are understood as affecting later development within a normative range; there is no theoretical prediction from insecure attachment history to later psychopathology in low-risk groups. However, when other psychosocial risk factors are present, insecure attachment styles have been shown to predict to later psychopathological outcomes. For example, Shaw and colleagues (Shaw et al., 1997; Shaw et al., 1996) found that dichotomized infant attachment variables (secure/insecure, organized/disorganized) were associated with both externalizing and internalizing behaviors in a sample of preschool-aged children whose families were low-income and receiving social services.

Consistent with this framework, the current study predicted that DV exposure would moderate the relationship between infant attachment and later symptoms of psychopathology. Contrary to this prediction, however, results demonstrated that DV did not moderate this relationship. Thus, the current results are inconsistent with these findings and with theoretical predictions that, within high risk environments, insecure

attachment will be a significant risk factor for poor psychosocial outcomes. This finding lends support to the alternative hypothesis that the SSP measure of infant attachment categories does not measure internalized relationship strategies, but, instead, captures infant temperamental qualities that manifest early in development and are reflective of the normal range of temperamental qualities in humans from reserved and organized to outgoing and gregarious. Furthermore, from a theoretical standpoint, attachment theory argues that DV exposure is likely to have a powerful influence on the early social-emotional development of the infant and young child, and on the formation of early infant relationships. That is, DV is expected to be a particularly influential risk factor during early childhood. Thus, the finding that DV does not moderate this relationship suggests that attachment relationships may not be associated with later psychopathology, even in the context of other contextual risk factors.

An alternative explanation, however, is related to the use of a community sample in the present study. Specifically, the lack of association between infant attachment history and child symptoms of psychopathology (e.g., internalizing and externalizing behaviors), in this heterogeneous-for-risk sample, may also suggest that exposure to DV within *community samples* may not constitute sufficient psychosocial risk such that insecure attachment leads to symptoms of psychopathology in young children. This finding is partially consistent with other research examining the influence of DV on child outcomes in community samples. For example, using a community sample, Levendosky and colleagues (Levendosky et al., 2003) found increases in externalizing, but not internalizing behaviors in DV-exposed preschool aged children. In addition, in a second study by the same researchers, DV exposure in a community sample was not associated

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with increases in either internalizing or externalizing behaviors (Levendosky et al., 2002). Further, using a sample of DV-exposed families, Lieberman and colleagues (Lieberman et al., 2005) found that, when other variables such as mother-child relationship quality were controlled, child DV exposure failed to predict to child behavior problems as measured on the CBCL. Thus, the current study, which includes maternal parenting in the full model, lends support to the hypothesis that the levels of DV found in community samples are not sufficient to place children with insecure early attachments at risk for later psychopathology.

A further alternative explanation of these results is that the lack of association between infant attachment and later child psychopathology within the current sample may be due to methodological and contextual factors that are somewhat idiosyncratic to DV-exposed samples. Specifically, the variance and range of both the internalizing and externalizing subscales of the maternally-rated CBCL in this study were relatively restricted and positively skewed. Further, none of the internalizing scores and only three of the externalizing scores within this dataset fell within the clinical range ($t > 70$). These results are consistent with the work by Lieberman and colleagues (Lieberman et al., 2005) who found that the mean CBCL total problem score in their community sample of DV-exposed women and children fell below the clinical cut-off. Thus, it may be that these scores represent a pattern of maternal underreporting. There are two potential reasons for this possibility. First, the negative psychosocial effects of DV exposure on maternal parenting have been demonstrated in other samples (McCloskey et al., 1995), and are evident in this sample as well. That is, as DV exposure increases, maternal positive parenting decreases. Positive parenting, as defined here and elsewhere (Dix,

1991), requires the capacity to be attentive to the behaviors of one's child. Trauma theory predicts that traumatic exposure leads to cognitive and emotional preoccupation on the part of the victim, making her less able to function effectively within other social domains (Herman, 1992). Thus, it is possible that the low CBCL scores reported by the mothers in this study represent a rater bias that is related, in part, to decreases in the ability of these mothers to fully attend to and report on psychopathological symptoms in their children. Secondly, feelings of guilt and shame on the part of the victim are associated with DV exposure (DeVoe & Smith, 2002). For example, when asked about how DV exposure influenced her relationship with her children, one mother in the current study said, "When he [the assailant] was around and we were fighting, I was stressed out. And then I wouldn't take it out on them [her children]. . . but I was short with them and I could tell and then that would make me feel bad because it wasn't their fault. It was my fault, I felt, like from letting him be here. And then I would feel bad, I'm like god, you know, it's not their fault. I should get them out of here." Consistent with this woman's self-report, prior qualitative work has documented that some women experience feelings of guilt and shame about their belief that they have intentionally placed their children in harm's way (DeVoe & Smith, 2002). Thus, there may be a form of cognitive dissonance that is interfering with the ability of these mothers to accurately report on the symptoms of psychopathology exhibited by their children. That is, the idea that their children are exhibiting signs of psychopathology may be extremely difficult for these mothers to attend to and report due to their feelings of shame and guilt about "causing" their children's problems.

In addition to the lack of an association between infant attachment and later child internalizing and externalizing behaviors, the current study also failed to find a significant association between the child's observer-rated emotional self-regulation capacities and concurrently-assessed maternal ratings of externalizing and internalizing behaviors. This finding suggests that evaluations of the child's emotional self-regulation capacities as measured in an unfamiliar laboratory environment are not related to behavioral symptoms of internalizing and externalizing behaviors as they manifest in the child's daily living environment. This suggests that other factors are influential in the development of behavioral symptoms of psychopathology and that a child's observed regulatory behaviors are not influential. Social learning theory, for example, predicts that the child's behaviors are influenced by observations of behaviors of others within their environment. In fact, the current study found that maternal parenting behaviors were predictive of the child's externalizing behaviors, lending support to this hypothesis. Other factors that were not measured in this study are also likely to be influential in the development of behavioral symptoms of psychopathology such as the genetic makeup of the child. Given these results, future research should examine the influence of parenting, family and child characteristics that may be influencing the development of these symptoms.

Alternatively, it is possible that the caretakers of the children with ambivalent attachment histories have adapted to their dysregulated style and are able to accommodate their need for extra support. For example, parents and teachers may have adapted to the child's deficits in emotional self-regulation by remaining physically close to the child more often than they would for other children. These may be the children

who hold the teacher's hand at recess, are allowed to always sit in the front of the group during 'story time' at school and who avoid playing with other neighborhood children unless a parent or caretaker is physically present. If the child's caretakers are able to adapt to these kinds of behaviors, the needs of these children may be sufficiently met within their social environment such that symptoms of psychopathology do not develop despite their deficits in emotional self-regulation. This study is the first to examine this relationship and, as such, contributes to our understanding of this relationship in preschool-aged children.

An alternative explanation of the lack of a significant association between the child's emotional self-regulation and symptoms of psychopathology may be that the *concurrent* assessment accounts for the lack of significant findings in this relationship. Specifically, from a transactional perspective (Sameroff & Fiese, 2000), it is the interaction of child, parent, and contextual factors across time that best predicts to child outcomes. As argued here, social expectations for emotional self-regulation become primary during the preschool period of development. It is at this point that there is likely to be a shift from tolerance of the child's dysregulation on the part of the child's adult caretakers to intolerance and anger. For example, "temper tantrums" that may be partially tolerated during the toddler period of development, are unlikely to be tolerated during the preschool period. In this study emotional self-regulation was measured at the point in development when the child's capacity for self-regulation is beginning to be more fully expected. Thus, it may be that the negative consequences of emotional dysregulation will only manifest later in development as a consequence of repeated negative interactions with adults in the child's life.

Domestic Violence: Influences on Parenting and Child Outcomes

Results from the current study demonstrated that increases in maternal exposure to DV over the first four years of the child's life resulted in decreases in observer-rated levels of positive maternal parenting measured when children were four years of age. This finding is consistent with trauma theory which argues that traumatic exposure influences the psychosocial functioning of women in ways that affect her functioning across many life domains, including parenting (Herman, 1992; Levendosky & Graham-Bermann, 2001b). Specifically, trauma theory predicts that exposure to DV will result in a state of both emotional and cognitive hypervigilance on the part of the victim (Herman, 1992). Consistent with this theory, prior empirical research has demonstrated the negative influence of DV on parenting behaviors (Bogat et al., 2006; DeVoe & Smith, 2002; Levendosky, Lynch, & Graham-Bermann, 2000). Parenting may be impaired due to the cognitive and emotional preoccupation that occurs in the context of traumatic hypervigilance and this may decrease a woman's ability to flexibly adapt her parenting to meet the changing needs of her children.

