# Maternal Psychological Symptoms and Emerging Anxiety and Depression in Children: The Mediating Role of Attention

by

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## ABSTRACT

The nature and correlates of emerging internalizing symptoms in young children are largely unknown. Maternal factors such as psychological symptoms and detached parenting style have been found to be present in children with anxiety and depression. Further, child attentional control in task completion has been associated with difficulty related to internalizing problems. This study tested hypotheses that child anxiety and depression at age five could be predicted by a combination of maternal distress and maternal detached behavior recorded at age three. An additional hypothesis was tested to determine if child attentional control at age four may be a partial mediator of the relation between maternal symptoms and parenting to child internalizing symptoms. Using structural equation modeling, no hypotheses were supported; child internalizing problems were not significantly predicted by maternal distress nor detached parenting. Further, child attentional control was not predicted by maternal distress or detached behavior, nor did attentional control predict internalizing problems. Findings indicate that over a two-year interval, childhood internalizing problems at age five are likely best predicted by early internalizing problems at age three. There was no support that the mother or child factors tested were predictive of child outcomes.

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# Maternal Psychological Symptoms and Emerging Anxiety and Depression in Children: The Mediating Role of Attention

Internalizing symptoms are common in young children, yet not well understood in both research and clinical practice. In addition, they can impose a great negative impact on the lives of children affected by such conditions. Children with externalizing symptoms are more disruptive and therefore more easily identified by supervising adults; in contrast, children struggling with symptoms such as anxiety, phobia, and depression often go unnoticed until problems become severe enough to interfere with functioning. Much the same as with externalizing problems, children with internalizing difficulties are at high risk for developing internalizing disorders as well as many later problems in adolescence and into adulthood, warranting intervention. However, there has been insufficient effort to date to investigate the developmental processes that lead to such symptomatology, hindering the development of both risk and intervention models.

Family influence, and especially parental influence, plays a large role in the development of a child's psychological well-being. Parents who experience internalizing symptoms themselves present risk for their children to also have internalizing disorders. However, the mechanisms that underlie increased risk in offspring of affected parents are not fully understood. Functional emotion theory posits that maladaptive strategies modeled by parents contribute to the emotional development of children, suggesting that emotion regulation skills may be

transmitted to the child (Cole, 2004). If regulatory strategies are in fact learned primarily from parents, children of parents with internalizing symptoms may have fewer resources to foster healthy emotion regulation strategies, contributing to increased risk of internalizing symptoms.

Although parental history of distress predicts a generally increased likelihood for child emotional distress, it falls short of fully accounting for the variability in child psychological outcomes. Other**,** more child-oriented factors, such as emotion self-regulatory strategies, may improve predictive power for identifying specific syndromes children may develop. During negatively arousing events, children employ behavioral and cognitive strategies that attempt to regulate their emotional reactivity. This allows them to focus on tasks and think clearly despite an aroused affective state. Indeed, certain emotion regulatory strategies have been associated with specific developmental competencies in children. In particular, the use of attention-shifting during stressful situations has been associated with healthy psychological and physiological development (Compas et al., 2001b).

Development of self-regulation (including attention-shifting) in children, however, may be delayed or diminished when a parent experiences psychological distress, especially depression (Goodman & Gotlib, 2002; Feldman, 2007). In turn, children who do not successfully employ regulatory strategies can be adversely affected by stress; this can result in the expression of negative emotions, including anger, frustration, anxiety, or sadness (Cole et al., 2004). If

we can understand parents' contributions to young children's emerging emotion regulation, we may be able to better understand and predict how it relates to children's internalizing symptoms.

The current study examines children's risk for internalizing symptoms as a function of maternal depressive symptomatology and the potentially mediating role of early regulatory strategy use. It is predicted that mothers who experience psychological distress at child age three will have children who exhibit comparatively more anxiety and depression symptoms at age five. Further, for such children, the risk for internalizing symptoms is hypothesized to be partially mediated by poor attentional control (namely attention-shifting) at age four.

## Background Literature

### Early Anxiety and Depression

Until very recently, childhood anxiety and depression have received relatively little attention in developmental research, although they are believed to be equally as prevalent as externalizing disorders in toddlers (Sterba et al., 2007). Generally, children with externalizing disorders are more easily recognized and diagnosed because behavior is disruptive and clearly apparent. In contrast, internalizing symptoms are covert and nonintrusive by nature, making referral, assessment and intervention especially difficult. Indeed, children who suffer from internalizing disorders often present as well-behaved and compliant in the classroom and at home. As a result, internalizing disorders have been widely

understudied, despite the relatively high prevalence rates (Gresham & Kern, 2004; Hammen & Rudolph, 2003).

The manner by which internalizing symptoms emerge, develop and change from childhood into adolescence and adulthood is in need of further exploration. Research suggests the presence of a more severe longitudinal course of psychological distress for children who experience internalizing symptoms from an early age (Sterba et al., 2007). In addition, children who do not receive appropriate treatment are at increased risk of developing serious mental health problems, substance abuse, truancy, adult crime, school failure, marital problems, and erratic employment into adulthood (Rutherford et al., 2004). Given evidence that early development of internalizing symptoms is associated with higher risk for more severe problems later in life, there is an emerging need for research that examines the developmental trajectory and risk factors for such symptomatology.

Depression in early childhood has been especially enigmatic for both research and applied clinical domains, as debate emerged as to whether it might appear with comparable features to adult depression, whether it possesses its own age-specific components, or whether it could even exist at all in young ages. While it is clear that a variety of depressive symptoms occur in young children, they nearly always occur in conjunction with at least one other childhood psychological disorder. Among both community (Bird, 1993; Lewinsohn, 1995) and clinic samples (Kovacs, 1996), only a minority of children do not present with a comorbid condition. Not only does this complicate research on childhood

depression, but comorbidity predicts poorer outcomes following treatment in short-term and sometimes even long-term follow-up (Waslick, Kandel & Kakouros, 2002). Further, some studies have shown that individuals with sub-syndromal symptoms of depression nonetheless have similar levels of impairment and similar longitudinal course as those with diagnosable depressive disorder (Lewinsohn et al., 2000). Thus, most cases of young children, even those with only some depressive symptoms, are less likely to experience successful treatment outcomes and are more likely to have difficulties persist.

Research on depression in children is especially complicated by high rates of overlap with anxiety (Brady & Kendall, 1992; Costello & Angold, 1995; Zahn-Waxler et al., 2000; Seligman & Ollendick, 1998). The first studies of epidemiology of depression were hindered by the surprisingly high rates of co-occurring anxiety, requiring later investigations to consider the complex interactions among multiple diagnoses (Knapp & Jensen, 2006; Lewinson et al., 1995). While only 1-3% of prepubertal children meet criteria for depression, those who do exhibit symptoms frequently also exhibit anxiety symptoms (Waslick, Kandel & Kakouros, 2002). Rates vary depending on the study, but between 42-100% of children with depression also meet criteria for some anxiety disorder (Harrington, 1993; Seligman & Ollendick, 1998).

The problem of high comorbidity rates brings to question whether depression can be considered as an independent disorder. Some have argued that comorbidity is simply due to a “halo” effect of overlapping detection criteria of

two or more disorders (Harrington, 1993). However, extant research also supports two other possibilities that may explain the comorbidity. First, anxiety and depression could exist independently but overlap in several symptoms that interact with one another. This is supported by several studies that have found more severe forms of each disorder when both are present, compared to having one single disorder alone (Harrington, 1993; Mitchell et al., 1988; Strauss et al., 1988). Not only is the comorbid diagnosis of depression plus anxiety associated with poorer outcomes in children compared to those with anxiety alone, depression in childhood increases risk of subsequent depression later in life (Harrington et al., 1990). Another possible explanation for high comorbidity is that depression and anxiety may lie along the same "negative affectivity" spectrum of a single dimension of disorder in a continuum. There is evidence that anxiety has temporal primacy, with depressive symptoms typically appearing after anxiety symptoms have emerged, and as anxiety worsens (Harrington, 1993; Brady & Kendall, 1992; Kovacs et al., 1989). Children with depressive affect alone are rarely referred to clinical settings, and yet it occurs in many who are referred for other reasons.

Achenbach (1982) pondered the problem of comorbidity by suggesting the possibility that depressive affect may merely be a "common byproduct" of other psychological problems. However, he also acknowledged that there may also be coherent syndromes of depression in a smaller subset of children. Harrington (1993) took this a step further by arguing that it may be more accurate to simply

diagnose the “comorbid disorder” of depression and discard the conventional concept of depression as a childhood disorder altogether. While it is nearly impossible to know for certain whether full depressive disorder as it is known in adults also occurs in young children, perhaps the most reasonable method for studying depressive symptoms is within the context of other symptoms that often co-occur. In the case of internalizing syndromes, perhaps depression and anxiety syndromes are, in actuality, not as separate as they may seem conceptually. In order to gain a better understanding of the processes underlying these enigmatic internalizing symptoms, it may be crucial to identify individual differences in children, such as emotion regulation strategies, as specific predictors of anxiety and/or depression.

**Maternal Distress**

The relationship between a young child and his/her parents is unique and vital to healthy development. The infant-caregiver relationship provides a context for socialization of emotion regulation through this bond, in which infants are emotionally regulated by touch, vocalization, and visual expression (Cole et al., 1994). As children mature, they begin to develop more autonomy in regulating their emotional arousal. While both mothers and fathers have strong influences on their children, to date most studies examine mothers exclusively due to their typically high involvement in their children’s rearing. Mother-child physiological and behavioral synchrony has been observed during interactions beginning at early infancy, and are associated with effective parenting behaviors as well as

positive outcomes in children's behavior, health, and emotional and cognitive development (Feldman, 2007).

Given the strong effect of maternal co-regulatory behavior on the child in early life, it is logical that maternal psychopathology might negatively impact development during early childhood. Indeed, parenting characteristics often associated with maternal psychopathology, such as support, warmth, and sensitivity are well-established predictors of a variety of problems in children, especially in social functioning and emotion regulation (e.g., Eisenberg, Cumberland & Spinrad, 1998; Spinrad et al., 2007; Silk et al., 2006). Maternal depression, specifically, has been extensively studied because of its prevalence as well as its later implications for children's development (Goodman & Gotlib, 2002). It affects 10-12% of post-birth mothers, and has been associated with myriad problems in mother-child interactive behavior and children's psychological well-being (Feldman, 2007). Children of depressed mothers often demonstrate difficulties in their social, emotional, and cognitive regulatory skills (Goodman & Gotlib, 2002).

Pertaining to psychological distress, maternal depression has predominantly been associated with increased risk for anxiety disorders in children more than any other type of disorder (Goodman & Gotlib, 2002; Beidel & Turner, 1997; Rosenbaum et al., 2000; Wickramaratne & Weissman, 1998). However, it has been suggested that specific prediction to child anxiety may be due to a combination of the prevalence of maternal depression and high rates of

comorbidity with anxiety in mothers, rather than depression itself. For example, Biederman and colleagues (2006) found that the parents of children with anxiety suffered from anxiety themselves, which was most often comorbid with depression. They also found that panic disorder (without comorbid depression) was associated with specific risk for child anxiety disorder, while parental depression (without comorbid panic disorder) conveyed specific risk for child depressive disorder (Feng et al., 2008). Children of depressed parents are estimated to be three to four times more likely to develop depression prior to adulthood (Beardslee et al, 1983; Silk et al., 2006); however child-onset depression usually occurs in conjunction to other disorders. These complexities related to specific prediction of child psychopathology from parent psychopathology suggest that symptoms of general psychological distress in mothers are likely to be especially influential upon the overall psychological well-being of their children, but may not provide clear pathways of pathology from parent to child.

Certainly, the connection between parent and child psychopathology has been a topic of some interest in the field. Many prospective explanations for the intergenerational transmission of symptoms are based on emotion and social learning theory. When parents engage in maladaptive coping strategies, their children imitate this behavior as they learn to regulate themselves (Gerull & Rapee, 2002). This process has been confirmed in observational studies of synchrony in mother-child interactions (Feldman, 2007). When parents and their

children communicate well with one another, a synchrony occurs in which parent and child are responsive to one another, allowing for an intimate bond to be formed. Depressed mothers, however are at a disadvantage for engaging in successful synchrony. Depression slows the ability for an individual to detect and respond to subtle changes in facial expression (Feldman, 2007). Moreover, individuals with depression often demonstrate flat, stressed, or negative facial expressions and can be physically withdrawn. The emotional effects of flat affect have been observed in Tronick's (1980; 1989) Still-Face Paradigm, in which an emotionless mother ceases typical interaction with her infant by using a neutral facial expression. Infants as young as three months old have been found to take on a negative mood and reduce their visual contact with their mothers during this activity, which lasts for several minutes even after the exercise ends and interaction resumes. Such lasting effects of maternal interactive style on their children, even following brief changes in affective expression by the mother, reveals the degree to which maternal depression may impact the emotional development of a child (Tronick, 1989; Cohn & Tronick, 1983).

Clearly, research suggests a link between maternal depression and childhood internalizing symptoms. However, the links are often nonspecific and place the child at risk for a variety of difficulties rather than only internalizing problems. Among children whose mothers are depressed, the question remains as to which children are more likely to develop anxiety and depression specifically. Given the parents' crucial role in coregulating emotions and teaching strategies

for self-regulation in their children, it may be important to account for parents' psychological histories when predicting child outcomes. In order to understand risk for specific syndromes such as anxiety and depression, considering ER strategy development as well as parent factors may illustrate a more complete profile of risk.

Literature to date suggests that parental difficulty as well as child ER strategy use may be predictive of specific child outcomes. For instance, Eisenberg, Cumberland, and Spinrad (1998) proposed a heuristic model for the socialization of emotion which included emotion-related parenting practices mediated by child emotion-related regulation (such as temperament and emotion) as influential to child outcomes. Indeed, links have been established from maternal depression and supportiveness to child behavior problems, mediated by child effortful control and attentional strategies; however, specific links to internalizing symptoms have been inconsistent (e.g., Spinrad et al., 2007; Valiente et al., 2006; Silk et al., 2006). Attempts to test this model have yielded promising results, but require more work relating to internalizing symptoms at early ages in order to explicate its underlying mechanisms.

**Attention and Emotion Regulation**

Children learn self-regulation through a developmental process that begins with early parent-child co-regulation and becomes increasingly independent and complex. According to functional theory of emotion regulation, children are faced with the necessity to regulate emotions from birth, as soon as they begin to

respond to their environment. In understanding emotion regulation, there are multiple theoretical perspectives that can provide a foundation for observed behaviors that reflect regulatory function. One well-respected perspective is functional emotion theory, which reaches beyond the scope of discrete emotion to examine the dynamic interplay of affective arousal, social context, and the goals of an individual (Campos et al., 1994). From a functional perspective, *emotion* is defined as "the attempt by the person to establish, maintain, change, or terminate the relation between the person and the environment on matters of significance to the person" (Campos, 1994, p.285). Thus, functional emotional theory requires that emotion include behavior that causes the individual to respond to and act upon his or her environment in a dynamic exchange, and context is an important determinant of the manner in which emotion is outwardly expressed. Tightly intertwined with emotions and their expression is emotion regulation (ER), which has been described earlier as a tool for preparing a response to emotional arousal. Thompson (1994) attempts to differentiate the concept of emotion from emotion regulation by explaining, "while the discrete emotion may 'play the tune' of a person's emotional response, these emotion regulation processes significantly influence its quality, intensity, timing, and dynamic features and thus significantly color emotion experience" (p. 25). He describes emotional responses as flexible, situationally responsive, and performance-enhancing.

The exact nature of emotion regulation is far from universally agreed upon, despite many careful attempts to specify its defining criteria. Eisenberg &

Spinrad (2004), for example, argue that ER should be applied only to behaviors that appear to result from apparent changes in the activated emotion, a process that indicates “emotion as regulated”. However, Cole et al. (2004) argues that ER should include any changes associated with activated emotions, including not only contexts in which emotion is regulated, but also those in which emotion serves a regulating function. It is likely that the regulation that is associated with an emotional experience is the result of processes that describe both emotion as regulated and emotion as regulating; more importantly, the lack of consensus requires that ER be defined carefully for each construct examined so that it may be studied from multiple perspectives.

