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The connection between maternal depression, parenting, and child externalizing disorders

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THE CONNECTION BETWEEN MATERNAL DEPRESSION, PARENTING, AND CHILD EXTERNALIZING DISORDERS

by

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An Abstract

Of a thesis submitted in partial fulfillment of the requirements for the Doctor of Philosophy degree in Psychology in the Graduate College of The University of Iowa

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ABSTRACT

Maternal depression has been found to be a risk factor in the development of child psychopathology (Burke, 2003) and more specifically, in the development of child externalizing disorders (Brennan et al., 2000; Hay et al., 2003; Kim-Cohen et al., 2005). The relation between maternal depression and poor parenting has also been identified in a number of contexts (Lovejoy et al., 2000; Shay & Knutson, 2008), as has the relation between poor parenting and child externalizing disorders (Morrell & Murray, 2003; Pevalin et al., 2003). Because maternal depression confers risk on parenting and child outcome, this study was an attempt to reveal the specifics of how maternal depression relates to the development of child externalizing disorders. The proposed model purports that maternal depression, mediated by trait irritability, which then leads to harsh discipline, will result in the development of Oppositional Defiant Disorder (ODD) and Conduct Disorder (CD), but not Attention Deficit Hyperactivity Disorder (ADHD). The model also purports that maternal depression, mediated by poor supervision will be associated with care neglect, as found in Knutson et al. (2005), leading to the development of ODD and CD, but not ADHD. Furthermore, it is proposed that child ADHD will not follow either the maternal depression—irritability—poor parenting pattern or maternal depression—supervisory neglect—care neglect pattern.

One-hundred thirty four economically disadvantaged mothers who were enrolled in a study of parenting were assessed for depression using both dimensional and categorical measures of current and lifetime depression. Parenting was assessed using a variety of measures which assessed supervisory neglect, care and environmental neglect, and harsh discipline. Maternal irritability not specific to discipline was assessed using

the Spielberger Trait Anger Expression Inventory (Spielberger, Johnson, Russell, Crane, Jacobs, & Wordent, 1985). Child externalizing disorders were evaluated based on parent and teacher report as ADHD and a combined ODD/CD construct.

As hypothesized, child externalizing disorders were related to maternal depression. The findings of the current study indicate that the relation is not direct and that maternal depression, mediated by trait irritability, leads to poor parenting characterized by inconsistent discipline, and that this poor parenting leads to the development of child ODD and CD. Moreover, whether the index of maternal depression was based on current dimensional data or lifetime history of maternal depression, the results of the analyses supported the hypothesized relation between maternal depression and child ODD/CD. However, an unexpected direct relation between current maternal depression and child ADHD was found, whereas a lifetime history of maternal depression was unrelated to child ADHD. Nonetheless, the relation between maternal depression and child ADHD did not follow the same pattern as the relation between maternal depression and child ODD/CD. Findings suggest that maternal irritability and inconsistent parenting are central to the putative link between maternal depression and child ODD/CD and that depressed mothers should be treated in an effort to reduce the risk for development of child ODD and CD.

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Graduate College
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CERTIFICATE OF APPROVAL

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PH.D. THESIS

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This is to certify that the Ph. D. thesis of

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CHAPTER I
MATERNAL DEPRESSION AS A RISK FACTOR FOR THE DEVELOPMENT OF OFFSPRING PSYCHOPATHOLOGY

Maternal depression has been found to be a risk factor for the development of psychopathology in offspring (Burke, 2003), although the onset of different classes of disorders in offspring is highly dependent on the child's developmental stage (Pilowsky et al., 2008). That is, as children age, the risk for the onset of disorders changes. Typically maternal depression confers risk for the onset of behavior disorders and anxiety prior to puberty (Brennan, Hammen, Andersen, Bor, Najman, & Williams, 2000; Hammen, Burge, Burney, & Adrian, 1990), major depression during early adolescence (Weissman, Wickramaratne, Nomura, Pilowsy, Verdeli, & Warner, 2006), and substance use disorders during the early to late teenage to adult years (Weissman, Warner, Wickramaratne, Moreau, Olfson, 1997). Because childhood referrals to psychiatric clinics are dominated by symptoms related to the externalizing disorders (Attention Deficit Hyperactivity Disorder [ADHD], Conduct Disorder [CD], and Oppositional Defiant Disorder [ODD]) (Johnson & Chuck, 2001) and because children whose mothers are depressed have been found to be at risk for the development of depression, anxiety, conduct problems, and poor overall functioning (Beardslee, Bemporad, Keller, & Klerman, 1983), it is important to investigate the relation between maternal depression and offspring externalizing disorders. Moreover, the externalizing disorders have many social consequences including crime, aggression, and disobedience, as well as educational disadvantage. Childhood externalizing disorders are also a harbinger of poor adult psychosocial adjustment. Thus, externalizing disorders are important clinically. They are also important theoretically, as causal bases for externalizing disorders have not

yet been definitively identified. Theoretically, many proposals have been made regarding why some children develop externalizing disorders and others do not, including investigations into parenting, genetics, and developmental factors.