Specifically, exposure to DV may inhibit a mother's ability to regulate her own affects and behaviors which may then compromise her ability to engage in well-regulated interactions with her child (Fonagy et al., 2004). Schore (2003) has argued that the parent's ability to regulate her own emotions is especially important with respect to the parenting of young children given the centrality of the mother-child relationship in early child development. He stated, "Infant research now suggests that the baby becomes attached to the modulating caregiver who expands opportunities for positive affect and

minimizes negative affect" (p. 8). Consistent with this view, Dix' (1991) empirical review and formulation argued that sensitive parenting across child development is dependent on the parent's ability to provide an affectively organized response to the child's behaviors. He argued that parents who are able to regulate their emotions are better able to attend to the child's behaviors and then modify their own behaviors to meet the physical and emotional needs of the child. More recently, the growing neurobiological literature has shed light on the ways in which early, regulated, parent-child interactions play a critical role in the neurological and psychosocial development of young children (Fonagy et al., 2004). DV exposure may inhibit a mother's ability to provide this kind of sensitive, modulating care to her child. The majority of empirical research in this area, however, has examined the influence of DV on parenting in school-aged groups of children. The current study sheds light on the relationship between DV and parenting during early childhood.

Prior work using data from the current longitudinal study has demonstrated both that DV exposure predicts to a mother's internal representation of her child (Huth Bocks, Levendosky, Theran, & Bogat, 2004) and, furthermore, that both pre- and post-natal representations predict to the mother's parenting behaviors with that child (Dayton, Levendosky, Davidson, & Bogat, in press.; Theran, Levendosky, Bogat, & Huth-Bocks, 2005). Specifically, Huth-Bocks and colleagues found that exposure to DV during pregnancy was associated with the prenatal balanced/non-balanced status of a woman's internal working model of her child (Huth Bocks et al., 2004); women who were experiencing DV during pregnancy were more likely to develop non-balanced prenatal representations of their infants such that their representations were either emotionally

dysregulated (e.g., distorted) or emotionally distanced (e.g., disengaged). Subsequently, Dayton and colleagues (Dayton et al., in press.) found that prenatal maternal representations influenced later parenting when children were one year of age such that mothers who held balanced (secure) representations of their children were more likely to engage in positive parenting behaviors when compared to the two insecure groups. Additionally, mothers holding distorted representations were more likely to engage in hostile behaviors with their children, and mothers holding disengaged representations were more controlling with their children. The current study extends the prior work regarding the impact of DV on parenting behaviors by demonstrating that post-natal DV across early development is also influential in a mother's ability to effectively parent her child.

In contrast to the significant effects of DV exposure on maternal parenting behaviors, the hypothesized relationships between DV and child emotional self-regulation and psychopathology were not significant. This result is inconsistent with both the theoretical and empirical trauma literature (Lieberman et al., 2005; Osofsky, 2004). Especially relevant to the present investigation are two studies that used subsamples of the current longitudinal study. Specifically, DeJonghe and colleagues (DeJonghe et al., 2005) found that one-year old infants who were exposed to DV in the home were more distressed by a simulated telephone argument in a laboratory setting than non-exposed infants. Secondly, Bogat and colleagues (Bogat et al., 2006) found that maternal self reports of their own DV-related trauma symptoms predicted maternal report of infant trauma symptoms for infants who had witnessed severe levels of violence.

Thus, results from the current study are inconsistent with other work drawing from the same longitudinal sample. Current results suggest that DV exposure across early development may be less influential on later child outcomes than they are on outcomes in infancy. This finding suggests that children are more resilient to the effects of DV exposure than was previously thought. It may be that, although they demonstrate early signs of negative reactions to DV exposure, children are able to adapt to their environments effectively over the course of time. In fact, more recent published data from the longitudinal sample have demonstrated that both risk and resiliency factors are influential in accounting for the relationship between child DV exposure and psychosocial outcomes in early childhood including internalizing and externalizing behaviors (Martinez-Torteya, Bogat, Von Eye, & Levendosky, in press.). Further, results of these analyses demonstrated that cumulative exposure to DV was not a significant predictor of child psychosocial outcomes. Instead, they found that chronic exposure to abuse, in contrast to intermittent exposure, best predicted outcomes. Thus, the current findings are consistent with more recent work on the longitudinal study that failed to find a linear (e.g., dose-response) relationship between DV exposure and child psychosocial outcomes.

One alternative explanation of this finding is that DV may influence child outcomes primarily through the indirect effects of the abuse on the mother's parenting behaviors. Consistent with the current results, using an observer-rated measure of parenting behaviors, Levendosky and colleagues (Levendosky et al., 2003), found an indirect, but not a mediating, relationship wherein DV exposure was negatively related to positive parenting and positive parenting was negatively associated with the externalizing

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behaviors of preschool-aged children. Consistent with these findings, Katz and Windecker-Nelson (2006) found that emotion coaching, a particular subskill of parenting that is thought to promote children's emotion regulation capacities, moderated the effect of DV exposure on child aggression in a preschool sample (n = 130). However, other studies that have examined these constructs in older children have failed to find these indirect effects (McCloskey et al., 1995).

The disparity among studies of preschool-aged versus school-aged children may be due to the differential effects of parenting on younger (birth to preschool) versus older (school-age through adolescence) children. That is, as argued by attachment theory, parenting during early child development establishes a psychological foundation within the child through the creation of internal representations. During early development, the child's basic understanding of his or her social world is filtered through the parent in important ways that, in healthy development, tend to decrease over time. Infants and toddlers, for example, engage in the process of *social referencing* whereby, when faced with an unknown stimulus, they look to their caretaker in an effort to gauge the emotional salience of the event (Stern, 1985). If they perceive danger or anger on the part of the adult, they are likely to become upset; if they read the parent's face as reflecting humor or warmth, they are likely to remain calm or even engage more fully with the stimulus. Thus, it may be that, when mothers are able to engage in positive parenting with their young children they effectively shield them from some of the possible trauma-related consequences of exposure to the abuse. This process is not likely to occur as intensively for older children. In fact, as children mature, they may be more likely to attempt to

intervene to protect the mother, thereby placing themselves even more at risk for experiencing the direct effects of the violence.

This hypothesis may explain the difference between the current findings and findings from the two prior studies drawn from the present longitudinal sample. In the prior studies, DV exposure was found to influence child outcomes in one-year-old children. Specifically, in the first study, DeJonghe and colleagues (DeJonghe et al., 2005) examined the infant's reactions to an angry phone call when the mother was not in the room. Thus, the infant was not able to visually reference the mother in order to gauge her reaction to the event. These investigators found that DV exposed infants were more reactive to the simulated angry event than non-exposed infants. It is possible, however, that these results may have been different had the mother been present in the room. That is, if the mothers were present, they would have likely reflected a sense of safety to the children about the simulated anger being expressed and this may have resulted in the children not reacting to the event. The second study by Bogat and colleagues also lends support to the hypothesis that DV influences child outcomes primarily through its indirect effect on maternal parenting. In that study, maternal reports of their own trauma symptoms predicted infant trauma symptoms for infants who had witnessed severe levels of violence. This suggests that, when the mother's reactions to the abuse were extreme as in PTSD, the infant may have read maternal cues as reflecting that the situation was, in fact, dangerous. These infants then began to demonstrate PTSD symptoms of their own.

In summary, results from the current study suggest that DV may be most influential in predicting child outcomes through its effect on maternal parenting. The direct influence of DV exposure on child psychosocial outcomes in preschool-aged children

appears to be less influential. It is hypothesized that the influence of DV on parenting may be especially important for young children. Further research is necessary to examine the possible differential effects of DV exposure and parenting on children at varying developmental stages.