The current project will utilize a functional approach to emotion and ER in order to understand behavior from a dynamic contextual perspective. While it is likely that emotion is both regulated and regulating during an arousing situation, specific regulatory strategy use of young children in stressful situations will be examined from a perspective in which emotion is regulated, with children acting on their emotion. Emotion as regulated is of most interest here because of its central focus on the reaction to stress rather than the expression of emotion itself.

As part of the development of emotion regulation, some common tasks faced by young children include frustration tolerance, socializing with others, recognizing danger, and coping with fear and anxiety. Initially, caregivers must engage in co-regulatory behavior in order to help infants manage their emotional experience, as previously described. Children gradually learn to attune their

emotional arousal to situational demands, increasing their use of strategies for more independent self-regulation (Cole et al., 1994; 2004). Advances in cognition, motor ability, and language development facilitate the emergence of more complex and independent ER strategies as children develop across the preschool period (ages 2 through 5) (Cole et al., 2004; Thompson, Lewis, & Calkins, 2008).

As one co-regulatory mechanism, caregivers often use redirection of attention as a strategy to manage arousal in infants, reflecting early utilization of distraction by parents. For example, during a threatening or stressful event, caregivers may distract a child or focus attention on the positive features of the experience (Thompson, 1994). The ability to voluntarily shift attention away from a stressor is conceptualized as a part of effortful control, a dispositional characteristic which includes attentional and behavioral regulatory strategy use (Eisenberg et al., 2004; Spinrad et al., 2007). Not surprisingly, distraction is one of the earliest self-regulatory strategies observed in young children once they begin to engage in regulatory behaviors independently from direct parental support. Children as young as 28 months have been observed to use attention-based strategies in fearful situations, and as children become toddlers and begin to regulate more independently (often with the indirect assistance by their parents), use of attention management strategies such as covering their eyes and ears, removing emotionally arousing stimuli, or leaving a stressful situation altogether are seen (Thompson, 1994). Further, when faced with the need to delay

gratification, children ages 2 through 6 commonly redirect their attention away from the reward (Mischel & Mischel, 1983)).

Attentional control has been conceptualized in a number of ways, predominantly as either a subtype of emotion regulation or as a coping strategy. There is a complex debate in the emotion literature regarding the differences and similarities of ER versus coping as constructs, and which strategies fall under which process. Specifically, distraction, one of the most common and observable attention-based ER strategies, is particularly difficult to categorize because of its prevalent overlap in the coping and ER literatures. As such, it is important to differentiate between ER and coping in order to best understand distraction use. Coping is often defined as a conscious response to stressful arousal involving efforts to regulate emotion, behavior, cognition, physiology, and the environment (Eisenberg et al., 1997; Compas et al., 2001b). According to this definition, distraction may be considered to be a secondary engagement coping strategy which can include both active and passive manipulation of attention. However, it is unclear whether distraction must, by definition, be a deliberate attempt to respond to a stressful stimulus or whether it occurs automatically at times. Many argue that distraction is often employed unconsciously, especially in young children, suggesting that it may fall under different categories depending on the context. For example, Garnefski and colleagues (2001) explain that distraction may occur as an unconscious cognitive process related to selective attention, memory distortion, denial, or projection; however, it may also occur through more

conscious efforts, such as blaming, ruminating or catastrophizing (Eisenberg & Spinrad 2002, 2004). While coping may be considered a subcategory of ER (e.g., Compas et. al, 2001) because of its dynamic relationship with emotional arousal, it is sometimes viewed as a completely separate process from the traditional definition of ER (Skinner & Zimmer-Gembeck, 2009). Regardless, coping and ER seem to be overlapping constructs that share certain features, and this seems to be especially true in the case of attentional control strategies during early childhood. While it may be difficult to categorize distraction as a coping strategy, it does clearly meet criteria to serve a regulatory function. Thus, for the current study, distraction will be considered as an ER strategy indicating attentional control, despite the fact that the description of distraction as a coping response may also be appropriate in other specific situations.

Regardless of the conceptual confusion, there is foundational research indicating several possible connections between attentional control and psychological health. Increased use of distraction during stressful events is generally associated with better functioning and fewer emotional, behavioral, and health problems, including decreased risk of internalizing and externalizing problems in adolescents (Compas et al., 2001b; Eisenberg et al., 2004; Spinrad et al., 2007). However, outcomes specifically associated with the under-utilization of distraction strategies (indicating sustained attention to aversive stimuli and poor attentional control) are not well understood and have not been examined extensively at key developmental ages. Nonetheless, there is evidence for a link

between poor attentional control and psychopathology in young children. While associations between externalizing disorders and problem behaviors have been established, literature tends to be inconsistent and vague pertaining to attentional control and internalizing disorders (e.g., Valiente et al., 2006; Spinrad et al., 2007; Lemery-Chalfant, Doelger & Goldsmith, 2008). Nonetheless, it is hypothesized that poor attentional ER strategy use may be a key feature of the development of anxiety and depression (Eisenberg, Cumberland & Spinrad, 1998; Eisenberg et al., 2004; Silk et al., 2006). Interestingly, Murray & Kochanska (2002) found an association among preschoolers exhibiting high effortful control scores with higher mother-reported symptoms of internalizing problems. This may have been due to a less severe range of internalizing symptoms in their sample, or perhaps was an artifact of the influence of developmental age (Eisenberg et al., 2010). Despite mixed results in literature, effortful control and its elements tend to be negatively associated with internalizing. Poor attention-shifting and attentional control has been associated with rumination and involuntary engagement coping, which are often found in internalizing disorders (Feng et al., 2008; Compas et al., 2001a; Connor-Smith, et al, 2000; Nolen-Hoeksema, 1994; Silk et al, 2003). Further, avoidance, often considered a passive aspect of distraction, is associated with a shame-prone temperament, which has been correlated with depression in older adolescents (ages 16-19 years) (Connor-Smith et al., 2000). Although a direct relationship between attention and internalizing psychopathology has yet to be established, research to date appears to indicate more positive developmental

outcomes are associated with appropriate use of distraction, whereas more detrimental outcomes are associated with poor attentional control and involuntary engagement.

**Summary**

Although anxiety and depression symptoms are common in young children and can suggest serious implications into adulthood, the origins and risks for such disorders are not fully understood. Clearly, the ability to effectively regulate emotion is key to children's early psychological development, as dysregulation is associated with difficulty adapting to novel or stressful situations. Given the importance of coregulation early in life, the strategies children learn from their parents play a vital role in the developmental success of the child. Mothers with depression are typically less synchronous with their children and may be dysregulated themselves, thus adversely influencing the ability for their children to develop effective ER strategies. It is likely that other psychological problems may adversely affect parenting skills as well. Mothers suffering from more psychological distress may be more distant and less tuned into their child's needs and personal experience, resulting in detached and unengaged behavior. Certain regulatory strategies such as attentional control may not be employed successfully by depressed mothers, inhibiting their children's ability to shift attention away from aversive stimuli. Further research is needed that explicates the ways in which ER and maternal psychological symptoms might improve prediction to the development of anxiety and depression in children. Young

children who engage in poor attentional distraction and whose mothers suffer from symptoms of depression may be at especially high risk for internalizing problems, which may affect both prevention and intervention planning.

**Current Study**

The current study was designed to examine potential risk factors that serve as precursors to anxiety and depressive symptoms in early childhood. Children who exhibit poor attentional control, in combination with mothers who experience psychological distress and behave in ways that are more detached, may have increased risk for emotional difficulty (such as rumination and other internalizing problems). Hypotheses were tested utilizing data from a longitudinal, prospective study that includes direct observation of children's regulatory behavior, mothers' reports of their own psychological distress, observed detached mothering behavior, as well as parent reports of children's internalizing symptoms. Findings from this study will extend knowledge on early childhood anxiety and depression by aiming to predict discrete symptoms from behavioral regulatory strategies and maternal symptoms at earlier points in time. To date, few attempts have been made to predict specific internalizing symptomatology from observed ER strategies, especially in young children (Spinrad et al., 2007). In order to account for the strong influence of parental psychological distress on children's ER strategies as well as the effects of both on child internalizing outcomes, this project will consider parent difficulties at child age three as well as child attentional ER behavior at age four in the prediction of anxiety and depressive

symptoms at age five. In order to determine the effect that maternal distress may have upon their children, this analysis will examine self-reported distress as well as observational ratings of detached behavior toward their children in mothers. If behavioral modeling by mothers is influential to children, maternal distress will be associated with child outcomes. The relations among the factors are hypothesized to operate within a partially mediated model (see Figure 1); in other words, maternal psychological symptoms will be associated with more detached parenting behavior, which will predict increased symptoms in the child, with a proportion of the variance accounted for by the infrequent use of distractive ER strategies. This study will explore five main inter-related hypotheses:

1. Mothers' psychological distress will be associated with higher levels of detached behavior toward their children at 36 months. Previous research suggests a behavioral component of influence from mothers to their children; therefore overall distress and parenting behaviors will be correlated with each other as well as examined in relation to larger prediction within the model.

2. Mothers' psychological distress at child age 36 months will predict higher levels of anxiety and depressive symptoms in their children at age 60 months. In addition, mothers with higher levels of psychological distress will exhibit more detached behavior toward their children and be overall less engaged with them. Given the prevalence research of maternal depression as a risk factor for poor parenting behaviors and child difficulties, this study examines the

specific predictive power of maternal distress as well as maternal detachment on the risk for emergence of anxiety and depression in the child.

3. Maternal psychological distress and maternal detached behavior at child age 4 (36 months) will be predictive of poor attentional control in children at age 5 (60 months). From a functional perspective, it is predicted that maternal depression and anxiety will adversely influence strategy use in children. This may occur through social learning and modeling of strategies (or failure thereof) as well as a less synchronous bond between the mother and child. Thus, children of mothers with higher psychological distress or more detached behavior will exhibit higher levels of attention, indicating under-utilization of constructive ER strategies such as attention-shifting.

4. Poor attentional control in children at age 4 (48 months) will be associated with increased symptoms of anxiety and depression in children at age 5 (60 months). Given previous research indicating that high distraction serves as a protective factor and also that poor attentional control is a predictor of internalizing symptoms, this study examines whether variation in anxiety and depression is reliably explained by level of attention at an earlier age.

5. The level of child attentional control at 48 months will partially mediate the relationship between maternal symptoms and detachment at child age 36 months as well as child anxiety and depression symptoms at 60 months. While the link between maternal depression, detachment, and more problematic child outcomes is well-established, the addition of attention as a determinant of risk for

specific anxiety and depression may account for a meaningful portion of the variance within this subset of children. The aim is to investigate the predictive power of attention to a stressful task and maternal depressive symptoms over the developmental period from child ages three to five.

## Method

### Participants

The participants were 125 (64 male, 61 female) typically developing children and their mothers, drawn from a larger longitudinal investigation, the Collaborative Family Study (CFS). The CFS prospectively explores family systems, emotion regulation, and the development of behavior problems in typically developing as well as developmentally delayed children followed from age 3 until age 9. Participants were recruited at 36 months of age from central Pennsylvania and southern California through community agencies, including early childhood centers, family resource centers, preschools, and early intervention programs, and through flyers posted in the community. Attrition was minimal in the years following recruitment, and there were no differences found between families who remained in the study and families who dropped out.

Developmental status was measured using the Development Index (MDI) subscale of the Bayley Scales of Infant Development II (BSID-II), a widely used measure of mental development in children (Bayley, 1993; Robinson & Mervix, 1996). Families were excluded from the larger study if the child was non-ambulatory, had severe neurological impairment, or if there was a history of

abuse. For this project, children who were categorized as borderline or developmentally delayed will be excluded from the analysis. Ethnicity was representative of the populations at each site (see Table 1).

**Procedures**

In the larger study, children and their families were seen every six months from child ages three to five years and then subsequently every year until age nine. After qualifying for the larger study, families were contacted by phone and scheduled for an initial home visit when the child was approximately 36 months of age. Demographic information was collected from the families, including information on income, ethnicity, marital status, parental education level, employment status, and health history. For the current investigation, only relevant procedures completed at child ages 36 (T1), 48 (T2) and 60 (T3) months will be included.

At child age 36 months (T1), families participated in home and laboratory observational visits as well as a series of questionnaires. The home visit was conducted to obtain naturalistic observation of child behaviors, parenting, parent-child, and parent-parent interactions. The visit lasted approximately ninety minutes and was broken into six 10-minute periods of coding with five minute breaks between sessions. During this time, two trained graduate students observed the family for 10 minutes and then used the Parent-Child Interaction Rating System (PCIRS; Belsky, Crnic & Gable, 1995, See Appendix A) to code parent, child, and dyadic behavior for five subsequent minutes. The parents and children

were encouraged to behave naturally, as if the coders were not there. Coders always followed the child during the visit to assess their behavior and interactions.

During the home visit at 36 months, mothers and fathers were given booklets of questionnaires to assess overall child, parent and family functioning as well as parent attitudes and beliefs and the parent-child relationship. Parents were instructed to complete the booklet of questionnaires independently and to return them by mail to the study in postage-paid envelopes. Maternal psychological symptoms reports were collected as part of the questionnaires completed at this data collection period.

In addition to the home visit and questionnaires, mothers and their children also visited the laboratory at 36 months to complete a series of tasks and activities, which were video-recorded. They began with a ten-minute free play, in which mothers were told to feel free to do anything they would normally do at home. Children were shown a basket of age-appropriate toys and were told they could play with them for a while. In addition to the toys, an adult-sized chair with magazines nearby was placed in the room. Following the ten minutes, the child was asked to put the toys away so they could continue with planned activities.

At child age 48 months (T2), children and their mothers returned to the lab. Trained graduate students led the participants through several tasks, each of which was videotaped. Among these tasks was the task of specific interest for this investigation, a delay of gratification "waiting" task. The wait task followed

several problem-solving tasks, which were completed by the child with help from the mother. At the start of the waiting task, the experimenter brought an attractive wrapped present and a horse with a broken leg to the child. The experimenter informed the child that he/she would receive a present as a reward for working hard that day, but could not open it until the experimenter returned to the room. The child was told that he/she could play with the horse until it was time to open the present. Mothers were given paperwork to fill out while the child waited for the experimenter to return, and were therefore distracted by their own task. Subsequently, the child and mother were left in the room for five minutes.

At child age 60 months (T3), mothers were again asked to complete a series of questionnaires and engage in a series of observational tasks with their child. Measurements of children's internalizing behavior problem were obtained from the maternal report questionnaires obtained at this data collection period.

**Measures**

**Maternal distress.** The Symptom Checklist-35 (SCL; Derogatis, 1993) is a 35-item questionnaire rated on a five point scale from 0 (not at all) to 5 (extremely) that was administered to mothers when children were 36 months of age. The SCL-35 has a total sum score of perceived distress as well as subscales for somatization, interpersonal sensitivity, depression, anxiety, and hostility. The total sum score of symptoms will be used for this analysis to capture overall maternal distress.

**Maternal detachment.** In addition to reports of maternal distress, mothers' behavior during home visits and "free play" activity in the lab visit at 36 months were coded for "detached" behavior toward their child. Detached behavior was coded on a 1 to 5 scale, with 1 being not at all detached and 5 being highly detached. Details on coding for detached behavior can be found in Appendix A.

**Child attentional control.** As noted above, the waiting task was videotaped to allow for later coding by teams of trained, supervised undergraduate students when children were 48 months of age (T2). The "waiting" task was coded for various behaviors to obtain a global assessment of the emotional expression displayed as well as specific behaviors (strategies) children used when presented with new and moderately challenging situations. Coders were trained by watching videotaped lab sessions until they reached sufficient reliability with a criterion coder. Coders were assigned in pairs to watch and score the tapes; a graduate student master coder served to train coders to a metric of 70% exact agreement and in excess of 95% agreement within one scale point on scales involving global ratings, and to a minimum criterion of kappa = .60 for frequency of strategy use.