To investigate the externalizing disorders in the context of maternal depression, it is essential to know what each separate externalizing disorder entails. ADHD is characterized by inattentiveness, hyperactivity, impulsivity, and distractibility, which may lead to educational difficulties, as well as difficulties at home. ODD, very differently, is associated with explosive behavior, arguing with adults, refusal to comply with adults' demands, annoying behavior, as well as vindictive behavior. ODD diagnoses are typically given to children before age eight (American Psychiatric Association, 2000). On the other hand, CD, associated with violation of societal norms, including aggressivity toward other people or animals (i.e. fighting, cruelty to animals), destruction of other's property, deceitfulness or theft, and serious rule violations (i.e. running away from home, truancy), is more often diagnosed between middle childhood and middle adolescence (American Psychiatric Association, 2000).

Although a number of different social variables have been considered as contributors to the development of ODD, CD, and ADHD, few studies have been conducted to date investigating the link between various social/contextual variables and the development of each of the externalizing disorders as distinct entities. Instead, the externalizing disorders have often been studied as a group of disorders instead of as individual disorders (e.g. Kim-Cohen et al., 2005; Lundy, Field, McBride, Abrams, & Carraway, 1997; Pevalin, Wade, & Brannigan, 2003); however, each disorder is distinct in symptomatology and defining criteria. In the literature regarding the three

externalizing disorders, many studies have focused on subgroups of externalizing disorders and sometimes have blurred the distinctions between the three (e.g. Kim-Cohen et al., 2005; Lundy et al., 1997; Pevalin et al., 2003). Because the three different disorders are distinct in their diagnostic criteria, it is important that each distinct externalizing disorder be investigated separately. Also, because of the presumption that the processes underlying individual disorders and comorbid disorders are different, it becomes important to distinguish amongst the externalizing disorders with and without comorbidity. Childhood ADHD has often been studied in relation to poor quality parenting, but is believed to be mainly biological in nature (Barkley, 1990; 1997). Conduct disorder and ODD, on the other hand, appear to have some biological components, but the development of the disorders seems to be highly dependent on parenting (Drabick, Gadow, & Sprafkin, 2006). ADHD in combination with either CD or ODD can be assumed to be worse in form and outcome than either disorder alone (Hinshaw & Lee, 2003). The current study was designed to investigate the relation between maternal depression, parenting, and the subsequent development of ODD, CD, and ADHD in children and to determine what factors link maternal depression, parenting, and the specific externalizing disorders.

CHAPTER II
MATERNAL DEPRESSION CONFERS RISK TO CHILDREN

Maternal Depression Confers a General Risk

Because depression is the most prevalent psychiatric disorder in the adult population (American Psychiatric Association [APA], 1994), and therefore, the most common psychiatric disorder to which children are exposed, it is essential to understand both the prevalence and symptoms of depression and how they might impact children of depressed parents. Within the general public, depression has been estimated to affect 6 % of the female population at any one point in time (American Psychiatric Association [APA], 1994) and will affect 10 to 25% of women (American Psychiatric Association [APA], 2000) at some point in their lives. Maternal depression reflects a range of symptoms including lethargy, increased negative affect, and anhedonia, which play a role in child development (Petterson & Albers, 2001), as well as parenting (Forman, O'Hara, Stuart, Gorman, Larsen, & Coy, 2007). It is also important to recognize side effects associated with depression which are not considered diagnostic, such as irritability (Painuly, Sharan, & Matoo, 2005), which is characterized as a quick excitability to annoyance, impatience, or anger, and is often stable in nature.

A large literature points to maternal depression conferring risk to children in a number of contexts. Maternal depression places children at risk for maltreatment (e.g., Kotch et al., 1995; Kotch et al., 1997; Zuravin, 1988) and poor parenting (Lovejoy, Graczyk, O'Hare, & Neuman, 2000). Depressed mothers are more likely to physically abuse their children (Kotch et al., 1995; Kotch et al., 1997) and to be more deficient parents (Lovejoy et al., 2000) than non-depressed mothers. Additionally, depressed mothers have been shown to be more hostile toward their children (Burke, 2003; Hops,

Sherman, & Biglan, 1990; Lovejoy et al., 2000; Seagull, 1987; Webster-Stratton & Hammond, 1988) and to interact less with their children than non-depressed mothers (Weissman, Paykel, & Klerman, 1972).