Parenting and Child Outcomes

Despite the restricted variance within the child internalizing and externalizing variables, the current investigation found that maternal positive parenting was significantly, negatively associated with concurrently assessed externalizing behaviors. This finding is consistent with a substantial amount of empirical literature that has demonstrated the effects of parenting behaviors on child psychosocial outcomes within school-aged samples of children (W. A. Collins, Madsen, & Susman-Stillman, 2002). In addition, it is consistent with Belsky and Fearon's (2002) finding that concurrently assessed parenting behaviors of toddlers significantly influenced child behavioral problems beyond the influence of infant attachment classification. In contrast, a significant relationship between positive parenting behaviors and internalizing behavioral symptoms was not found in this study. This suggests that parenting in DV-exposed families is more influential on the development of child externalizing than internalizing behaviors. Exposure to violence in the home may explain this distinction. That is, social learning theory predicts that violence observed by children is learned and imitated (Bandura, 1977). In this particular sample, however, given the possible trauma-related effects of maternal preoccupation with the violence in the DV-exposed women, it is possible that mothers are better able to attend to and report the externalizing behaviors of

their children and less able to detect internalizing behaviors which require a greater sensitivity to the subtle signs of the child's social-emotional functioning.

The current study also failed to find an effect of concurrently-assessed parenting on the emotional self-regulatory capacities of preschool children. In contrast to the infant, toddler and school-aged periods, parenting during the preschool period has not been well-studied. During the infancy and toddler periods, the child's attachment strategy is thought to reflect, in part, the parenting behaviors of the caretaker(s). During the preschool period of development, the emotional self-regulation capacities of children that have evolved in the context of the parent-child relationship(s), are expected to be more fully internalized and have become relatively stable characteristics of the child's personality (Sroufe, 1995). At this point, parenting behaviors, like the child's behaviors, are likely to shift as the child's regulation moves more fully from a dyadic to an independent process. In fact, in their meta-analysis of the extant empirical examinations of parenting behaviors, Holden and Miller (1999) found that parenting becomes increasingly stable across time beginning when children are school-aged. Thus, parenting during the preschool period may be in a period of transition and therefore less predictive of concurrently assessed regulatory functioning. That is, earlier parenting, as reflected in the child's infant attachment category may still be more predictive of child regulatory capacities at this point in development whereas concurrent parenting may be more influential in predicting the child's daily behavioral functioning (e.g., externalizing behaviors).

The differences in effective or optimal parenting during the preschool stage of development compared with earlier parenting have not been fully examined. However, from a theoretical, child development perspective, it may be that parenting during the

preschool period is less concerned with the "how" of regulation that is more reflective in the child's internalized attachment and regulatory strategy, and more concerned with the "where, when and why" of regulation. The latter may be better captured by the CBCL (Achenbach, 1991) in that this measure assesses the child's behaviors as they manifest within their day to day environments. For example, items that reflect the child's propensity to disobey and to argue with adults are captured by this measure and reflect the child's relative ability to function within his or her social environment. Children during this developmental period need adults to help them identify when and where it is necessary to utilize their newly consolidated regulatory strategies (Sroufe, 1995), and parenting may be shifting during this period to accommodate this developmental need. For example, at this age it becomes important to sit still when the preschool teacher is reading a book to the class, but it is equally important to understand that the demands on emotional self-regulation shift during recess when it becomes important to engage in activities that allow for the discharge of energy. Children need their parents, as well as other caretaking adults in their lives, to help them understand the logistics of these changing environmental demands. Future research on the differential skills necessary for effective parenting in the preschool period compared to the infant and toddler periods is necessary to more fully test these hypotheses.

Limitations of the current study

The current study has several important methodological limitations. For example, although the use of observer rated maternal and child behaviors in this study is a methodological strength, these data were gathered during relatively short behavioral observations in the laboratory environment and not in the family's home environment.

The nature of the sample made home observation potentially dangerous to both the family and the researcher. However, especially in the case of maternal behaviors, it is possible that women were able to exhibit their highest level of parental functioning in this setting for this limited period of time. It may be that had observations been conducted for longer periods of time in the home environments of these families, different results would have emerged. Ainsworth's (Ainsworth et al., 1978) original work, for example, used home assessments of longer duration, and yielded significant results despite a small sample size (n = 23). Given the frequent use of relatively short-duration laboratory assessments within the child development area of research, future work that establishes the validity of these assessments compared to home observations will be an important next step.

Another significant methodological limitation of this study is the lack of temporal precision in the measurement of domestic violence exposure. That is, the measures utilized in these analyses assessed whether the woman had been exposed to abuse in the year preceding the interview; the specific timing of the abuse was not assessed. Thus, one woman could have been abused eleven months prior to the time of the data collection and then left that relationship, whereas another woman may have been currently in an abusive relationship. The measure captured the number and type of abusive events; it did not assess its recency. Therefore, in the case of this example, if both of these women had been exposed to the same level of abuse, they would have received the same domestic violence score, even though it is likely that the impact of the abuse on current parenting behaviors and child outcomes may have been stronger for the woman who remained in an abusive relationship.

In addition, despite the significant use of observer rated methodology for both child and maternal behaviors, three of the measures rely solely on maternal report. Specifically, measurement of both the mother and child DV exposure is reliant on maternal self report. In both cases, practical considerations, including the safety of the mother and child, make it difficult to obtain third-party reports of the frequency and intensity of the DV exposure. In some families, obtaining information from the assailant could place the mother and her children at significant risk of continued or intensified abuse. A third party reporter such as a friend or family member of the mother may be one way to obtain confirmatory data about the abuse. This too, however, presents safety issues in that, unlike the research team, family and friends are not bound by confidentiality and possible disclosures may compromise the mother's safety.

As described within this paper, maternal report of child exposure to the DV is especially problematic in that there are many potential reasons that a mother may minimize her report of the child's exposure, including her psychological need to minimize the exposure in order to reduce her own sense of guilt. In addition, maternal report of her child's symptoms of internalizing and externalizing behavioral problems may be minimized for similar reasons. Concurrent reports of these behaviors from other significant caretakers in the child's life would have strengthened the methodology of the current study. While the longitudinal study attempted to obtain teacher/caretaker reports of these behaviors in children, many children were not in out-of-home care or preschool at this time point, and only a minority of the available teachers and childcare providers provided CBCL data. Thus, the results of this data were deemed to be of insufficient quantity for use in the current analyses.

Finally, one significant limitation of the current study is that it utilized a sample of convenience and, therefore, there are inherent threats to both internal and external validity. For example, there were many variables that were not measured or accounted for in the current study such as the child's possible exposure to child abuse, or genetic predisposition for psychopathology. These kinds of data were not collected and, therefore, could not be controlled or manipulated in the current study. This leaves open the possibility that the data examined here are influenced by other variables that may account for the variance in both the independent and dependent variables. In addition, threats to external validity include the fact that, since these women self-selected for participation in the study, they may be unique in some way relative to the broader population. It is possible, for instance, that the women who chose to participate were experiencing lower levels of DV, even relative to their non-shelter, DV-exposed peers. In this case, our sample would not represent the population of women who are exposed community levels of DV.

Clinical & Research Implications

Results from the current study indicated that the children with ambivalent maternal attachment histories evinced deficits in emotional self-regulation capacities during the preschool period of development. These children became dysregulated during a short separation from their mother in an unfamiliar environment. However, emotional self-regulation as measured in this environment was not associated with externalizing or internalizing behavioral symptoms in the child's everyday life. Although this suggests that the child's emotional self-regulation deficits do not affect his or her global functioning – at least in terms of the development of externalizing and internalizing

behaviors, it is likely that there will be occasions wherein the child is required to endure separations from parents or caretakers in unfamiliar environments. The results from this study suggest that children with ambivalent attachment histories may have an especially difficult time in these situations. In the case of DV exposed families, there may be separations due to the mother and children fleeing the abusive situation and, as is often the case in the cycle of abuse, returning after a period of time. Children in these families are often placed with different caretakers at different times in this cycle. In what has been termed "compassion fatigue", clinical experience suggests that a woman's friends and relatives are often willing to provide them with assistance, including childcare support, early on in the cycle of abuse, but may become weary after several cycles of the woman leaving, and then returning, to the abusive relationship.

These kinds of disruptions may be especially difficult for children with ambivalent attachment histories. That is, due to their inability to use flexible and age-appropriate emotional self-regulation strategies, children with ambivalent attachment histories are likely to struggle within these kinds of chaotic life styles. This suggests that infant mental health (IMH) interventions that are designed to foster secure mother-infant attachment relationships within DV exposed populations may be particularly helpful to the children who would otherwise form an insecure-ambivalent attachment relationship. A recent study using data from the current longitudinal sample suggests that child outcomes in DV exposed families are best predicted by both risk and resiliency factors (Martinez-Torteya et al., in press.). Thus, IMH interventions that help infants develop secure attachment relationships with their mothers may provide a protective factor for

children from the negative influence of the chaotic life style that is often associated with DV exposure.