The Strategies (Behavioral Expression) Coding System, which was developed expressly for the larger CFS study, was utilized to identify children's emotion regulation strategies used during each laboratory task. This coding system was designed to capture both the frequency and intensity of children's

regulatory strategies across five different categories: distraction/ disengagement, comfort seeking, self-soothing, constructive coping, and aggression/anger venting. Each strategy was scored for frequency of episodes (number of times the given behavior was exhibited) as well as intensity for each episode, which was rated on a scale from 1 to 3 (1=infrequent/low degree, 2=sometimes/moderate degree, 3=most of the time/high degree). Frequency total (sum of episodes), maximum level of intensity (the single highest intensity rating of all episodes), and intensity total (the sum of all intensity scores) were also calculated (see scoring sheet, Appendix B).

The specific strategy of most interest for the present study is "Attention to Object", a strategy uniquely measured for the "waiting" task. This strategy was defined in the coding system as the amount of time the child is focused on the "forbidden" target object (rather than distraction from it). There were three ways in which the child could be considered to be focused on the object: visually (looking at the object), verbally (talking about the object), and tactilely (touching the object). Any of these behaviors indicated focus on the object. Every episode of attention toward the object was recorded for its duration and intensity. Intensity ratings depended upon the number of "areas" of attention at a given time, with a score of "1" including only one area, "2" indicating two modalities, and an intensity score of "3" indicating all three modalities of attention at once. For example, being both visually and verbally focused at the same time would receive an intensity score of "2", while visual attention alone would receive a score of

"1". Four scores indicating attentional control were recorded: The total duration of attention on the object, maximum intensity across episodes of attention, total frequency of attentive episodes, and "intensity total" (a summed score of the frequency of attention which accounted for the intensity of each episode).

**Child internalizing problems.** The Child Behavior Checklist (CBCL, Achenbach, 1991) CBCL version for ages 1 ½ to 5 was completed at 36, 48, and 60 months. The CBCL is a commonly used questionnaire designed to assess of child behavior problems, consisting of 100 items listing problem behaviors. For each statement, the reporter (in this case the parent) was asked to respond using a scale from 0 to 2 (0=not true, 1=somewhat or sometimes true, and 2=very true or often true) based on how much it applied to the child within the past 6 months. For this project, both father and mother reports will be used in analyses to reduce shared method variance of mother reports. The CBCL has been found to be highly predictive of later psychopathology at five year follow-up for individuals identified as borderline or clinical (Roza et al., 2003). Two indices of symptom types will be used in this analysis: two specific, DSM-IV-oriented subscales for anxiety and affective problems were computed using Achenbach's well-established computerized ADM (Assessment Data Manager) at UCLA (Achenbach, 1991). Full reliability and validity information is available in Achenbach & Rescorla (2000).

## Data Analyses

**Data Reduction.** Sum scale scores for anxiety and affective problems (corresponding to depression and other mood symptoms) were created from Achenbach's automated scoring system, as noted previously. In addition, a composite of detached behavior towards the child was computed using seven observation scores: six observations during a home visit, and one additional observation from free play in the laboratory. This composite was calculated for all mothers with at least 3 of 7 observations. Cronbach's alpha for reliability of the detachment composite was .741 (N=123).

**Preliminary analyses.** Descriptive statistics were run on all demographic characteristics, child attentional control scores, maternal symptom scores, and child internalizing symptom variables to identify means, standard deviations, outliers, and normality (shown in Table 2). Again, percentages of participant ethnicity are listed in Table 1.

**Hypothesis Testing.** Hypotheses were tested using Structural Equation Modeling with MPlus software (Muthén and Muthén, 2005). Four models were estimated to explore the different effects of specific pathways between variables as well as the effects of baseline level variables (36 month anxiety and affective problems) and covariates (child sex and mother education). Maternal education, a variable known to be correlated with socioeconomic status and parenting behaviors (Bornstein et al., 2002), was included in all analyses initially. All

models included the hypothesized partially mediated pathways, and therefore tested all five hypotheses.

Hypothesis #1 addressed whether elevated self-reported maternal psychological distress predicted an increase in observed detached behavior toward their children at T1. The composite score for detached behavior was used as a variable in this case. A path from maternal distress to maternal detachment was included.

Hypothesis #2 addressed whether elevated maternal psychological distress at T1 predicted more intense attention by the child at T2. Simple correlations were run to examine all available measures of attention, including total duration, frequency, and intensity total of attention episodes. No measures of attention were significantly correlated to maternal distress, maternal detachment, or 60 month child problems. Maximum intensity of attention on the desired object (scores ranging from 1-3) was theoretically relevant to the extent and quality of attentional control, and is also the standard for previous research, and therefore was included in the SEM models.

Hypothesis #3 addressed whether elevated maternal psychological distress at T1 predicted elevated anxiety and/or depression symptoms in children at T3. Anxiety and affective problem scores were entered into the SEM models as endogenous variables with maternal distress entered as a continuous exogenous predictor.

Hypothesis #4 addressed whether increased maternal detached behavior at T1 predicted elevated anxiety and/or depression symptoms in children at T3. Child anxiety and affective symptoms at T3 were entered into the SEM models as endogenous variables, each with the maternal detached behavior composite variable at T2 entered as an exogenous predictor.

Hypothesis #5 addressed whether intensity of child attention at T2 partially mediated the effect of maternal psychological distress and maternal detached behavior at T1 to child anxiety and depression at T3. Child anxiety and affective symptoms at T3 were entered as endogenous variables, with attention entered as a causal endogenous variable for the former three variables. Maternal distress and maternal detachment were entered as exogenous variables with paths to all endogenous variables. Direct and indirect effects were calculated within the model.

**Missing data.** To manage missing data across time points, full information maximum likelihood (FIML) estimation was used. FIML estimation is a less biased procedure for dealing with data that is missing at random (MAR) than listwise or pairwise deletion strategies (Enders & Bandalos, 2001). FIML estimation was used to retain the highest number of participants for the analyses while also reducing bias.

# Results

## Quality of Data

See Table 2 for full descriptive statistics. All variables fell within an acceptable range for skew and kurtosis, according to cutoffs identified by West, Finch, & Curran (1995) (skew greater than two and kurtosis greater than six should be examined). However, several of the skew and kurtosis measures were statistically significant when the scores were compared to their standard errors, which may indicate problematic distribition. FIML estimation included nearly all data available; for all variables, there was between 96.8-100% covariance coverage for each variable using this approach to missing data.

## Correlations between Variables at Ages 3 and 4 to Symptoms at Age 5

Simple correlations were computed to estimate the overall strength of association between variables without accounting for any shared variance with other variables (shown in Table 5). To determine how best to assess the outcome factors, mother and father ratings of child symptoms on the CBCL were examined at 60 months (see Table 3). Overall, mother and father ratings were highly correlated for Anxiety, Internalizing, and Affective Symptoms.

Subscales of the Symptom Checklist completed by mothers at child age 36 months were compared to the same subscales at 60 months for child anxiety, internalizing, and affective problems to determine whether a specific set of maternal symptoms may have been more strongly associated with reported child internalizing problems than others (see Table 4). Although several variables were

highly correlated with child problems at 60 months, total sum score of overall distress was most highly and consistently correlated with anxiety, internalizing and affective problems. In addition, no specific maternal symptoms had zero correlation with 60 month internalizing problems in children. Therefore, total sum score from the SCL was used in these analyses.

Finally, correlations were computed for the hypothesized predictors of dependent variables. Relating to the hypothesis that maternal distress would be associated with 60 month child anxiety and affective problems, maternal distress was significantly correlated with 60 month affective problems. However, t maternal distress and child anxiety were not significantly correlated. In addition, there were no statistically significant correlations between maternal detachment and child symptoms at age 36 or 60 month or with 48 month child attention. Similarly, there were no statistically significant correlations between child attention and any variables, including all 60 month child problems and 36 month maternal distress or detachment. Results from simple correlations suggest a predictive relation between maternal distress and some internalizing symptoms of children at 60 months, but no relation between child attention and any other variables in the model. In sum, simple correlations provided preliminary support for the hypothesis that maternal distress would predict child problems at 60 months, but no support for maternal detachment predicting to child problems at 60 months. In addition, correlations did not support the hypothesis that child attention would be influenced by maternal distress and detachment, nor did it

indicate any significant association between child attention at 48 months and child outcomes at 60s. Therefore, there was no preliminary indication of any relation (including mediation) of child attention to any other hypothesized variables.

**SEM Analyses of Direct and Indirect Effects on Child Internalizing Problems**

A path model using all measured variables was first tested, followed by a model using latent factors where they were theoretically relevant and had empirical support. The manifest variable model, referred to as Model A, is shown in Figure 2, and the latent factor model, or Model B, is shown in Figure 3.

Model A was tested first for the extent to which it fit the data (Figure 2; fit indices for all models shown in Table 7). This model included all hypothesized paths as well as baseline variables for anxiety and affective problem variables at 36 months. In addition, this model initially included child sex and mother's education as covariates. However, paths for child sex and mother education covariates were not significant and were therefore removed from the model. The overall fit of the resulting model was very good ($\chi^2$ (4, N=125)=122.91, p=.57; CFI=1.00; RMSEA=.00; SRMR=.02), although none of the hypothesized paths were significant. Anxiety and affective symptoms at 60 months were not predicted by maternal distress at 36 months (mother report anxiety: β=-.26, p=.34; father report anxiety: β=-.25, p=.51; mother report affective problems: β=.01, p=.12; father report affective problems: β=-.10, p=.75). Maternal distress was significantly correlated with mother-report anxiety (Φ=12.05, p<.05) and affect problems (Φ=7.78, p<.05) at 36 months, suggesting a relation between distress in

mothers and the report of child problems. In contrast, maternal detached parenting was not associated with child symptoms at 36 months (mother report anxiety: $\Phi$=.08, p=.64; father report anxiety: $\Phi$=.04, p=.77; mother report affective problems: $\Phi$=.05, p=.71; father report affective problems: $\Phi$=-.02, p=.91), nor was detached parenting associated with mother psychological symptoms at 36 months ($\Phi$=1.37, p=.29). Anxiety and affective problems at 60 months were not predicted by maternal detachment at 36 months (mother report anxiety: $\beta$=-.26, p=.34; father report anxiety: $\beta$=-.25, p=.51; mother report affective problems: $\beta$=.07, p=.77; father report affective problems: $\beta$=-.10, p=.75) or by child attention at 48 months (mother report anxiety: $\beta$=-.31, p=.34; father report anxiety: $\beta$=-.19, p=.68; mother report affective problems: $\beta$=.12, p=.68; father report affective problems: $\beta$=-.41, p=.30). Instead, path coefficients from 36 to 60 month child outcomes were only significant for the same variable measured at both occasions: anxiety and affective problems. These paths were only significant between corresponding raters (e.g., father-rated anxiety at 60 months to father-rated anxiety at 36 months) and corresponding sets of symptoms, such as anxiety (mother report anxiety: $\beta$=.46, p<.001; father report anxiety: $\beta$=.34, p<.05; mother report affective problems: $\beta$=.45, p<.001; father report affective problems: $\beta$=.28, p<.05). Significant path coefficients, standard errors and standardized solutions are shown in Figure 2.

In an effort to more accurately measure the constructs in the model, latent factors were created for 36 month internalizing problems, maternal detachment,

child attentional control, and 60 month internalizing. There were not enough indicators to create a latent variable for maternal distress, since only one questionnaire was available. The new model which included all four latent factors, however, did not converge. In an effort to more carefully create latent variables for the model, confirmatory factor analyses were conducted on each latent factor (fit statistics in Table 7) Indicators for 48 month child attention did not have significant loadings on an attentional control variable, despite efforts to constrain and use different combinations of specific variables. CFA for indicators of 36 month child internalizing symptoms, 48 month maternal detachment, and 60 month child internalizing symptoms did significantly load onto latent factors.

Once latent factor models were established, the structural model for relations among latent constructs was analyzed with each latent factoradded one at a time. This was completed for 36 month internalizing, maternal detachment, and 60 month internalizing, each separately. The model with the latent factor for child internalizing at 36 months did not meet cutoffs for good fit for its chi-square test, ($\chi^2$(32, N=125)=106.11, p<.001), CFI (.81) or RMSEA (.14). However the SRMR did meet the cutoff for adequate fit (.06). The model which included detached maternal behavior as a latent factor did not meet criteria for good fit with chi-square ($\chi^2$(92, N=125)=118.98, p<.05) or CFI (.93), but did meet criteria for adequate fit in RMSEA (.05) and SRMR (.06). The model with 60 month internalizing as a latent factor was the poorest fit of all, with no indices meeting criteria for adequate fit ($\chi^2$(35, N=125)=155.82, p<.001, df=35; CFI=.52;

RMSEA=.17; and SRMR=.09). Since none of the latent factor models had sufficient fit to the data, additional modifications were attempted.

Due to the empirical support from factor analyses for all three latent factors, and the fact that none were particularly strong in the model, a latent model which included all three latent factors (36 month internalizing, maternal detached behavior, and 60 month internalizing) was analyzed for exploratory purposes. Fit indices were insufficient to meet any cutoffs for adequate fit ($\chi^2$=286.13, p<.001, df=112; CFI=.66; RMSEA=.11; SRMR=.09). This model was also modified in several ways to assess possible contributions to the decline in fit. First, the covariates of mother education and child sex were re-introduced; although effects in the manifest variable model were insignificant, they could have influenced overall fit of the hypothesized model. However, this model fit more poorly than the original model ($\chi^2$=318.07, p<.001, df=138; CFI=.66; RMSEA=.10; SRMR=.09). Next, covariance within reporters for the 36 month internalizing factor was included in the model. Thus, the two father-report measures (anxiety and affective problems) were allowed to share variance, as were the two mother-report measures. Fit was relatively unchanged ($\chi^2$=280.90, p<.001, df=110; CFI=.67; RMSEA=.11; SRMR=.09). The next variation in the model grouped home visit data into two parcels in order to reduce degrees of freedom and the number of overall indicators: home visit observations 1-3 and observations 4-6, in addition to the laboratory observation. However, this was unsuccessful; in confirmatory factor analysis, the three parcels did not load to

form a latent factor for maternal detachment, and maximum iterations were exceeded when including this factor in the larger model. Finally, the latent factor which accounted for baseline levels of internalizing problems at 36 months was removed from the model so that only the factors for maternal detached behavior and 60 month internalizing remained, in addition to the measured mother distress variable. Model fit improved but still did not meet any requirements for fit to the data ($\chi^2$=142.04, p<.001, df=61; CFI=.73; RMSEA=.10; SRMR=.08). Since no variation improved model fit to an adequate level (nor did it change pathways in any notable way), the original latent model with factors for 36 month internalizing, maternal detached behavior, and 60 month internalizing is reported was retained as the final latent model.

In the latent model, no hypothesized paths were statistically significant. There was no direct path from mother distress at 36 months nor mother detached behavior at 36 months to child internalizing symptoms at 60 months (distress: β=0.0, p=1.0; detached: β=-.11, p=.69). Further, neither maternal distress nor detachment predicted to child attentional control at 48 months (distress: β=-.02, p=.47; detached: β =-.12, p=.38). In addition, child attentional control at 48 months did not predict to internalizing at 60 months (β=.00, p=.47). Maternal distress was associated with the 36 month internalizing latent factor (Φ=7.7, p<.05), but was not with maternal detachment (Φ =1.3, p=.11). Overall, results were consistent with the manifest variable model A. In sum, there was no support for a direct relation between maternal distress or detached behavior and later child

attention or internalizing symptoms. There was, however, a direct path from 36 month internalizing and 60 month internalizing symptoms in children ($\beta$=.42, $p<.05$). Indirect effects were analyzed as a test of mediation for 48 month attention. No significant effects were detected, with indirect effect estimates equal to zero with a standard error of -.01 for both paths, from 36 month maternal distress to 60 month internalizing and 36 month maternal detachment to 60 month internalizing, with child attention as the mediator. Results suggest that child attention at 48 months had no measurable effect on child outcome symptoms at 60 months.