In a recent analog study (Shay & Knutson, 2008) maternal depression was found to confer risk to children in the form of increased potential for physical discipline. Maternal depression leading to escalated punishment was found to be mediated by irritability. That is, depressed mothers with increased irritability were more willing to escalate their punishment strategies to physical punishment on the analog task as evidenced by moving from nonphysical punishment to physical punishment under circumstances of repeated simulation of child transgressions on the analog task.

Maternal Depression Confers a Specific Risk for Offspring Externalizing Disorders

Maternal depression has been investigated as a factor leading to externalizing disorders in children by a number of researchers (e.g., Brennan et al., 2000; Fergusson & Lynskey, 1993; Hay, Pawlby, Angold, Harold, & Sharp, 2003; Kim-Cohen et al., 2005). Interestingly, some researchers have found that maternal depression relates directly to child externalizing behaviors, even when controlling for demographic variables such as SES, mother's age and education, and changes in marital status (e.g., Brennan et al., 2000), while others have not found strong support for the relation between maternal depression and externalizing disorders after controlling for similar variables such as SES, parental change, and marital unhappiness (e.g., Fergusson & Lynskey, 1993).

In a study of referred grade school children diagnosed with either a depressive or a disruptive behavior disorder (a general rubric for ADHD, CD, and ODD in the DSM-IV, but is undifferentiated [American Psychiatric Association, 2000]) (Lundy et al.,

1997), maternal depression and parenting were investigated as possible variables that may contribute to child externalizing behavioral outcomes. Mothers were assessed for depression using the CES-D to determine whether maternal depressive symptoms played a role in the mothers' interactions with their children, which in turn were hypothesized to be related to different types of child outcome diagnoses. Depressed mothers were found to be less involved, less interactive, and demonstrated lower amounts of eye-contact with their children than nondepressed mothers. These attributes of depressed mothers were related to greater parent-child difficulties, as well as greater child behavior problems, especially among children who had been previously diagnosed with a disruptive behavior disorder. The children diagnosed with disruptive behavior disorders who had depressed mothers were found to be the least submissive, the least likely to follow the rules, and the least contingently responsive to their depressed mothers, indicating that children of depressed mothers may behave more poorly than children of non-depressed mothers, especially when the child is diagnosed with a disruptive behavior disorder. The authors hypothesized that one possible explanation for the child behaviors may be that the depressed mother is ineffective in her use of discipline. Problematically, the authors did not assess children who were non-referred so that the study is not generalizable, as non-referred children of depressed mothers were not evaluated to determine if they also were at increased risk for behavior problems. Nonetheless, this study highlights the fact that children with disruptive behavior disorders were more affected by maternal depression than those children diagnosed with an internalizing disorder. Although both groups of children were affected by maternal depression, the findings lend some support to a hypothesized stronger relation between maternal depression and externalizing behaviors.

Another study of referred children who were diagnosed with either ADHD alone or ADHD accompanied by ODD or CD investigated the relation between parental psychiatric disorders, family functioning, and child externalizing disorders (Kiliç, & Şener, 2005). Findings indicated that nearly all of the CBCL subscale scores (a standardized questionnaire regarding child behavior) were higher (more negative) for the children with comorbid disorders than those with ADHD alone. Poor parenting was found to play a role in the development of the comorbid ADHD/ODD or CD diagnoses. Importantly, it was also found that maternal depression and paternal alcohol use disorders were found at higher rates for the children with the comorbid condition, implicating maternal depression as a factor conferring risk on children in the development of externalizing disorders, especially the comorbid ADHD/CD or ADHD/ODD pattern. It is also possible that poor parenting was linked to maternal depression, as each was individually related to the child's comorbid condition, although analyses of parenting were not conducted.

Another study completed on a non-generalizable, selected sample was conducted in Ontario, Canada, utilizing a register of children whose parent had been reported to a child protective agency (Leschied, Chiodo, Whitehead, & Hurley, 2005). The retrospective review investigated the link between maternal depression, parenting, and child behavioral outcome using a number of measures. Children with depressed or non-depressed mothers were assessed on measures of child psychopathology, school-related risk, attachment disorders, neglect, and physical abuse. The children of depressed mother scored more deviantly on all behavioral scales and were also more likely to be diagnosed with ADHD than those children of nondepressed mothers. Depressed mothers were also

more likely to be unemployed and to be receiving government assistance, suggesting a possible relation between maternal depression, externalizing disorders, and social adversity; however, the authors did not assess that possibility. Although the study found that maternal depression was related to offspring ADHD, the study was conducted cross-sectionally and did not follow the young children (mean age=6.9 years) into the later developmental years when the risk for ODD and CD is heightened. Therefore, it is possible that ODD or CD related to maternal depression would have developed in these children later in life.