In a related finding, results from the current study also indicated that there is an indirect effect of DV exposure on child externalizing behaviors via the impact of DV on maternal parenting. This finding points to the need for intervention programs that are aimed at improving parenting skills in DV exposed families. There are currently many programs designed to assist women in leaving abusive relationships. Fewer interventions are aimed specifically at improving the parenting skills of DV-exposed women. In one important exception, Graham-Bermann (Graham-Bermann et al., 2007) has developed a community-based intervention program for DV-exposed mothers and their children that employs both peer support and skill building components and has produced empirical data supporting its effectiveness (Shavers et al., 2005). Infant mental health theory argues that parents are often willing to make significant changes on behalf of their children that they might be unable to make for their own wellbeing (Fraiberg, 1987). Thus, parenting interventions with DV-exposed women may serve to decrease the possible cognitive dissonance they experience with regard to minimizing the effect of the violence on their children, and thereby increase their propensity to leave abusive relationships.

Results from the current study also suggest many avenues for future research. For instance, although results indicated that child emotional self-regulation capacities were not associated with concurrently assessed internalizing and externalizing behaviors, it is not known whether there may be an association with symptoms of behavioral disorders later in development. Theoretical arguments from transactional theory and developmental psychopathology suggest that the impact on these symptoms may not become evident

until later in development. This possibility is most clear for children with ambivalent attachment histories who were found in this study to evince deficits in their emotional self-regulatory capacities. As social pressures for independent self-regulation continue to increase, these children may encounter increasingly negative feedback from their adult caretakers resulting in the establishment of externalizing behaviors later in development.

Another important step for future research within the domestic violence field is the development of temporal precision in the assessment of DV. One strength of the current study was the use of quality tracking procedures to ensure a substantial retention rate over several waves of data collection in a high risk sample. Specifically, women were contacted every three months to confirm and, when necessary, update their contact information. One possible way in which to capture more precise measures of DV is to link these tracking contacts with the assessment of DV. Employing this level of data collection could improve the precision with which DV is measured and may also improve the validity of the maternal report in that they would be asked to remember and report on DV exposure over a much shorter period of time.

Similarly, the assessment of SES in this study was based fully on the family's income. There are many important indicators of a family's SES including income, parental educational level, access to concrete supports and services, among others. In addition, the sociocultural and racial background of the family is also likely to hold significant consequences for the overall functioning of the family due to social processes that often restrict access to resources for socially oppressed groups. Future research should examine the influence of a broader range of factors that influence SES in an effort

to better understand the influence of particular variables, or combinations of variables, that impact child regulation and symptoms of psychopathology.

Finally, the current study found significant associations between infant attachment classification and later emotional self-regulation capacities in preschool aged children. However, concurrently assessed, observer-rated parenting behaviors were not found to be related to the child's regulatory capacities. Future research should further examine the parenting behaviors that are effective in helping preschool children negotiate the age-appropriate developmental press to consolidate their emotional self-regulation capacities. The ways in which effective parenting during this developmental period compared to other periods of development is especially needed, given the relative paucity of examinations of parenting during the preschool period.

Summary of Study Contribution

Despite explicit theoretical predictions linking infant attachment to emotional self-regulation styles across the lifecourse (Bowlby, 1969/1982), this study is the first to examine the influence of infant attachment category on child regulatory capacities at the typological level in preschool children. The preschool period is unique relative to the child's development of emotional self-regulation; it is at this point in development when regulatory strategies become more fully consolidated resulting in increases in the prediction of individual differences from this point forward (Sroufe et al., 2005). Results from the current study suggested that, in a combined community (e.g., non-shelter) sample of DV-exposed and non-exposed families, insecure infant attachment was, in fact, associated with the child regulatory capacities of four year old children. These results

provide empirical support for the theoretical hypothesis that early attachment experiences influence later emotional self-regulation capacities.

In addition, the current study contributes the growing body of literature examining the effects of attachment on later child symptoms of psychopathology. Once considered a fundamental deficit associated with negative developmental outcomes (Erickson et al., 1985), empirical work has demonstrated that insecure attachment is predictive of psychopathology most robustly in the presence of other risk factors (Greenberg, 1999). The current study contributes to this literature by examining this relationship in a sample of mothers and children of whom seventy percent endorsed maternal DV exposure at some point during the child's first four years of life. DV exposure in early childhood is unique in that it poses threats to the child and to the child's primary attachment figure at a time in development when the child's regulatory capacities are based most fully on their attachment relationship. Results indicated that DV exposure was not directly predictive of child externalizing behaviors but, instead, was indirectly predictive through its impact on maternal parenting. This finding is consistent with attachment research and theory which highlights the centrality of the primary attachment relationship to the child's early growth and development. The findings reported here contribute to our understanding of the complex dynamics that underlie the effects of DV in early child development.

APPENDIX

MATERNAL PARENTING CODING SCHEME

Mother Infant Study Coding Manual
4 Year Old Eyberg Protocol (adapted)

MATERNAL CODES

This adapted version of the Eyberg Protocol lasts a total of 14 minutes and is equally divided into two situations: 1) child directed play and 2) mother directed play. There are 7, 5-point, maternal scales which are scored in one-minute intervals. Scores for each domain are then averaged across all 7 one-minute segments for each of the 2 protocol situations. This yields a mean score which is used as the final score for that domain in that situation. Thus, each case receives a final average score for each domain (e.g., positive affect) in both of the 2 protocol situations.

Maternal Codes*

1. Positive Affect and Affection
2. Negative Affect and Feedback
3. Positive or Neutral Feedback
4. Facilitates Self Regulation
5. Intrusive / Overcontrolling
6. Unresponsive, Unavailable, Undercontrolling
7. Sensitivity

*Adaptations:

The first 6 codes included in this manual were adapted from the *MSU Family Project Second Revision of Belsky's Parent-Child Interaction Coding System*, by Ellen E. Whipple, Ph.D., Natalie L. Denburg, and W. Hobart Davies, Ph.D. Their version was adapted from : Belsky, J., Youngblade, L., Rovine, M. & Volling, B.A. (1991). Patterns of Marital Change and Parent-Child Interaction. *Journal of Marriage and the Family,* 53, 487-498.

The sensitivity code is adapted from the *Emotional Availability Scales* developed by Dr. Zeynep Biringen in collaboration with Drs. JoAnn L. Robinson and Robert N. Emde.

Biringen, Z. (2000). Emotional availability: Conceptualization and research findings. *American Journal of Orthopsychiatry, 70*, 104-114.

Biringen, Z. in collaboration with J. L. Robinson and R. N. Emde, Emotional availability scales, 3rd edition. *Attachment and Human Development (special issue on emotional availability and attachment), 2*, 257-270.

General Coding Comments

- Coding Procedures:
    - Reread the manual before you start coding. After you've coded a critical mass of these you will be able to skip this part but in the beginning and middle phases of this project you should do this every time
    - Watch the first minute, stop the DVD and code each domain.
    - Rewatch the first minute, stop the DVD and check your codes. Make any changes and then repeat this process for each of the 14 minutes.
    - You may need to watch each minute more than two times – especially at the beginning.
    - Make sure that you fill out the coding sheet completely (date, name, etc.).
- For each of the scales, the baseline score is indicated with a **B**. This is to give the coder a frame of reference as to which is the most frequently occurring rating for each construct.
- Coders should make note on the code sheet of any unusual incidents which occurred during the segment. Examples may include the child leaving the room for a period of time, problems with audio or video, mistakes in the administration of the protocol such as timing, etc.
- An important feature of this coding system is that it taps both qualitative (feeling, intuition) and quantitative (behavioral frequency) aspects of the parent-child interaction. This includes verbal / nonverbal communication and direct / indirect factors. Additionally, this system is an effort to identify the way things are said (the affective quality) in addition to the content of what is said.
- Some of the scales are interrelated, in that if you give a certain score on one item, other scales must receive especially high/low scores.