Based on the model tests, there is no evidence to support the hypothesis that child attention serves to partially mediate the relation between maternal distress/detachment and the emergence child internalizing symptoms between ages 3 and 5. Further, maternal distress was not associated with maternal detachment. Paths were not affected by inclusion of child sex and mother's education. Neither maternal detachment nor distress significantly predicted child attention, anxiety or affective problems. It appears that the strongest predictor for child internalizing symptoms at 60 months was child internalizing symptoms at 36 months. Finally, there was no significant prediction to or from child attention at 48 months in any of the models, indicating a lack of support for a mediated model.

## Discussion

This study aimed to explicate possible precursors to child internalizing symptoms such as maternal distress, maternal detachment, and child attentional control. The longitudinal, prospective design provided an opportunity to explore early factors as potential warning signs for later emergence of child internalizing symptoms. Previous research suggests that anxiety and mood problems in early childhood may be associated with mothers' psychological well-being and parenting behaviors (e.g., Goodman & Gotlib, 2002; Beidel & Turner, 1997; Rosenbaum et al., 2000; Wickramaratne & Weissman, 1998). In addition, emotion regulation and social learning theory provide foundations which would also predict that early maternal distress and detached parenting style could relate to development of maladaptive coping styles in children, such as poor attentional control (Gerull & Rapee, 2002). Detrimental effects of distressed mothers on children's development have been confirmed in observational work by Tronick (1989) and Feldman (2007). In turn, it has been proposed that poor control over the ability to flexibly manage attention is integral to underlying mechanisms of anxiety and depression, although empirical reports have been less consistent in this domain (Eisenberg, Cumberland & Spinrad, 1998; Valiente et al., 2006; Eisenberg et al., 2004; Silk et al., 2006). Moreover, theoretical models have been proposed and supported which demonstrate the relation between maternal difficulty and child behavior problems, mediated by effortful control and attention strategies in children (Eisenberg, Cumberland, and Spinrad, 1998; Spinrad et al.,

2007; Valiente et al., 2006; Silk et al., 2006). However, contrary to theory and previous empirical support, findings from the current study detected no relation among any of these key variables for this sample. No direct or indirect effects of hypothesized maternal or child variables were observed relating to later child symptoms. Results observed here suggest that child attention, maternal distress, and maternal detached parenting are not strongly influential on later expression of internalizing problems.

Contrary to hypothesis #1, maternal distress did not appear to have much relation with maternal detached behavior. There are theoretical and empirical reasons to believe that detached behavior may be more prominent in mothers experiencing psychological distress. Psychological distress, especially depression, often reduces the ability for mothers to detect and respond to subtle changes in their children and to produce appropriate affective behavior. This has been found to result in mothers behaving in a detached or disengaged manner toward their children (Feldman, 2007; Tronick, 1980). Indeed, it seems counterintuitive that mothers experiencing higher levels of psychological distress would not also experience some deterioration in parenting, including detached behavior. There may well be a relation between distress and detached parenting, but mothers were effective at compensating for their shortcomings while being observed during the home and laboratory observations. Alternatively, mothers with higher distress may indeed suffer parenting problems, but in domains other than detached behavior, such as hostility, reduced pleasure or intrusiveness.

Maternal detached behavior was also unrelated to child behavior problems in any notable way. Although maternal distress was associated with child internalizing problems at 36 months, this relation was not present at 60 months. It would be expected that mothers with distress and detached behavior would be more likely to have children with behavior problems. Epidemiological research has shown that distressed children who have maladaptive coping strategies are more likely to have mothers with psychological distress and poorer parenting skills (e.g., Gerull & Rapee, 2002; Biederman et al., 2006; Feng et al., 2008). Thus, negative or unengaged behavior and ineffective emotion regulation in distressed mothers would likely affect the psychological wellbeing of their children, and simultaneous psychological distress in children would impact mothers' well-being as well. However, findings in this study do not support such a conceptualization. Since there was an association between maternal distress and child internalizing problems at 36 months but not at 60 months, it is possible that children may become less affected by maternal problems as they develop out of toddlerhood and into early childhood. They may learn necessary coping skills to overcome any shortcomings their mothers may have in teaching effective regulatory strategies essential to psychological well-being through exposure to peers and other individuals outside the home environment (Eisenberg & Morris, 2002). This study did not include maternal distress or detached behavior at 60 months, so it is not possible to know whether maternal distress was stable across

time, or if maternal factors at 60 months may have been related to child problems at 60 months.

In addition to mother-related issues being unrelated to child outcomes, child attentional control was not associated with maternal distress, detached behavior, or child internalizing symptoms, as originally hypothesized. The lack of association to mother distress and detached mother behavior is inconsistent with most previous research, which does indicate that attentional control is affected by maternal distress and observed expressivity toward their children (Eisenberg et al., 2010). Moreover, current findings do not support evidence that effortful control is integral to effective emotion regulation in children (Thompson, 1994; Compas et al., 2001b; Eisenberg et al., 2004; Spinrad et al., 2007). The failure to find similar relations suggests that this study may not have effectively captured attention as a function of effortful control or emotion regulation. The measurement used was a one-time observation of intensity of attention on a desired object rather than an evaluation of overall performance in the task. It did not include latency to touch the desired object, parent reports of temperament, or specific parent ratings of attentional control, which were not available at the appropriate ages. Therefore, the measure of attention may have been too limited and specific for it to serve as a reliable indicator of attentional control.

Despite possible measurement issues, it could still be that child attention may not be the most salient indicator of maternal problems nor the best contributing factor for child internalizing symptoms. There are several possible

explanations for the lack of findings connecting attention to maternal distress, detachment, and child internalizing symptoms. First, attentional control may only relate to effective regulation and functioning under a specific set of circumstances not present in the laboratory experiment. For example, performance of attention in a high-stress environment such as one that presents aversive stimuli or some form social evaluation may be a more effective measure of attentional coping skills that are affected by the level of emotional competence in mothers (Grolnick, Bridges & Connell, 1996). Second, attention as part of effortful control may be determined primarily as a stable personality trait and may be best captured by parent- or caregiver-report or a combination of multiple, converging measures (Cole, 2004). It is possible that this study illustrates a specific segment of attention that does not connect to mother influences or behavior problems. Effortful control in the form of attention may have a relatively small independent influence on the emergence of internalizing symptoms, which might depend on the presence of certain other factors such as low emotional expression or involuntary control (Eisenberg et al., 2001). However, replication of the unexpected findings in this study would be needed to support such conclusions.

Even if maternal distress or detachment is not associated with the development of inappropriate attention, parenting may nonetheless be associated to broader emotion regulatory strategies. For example, Silk and colleagues (2006) scored preschool children on a combination of several emotion regulation behaviors during a delay of gratification task. They reported a positive relation

between ineffective strategies among children of depressed mothers, compared to non-depressed mothers. Results may have been quite different if the present study included emotion regulation in combination of several different behaviors, including attentional control. However, a comparative study with the specific goal of contrasting measures for emotion regulation within the same sample and experiments would be required in order to support this explanation.

Despite the lack of support for hypothesized paths and the poor fit of the latent model, the overall measured structural equation model did fit the data well. This was probably a function of the strong relations between early and later child anxiety and affective problems. Within this study, the only predictor of anxiety and depression in children at 60 months were the same symptoms (anxiety and depression, respectively) at 36 months. This indicates that that child internalizing problems tend to be fixed and stable in early childhood, even beginning as early as age three. Interestingly, there was no indication from the manifest variable model that early problems in one domain (e.g., anxiety) would predict problems in a different domain (e.g., affective problems) two years later. This may indicate that internalizing symptoms do not change from one set of manifestations into another form once established, such as anxiety symptoms being replaced by depression as a child grows older. However, multi-level, growth curve modeling is needed to assess the trajectory of child symptoms at the individual person-level, rather than at the group level. Such analyses would allow more accurate examination of symptom trajectories across early childhood.

It is unlikely that all children are stable in their presentation of internalizing problems between 36 and 60 months. Instead, it is possible that children who express symptoms by 36 months are instead predisposed to internalizing problems from a very young age and are not highly affected by environmental factors. This could be due to intrinsic influences inherited from parents or affected by the prenatal environment such as neurochemistry or other genetic features (Lemery-Chalfant, et al., 2008; Beidel & Turner, 1997; Cole et al., 1994). The children with symptoms at age three may demonstrate a stable pattern which thereby maintains symptoms at age five. However, another subset of children may develop symptoms later in childhood more predominantly as a response to extrinsic influences such as the home environment and parenting behavior. The presence of a majority of children with stable symptoms may preclude detection of possibly variable symptoms in a minority of children who develop symptoms at a later age. If this is the case, the strongest detectable predictors for internalizing problems at age five may appear to be internalizing problems at age three because of a confound of other variables. Further examination of subsets of the sample would be needed to confirm this explanation, but would reduce power too much to allow for structural equation modeling. If there are truly different manifestations of internalizing profiles in children, the possibility still remains that certain children who develop anxiety and depression could be identified through attentional control, maternal symptoms and behavior. Additional work investigating the growth curves of children

developing symptoms early versus later in childhood would be needed to examine this further. Such an approach would shed light on the question of whether certain subsets of children who develop behavior and emotional problems are responding to environmental influence rather than physiology, while others may possess a biochemical diathesis to certain symptomatology.

Both mothers and fathers were satisfactory enough raters for reported symptoms to effectively predict later child symptoms. Further, mother-reported and father-reported child problems were highly correlated, which improved reliability of ratings for symptoms. There was an association between maternal distress and higher mother-rated symptoms in children at 36 months, so that mothers who reported higher distress also rated their children with more problematic behaviors. Given the high consistency between father-report and mother-report, it seems clear that children of mothers with higher distress receive higher ratings of internalizing problems at 36 months because they do in fact exhibit higher levels symptoms, and not due to any bias in mother reporting. In short, there seems to be a legitimate relation between distress in mothers and distress in their children. However, examining directionality is not possible in this study due to the concurrent measurement time point for both mother and child problems.

Several aspects of the design of this study helped to provide new, in-depth information about phenomena which may have otherwise been observed in more limited manners. First, this study was longitudinal in design, which allowed the

inference of changes over time. In addition, the sample was pulled from the community and was not over-sampled for specific clinical populations, providing a more realistic representation of the rates and nature of emerging symptoms in young children and their parents. Further, when parent report was used to measure a variable, both mother and father reports were included in the model. This allowed for the comparison between reporters and the assessment of reliability in reported behaviors. Finally, this study used mixed methods for gathering data, which included self- and parent-report as well as laboratory and home observation by indifferent, naïve investigators.

Despite the strength in approach within this study, analyses did not replicate phenomena reported in previous work. It is possible that the differences in longitudinal design and measurement of certain constructs, such as observational rather than self- or parent-report, could have resulted in measurement differences. Perhaps the means for capturing certain behaviors, such as detached parenting, tapped into different aspects of parent behavior than other means for identifying detachment. For example, parents who report little interest or concern in their children may be different in nature than parents who behave in a detached manner while observers blatantly watch them interact with their children. Moreover, the two-year span of time for observation may have been too long to observe relations between maternal difficulty, detached behavior and the later emergence of children's internalizing problems. Although children's symptoms themselves seemed stable across the two year delay, countless changes

within families and their environments may have introduced too much variation to detect relations that have been observed in a cross-sectional study design.

This study did have several limitations that warrant caution when considering the present findings and possible reasons for inconsistency with previous theories and findings. Primarily, it is possible that the constructs discussed and included here may not have been measured effectively. For example, the variable for attentional control was a laboratory observed measure of the intensity of the attention children paid to a desired object. However, previous measures of attentional control often integrate parent-report and observation of temperament-related attentional control (e.g., Spinrad et. al, 2007). A latent construct of attentional control using observation as well as additional indicators would have been ideal, but were unavailable. Future studies which combine measurements of temperament, parent-report, or observation over more time points may provide improved ability to understand the nature of attentional control. Power may have also been an issue for this study, which may have precluded the detection of certain relations which may be smaller in signal strength. Moreover, although longitudinal design is considered a strength in this study, it may also be a limitation because it allows for great variability over a two year time span. Perhaps different time points for measurement could change findings. Finally, the nonnormality of the distribution may have affected fit of the models; correction for skew and kurtosis may improve the fit. Nonetheless, current findings illustrate that certain relations between early problematic

behaviors and symptoms and later emerging symptoms may not function exactly as originally hypothesized.

## References


Achenbach, T.M. (1982). *Developmental Psychopathology* (2nd ed). NY: Wiley and Sons, Inc.

Achenbach, T. M. (1991). *Integrative Guide to the 1991 CBCL/4-18, YSR, and TRF Profiles.* Burlington, VT: University of Vermont, Department of Psychology.

Achenbach, T.M. & Rescorla, L.A. (2000). *Manual for the ASEBA Preschool Forms & Profiles.* Burlington, VT: University of Vermont, Department of Psychology.

Bayley, N. (1993). *Bayley Scales of Infant Development.* San Antonio: Psychological Corporation.

Belsky, J., Crnic, K., & Gable, S. (1995). The determinants of coparenting in families with toddler boys: Spousal differences and daily hassles. *Child Development, 66,* 629-642.

Beidel, B.C. & Turner, S.M. (1997). At Risk for Anxiety: I. Psychopathology in the Offspring of Anxious Parents. *Journal of the American Academy of Child & Adolescent Psychiatry*, 36(7).

Biederman J., Petty C., Hirashfeld-Becker D.R., Henin A., Faraone S.V., Dang D., et al. A controlled longitudinal 5-year follow-up study of children at high and low risk for panic disorder and major depression. Psychological Medicine. 2006;36:1141–1152.

Bird, H., Gould, M.,& Staghezza, B. (1993). Patterns of diagnostic comorbidity in a community sample of children aged 9 through 16 years. *Journal of American Academy of Child & Adolescent Psychiatry*, 32: 361-368.

Bornstein, M.H., Hahn, C.S., Suwalsky, J.T.D., & Haynes, O.M. (2002). Socioeconomic status, parenting, and child development: The Hollingshead Four-Factor Index of Social Status and Socioeconomic Index of Occupations. In M.H. Bornstein & R.H. Bradley (Eds.), *Socioeconomic Status, Parenting, and Child Development* (pp.29-82). Mahwah, NJ: Lawrence Erlbaum Associates, Inc.

Brady, E. U., & Kendall, P. C. (1992). Comorbidity of anxiety and depression in children and adolescents. *Psychological Bulletin,111*, 244-255.

Campos, J. J., Mumme, D. L., Kermoian, R., & Campos, R. G. (1994). A functionalist perspective on the nature of emotion. *Monographs on the Society for Research in Child Development, 59,* 284-303.

Cohn, J. E, & Tronick, E. Z. (1983). Three-month-old infants' reaction to simulated maternal depression. Child Development, 54, 185-193.

Cole, P.M., Michel, M.K., & Teti, L.O. (1994). The development of emotion regulation and dysregulation: A clinical perspective. In N.A. Fox (Ed.), The development of emotion regulation: Biological and behavioral considerations. *Monographs of the Society for Research in Child Development*, 59 (2-3, Serial No. 240), 73-100.

Cole, P.M.; Martin, S.E.; & Dennis, T.A. (2004). Emotion regulation as a scientific construct: Methodological challenges and directions for child development research. *Child Development, 75*, 317-333.

Compas, Bruce E.; Boyer, Margaret C. (2001a) Coping and attention: Implications for child health and pediatric conditions. *Journal of Developmental & Behavioral Pediatrics*, Vol 22(5), 323-333.

Compas, B. E., Connor-Smith, J. K., Saltzman, H., Thomsen, A. H., & Wadsworth, M. E. (2001b). Coping with stress during childhood and adolescence: Problems, progress, and potential in theory and research. *Psychological Bulletin*, 127, 87–127.