In a longitudinal study investigating the relation between maternal depression and psychosocial outcomes of children including externalizing behaviors, the authors compared children of depressed women to children of bipolar, medically ill, and healthy mothers (Anderson & Hammen, 1993). Children of mothers diagnosed with unipolar depression were found to have the worst outcomes, scoring lowest on the Social Competence scale, compared to children of the mothers in the other groups. Those same children of depressed mothers were also reported by their mothers to have higher scores on the Behavior Problem scale than did the children of bipolar, medically ill, and control mothers. Teachers also reported more problem behavior at school, as well as poorer academic performance by the children of depressed mothers. These findings indicate that children of depressed mothers may demonstrate poorer social competencies and higher levels of externalizing behaviors both at home and at school than do children of bipolar, medically ill, or control mothers. Interestingly, the findings indicated that if mania cycles with depression, the children do not have such poor outcomes. These findings lend

support for maternal depression, but not with mania, being related to poor social competence and behavior problems in children.

In another study of maternal depression conferring risk to children, multiple risk factors for CD and attention problems were evaluated including maternal depression, mother emotional lability, poor mother-child communication, harsh coercive discipline, and low maternal marital satisfaction (Drabick, Beauchaine, Gadow, Carlson, & Bromet, 2006). Findings indicated that maternal depression alone was directly related to child conduct problems; however, poor mother-child communication and mother emotional lability were also directly related to conduct problems. Thus, maternal depression by itself appears to be a risk factor for the development of CD; moreover, poor parent-child communication and maternal emotional lability, often associated with depression, are also risk factors. It is possible that the combination of maternal depression, maternal emotional lability, and poor communication may lead to increased child conduct problems, although the combination was not assessed within the study. In the study it was notable that no relation was found between child attention problems and maternal depression, as many studies (e.g. Lundy et al., 1997; Morrell & Murray, 2003) have assumed that the risk factors for ADHD are the same as the risk factors for ODD and CD. Instead, this study provides evidence that maternal depression confers risk for CD, but not ADHD, and that further work must be conducted in order to determine whether the risk factors differ for each of the externalizing disorders.

Another study investigating the externalizing disorders as separate entities (i.e., ADHD, ODD, and CD), in adopted and nonadopted adolescents, assessed the role of parental depression and environment and the development of adolescent disruptive

behavior disorders (Tully, Iacono, & McGue, 2008). The authors considered lifetime diagnoses of major depressive disorder in the parents, child MDD, child ODD, child CD, child ADHD, and child substance use disorders. Analyses were conducted on mother and father data separately, as well as combined to determine relative contributions of each parent to child outcome. The study found that irrespective of adoption status, adolescents with a depressed mother were at increased risk for development of MDD and disruptive behavior disorders. Moreover, maternal depression was found to be significantly related to ODD and CD, but not to ADHD. The finding that ADHD was unrelated to maternal depression, although inconsistent with the findings of Leschied et al. (2003), may be due to the fact that the Leschied et al. study was based on case review in low SES mothers, not using standardized measures of either predictor variables or outcome variables, unlike the measures used in the Tully et al. study. Paternal depression had no statistically significant association with the development of adolescent psychopathology. Thus, the findings indicate that the risk conferred by depressed mothers has a strong environmental component because both adopted and nonadopted adolescents were at risk for the development of psychopathology. These findings provide further support for maternal depression and other environmental factors leading to ODD and CD.

Maternal depression and child behavioral outcomes were investigated in the context of quality of mother-child interactions (Harnish, Dodge, & Valente, 1995). Specifically, mother-child interaction quality was investigated as a partial mediator between maternal depression and child behavior problems. Importantly, the authors conducted the investigation in all socioeconomic groups in both Caucasian and African-American families, finding that poor mother-child interaction quality was related to

increased risk for child externalizing problems and that the association between maternal depression and externalizing behaviors was partially mediated by poor mother-child interactions; however, the findings only applied to Caucasians. In all groups low SES was associated with increased maternal depression, poorer mother-child interaction quality, and worse child externalizing behavior outcome. Mother-child interaction quality partially mediated the relation between low SES and increased child behavior problems, consistent with the findings of Knutson et al. (2005). Thus, the relation between maternal depression and child externalizing behaviors is partially mediated by mother-child interaction quality, even when controlling for SES in Caucasians, suggesting that poor parent-child interactions demonstrated by depressed mothers with their children may lead to child externalizing disorders. It is possible that the different findings in racial groups were biased due to unequal SES distribution between the Caucasian and the African-American samples, which was not considered in the study. Again, as in other studies, the relation between maternal depression and child externalizing disorders was only partially mediated, indicating that something else may be contributing to the link between maternal depression and childhood externalizing disorders.