1. POSITIVE AFFECT & AFFECTION

This rating assesses the extent to which the parent displays warmth, nurturance, and positive affection toward the child and enjoys interacting with the child. Extent is defined in terms of both frequency and intensity. Behaviors that evidence such an orientation are numerous and diverse. Among others, they include affectionately touching the child, smiling at and laughing with the child, as well as being enthusiastically involved in what the child is saying or doing.

In comparison with the positive feedback rating, these behaviors do not have to be contingent on child behavior. However, for positive affect to be coded as feedback, the parent's response must be specific to a very explicit child behavior. The more general the situation that evokes the parents' positive affect, the more likely it is that it should be coded positive affect instead of positive feedback. Positive affect that qualifies as positive feedback is not coded here (e.g., affect is a feeling , feedback is a behavior).

NOTE: All instances of positive affect should represent genuine warmth. Smiles and laughter that are sarcastic or mocking should not be counted.

1. No or very few instances of warmth, affection, or enjoyment are observed. Parent may be instructional or uninvolved.

2. **B** Parent is involved in what the child is doing, initiates talk with the child.

3. 1-2 instances of verbal or nonverbal warmth, affection, and enjoyment are observed. For example, parent laughs with the child. Parent smiles or appears genuinely happy, or makes eye contact which conveys warmth.

4. 3 instances of verbal or nonverbal warmth, affection, and enjoyment are observed. Parent is involved and enthusiastic. Feeling is one of support and nurturance consistent throughout the minute.

5. Instances of warmth, affection, and enjoyment are very frequent, or intense, exuberant (4 or more instances).

2. NEGATIVE AFFECT & FEEDBACK

This rating assesses the extent to which the parent displays hostility, negative affect, and displeasure or annoyance toward the child, with extent defined in terms of both frequency and intensity. Behaviors that evidence such an orientation are numerous and diverse. These include annoyed or scornful facial expressions and posturing, aggressive handling of the child, explicitly negative or scornful vocal tones, and clear lack of enjoyment of the child in this situation. The parent behaviors rated in this scale do not have to be contingent upon the child's behavior but they may be. The demonstration of "flat" affect is not coded here. A mother must actively demonstrate negative affect to score here (note that this may come through in her body posture, tone of voice, etc.).

NOTE: This rating includes sarcasm. Sometimes it may be difficult to distinguish between positive and negative affect as the parent may smile in a way which on the surface appears positive, but s/he is laughing at the child and/or ridiculing him/her.

NOTE: This rating also includes criticism.

NOTE: Negative affect can be expressed nonverbally.

NOTE: This code includes disappointment and displeasure with the child's behavior even if this disappointment seems justified. For example, the mother repeatedly expresses displeasure because her child disobeys her when she asks him/her to switch tasks.

1. **B** No instances of hostility, negative affect, or displeasure are evident.

2. Parent's facial expression, posturing, or tone of voice is negative. However, there are no explicit negative messages (e.g. verbal comments or physical gestures).

3. Some subtle instances of hostility, negative affect, or displeasure/annoyance occur, but there is no escalation in intensity or loss of control.

4. 3-4 instances with some escalation or loss of control.

5. Instances of hostility, negative affect, and displeasure are frequent (>4) and/or intense. Much of the time during the one-minute period is characterized by this kind of behavior.

3. POSITIVE OR NEUTRAL FEEDBACK

This scale assesses the extent to which the parent provides contingent rewards and praise to the child for his/her behavior via verbal and/or nonverbal feedback, with extent defined in terms of both frequency and intensity of feedback. Statements such as "that's good" would thus be weighted less heavily in this rating than more elaborate ones like ""that's terrific, you really worked hard at that ; I'm proud of you!". Other examples of positive feedback include statements like "you did a good job", or a pat on the back or clapping of hands in response to the child's accomplishments. The observer must be able to identify the contingency between child and parental behaviors in order to score this as feedback as opposed to positive affect. The parent should be intentionally or explicitly providing a positive response to particular child action.

NOTE: Emotional feedback should be credited here as well. Labeling the child's feelings or responding empathically (e.g., affect attunement) (e.g., "You really like doing this, don't you?") should be scored >4.

NOTE: This scale is includes "neutral" feedback, as sometimes the parent provides neutral feedback such as "there you go" or "that's right". Thus, the parent is providing the child with some – as opposed to no – input.

1. No feedback is observed. Mother has to be fairly non-responsive to be coded here.

2. **B** Parent makes one or more neutral acknowledgements (e.g., OK, uh-huh) in response to child's verbal or nonverbal behavior or vocalizations. Thus, parents who are really attentive are probably going to score at least a 2 on this scale.

3. Within any single minute parent says 1-2 times "that's good" or "very good" without elaborating on the feedback and/or without special enthusiasm. Other examples include "there you go" or "nice job".

4. Parent gives 3 feedbacks or fewer than 3 but with special enthusiasm (e.g., elaborating on the feedback verbally).

5. Positive feedback is frequent or **intense** and characterizes much of the way the parent responds to child. To give a 5, it should seem as if there is continuous **positive** feedback. The feedback should have a personal quality that validates the child's sense of self.

4. FACILITATES SELF-REGULATION

This scale assesses the extent to which the parent facilitates his/her child's ability to control self and actively and positively engage the situation. That is, provides the "scaffolding" which allows the child to direct/structure the play. **This is based on the presupposition that in order to facilitate the child's attempts at self-regulation, the parent must be able to take the child's perspective in any given moment or interaction and respond according to the child's needs.** Parents are rated in terms of their ability to provide supportive assistance that facilitates the child's competent functioning, with extent being defined in terms of the frequency and intensity of parent's behavior. With a facilitative parent, you get the sense that she is involved and available to the child and is "pre-digesting" the information for the child and making the task a bit easier and more manageable. The interaction has a positive feeling with a facilitative parent.

The evaluation of the parent on this scale is not dependent upon the success of parent's facilitative acts; thus this scale assesses only the parent's skill, effort, and intent. Also, one never lowers scores (except when considering a score of 5) because of additional intrusive, unresponsive, or negative parental behavior.

For Child-Directed Play, it should be noted that if the parent sits close to child and is attentive and available to him/her, the parent will receive a minimum score of 3. For Parent-Directed Play, parent and child working together on a chosen activity is scored a minimum of 3. As more specific facilitative behavior is displayed, the parent's score will increase appropriately.

Examples:

A. During play, parent provides supportive presence, whether actively playing with child or watching child play yet, "being there" for child.

B. The provision of rationales which offer information or appeal to positive or neutral consequences in order to obtain compliance. For example, the parent's rationale might indicate that some child action will please the parent, will be in accordance with a rule, or will lead to pleasant outcomes. Rationales that provide information might involve statements like "Why don't you do X, because something interesting might happen; because it works that way," or the like.

C. The manipulation of materials in a way that improves child's chances for being successful, yet does not involve doing the task or action for child. Such facilitative assistance may take the form of giving verbal hints, repositioning a piece where child will see it better, assisting child in doing something difficult by helping him/her manipulate the piece -- in essence, by providing a "scaffolding" for the child to use.

D. The provision of a well-timed directions (but not too frequent or intrusive), delivered in a pleasant or encouraging tone of voice which points child in the "right" direction. For example, describing how to fit the block together to achieve a desired goal, or helping them write their name. Suggestions made by the parent lead to more developed play.

E. The provision of well-timed interventions that prevent child from becoming over-aroused and disorganized. Such facilitative parenting may take the form of the parent "steering" or "inducing" child away from a potential frustration, but not before child him/herself has a chance to cope, unless even one effort to cope is likely to overwhelm child.

F. Assisting child in the expression of his/her thoughts or feelings that supports the child's desire to express and control them. Conversation or dialogue in the service of maintaining child's organization. More generally paraphrasing child's feelings in ways that facilitate the organization of a child's behavior and his/her coping is considered here.

1. No evidence of facilitative behavior is observed OR parent does not pay attention to child in child-directed play OR parent plays by him/herself during parent-directed play OR just orders and sits back observing.

2. Echoing child's comments while sitting back OR has limited involvement with the child.

3. **B** 1 clear instance of facilitative behavior in addition to being available to child; paying attention to what child is doing; involving child in play during parent directed play.

4. 2 clear instances of genuine facilitative behavior in addition to being attentive, where the parent seems emotionally invested Must be explicit acts which have a genuine quality of the parent trying to be helpful.

5. Instances of facilitative behavior are frequent (3 or more) or especially salient and characterize much of the parent's way of relating to the child.