Connor-Smith, J. K., Compas,B. E., Thomsen, A. H.,Wadsworth, M. E.,& Saltzman, H. (2000). Responses to stress: Measurement of coping and reactivity in children and adolescents. *Journal of Consulting and Clinical Psychology*, 68, 976–992.

Costello, E. J., & Angold, A. A. (1995). Epidemiology. In J. S. March (Ed.), *Anxiety disorders in children and adolescents*. New York: Guilford Press.

Derogatis, L.R. (1993). *BSI Brief Symptom Inventory: Administration, Scoring, and*
*Procedures Manual.* Minneapolis, MN: National Computer Systems.

Eisenberg N, Cumberland A, Spinrad TL. (1998). Parental socialization of emotion. *Psychological Inquiry*. 9:241–273.

Eisenberg, N. & Morris, A.S.Children's emotion-related regulation. In: Reese H, Kail R, eds, *Advances in child development and behavior.* Vol. 30. San Diego, CA: Academic Press; 2002, pp. 189–229.

Eisenberg, N. & Spinrad, T.L. (2004). Emotion-related regulation: Sharpening the definition. *Child Development*, 75: 334-339.

Eisenberg, N., Spinrad, T.L., & Eggum, N.D. (2010). Emotion-Related Self-Regulation and its Relation to Children's Maladjustment. *Annual Review of Psychology*, 6: 495-525.

Eisenberg N, Spinrad TL, Fabes RA, Reiser M, Cumberland A, Shepard SA, et al. (2004). The relations of effortful control and impulsivity to children's resiliency and adjustment. *Child Development*, 75:25–46.

Eisenberg N, Spinrad TL, Morris AS. (2002). Regulation, resiliency, and quality of social functioning. *Self Identity*,. 1:121-28

Enders, C. K., & Bandalos, D. L. (2001). The relative performance of full information maximum likelihood estimation for missing data in structural equation models. *Structural Equation Modeling, 8,* 430-457.

Feng, X.,Shaw, D.S., & Silk, J.S. (2008). Developmental trajectories of anxiety symptoms among boys across early and middle childhood. *Journal of Abnormal Psychology*, 117: 32-47.

Feldman, R. (2007). Parent-infant synchrony and the construction of shared timing; physiological precursors, developmental outcomes, and risk conditions. *Journal of Child Psychology and Psychiatry*, 48(3/4), 329-354.

Garnefski, N., Kraaij, V., & Spinhoven, Ph. (2001). Negative life events, cognitive emotion regulation and depression. *Personality and Individual Differences*, 30: 1311-1327.

Gerull F.C. & Rapee R.M. Mother knows best: The effects of maternal modeling on the acquisition of fear and avoidance behaviour in toddlers. *Behaviour Research and Therapy*. 2002; 40:279–287.

Goodman, S.H. & Gotlib, I.H. (Eds). *Children of Depressed Parents*: *Mechanisms of risk and implications for treatment*. Washington, D.C.: American Psychological Corporation, 2002

Gresham F.M. & Kern, L. (2004). Internalizing behavior problems in children and adolescents. In Rutherford Jr., R.B.; Quinn, M.M.; Mathur, S.R. (eds) *Handbook of Research in Emotional and Behavioral Disorders*. NY: Guilford Press.

Grolnick, W.S., Bridges, L.J. & Connell, J.P. (1996). Emotion regulation in two-year-olds: Strategies and emotional expression in four contexts. *Child Development*, 67(3): 928-941.

Hammen, C. & Rudolph, K.D. (2003). Childhood mood disorders. In Mash, E.J., & Barkley, R.A. (eds.). *Child Psychopathology* (2nd ed). New York: Guilford Press.

Harrington, R. *Depressive disorder in childhood and adolescence*. New York: John Wiley & Sons, 1993.

Knapp, P. & Jensen, P.S. Recommendations for DSM-V. In Knapp, P., Jensen, P.S., & Mrazek, D.A. *Toward a new diagnostic system for child psychopathology*. New York: The Guilford Press, 2006, pp. 162-181.

Kovacs, M. (1989). Affective disorders in children and adolescents. *American Psychologist*, 44: 209-215.

Kovaks, M. (1996). Presentation and course of major depressive disorder during childhood and later years of the life span. *Journal of the American Academy of Child and Adolescent Psychiatry*, 35, 705-715.

Lemery-Chalfant, K.; Doelger, L.; & Hill Goldsmith, H. (2008). Genetic relations between effortful and attentional control and symptoms of psychopathology in middle childhood. *Infant and Child Development*, 17: 365-385.

Lengua, L.J., Sadowski, C.A., Friedrich, W.N., and Fisher, J. (2001). Clinically and empirically derived dimensions of children's symptomatology: Expert ratings and confirmatory factor analysis of the CBCL. *Journal of Consulting and Clinical Psychology*, 69(4): 683-698.

Lewinsohn, P.M.; Rohde, P.; Seeley, J.R. (1995). Adolescent Psychopathology: III. The clinical consequences of comorbidity. *Journal of American Academy of Child & Adolescent Psychiatry.*

Lewinsohn, P.M.; Rohde, P.; Seeley, J.R.; Klein, D.N.; & Gotlib, I.H. (2000). Natural course of adolescent major depressive disorder in a community sample: Predictors of recurrence in young adults. *American Journal of Psychiatry*, 157: 1584-1591.

MacKinnon, D.P. *Introduction to Statistical Mediation Analysis.* New York: Psychology Press, 2008.

Mitchell, J., McCauley, E., Burke, P.M., & Moss, S.J. (1988). Phenomenology of depression in children and adolescents. Journal of the American Academy of Child and Adolescent Psychiatry, 27: 12-20.

Mischel, H.N. & Mischel, W. (1983). The development of children's knowledge of self-control strategies. *Child Development,* 54, 603-619.

Murray KT, Kochanska G. (2002). Effortful control: Factor structure and relation to externalizing and internalizing behavior. *J. Abnorm. Child Psychol.* 30:503-14

Muthén, L. K., & Muthén, B. O. (2005). Mplus user's guide ($4^{th}$ed.). Los Angeles: Muthén & Muthén.

Nolen–Hoeksema, S., & Girgus, J. (1994). The emergence of gender differences in depression during adolescence. Psychological Bulletin, 115, 424–443.

Robinson, B. F., & Mervis, C. B. (1996). Extrapolated raw scores for the second edition of the Bayley Scales of Infant Development. *American Journal on Mental Retardation, 100,* 666-671.

Rosenbaum, A. F., Biederman, J., Gersten, M., Hirshfeld, D. R., Meminger, S. R., Herman, J. B., Kagan, J., Reznick, S., & Snidman, N. (1988). Behavioral inhibition in children of parents with panic disorder and agoraphobia: A controlled study. *Archives of General Psychiatry,* 45, 463-470.

Roza S.J., Hofstra M.B., van der Ende J., & Verhulst F.C.. Stable prediction of mood and anxiety disorders based on behavioral and emotional problems in childhood: A 14-year follow-up during childhood, adolescence, and young adulthood. American Journal of Psychiatry. 2003;160:2116–2121.

Rutherford Jr., R.B. Quinn, M.M. & Mathur, S.R. (eds) (2004). *Handbook of Research in Emotional and Behavioral Disorders*. NY: Guilford Press.

Seligman L.D. & Ollendick, T.H. (1998). Comorbidity of anxiety and depression in children and adolescents: An integrative review. Clinical Child and Family Psychology Review 1(2) 125-144.

Silk J.S., Steinberg, L., & Morris, A.S. (2003). Adolescents' emotion regulation in daily life: Links to depressive symptoms and problem behavior. *Child Development,*74:1869–1880.)

Skinner, E.A. & Zimmer-Gembeck, M.J. (2009). Challenges to the developmental study of coping. In E.A. Skinner & M.J. Zimmer-Gembeck (Eds.), *Coping*

*and the development of regulation. New Directions for Child and Adolescent Development*, 124, pp.5-17. San Francisco: Jossey-Bass.

Spinrad, T.L.; Eisenberg, N.; Gaertner, B.; Popp, T.; Smith, C.L.; Kupfer, A.; Greving, K.; Liew, J.; & Hofer, C. (2007). Relation of maternal socialization and toddlers' effortful control to children's adjustment and social competence. *Developmental Psychology*, 43: 1170-1186.

Sterba, S.K., Prinstein, M.J., and Cox, M.J. (2007). Trajectories of internalizing problems across childhood: Heterogeneity, external validity, and gender differences. *Development and Psychopathology*, 19: 345-366.

Strauss, C.C., Last, C.G., Hersen, M., & Kazdin, A.E. (1988). Association between anxiety and depression in children and adolescents with anxiety disorders. Journal of Abnormal Child Psychology, 16: 57-68.

Thompson, R.A. (1994). Emotion regulation: A theme in search of definition. *Monographs for the Society for Research in Child Development*, 59: 25-52.

Tronick, E. (1980). On the primacy of social skills. In D.B. Sawin, L.O. Walker, & J.H. Penticuff (Eds.), *The exceptional infant. Psychosocial risks in infant environment transactions* (pp.144-18). New York: Brunner/Mazel.

Tronick, E.Z. (1989). Emotions and emotional communication in infants. *American Psychologist*, 44: 112-119.

Valiente, C.; Eisenberg, N.; Spinrad, T.L; Reiser, M. ; Cumberland, A. ; Losoya, S.H. ; & Liew, J. (2006). Relations among mothers' expressivity, children's effortful control, and their problem behaviors: A four-year longitudinal study. *Emotion*, 6: 459-472.

Waslick, B.D., Kandel, R., & Kakouros, A. (2002). Depression in children and adolescents. In Shaffer, D. & Waslick, B.D. (eds). *The Many Faces of Depression in Children and Adolescents*. Review of Psychiatry, vol. 21. Washington D.C.: American Psychiatric Publishing, Inc. pp. 1-36.

Wickramaratne, P.J. & Weissman, M.M. (1998). Onset of psychopathology in offspring by developmental phase and parental depression. *Journal of the American Academy of Child and Adolescent Psychiatry*, 37(9): 933-942.

Zahn-Waxler, C., Klimes-Dougan, B., & Slattery, M.J. (2000). Internalizing problems of childhood and adolescence: Prospects, pitfalls, and progress

in understanding the development of anxiety and depression. *Development and Psychopathology*, 12, 443–466.

Table 1

*Participant Ethnicity*

| | African-American | Asian | Caucasian | Hispanic | Other |
|---|---|---|---|---|---|
| Child | 11.7% | 4.8% | 60.0% | 8.3% | 15.2% |
| Mother | 12.4% | 6.9% | 65.5% | 12.4% | 2.8% |

Table 2

*Descriptive Statistics for Variables of Interest*

| | | | | | Skewness | | Kurtosis | |
|---|---|---|---|---|---|---|---|---|
| | N | Minimum | Maximum | Mean | Std. Deviation | Statistic | Std. Error | Statistic | Std. Error |
| Child Sex | 125 | 1.00 | 2.00 | 1.51 | .50 | -.049 | .22 | -2.03 | .43 |
| Mom Yrs. Education | 125 | 10.00 | 20.00 | 15.82 | 2.44 | -.11 | .22 | -.57 | .43 |
| 36mo Mom Distress | 124 | 1.00 | 96.00 | 20.64 | 19.64 | 1.99 | .22 | 4.10 | .431 |
| 36mo Mom Detached | 123 | 1.00 | 4.40 | 2.28 | .72 | .412 | .22 | -.45 | .433 |
| 48mo Distraction | 121 | 0.00 | 3.00 | 2.64 | .61 | -1.69 | .22 | 2.83 | .44 |
| 60mo Internalizing sum | 121 | 0.00 | 33.00 | 7.53 | 6.15 | 1.53 | .22 | 2.97 | .44 |
| 60mo Affective sum | 121 | 0.00 | 13.00 | 1.91 | 2.14 | 1.88 | .22 | 5.66 | .44 |
| 60mo Anxiety sum | 121 | 0.00 | 14.00 | 2.79 | 2.64 | 1.70 | .22 | 3.84 | .44 |

Table 3

*Correlations Between Mother- and Father-Report CBCL Ratings*

| | CBCL 36 Mom Affective Sum | CBCL 36 Mom Anxiety Problems Sum | CBCL 60 Mom Affective sum | CBCL 60 Mom Anxiety Problems sum |
|---|---|---|---|---|
| CBCL 36 Dad Affective Sum | **.49**** | **.21*** | **.35**** | **.19*** |
| CBCL 36 Dad Anxiety Problems Sum | **.34**** | **.50**** | **.19*** | **.40**** |
| CBCL 60 Dad Affective Sum (N=105) | **.22*** | -.01 | **.43**** | .06 |
| CBCL 60 Dad Anxiety Sum (N=121) | **.26**** | **.20*** | **.28*** | **.27**** |

Note. *. Correlation is significant at the 0.05 level (2-tailed); **. Correlation is significant at the 0.01 level (2-tailed).

Table 4

*Simple Pearson Correlations for Maternal Distress Scales*

| | 60mo Internalizing Problems | 60mo Affective Problems | 60mo Anxiety Problems |
|---|---|---|---|
| SCL 36 Mom Somatization subscale | **.206*** | .129 | .113 |
| SCL 36 Mom Interpersonal Sensitivity subscale | **.277**** | **.203*** | **.178*** |
| SCL 36 Mom Depression subscale | **.215*** | **.225*** | .141 |
| SCL 36 Mom Anxiety subscale | **.253**** | **.264**** | .173 |
| SCL 36 Mom Hostility subscale | **.193*** | **.195*** | .143 |
| SCL 36 Mom Total score | **.266**** | **.241**** | **.177*** |
| **. Correlation is significant at the 0.01 level (2-tailed). | | | |
| *. Correlation is significant at the 0.05 level (2-tailed). | | | |

Table 5
*Correlations for Manifest Variable Model A (df=4)*

| | | Mean | Std. Dev | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 36mo Mom Report Child Anxiety | 3.24 | 2.51 | 1.00 | | | | | | | | | | | |
| 2 | 36mo Dad Report Child Anxiety | 3.18 | 2.23 | 0.50 | 1.00 | | | | | | | | | | |
| 3 | 36mo Mom Report Child Affective Problems | 2.23 | 2.13 | 0.50 | 0.34 | 1.00 | | | | | | | | | |
| 4 | 36mo Dad Report Child Affective Problems | 2.26 | 2.20 | 0.21 | 0.47 | 0.48 | 1.00 | | | | | | | | |
| 5 | 36mo Total Mother Symptoms | 20.64 | 19.64 | 0.25 | 0.03 | 0.19 | 0.14 | 1.00 | | | | | | | |
| 6 | 36mo Mother Detached Behavior (Composite) | 2.28 | 0.72 | 0.04 | 0.03 | 0.03 | -0.01 | 0.10 | 1.00 | | | | | | |
| 7 | 48mo Child Attention Intensity Max | 2.64 | 0.72 | -0.11 | -0.14 | -0.03 | -0.01 | -0.08 | -0.08 | 1.00 | | | | | |
| 8 | 60mo Mom Report Anxiety Problems | 2.79 | 2.64 | 0.56 | 0.38 | 0.34 | 0.19 | 0.17 | -0.04 | -0.14 | 1.00 | | | | |
| 9 | 60mo Dad Report Anxiety Problems | 2.96 | 2.73 | 0.25 | 0.35 | 0.30 | 0.25 | 0.11 | -0.04 | -0.08 | 0.33 | 1.00 | | | |
| 10 | 60mo Mom Report Affective Problems | 1.91 | 2.14 | 0.29 | 0.17 | 0.53 | 0.33 | 0.24 | 0.05 | 0.01 | 0.53 | 0.33 | 1.00 | | |
| 11 | 60mo Dad Report Affective Problems | 1.86 | 2.31 | 0.05 | 0.10 | 0.25 | 0.31 | 0.13 | -0.02 | -0.10 | 0.14 | 0.75 | 0.10 | 1.00 | |