Because transmission of risk for child externalizing disorders appears to be not only dependent on maternal depression, but also on the environment, fathers may play a role in the development of child externalizing disorders depending upon engagement in their role as a parent (Lamb, 2002). Positive father influence may play a role in the effect maternal depression has on children, such as creating a buffer against the effects of maternal depression. On the other hand, fathers who evidence psychopathology may

exacerbate the negative effects of maternal depression on children. Additive and interactive effects of paternal psychopathology and maternal depression on child outcome were assessed in a study by Brennan, Hammen, Katz, and Le Brocque (2002). After statistically controlling for mother's educational level, the child's gender, and the familial income level, maternal depression was found to be related to both child internalizing and externalizing disorders, whereas paternal depression was related only to youth externalizing outcomes. Maternal and paternal depression had an additive effect on youth externalizing disorders, such that youth with both a depressed mother and depressed father were more likely to have developed an externalizing disorder than those children who had only one depressed parent. Importantly, fathers were found not to mediate the relation between maternal depression and child externalizing disorders, but fathers may moderate the risk if they are depressed. Thus, not only do depressed mothers confer risk for externalizing behaviors, but depressed fathers do so as well.

Another study investigating two parent families similarly found that maternal and paternal depression additively, as well as individually, predicted externalizing behaviors (on the CBCL) in 30 month old children (Weinfeld, Ingerski, & Moreau, 2009). Again, as in the Brennan and colleagues (2002) study, having both a depressed mother and a depressed father led to an increased likelihood for child externalizing behavior. Differently, the authors found that when controlling for reports of marital quality, the relation between parental depression and child externalizing behaviors in the additive model was no longer significant, suggesting that environmental factors such as marital conflict and spouse interaction, may play a key role in the relation between maternal depression and child externalizing disorders in two parent families. However, in the

individual model, maternal depression continued to predict child externalizing behaviors even when controlling for marital quality, suggesting that in one-parent families maternal depression influences the development of child externalizing behaviors for mothers and that in two-parent families where the father is not depressed, maternal depression will continue to influence child externalizing behavioral outcomes.

Marmorstein, Malone, and Iacono (2004) also studied two-parent families, investigating the environmental and biological role that fathers may play in the association between maternal depression and offspring conduct disorder. The authors explored the relation between paternal mental health disorders and child psychopathology, hypothesizing that paternal depression and/or antisocial personality disorder (ASPD) would mediate the relation between maternal depression and child psychopathology, such that the relation between maternal depression and child CD would be weakened. The authors also studied the occurrence of assortative mating (depressed females mating with antisocial males). Findings revealed that maternal depression and paternal antisocial behavior were independently associated with offspring conduct disorder, such that paternal mental health did not mediate the relation between maternal depression and offspring CD. Thus, as before, each parent contributed risk to the child independently of the other. These findings indicate that a combination of genetics and environment contributes to the development of conduct disorder in offspring, although no mediating factor between maternal depression and offspring externalizing disorders was identified in the study. The authors proposed, however, that poor parenting, such as lax monitoring and lethargy, often associated with supervisory and care neglect, may mediate the association between maternal depression and externalizing disorders, although it was

not assessed in the study. Consistent with that proposition, two studies (Knutson et al., 2005; Knutson, DeGarmo & Reid, 2004) found that poor parenting, defined as harsh discipline, led to child antisocial behavior, and that care neglect, characterized as denial of appropriate care, also led to antisocial, aggressive behavior. Additionally, supervisory neglect, characterized as inadequate supervision and parental involvement, led to harsh discipline, and thereby contributed to aggressive child outcomes.

Genetics

Although maternal depression confers risk for the development of externalizing disorders in children, it is also possible that genetics may play a role in the development of externalizing disorders. Kim-Cohen and colleagues (2005) investigated nature and nurture variables which may influence the development of antisocial behavior in children. Specifically, non-nurture associations included genetic liability for antisocial behavior due to parental antisociality and environmental influences included maternal depression. The authors hypothesized that children of depressed mothers may inherit a genetic liability for externalizing disorders due to high risk of comorbidity of maternal depression and antisocial traits (Kendler, Gardner, & Prescott, 2002). The findings indicated that maternal depression, not parental history of antisocial behavior, partially accounted for offspring antisocial behavior and that the more maternal depression to which a child was exposed, the more externalizing behavior was exhibited. Because the findings indicated that maternal depression only partially accounted for later child behavior, other variables may be implicated in the relation between maternal depression and child antisocial behavior. Importantly, although heritability for antisocial behavior was high, it was also found that children exposed to maternal depression were more likely to develop antisocial

behavior through a risk process that operates through unknown environmental processes proximal to the mother and child--processes which may be related to depression. Moreover, those children whose mother is both antisocial and depressed are at greatest risk for development of antisocial behavior. Therefore, the findings demonstrate that although genetic risk through parental antisociality is important, maternal depression also plays an important role in the development of child antisocial behavior.