5. INTRUSIVE / OVERCONTROLLING

This scale assesses the extent to which parental behavior is ill-timed, intrusive and excessively and inappropriately controlling relative to what the child is doing. The parent's behavior may be ill-timed in the sense that it disrupts child's own goals and pursuits, or lacks empathy or synchrony with the child's feelings and action, respectively, and thus is psychologically intrusive. Intrusive behavior is likely to be dictated by a parental agenda regarding what should be going on and disregarding child's behavior. It can be either verbal or nonverbal, direct or indirect.

NOTE: Intrusive and facilitative behaviors are on a continuum, where it can be hard to draw a line between the two. For example, a parent may receive high facilitation scores for several minutes because s/he is actively engaged in helping the child build a house with Lincoln logs. However, a "line" may be crossed from facilitative to intrusive when you feel the parent is over-involved in helping the child in a manner that is not promoting his/her success/independence. In this example, the parent "tells" (directly or indirectly) how to build the house in a manner that stifles the child's creativity/growth.

Examples:

- during play parent directs/structures play in a way that does not allow child to explore and decide what to play with. Parent often tells child what to play with or in some way decides what parent/child will play with together, without regard to child's wishes (e.g., "We're going to play with this toy now" or "Here, you play with these blocks now"). Parent interrupts or distracts child's own play or conversation. (this does not include the transition to parent-directed play)

- the provision of constant verbal directions that are not timed according to what child is doing and leaves child which little room for autonomous functioning.

- "quizzing" child in an interfering way ("What color is that? How about that? Who is that?" etc). This is typically done in a repeated manner where the child is forced to respond to the parent's question.

- intrusive manipulations of child's body or materials to force child to behave in a certain manner, (e.g., pushing child's arm back and forth to "help" him do something.)

- interventions into child's actions before child has a real chance for mastery -- not timed to child's degree of coping, but rather to parent's need to "get on with it"

- while child is pretending/participating in pretend with parent, parent usurps control by trying to force in literal explanations rather than going along with child's non-literalness.

- during parent-directed play, parent gives child no freedom within the chosen activity; stifles child's creativity or elaboration.

INTRUSIVE / OVERCONTROLLING (cont.)

1. **B** No evidence of intrusiveness is observed

2. Unnecessarily dictatorial instructions OR subtle intrusions that don't necessarily distract child. One verbal intrusion.

3. Some instances or intrusiveness are observed in a way which clearly interrupts the flow of the play. (2 instances of verbal intrusions or one intense physical intrusion).

4. 3 verbal intrusions or 2 physical intrusions.

5. Instances of intrusiveness are frequent (>3) or especially salient and characterize much of the parent's way of relating to the child.

* Remember to code for intrusive behavior that occurs during the transition (the first minute of mother directed play).

6. UNRESPONSIVE, UNAVAILABLE, UNDERCONTROLLING

This scale assesses the extent to which the parent makes no attempt either to control or to facilitate the child's behavior at a time when support, assistance, or availability would be helpful to the child. Indeed, undercontrol should be seen as "doing nothing," or token gestures made by the parent for the benefit of the experimenter, but not the child. This scale taps parental permissiveness. This scale also assesses the mother's **overall level of involvement** with the child. For example, a parent who stares into space while the child plays happily would nevertheless receive a higher score on this scale.

Examples:

- Parent does not attempt to engage child in any activity or makes a "token gesture" for the benefit of the experimenter, during periods when child could use some support, guidance, etc. Parent allows child to direct/structure play activities, but does not supply a supportive presence for the child, when it is clear that the child could use some assistance. Parent may ignore bids for assistance from the child, or mistarget or misinterpret child's cues, or make perfunctory attempts at aiding child.

- If child transgresses, parent will deliver the prohibition in a vague, haphazard manner, or simply not deliver it at all.

- Parent does not respond to child's comments or questions or explicit child bids for engagement such as the child saying, "look at this.".

- Parent is playing independently of the child and appears self-absorbed. For example, both parent and child are drawing but mother concentrates on her own picture and makes no effort to connect with the child (e.g. conversation or smiles) or observe how the child is doing (e.g. glances over at the child picture). For these periods of time, the number of seconds should be counted exactly.

1. **B** No evidence of under-control or uninvolvement is observed.

2. A little evidence of under-control or uninvolvement. At least some (at least one clear instance, lasting at least 5 seconds) of the minute spent uninvolved with child (sitting back in chair OR looking around OR obviously bored OR not answering the child's questions).

3. A moderate amount of under-control or uninvolvement. Approximately 10 – 20 seconds of the minute.

4. About half of the minute spent in under-control or uninvolvement (21-30 seconds).

5. Most of the minute. Significant lack of involvement with the child OR salient individual instances of unresponsiveness as defined above (e.g., not responding to child's question). (Over 30 seconds)

7. SENSITIVITY

Sensitivity reflects the mother's ability to **perceive and accurately interpret the child's signals and to respond to them appropriately and promptly**. Sensitivity requires not only that the mother is accessible to the child, rather than ignoring or neglecting, but that she is **alert to subtle aspects of the child's signals**. Sensitive responses are **well-timed, reflect empathy with child's needs and feelings**, and even when limit setting is called for, involve behavior that will **enhance child's security, comfort, and development**. In this manner, a sensitive mother provides a **"supportive presence" for the child** and seems to be **emotionally connected** to the child.

- **CONTINGENCY** is weighted heavily here. Mothers who respond contingently to their child's behaviors are scored higher.
- **NEGATIVE BEHAVIORS & AFFECT** such as hostility and intrusiveness are also important. Mothers who demonstrate several examples of negative behaviors are rated lower.
- **POSITIVE BEHAVIORS & AFFECT** such as warmth and joy are also considered here. Mothers who demonstrate several examples of positive behaviors are rated higher. In addition, mothers who demonstrate authentic and contingent affect are scored higher.
- **ATTUNEMENT and AWARENESS** (which are related to contingency) of child behaviors and cues is critical to obtain a high score on this scale. Mothers who are in tune with their child will often comment on the child's behavior and extend the meaning – "That's right, that's the red ball". This may manifest behaviorally as well as when a mother extends a behavioral game which her child has started or is interested in. You have a red ball at home, don't you." Alternatively, mothers who consistently respond to their child's behavior with one script will score lower here – e.g. mothers who say, "what?, what?, what?" to everything the child does or comment only with one response over and over again.
- **RESOLUTION OF CONFLICT** is also important and includes the ability to be flexible and sensitive in resolving conflicts with the child.

1. **Highly Insensitive** Extreme insensitivity to the child's communications and little apparent knowledge of crucial child-rearing techniques. Affective negativity (in the form of either active harshness or passive disinterest/depression) is more extreme. Mother does not take each child into account when initiating, prolonging, or turning away from interactions. In fact, there may be little interaction for some of these dyads. This relationship is very painful for an observer to observe. If the observer has an impression of at least minimal positive experience for this child, the parent should receive a higher rating.

2. **Somewhat insensitive** - Insensitivity is typically displayed in one of two general ways, one being an active/harsh style (overly active and overbearing) and the other being a passive/depressed/affectively flat (noninteractive and silent) style. Still, there are positives here. Both styles suggest unresponsiveness to child communications and lack many of the features of sensitive interactions described earlier. The

active/harsh/volatile style involves facial expressions of disgust and anger and harsh/abrasive/condescending tones of voice. The passive/depressed/affectively flat style involves facial expressions that are depressed, and disinterested, and a vocal tempo that is slow, lethargic, or simply unenthusiastic. Also often seen is a business-like, matter-of-fact style that combines features of both abrasiveness and passivity. Although such interactions may lack a clear fun-like, synchronous quality, they indicate that this parent has some notions about what is important for child rearing. The observer feels somewhat uncomfortable or sad when watching this interaction, but still sees some positive experiences provided by such a parent. If the parent has only a couple of clearly non-optimal qualities, such as bland affect and an unenthusiastic tone of voice, s/he should receive a slightly higher rating.

3. **Inconsistently Sensitive** - The parent is sensitive in some ways, but the observer finds it difficult to give this relationship a clean bill of health. For example, the parent may fluctuate from being creative and joyful during play times to being preoccupied with other concerns, or other questionable (though not clearly negative/insensitive) behaviors. Mothers may "leak" inconsistencies of behavior; it may simply be too stressful for some to maintain well-modulated positivity for long. A rating of "3" is typically given when the observer notes some signs of sensitivity (e.g., positive statements, smiling, and interest) but also notes some problems in these areas (e.g., positive statements said in a slightly bored tone, smiling that does not seem authentic and genuine, or interest that is occasional or feigned).