Table 6
*Correlations for Latent Model B (df=112)*

| | | Mean | Std. Dev | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 36mo Mom Report Child Anxiety | 3.24 | 2.51 | 1.00 | | | | | | | |
| 2 | 36mo Dad Report Child Anxiety | 3.18 | 2.23 | 0.49 | 1.00 | | | | | | |
| 3 | 36mo Mom Report Child Affective Problems | 2.23 | 2.13 | 0.50 | 0.33 | 1.00 | | | | | |
| 4 | 36mo Dad Report Child Affective Problems | 2.26 | 2.20 | 0.21 | 0.47 | 0.47 | 1.00 | | | | |
| 5 | 36mo Total Mother Symptoms | 20.64 | 19.64 | 0.25 | 0.03 | 0.19 | 0.13 | 1.00 | | | |
| 6 | 36mo Mom Detached Home1 | 2.41 | 1.184 | -0.10 | -0.03 | -0.16 | 0.01 | 0.00 | 1.00 | | |
| 7 | 36mo Mom Detached Home2 | 2.5 | 1.201 | 0.06 | 0.05 | -0.05 | 0.02 | 0.02 | 0.44 | 1.00 | |
| 8 | 36mo Mom Detached Home3 | 2.46 | 1.215 | 0.10 | 0.09 | 0.09 | -0.03 | 0.02 | 0.19 | 0.45 | 1.00 |
| 9 | 36mo Mom Detached Home4 | 2.4 | 1.146 | -0.01 | -0.06 | 0.14 | 0.00 | 0.01 | 0.10 | 0.22 | 0.37 |
| 10 | 36mo Mom Detached Home5 | 2.39 | 1.247 | 0.02 | 0.00 | 0.19 | 0.02 | 0.14 | 0.26 | 0.35 | 0.34 |
| 11 | 36mo Mom Detached Home6 | 2.42 | 1.27 | -0.01 | -0.02 | -0.06 | -0.07 | 0.24 | 0.29 | 0.23 | 0.32 |
| 12 | 36mo Mom Detached Lab | 1.48 | 0.738 | 0.15 | 0.22 | 0.02 | 0.07 | 0.00 | 0.12 | 0.13 | 0.08 |
| 13 | 48mo Attention Intensity Max | 2.64 | 0.72 | -0.11 | -0.14 | -0.03 | -0.01 | -0.07 | 0.02 | 0.07 | -0.12 |
| 14 | 60mo Mom report Anxiety | 2.79 | 2.64 | 0.56 | 0.38 | 0.34 | 0.19 | 0.17 | -0.01 | 0.01 | 0.01 |
| 15 | 60mo Dad report Anxiety | 2.96 | 2.73 | 0.26 | 0.36 | 0.31 | 0.27 | 0.11 | -0.05 | -0.19 | -0.02 |
| 16 | 60mo Mom report Affective Problems | 1.91 | 2.14 | 0.29 | 0.17 | 0.53 | 0.33 | 0.24 | -0.01 | 0.00 | -0.03 |
| 17 | 60mo Dad report Affective Problems | 1.86 | 2.31 | 0.06 | 0.10 | 0.26 | 0.32 | 0.13 | 0.02 | -0.12 | -0.10 |

Table 6, continued
*Correlations for Latent Model B (df=112)*

| | | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 36mo Mom report Anxiety | | | | | | | | | |
| 2 | 36mo Dad report Anxiety | | | | | | | | | |
| 3 | 36mo Mom report Affective Problems | | | | | | | | | |
| 4 | 36mo Dad report Affective Problems | | | | | | | | | |
| 5 | 36mo Mom Total Symptoms | | | | | | | | | |
| 6 | 36mo Mom Detached Home1 | | | | | | | | | |
| 7 | 36mo Mom Detached Home2 | | | | | | | | | |
| 8 | 36mo Mom Detached Home3 | | | | | | | | | |
| 9 | 36mo Mom Detached Home4 | 1.00 | | | | | | | | |
| 10 | 36mo Mom Detached Home5 | 0.54 | 1.00 | | | | | | | |
| 11 | 36mo Mom Detached Home6 | 0.27 | 0.47 | 1.00 | | | | | | |
| 12 | 36mo Mom Detached Lab | 0.16 | 0.15 | 0.23 | 1.00 | | | | | |
| 13 | 48mo Attention Intensity Max | -0.07 | -0.05 | -0.17 | -0.06 | 1.00 | | | | |
| 14 | 60mo Mom report Anxiety | -0.09 | -0.04 | -0.14 | 0.08 | -0.14 | 1.00 | | | |
| 15 | 60mo Dad report Anxiety | 0.04 | 0.15 | -0.09 | 0.00 | -0.10 | 0.34 | 1.00 | | |
| 16 | 60mo Mom report Affective Problems | 0.10 | 0.12 | -0.06 | 0.04 | 0.01 | 0.53 | 0.35 | 1.00 | |
| 17 | 60mo Dad report Affective Problems | 0.06 | 0.13 | -0.05 | -0.03 | -0.10 | 0.14 | 0.76 | 0.46 | 1.00 |

Table 7
*Fit statistics from SEM for Models A and B*

| Model | Chi-Square ($\chi^2$ (df, N), p) | CFI | RMSEA | SRMR |
|---|---|---|---|---|
| A (Manifest Variable Model) | **$\chi^2$(4, 125)= 2.91, p=.57** | **1.00** | **0.00** | **0.02** |
| with 36mo Internalizing latent var | $\chi^2$ (32, 125) 106.11, p<.001 | 0.81 | 0.14 | **0.06** |
| with 36mo Detached latent var | $\chi^2$(92, 125)=118.98, p<.05 | 0.93 | **0.05** | **0.06** |
| with 60mo Internalizing latent var | $\chi^2$(35, 125)=155.82, p<.001 | 0.52 | 0.17 | 0.09 |
| B (Latent Model) | $\chi^2$(112, 125)=286.13, p<.001 | 0.66 | 0.11 | 0.09 |
| with covariates | $\chi^2$(138, 125)=318.07, p<.001 | 0.66 | 0.10 | 0.09 |
| with covariance among reporters | $\chi^2$(110, 125)=280.9, p<.001 | 0.67 | 0.11 | 0.09 |
| parceling "Detached" variable | could not converge | ----- | ----- | ----- |
| with no 36mo Internalizing baseline | $\chi^2$(61, 125)=142.04, p<.001 | 0.73 | 0.1 | 0.08 |

Note. Chi-square test of model fit, Comparative Fit Index (CFI), Root Mean Square Error of Approximation (RMSEA), and Standardized Root Mean Square Residual (SRMR). Good fit is indicated by chi-square p≥ .05, CFI≥ .95, RMSEA≤ .05. and SRMR≤ .06. Statistics meeting criteria for good fit are in bold.

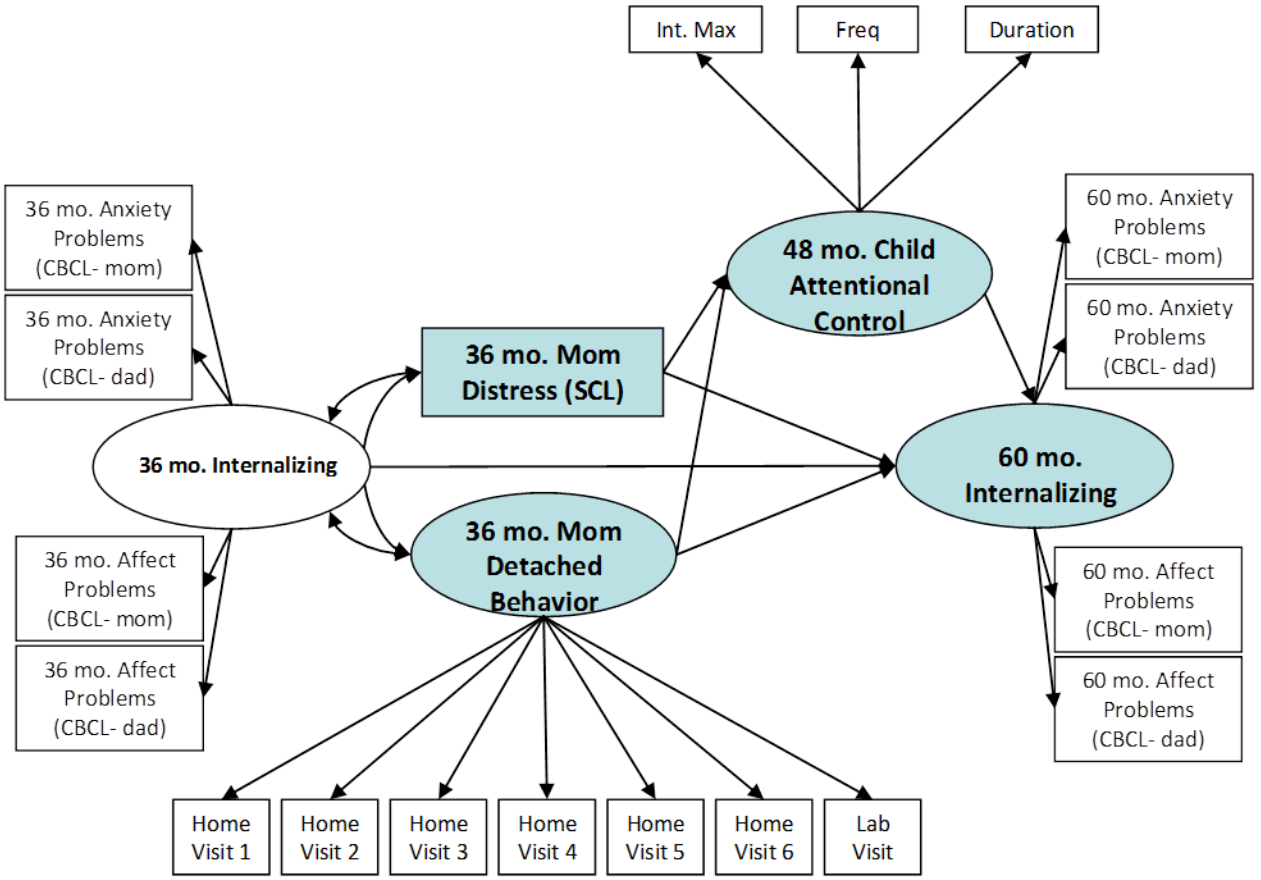



*Figure 1.* Proposed pathways between maternal distress, child attention, and child internalizing symptoms.

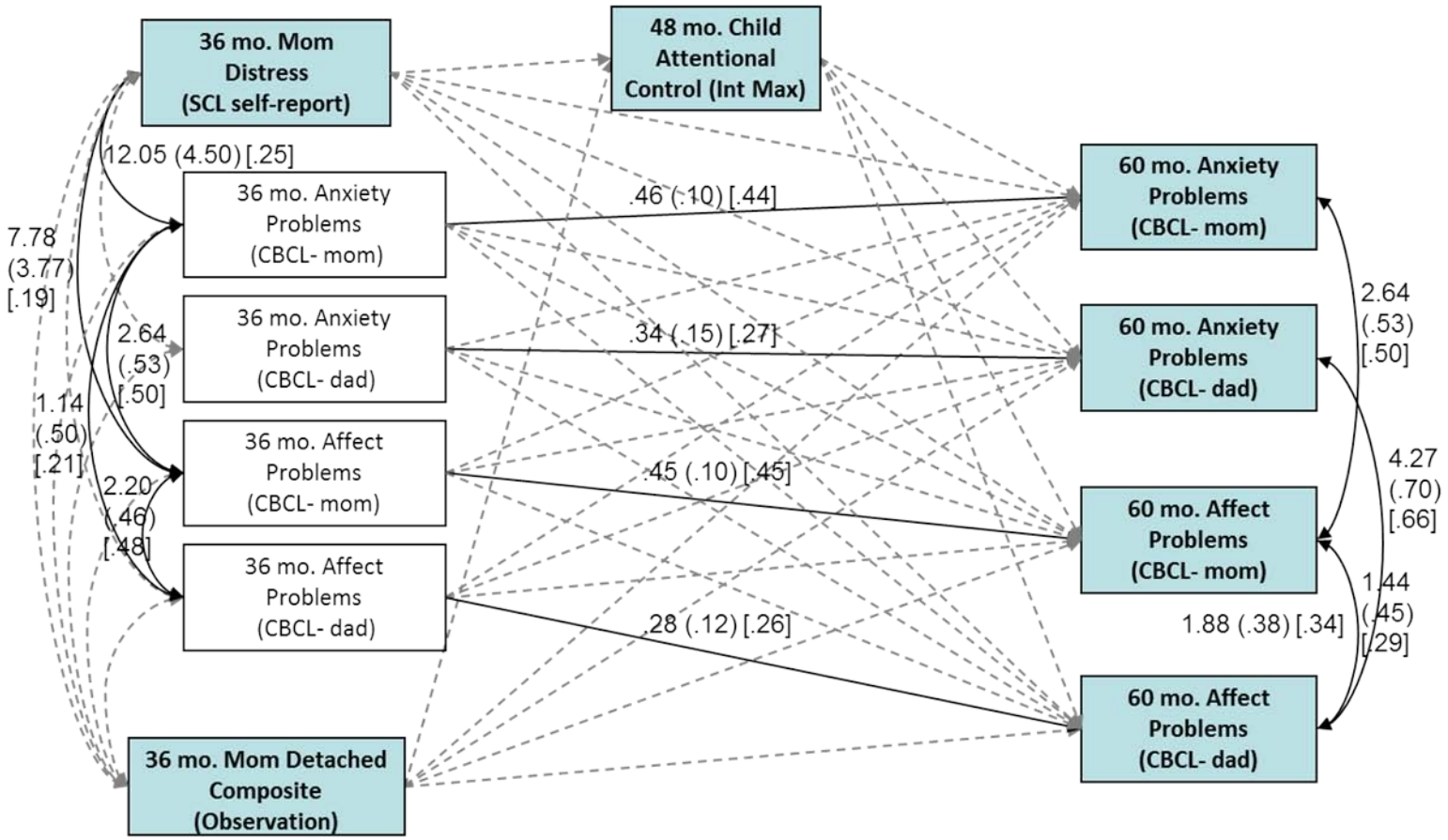



*Figure 2.* Manifest Variable Model "A". Significant pathways are reported next to black arrows in the following format: "coefficient estimate (standard error) [standardized solution]".