The literature suggests that conduct disorder tends to run in families with adults who were diagnosed with conduct disorder as children exposing their own children to considerable adversity when they themselves are parents, lending credence to a possible genetic risk. Moreover, parents diagnosed with conduct disorder as children are more likely to develop other Axis I disorders as adults, including depression (Sinotov, Kendler, Walsh, Patterson, & Prescott, 2009). A longitudinal study tracking three successive generations within families (Jaffee et al., 2006), hypothesized that second generation parents with a history of conduct disorder as children would provide sub-optimal caregiving environments to their children. The second generation parents were parents of three-year-olds (third generation) at the time of the study, limiting the findings of antisociality in the children, as nothing more than "behavior problems" could be diagnosed. Nonetheless, the risk of antisocial behavior was found to be highly familial. Those second generation parents who had any history of psychopathology (including depression) reported more social deprivation, poorer parenting abilities, more negative romantic relationships, and more interpersonal partner violence; those same parents were found to have children who were the most difficult to manage. Subsequently, sub-optimal caregiving was found to be a mediator between maternal Axis I disorders (i.e.,

maternal depression) and successive offspring behavior problems. Thus, although antisocial behavior was found to be highly familial, the transmission of risk for antisocial behavior is likely to be mediated by the interplay of environmental risks and genetics. Although it appears genetics may play a role in the development of child externalizing disorders, the study described here determined that maternal depression, parenting, and environmental factors all contribute to the development of child externalizing disorders. Because the current study is focused on social and environmental variables, genetic factors are not assessed. It is, however, recognized that genetic factors may play a role in the outcome of the children.

Timing

Another important factor in the relation between maternal depression and child externalizing disorders has been the timing of maternal depression relative to the developmental status of the child. The age at which the child was exposed to maternal depression has been an important factor in whether maternal depression plays a role in the subsequent development of externalizing disorders in children. It has been questioned whether there is a "critical period" in child development during which maternal depression adversely affects a child more than at other times during development (Brennan et al., 2000). Because it is impossible to test the role of the timing of maternal depression in a cross-sectional design, longitudinal studies have followed children's increasing negative behaviors, or lack thereof, across time.

A longitudinal study conducted in Australia assessed the association between maternal depressive history, current maternal mental health, and child conduct disorder and ADHD (Fergusson & Lynskey, 1993). The study also considered covariates related

to socioeconomic status and marital dysfunction and controlled for them in all analyses. When assessing all variables prospectively, a small but significant association between maternal depression that occurred anytime while the child was 8 to 11 years old and the child's behavioral outcome at 12 to 13 years old was found. If the exposure to maternal depression occurred anytime during that 3 year time period, it was more likely that the child developed conduct disorder or ADHD at age 12 or 13 than children whose mothers had depression only when the child was 12 or 13. When a mother had a history of severe symptoms that lasted for a time period of three years or more at anytime throughout the life of the child, regardless of the developmental timing of the depression, increased CD and ADHD behavior was reported. The findings supported the proposition that the accumulated exposure to maternal depression rather than current exposure to depressive symptomatology led to children demonstrating the highest levels of CD and ADHD behaviors, suggesting a dose-response model, rather than a critical periods model. However, when covariates were controlled, depression history and current depression became non-significant predictors of externalizing disorders. Family social position, standard of living, parental change and marital unhappiness instead accounted for CD and ADHD, suggesting that, when depression is also associated with social and contextual factors such as social disadvantage, stress, and marital problems, it does not contribute unique variance to child outcomes. Thus, stressors and family dysfunction related to maternal depression may mediate the relation between maternal depression and poor child outcomes.

Interestingly, Fergusson and Lynskey (1993) found that the relation between maternal depression and ADHD followed the same pattern of results as the relation

between maternal depression and CD, although this was likely due to a high correlation between symptoms of ADHD and CD (r = 0.80). The authors did not discuss comorbid disorders in the paper and thus it can be assumed that they did not consider comorbid disorders in their analyses and conducted their analyses as though each child had only CD or only ADHD symptoms, but not comorbid disorders.

In the previous discussion of the Kim-Cohen et al. (2005) study, the importance of timing of maternal depression on the development of child externalizing disorders was not acknowledged. In that study, mothers were assessed for depression before pregnancy, during pregnancy, during the postpartum period, and for the time period until the child was five years old. Maternal depression at the assessment directly following the child's birth, but not before birth, was related to future child antisocial behavior. Moreover, children who had a depressed mother during the first 5 years of life demonstrated higher levels of antisocial behavior at 7 years of age and that familial genetic liability was found to account for about a third of the variance in the association between maternal depression and offspring behavior. However, when mother and her mate's antisocial history were controlled, maternal depression continued to predict child antisocial behavior at 7 years old. Importantly, a dose-response relation was found between the number of time periods in the child's first five years of life during which mothers were depressed and the child's antisocial behavior at 7 years old. Thus, the amount of depression to which a child is exposed to, rather than whether the exposure occurred during a particular developmental period, is more likely to lead to child antisocial behavior.