4. **Generally Sensitive** - This parent is very similar to a "5"," except that there is a less spectacular quality to these parent-child exchanges. This rating refers to a "good enough" parent. Typically, very positive interactions get rated down to "4" for some of the following reasons: the parent did not interact in a creative manner, although s/he was affectively connected to the child and interactions were harmonious and enjoyable; or the parent's affect and behavioral style were extremely well suited to this child, creating a generally lively and engaging climate, but at brief moments, s/he displayed subtle preoccupation with his/her own thoughts, as if processing another agenda; or the like.

5. **Highly Sensitive** - Emotional communication and play interactions between parent and child are positive, joyful, and creative. The highly sensitive parent displays much genuine, authentic, and congruent interest, pleasure, and amusement with the child (as opposed to performing these behaviors), as demonstrated by warm smiles and giggles, interested eye contact, and comforting and playful physical contract. The parent accurately reads the child's signals, even subtle ones that may not be clear to an outsider and reacts appropriately. She has a well-developed sense of timing and rhythm during interactions with transitions between activities appearing smooth rather than abrupt and enforced. Parental behavior appears flexible and adaptable, according to the demands of particular situations. Verbal and visual communications between parent and child are ongoing but not constant or overwhelming. Conflict situations do not lead to long breakdowns in the relationship; instead, they too are handled smoothly and effectively.

CHILD REGULATION CODING SCHEME

Mother Infant Study Coding Manual
4 Year Old Child Coding Protocol

CHILD CODES

This protocol lasts a total of 12 minutes and includes 4 segments of the Strange Situation Protocol: First Stranger & Child Segment, Child Alone Segment, Second Stranger and Child Segment, Final Mother-Child Reunion Segment. There are 8 child scales which are scored in three-minute intervals.

Affect Codes
1. Comfort / Enthusiasm (Whipple)
2. Anger / Frustration (Whipple)
3. Sadness (CJD – based on Anger from Whipple)
4. Emotional Lability (Clark / CJD)
**Was the session ended early because of child distress? YES / NO

Emotional Regulation Abilities
5. Self-Regulation / Organizational Capacities (Clark; Cole et al 1992)
6. Regulation Strategies (5 domains) (CJD)

Attention & Activity
7. Attentional Regulation (CJD)
8. Activity Level (CJD)

The first 3 codes included in this manual were adapted from the *MSU Family Project Second Revision of Belsky's Parent-Child Interaction Coding System*, by Ellen E. Whipple, Ph.D., Natalie L. Denburg, and W. Hobart Davies, Ph.D.

General Coding Comments

- Coding Procedures:
    - Reread the manual before you start coding. After you've coded a critical mass of these you will be able to skip this part but in the beginning and middle phases of this project you should do this every time
    - Watch the first segment, stop the DVD and code each domain, making notes relative to each code on your coding sheet.
    - Rewatch the first segment, stop the DVD and check your codes. Make any changes and then repeat this process for each of the four segments.
    - You may need to watch each segment more than two times – especially at the beginning.
    - Make sure that you fill out the coding sheet completely (date, name, etc.).
- Coders should make note on the code sheet of any unusual incidents which occurred during the segment. Examples may include the child leaving the room for a period of time, problems with audio or video, mistakes in the administration of the protocol such as timing, etc.
- An important feature of this coding system is that it taps both qualitative (feeling, intuition) and quantitative (behavioral frequency) aspects of the child's behaviors. This includes verbal / nonverbal communication and direct / indirect factors.
- Some of the scales are interrelated, in that if you give a certain score on one item, other scales must receive especially high/low scores.

COMFORT and ENTHUSIASM

This scale assesses the comfortableness and enthusiasm of the child during the session. Factors to consider when coding this scale include ease of movement, relaxed posture of body, facial expressions, and/or behaviors. A child high on this scale would clearly be having a good time, with spontaneous and zestful expressions of fun and delight and clear interest in play and/or interaction. The child would also appear very relaxed, with a high degree of ease of movement. A child low on this scale would look frozen or highly tentative, with stiff body movements, and distressed facial expressions. An agitated, sad or angry child is also low on this scale.

1. **Very Uncomfortable:** There is no enthusiasm, smiling or interest. Movement may be either slow or agitated. Child may show extreme hesitancy to engage in play with toys. Child may appear highly anxious and withdrawn, frozen, or highly distressed. In sum, child seems very uncomfortable and apparently would rather not be here.

2. **Neutral or Uncomfortable:** Facial expressions most often are bland. Child may appear to be intensely concentrating on toys, but there is no quality of real engagement, excitement or fun. Body movements appear stiff and child shows little evidence of enjoyment. Child may appear bored. Interaction with toys looks almost obligatory as opposed to desirable. Further, interaction with toys will probably be characterized by repetitive, "non-thoughtful", simple manipulations of the items. Or, child may seem unhappy and/or agitated.

3. **Modestly Comfortable:** Brief moments of fleeting pleasure, engagement or enjoyment. Child looks relatively comfortable, but not fully at ease. Her movements may be somewhat hesitant, but she is more likely to look neutral than totally self-confident. Although child seems to be engaged in play or interaction, coder isn't convinced that she would choose to come back if she had the choice. "Slow to warm up" children who are hesitant at first but then seem to be enjoying themselves by the end of the session might be coded here. Note that there must be some sense of enjoyment – even if the only evidence is that they are well engaged with the toys.

4. **Comfortable:** Some animation, engagement or enthusiasm is apparent during segment. Facial expression shows interest and pleasure during play. Vocalizations clearly indicate child is enjoying and/or highly engaged with playing or interacting. Child appears comfortable and in charge. Child looks secure, and negative signs are very rare. Child typically appears thorough and/or spontaneous in play, but some tentativeness may be noted.

5. **Enthusiastic:** Child appears animated or delighted in terms of her interaction with toys or with the adult. Child obviously feels good about him/herself, confident, secure, comfortable. Child's activities appear spontaneous and zestful. He is clearly in control of the situation, purposeful, engaged in play and/or interaction, and seems glad to be here. Child is likely to be smiling, moving easily, "lost" in his play.

ANGER/FRUSTRATION

This scale assesses the extent to which the child shows anger, dislike, frustration or hostility, with extent defined in terms of frequency and intensity. Evidence of negativity may take the form of angry vocalizations, physical "acting-out" behaviors, etc.

Specific examples of negativity would be stomping feet, throwing toys, yelling in unpleasant tones, making angry facial expressions, pulling angrily at the door knob, or banging angrily on the toys or the door or the window. Negativistic behaviors directed toward persons would include shouting "no", throwing a tantrum, or throwing an object. Note that positive affect may be present (although not simultaneously) without influencing this score.

1. No evidence of angry affective expressions is displayed.

2. A few mild instances observed for brief periods.

3. Child displays some or modest evidence of angry or frustrated expression. This behavior should not escalate into an extensive display, i.e., behaviors are somewhat isolated - 3 instances observed for brief instances each time OR one moderately intense period.

4. Several instances are observed OR child displays angry behavior for extended period(s) of time.

5. Child displays anger and/or hostility frequently and in long duration. Anger seems to characterize this child's affect for much of the session.

**Note: Usually, if child is so angry/upset that the session is terminated early then they should receive a score of 5 on this code. However, there are cases where the child is not totally upset but the session was ended early anyway (presumably due to the mother's wishes). In these cases, code based on the observed behaviors.

** Note: If the difference between anger and sadness is really unclear – you should split the scores to represent an equal number of each.

SADNESS

This scale assesses the extent to which the child shows sadness with extent defined in terms of frequency and intensity. Sadness can include sad looking facial expressions such as pouty lips, crying, whimpering, sad verbal content such as "I'm all alone in here," lethargic/spacey play, etc.

1. No evidence of sadness is displayed.

2. One to two mild instances observed for a brief periods.

3. Child displays some or modest evidence of sadness. This behavior should not escalate into an extensive display, i.e., behaviors are somewhat isolated - 3 instances observed for brief instances each time OR one moderately intense period

4. Child displays sadness frequently or in long duration. Sadness seems to characterize this child's affect for much of the session.