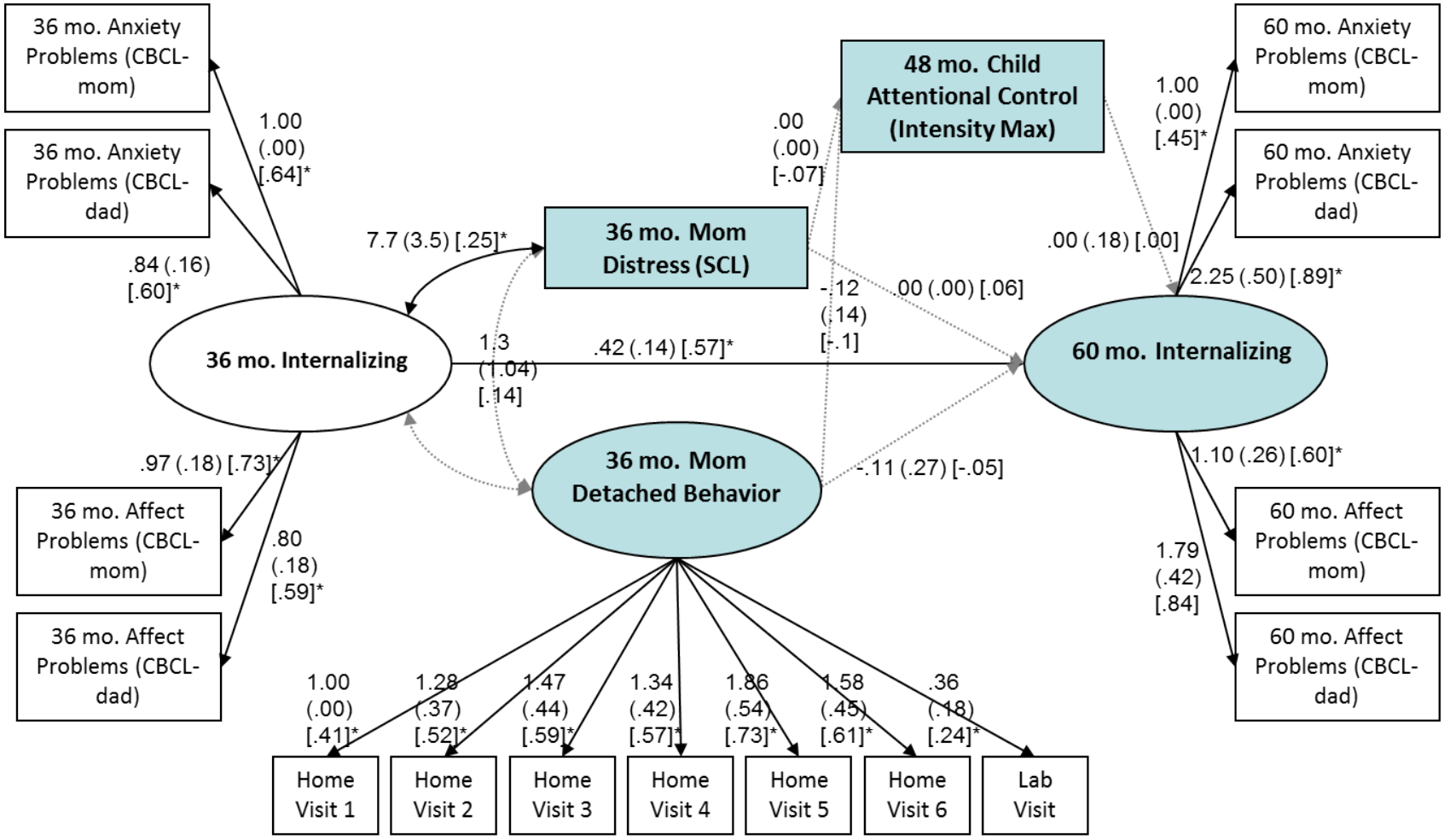



*Figure 3*. Latent Factor Model B. Significant pathways are reported next to black arrows in the following format: "coefficient estimate (standard error) [standardized solution]".

APPENDIX A: *Detached Manner Coding Manual*

(Belsky, Crnic & Gable, 1995)

Detached Manner

The detached parent appears unaware of the child's needs for appropriate interaction to facilitate involvement with objects or people, or parent is unable to provide such interaction. Parent is disengaged from the child. Behaviors typical of detached parents include not facing or making eye contact with the child, and/or not talking to the child. This parent does not react contingently to the child's vocalizations or actions, and does not provide the scaffolding needed for the child to explore objects. Detached, under stimulating parents "miss" the child's looks towards them or reaches towards a toy, and their timing is out of synchrony with the child's affect and responses (although not the overwhelming barrage of stimulation that intrusive parents present). The detached, under stimulating parent is passive and his/her non-involvement lacks the alertness of that of the sensitive parent.

Detachment and under stimulation can be marked by putting the child so he/she faces away from the parent; presenting toys without first engaging the child, or without showing, or explaining to him/her how to manipulate or use the toys; rarely talking to the child; not responding to the child's comments, smiles, or reaches for toys; an unawareness of the child's capabilities and developmentally appropriate activities; positioning the child so that he/she cannot reach, manipulate, or use a toy. Behaviors such as cleaning, soothing, talking to, or feeding the child are carried out in a mechanical, detached, distant manner without social interaction. Parents ignore the interesting things the child does, and let the child play unsupervised. Simply going through the motions when interacting with the child. Also, think about bids for interaction on the part of the child toward the parent; the detached parent will remain detached even in the face of these.

Detached Ratings

**1** = Not at all detached -- There are virtually no signs of parent detachment or under-involvement. When interacting with the child, the parent is clearly involved.

**2** = Minimally detached -- While the parent is sometimes non-involved, the parent is clearly more involved than not.

**3** = Equally detached and involved -- The parent demonstrates the ability to remain involved and interested in the child as well as demonstrating the tendency to act in an uninterested or detached manner. Difficult to characterize.

**4** = Moderately detached-- Here the balance shifts to the parent being relatively more non-involved than involved.

**5** = Highly detached-- The child lies or sits without parent attention virtually all of the time, while the parent remains within a suitable distance for interacting. In the minimal instances of involvement, parents' behaviors are simple, mechanical, stereotyped, bland, blank, and repetitive.

APPENDIX B:
*Behavioral Expression Rating Sheet*

| **Strategy** | **Waiting Task** | | **Freq. Inten. Total** | **Inten. Max.)** | **Total** |
|---|---|---|---|---|---|
| Attention to the Object (Mound) | | total duration on | | | |
| Comfort Seeking | | | | | |
| Self Soothing | | | | | |
| Obeying Rules | | | | | |
| Aggress./ Anger Venting | | | | | |

Time to completion for Waiting Task (3 min): _____

APPENDIX C:

*Path Models for Additional SEM Analyses*

*Note. Fit statistics provided in Table 7.*

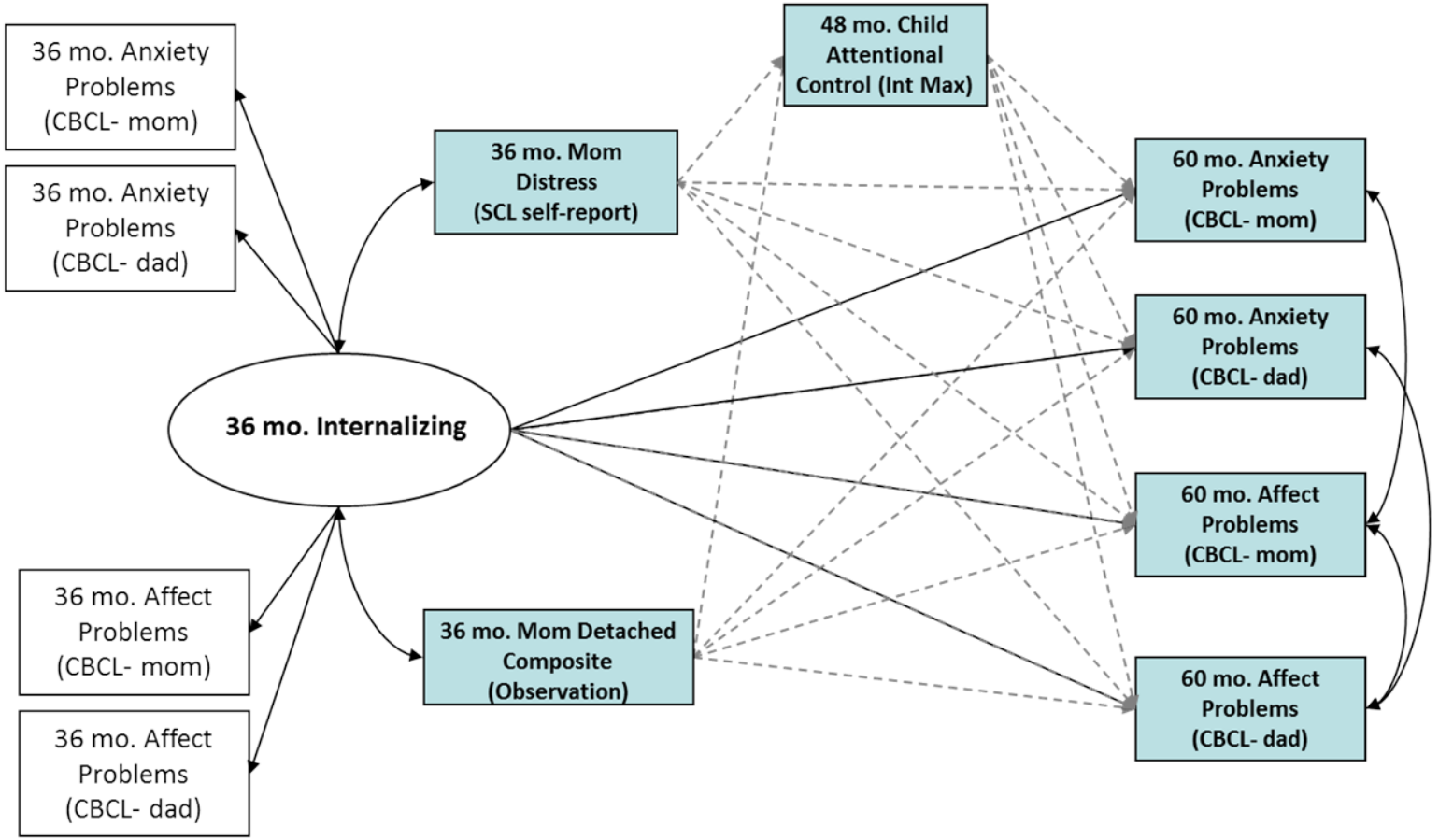



*Figure 4. M*odel A with 36 month internalizing latent factor

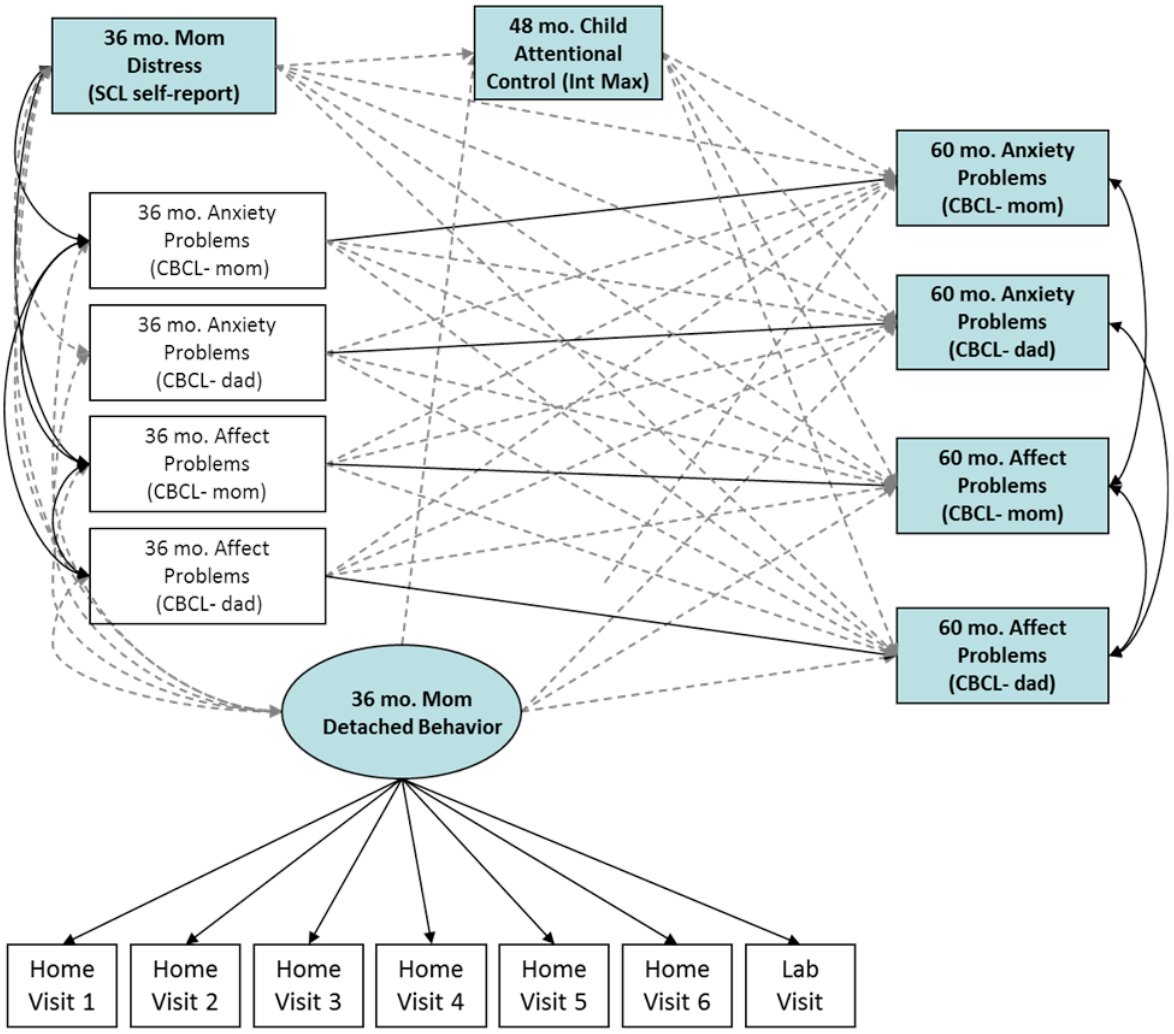



*Figure 5.* Model A with 36 month detached latent variable

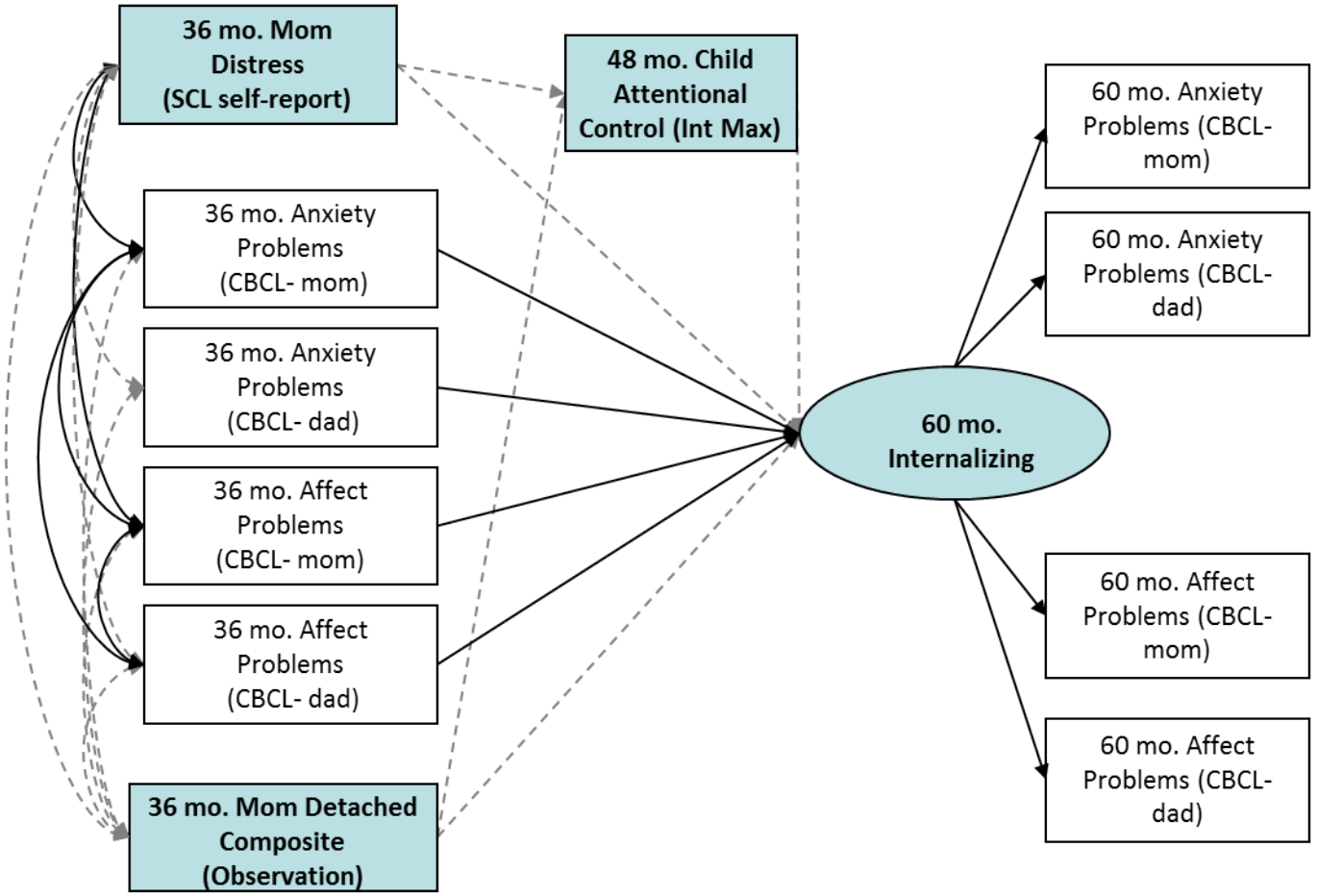
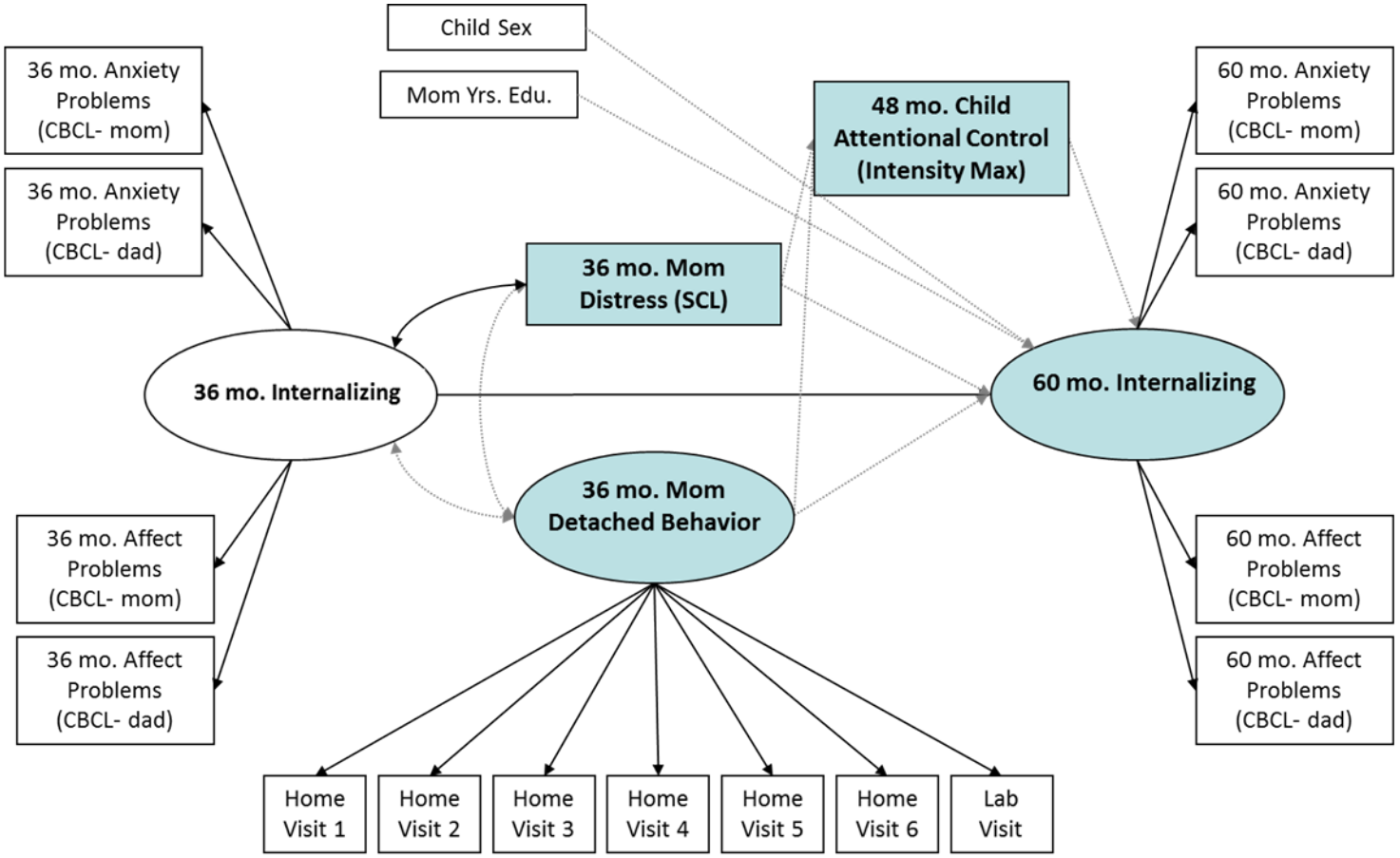



*Figure 6.* Model A with 60 month internalizing latent variable.




*Coefficients include "raw estimate (std. error) [standardized]"*

*Figure 7.* Model B with child sex and mother education covariates included

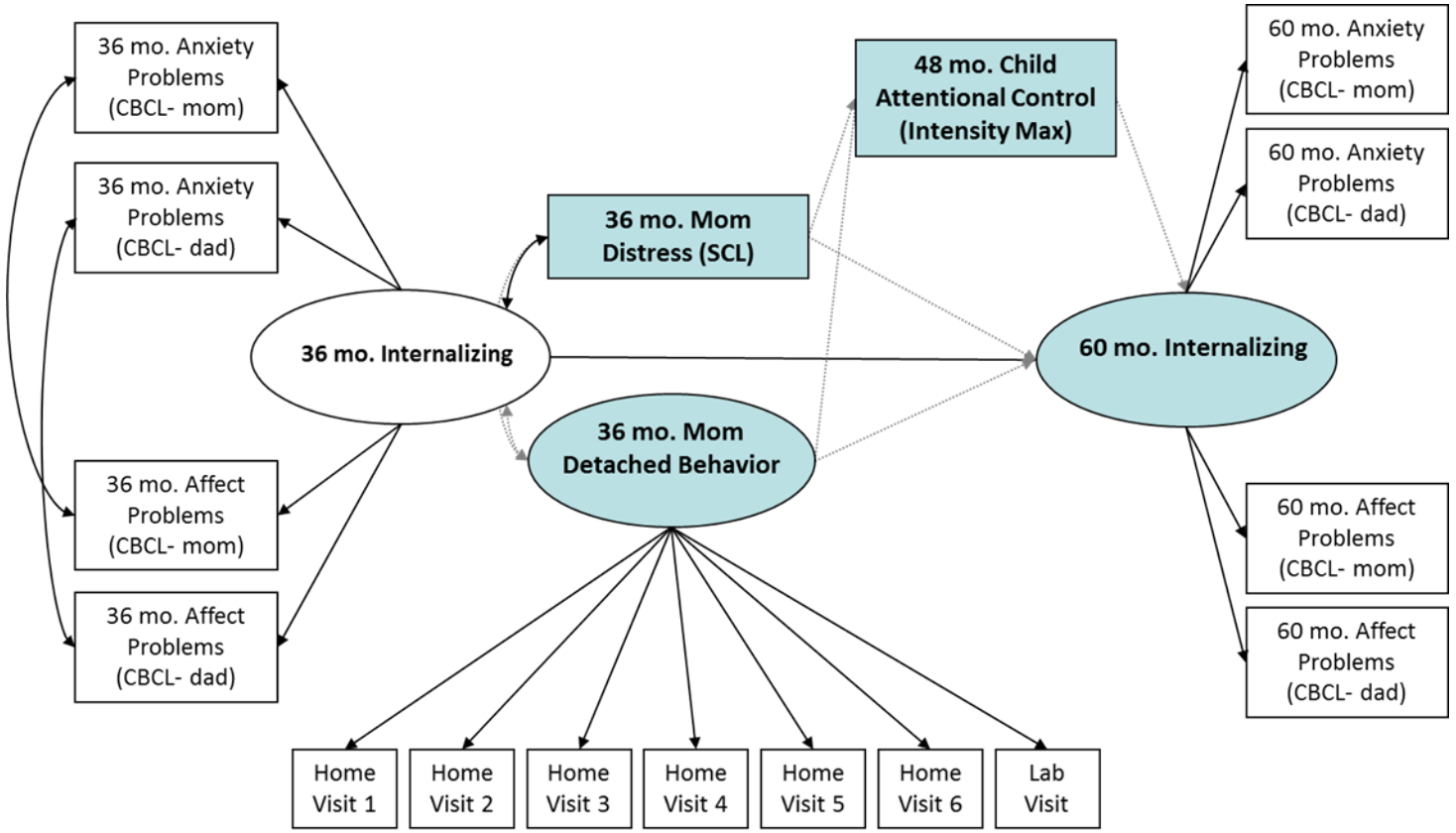



*Figure 8.* Model B with covariance among reporters

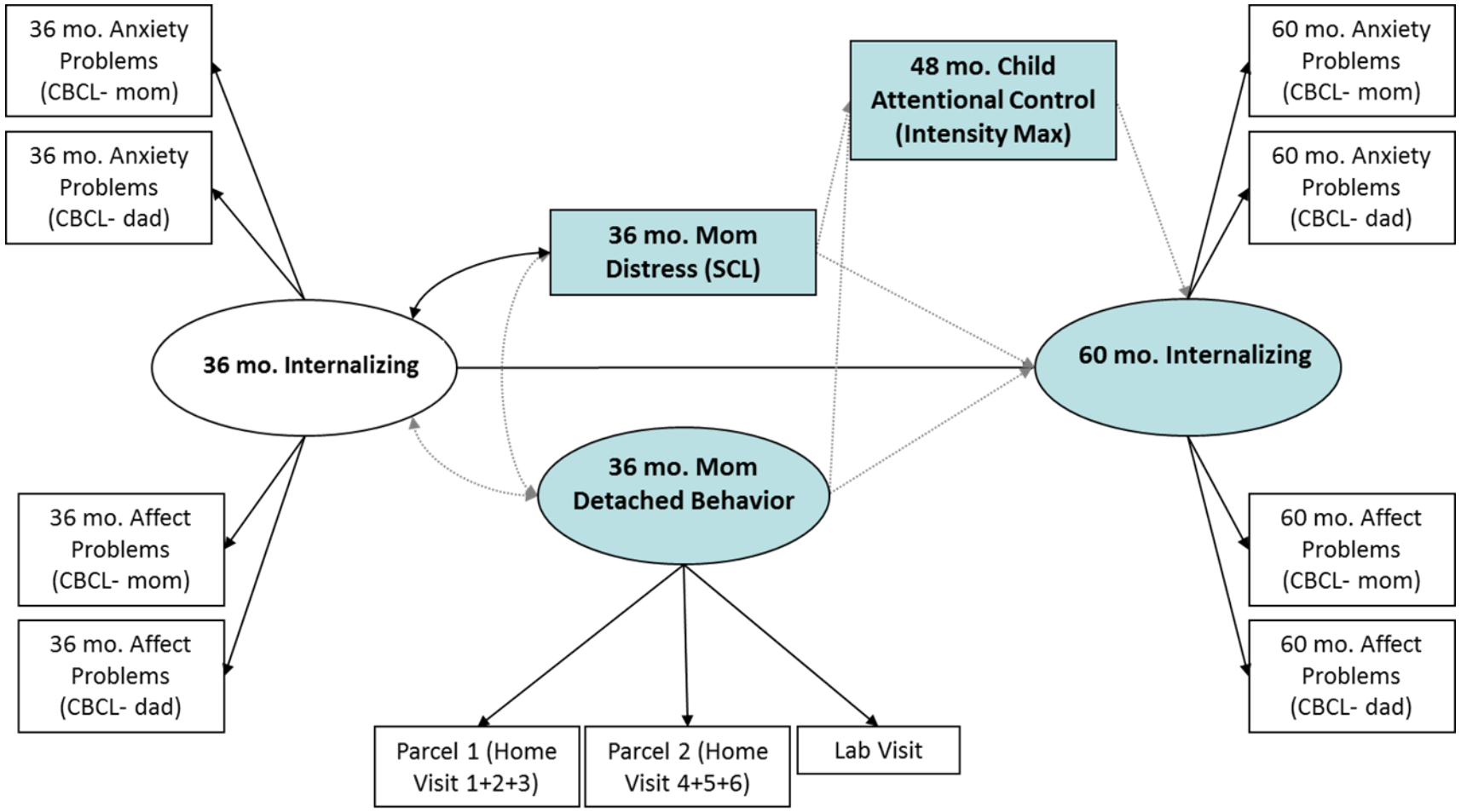



*Figure 9.* Model B with "detached" latent factor indicators parceled

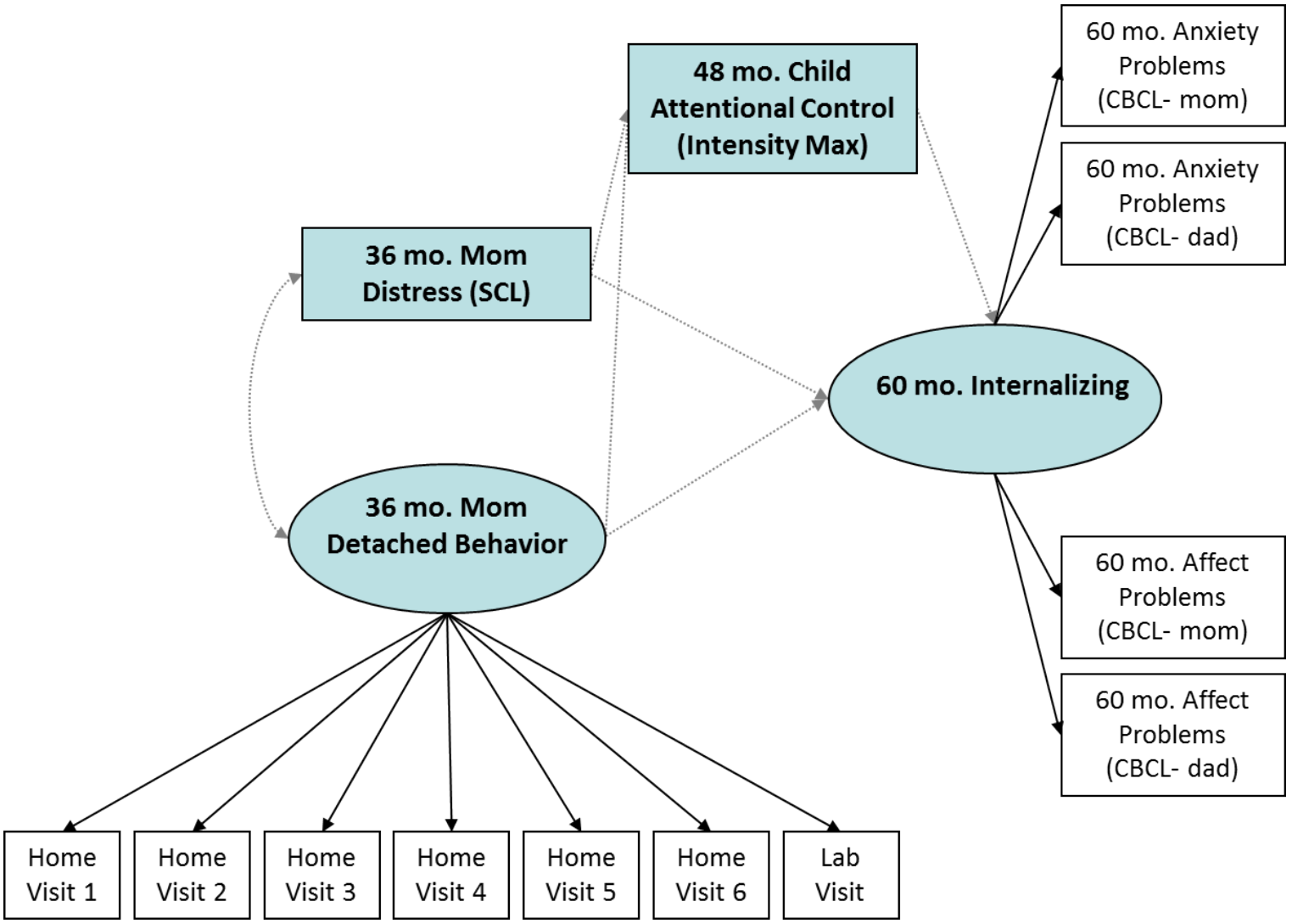



*Figure 10.* Model B with no 36 month internalizing factor