Another study investigating the timing of maternal depression and child outcomes explored the severity and chronicity of maternal depression in relation to child outcomes (Brennan et al., 2000). Chronicity and severity are often confounded when assessing depression retrospectively (Brennan et al., 2000); to avoid such problems, depression was assessed longitudinally at frequent intervals to disentangle chronicity and severity. Maternal depression was assessed while the mother was pregnant with the child, immediately postpartum (within the first few weeks after childbirth), six months postpartum, and when the child was five years old. Findings indicated that both the severity, defined as the maximum number of depressive symptoms endorsed, and chronicity, defined as the number of time periods in which a mother was depressed, contributed to both higher behavior problem scores on the CBCL and lower cognitive scores on the Peabody Picture Vocabulary Test. The timing of depression, however, seemed to play a small, if unimportant role in the development of behavior problems. Again, the findings indicate that the amount and severity of maternal depression are factors of importance in the development of externalizing behaviors. Some criticisms of the study include that the children were quite young and could not have been exposed to more than 5 years of maternal depression, parenting was not investigated, and the children had not yet reached the typical age of risk for externalizing behaviors. Importantly, the more severe the depression to which the child was exposed, the worse the child's externalizing behaviors. Thus, extrapolating from those findings, it is possible that if a child were exposed to chronic and severe symptoms of maternal depression, such as lethargy, irritability, and lowered mood, the child may be at increased risk for demonstrating externalizing behaviors.

Ashman, Dawson, and Panagiotides (2008) longitudinally investigated the effect of maternal depression on child psychophysiology and child behavior over a period of 7 years. Child behavior was investigated using a number of parent report and teacher report questionnaires, as well as parent interviews. The authors identified three separate course patterns of maternal depression (chronic depression, decreasing depression, and stable mild depression) which resulted in different child behavioral outcomes. Children of chronically depressed mothers were significantly more likely to be diagnosed with a behavior disorder and to demonstrate low social competence than children of nondepressed mothers or children of stably mildly depressed mothers. Children of mothers with either decreasing depression or stable mild depression were reported to demonstrate higher levels of externalizing-ADHD behaviors than children of nondepressed mothers. It was also found that contextual risk factors, including low marital satisfaction and high family conflict, mediated the relation between maternal depression and child behavior outcomes. Moreover, higher levels of maternal depression were associated with increased contextual risk. This study again supports the notion that the chronicity of exposure to maternal depression, along with contextual risk factors, is of great importance in the development of child behavior disorders.

A study coming from the STAR*D Child (Sequenced Treatment Alternatives to Relieve Depression) parent project investigated child behavioral outcomes in children of currently depressed mothers (Foster et al., 2008). A high proportion of the children in the study (29%) were diagnosed with a lifetime disruptive behavior disorder. The duration of the current maternal depressive episode was found to be strongly related to child externalizing behavior in boys. A recurrent course of maternal depressive episodes was

related to lower levels of household control, which included problems with parental supervision such as establishing household rules. Again, duration of maternal depression was found to be related to child outcome; however, unlike other studies, this study found that child gender moderated the association.

A longitudinal study focusing on the contribution of postnatal maternal depression to later childhood violent behavior (assessed as a continuous variable) also took into consideration the timing of maternal depression (Hay et al., 2003). It was hypothesized that the link between postnatal maternal depression and later child violent behavior (utilizing a Conduct Disorder framework) would be related to difficulties in attention regulation and anger control, which they assumed were not developed due to poor mother-child interactions as infants. Further, the authors hypothesized that child violent behavior related to postnatal maternal depression would emerge, even when controlling for socioeconomic disadvantage and family structure. When assessing the children upon follow-up at age 11, only 30% of the children had perpetrated violent acts, defined as overt violence directed against other human beings, in the 3 month period prior to testing, with girls being less likely to behave violently. In support of the importance of the timing of depression, the mother's depression at 3 months postpartum predicted violent acts by their children at 11 years of age, although no other time period in which maternal depression occurred predicted violent acts, similar to those findings of Kim-Cohen et al. (2005). Even when controlling for family characteristics such as financial difficulties, SES, and household composition, maternal depression at 3 months postpartum still predicted violent acts by their offspring, findings that are inconsistent with those of Fergusson and Lynskey (1993). When the covariates in the Fergusson and Lynskey study