5. Child displays sadness frequently and in long duration. Sadness seems to characterize this child's affect for most of the session. For a child to get a "5" on this scale (vs. a 4) you should not be able to identify a significant period of positive affect (happy) during the segment. Times of neutral affect may still be present

**Note: Usually, if child is so sad/upset that the session is terminated early then they should receive a score of 5 on this code. However, there are cases where the child is not totally upset but the session was ended early anyway (presumably due to the mother's wishes). In these cases, code based on the observed behaviors.

** Note: If the difference between anger and sadness is really unclear – you should split the scores to represent an equal number of each.

EMOTIONAL LABILITY

This item assesses the degree to which the child experiences identifiable emotional/affective shifts. The frequency of the emotional shifts are considered here with frequent transitional shifts resulting in higher scores on this scale. In addition smoothness of transition is also considered in that "smooth" transitions are awarded lower scores and "abrupt" transitions are awarded higher scores. Smooth transitions are defined as a slow move from one affective state to another. For example, a child may seem mildly sad and then, over a period of time, their sadness may slowly increase until they are crying outright. In contrast, an abrupt transition is exemplified by a child who seems perfectly happy and then, all of a sudden, begins to behave in an angry or sad manner. Note that valence itself is not relevant here. That is, a child who is happy throughout the session without shifts to other emotions would be scored the same as a child who is sad or angry throughout the segment. However, it is more likely that a child who is demonstrating strong negative emotions will have some shifts to more neutral emotions at some point(s) during the segment as she tries to regulate herself. Therefore, it is easier for a child to receive a "1" score if she is exhibiting relatively positive or neutral affect throughout.

1. Child's affective state is relatively stable throughout. Very little evidence of emotional lability. Note that children who seem mildly happy/comfortable and/or neutral are coded here.

2. At least 2 distinct emotional qualities (e.g. happy, sad, angry, neutral) can be detected in the course of the session but each emotion is likely to be relatively mild and transitions from one to another are smooth.

3. Mild emotional lability is evident either because transitions are somewhat difficult or because the intensity of the emotions and the emotional shifts seem more extreme.

4. High emotional lability is evident. Transitions seem difficult and intense. Emotions are expressed in an intense manner.

5. Extreme emotional lability. Child switches from one emotion to another quickly and without a sense of smooth transition. You would describe this child as "dysregulated".

SELF-REGULATION/ORGANIZATIONAL CAPACITIES

This item assesses the extent to which the child is able to organize and regulate his/her emotional state in response to internal or external stimulation or frustration (e.g. mother leaving). At one extreme the child may appear disorganized (e.g. hyperactive, labile, diffuse or unfocused) by the experience. On the other extreme the child is able to engage in the world while continuing to maintain organization and state stability (e.g. shows interest, focus, and an emotional resiliency to distress or frustration). The idea here is to gauge the extent to which a child is able to regulate his/her emotions such that she can be engaged with his/her environment (e.g. the toys in the playroom or the stranger or mother). A dysregulated child may be throwing a temper tantrum (and receive a high score on anger) or be crying intensely (and receive a high score on sadness) OR a child may be wimpering softly but still be so "undone" by her emotions that he/she wanders around the room aimlessly or sits in a chair without engaging fully in play, etc.

1. Child characteristically appears actively emotionally upset and disorganized OR upset and disengaged from contact with the environment and unable to maintain or regain focus or stable mood states. Child seems markedly unable to regulate her emotional state.

2. Considerable difficulty regulating emotional state. Evidence of successful attempts to stabilize mood on 1 or 2 occasions.

3. Moderate degree of difficulty maintaining self-regulation. Intense or prolonged negative response to distress on several occasions; some evidence of attempts to regulate affect.

4. Minimal difficulty. Child is able to quickly self regulate and/or refocus on most occasions – or rarely becomes dysregulated.

5. Child characteristically maintains interest in his/her environment and appears very resilient to stressful stimulation; maintains organized focus/approach.

REGULATION STRATEGIES

All children use various strategies to regulate themselves. Rate the degree to which the *child* used each of these methods to self-regulate during this segment.

1 = not at all
2 = 1-2 times; or short duration – quick attempts
3 = 3-4 times; or up to ¼ of the segment (= 45 seconds)
4 = 5-6 times; or up to ½ of the segment (= 90 seconds; 1½ minutes)
5 = 7 + times or more than ½ of the segment

A. Contact seeking with stranger/mother. This includes looking at the adult, initiating verbal conversations, going to the door to try to reunite with mother/stranger, looking in the window to see if she can see someone in there, etc.
   - Note that yelling for someone (most often yelling to mother) to come and help or get them counts as contact seeking.

B. Attention to toy or self-play

C. Physical self stimulation (playing with hair, sucking thumb, rocking, physical activity such as "pacing", drinking from the baby bottle, tapping toys in a repetitive manner with no obvious goal other than stimulation, manipulating toys in hand in a non-functional manner)

D. Talking or singing to self. This includes talking to the toys (e.g. comforting the babydoll). All vocalizations count except calling for the adult in a manner which indicates contact seeking.

E. Attempts to leave the room. This code captures the child's attempts to physically leave the room by getting out the door.

ATTENTIONAL REGULATION

This code captures the child's ability to direct her attention to one stimulus and stay focused on it without evidence of rapid shifting of her attention. A stimulus is defined here as an object (a toy, the water pipe in the room, etc.) or a person (stranger or mother), or an activity (e.g. trying to get the childlock off of the doorknob so she can get out of the room). Note that temper tantrums do NOT count as focused attention even though the child may be engaging in the tantrum for the majority of the segment. During the stranger/mother episodes we do NOT code shifts in attention which are the result of the stranger/mother directing the child's attention to a new toy or activity. Instead, we are *looking* to capture the child's own ability to stay focused on a task, stimulus, or interaction without the need for frequent shifts. A child scoring low on this scale will evince an ADHD behavioral quality. A child scoring high on this scale will be focused and attentive to one stimulus for long periods of time.

Note that there is a quantitative aspect to attention shifts in that some shifts are considered more major (e.g. moving from doll play with the doll house to putting together the puzzle) and some are considered more minor (e.g. moving from putting together the puzzle to trying to see if the puzzle pieces fit in the hammer toy). Children who are playing with a particular toy and attempt to draw the adult into their play (e.g. "Look at this mom.") are not considered to be engaging in a major shift of their attention. However, a child who plays with a toy for a while and then turns to engage in a conversation with the adult would be considered to evince a major switch of attention.

1. Child switches attention frequently throughout the segment. It seems as though he can not settle on what he wants to do.

2. Child seems unfocused and unable to maintain attention on particular stimuli for most of the segment. However, there are times – at lest 3-4 times; usually lasting 10 seconds or so per instance - when the child seems able to focus.

3. Child seems to be focused for about one half of the segment and relatively unfocused for the other half.

4. Child is able to maintain attentional focus without difficulty for the majority of the segment. There may be some switches in activity or attention given changes in the environment or changes in the child's interest but it is clear that the child can maintain focus for extended periods of time.

5. Child maintains attentional focus on one activity for extended periods of the segment. In fact, the child seems to be over-absorbed in one activity for most of the session. Child is focused on one activity for the majority of the segment – more than 2.5 minutes for a segment that lasts the entire 3 minutes.

ACTIVITY LEVEL

This code captures the child's physical activity level throughout the segment. Gross motor movements increase a child's score on this scale more than fine motor movements. That is, a child who is running around the room is considered to be more active than a child who is actively placing puzzle pieces in a puzzle. Thus, children who sit in one place the entire time and only move to manipulate toys receive low scores on this scale. Children who move around the room a great deal and/or attempt to leave the room receive higher scores.

1. **Very Low** activity level. Child seems somewhat lethargic and is not moving around much. This child may be engaged in just one floor toy the entire time. Child's play is almost entirely fine motor.

2. **Low** Activity level. Child is engaged in play but is mostly using fine motor movements.

3. **Medium** activity level. Play involving fine motor about ½ of the time and gross motor about ½ of the time.

4. **High** activity level. This child's actions mostly involve gross motor movements although there may be some fine motor or slower play activities as well.

5. **Very High** activity level. This child is actively moving around the room and exhibiting lots of gross motor movement. His movements may seem forceful and he may be physically manipulating toys, banging on the door, etc. You might describe him as somewhat "hyper".

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