(1993) (family social position, standard of living, parental change and marital unhappiness) were considered, depression timing became non-significant, although the covariates considered in that study are similar to those utilized in the Hay et al. (2003) study. The differences in the results of the two studies may be due to the fact that marital factors were measured in the Fergusson and Lynskey study (1993), where they were not in the Hay et al. (2003) study, or due to the differing behavioral outcomes that were measured. The Fergusson and Lynskey (1993) study focused on both ADHD and all types of CD behaviors, whereas the Hay and colleagues (2003) study solely considered violent CD behaviors against persons. At young ages, it is less likely that girls will commit violent CD acts against humans than commit property damage and covert CD acts (American Psychiatric Association, 2000). Nonetheless, the Hay et al. (2003) study implicates poor parenting by depressed mothers as a causal factor in the future development of *some* child externalizing disorders. Children whose mothers were diagnosed with postnatal depression and subsequent episodes of depression throughout the child's lifespan were at the highest risk for committing violent acts, again supporting the notion that the greater the amount of exposure the child has to maternal depression the more likely the child is to develop CD.

A study contrary to the findings of the Hay et al. (2003) and Kim-Cohen et al. (2005) assessed the effect of the developmental timing of maternal depression on antisocial behavior in older children (Compton, Snyder, Schrepferman, Bank, and Shortt, 2003). Findings demonstrated that early exposure to maternal depression, assessed retrospectively, was not related to later antisocial behavior, unlike the Hay et al. (2003) study. Even when a hypothesized mediated model was assessed, in which coercive

family processes that were hypothesized to mediate the relation between maternal depression and child antisocial behavior were assessed, no relation was found. The authors did, however, find that maternal depression was related concurrently to antisocial behavior in boys at 10 to 12 years old, but not four years later. Because this sample examined older children, the findings may be influenced by poor retrospective recall of lifetime depressive symptoms, which were assessed only when the child was 10 to 12 years old. The study also utilized measures that included concurrent daily interviews with the child regarding any antisocial behavior in which the child had engaged. Thus, concurrent antisocial behavior was rated on a daily basis, possibly providing more comprehensive data rather than just retrospective parent, teacher, and child self-report. These differences from other studies may account for some of the discrepancies in the results, but the findings do underscore the complexity in the relation between maternal depression and child outcomes.

The reviewed studies indicate that maternal depression can contribute to the development of childhood externalizing disorders and that the relation may function through a variety of genetic and social factors, such as marital discord, coercive parenting, or neglectful parenting. Importantly, across studies, the greater the duration of child exposure to maternal depression, the greater the risk of later externalizing behaviors (Brennan et al., 2000; Hay et al., 2003; Kim-Cohen et al., 2005). Although a variety of time periods of exposure to maternal depression have been investigated, with some consistent findings across the postnatal time period, it appears that the duration of exposure to maternal depression itself may be most important in the development of child externalizing disorders. Although there is clearly a relation between maternal depression

and child externalizing disorders, there appears to be a missing link between the two variables. Some of the studies reviewed found partial correlations between maternal depression and child externalizing behaviors (Harnish et al., 1995; Kim-Cohen et al., 2005), indicating that there are other unmeasured factors that play a role in the relation between the two variables. Many of the authors asserted that environmental factors may play a linking role in the relation, although often, those assertions were not tested. Some of the proposed environmental factors included poor parenting, such as lax monitoring and lethargy (Marmorstein et al., 2004), social adversity (Jaffee et al., 2006), and contextual factors (Fergusson & Lynskey, 1993). These studies taken together indicate that a study is needed that addresses the impact of parenting factors that may be influenced by maternal depression.

CHAPTER III
POOR PARENTING CONFERS RISK FOR CHILD EXTERNALIZING DISORDERS

General Risk

Investigations of parenting as a causal factor in the development of child externalizing disorders have examined a variety of contributing variables including situational/contextual, biological, and psychological variables. Researchers have examined the extent to which those variables have contributed to poor parenting, and in turn, have led to externalizing disorders in offspring. Some situational factors that have been investigated have included such attributes as socio-economic disadvantage, household composition (i.e. one or two parents), and parent-child interaction quality. One biological factor that has been investigated is parental history of antisocial behavior (Jaffee, Belsky, Harrington, Caspi, & Moffitt, 2006; Kim-Cohen, Moffitt, Taylor, Pawlby, & Caspi, 2005), while other genetic studies have investigated assortative mating for antisociality (Brennan, Hall, Bor, Najman, & Williams, 2003; Marmorstein, Malone, & Iacono, 2004). Although the genetic models have attempted to establish specific genetic liabilities, the authors recognize that parenting and social factors, such as poor supervision (Marmorstein et al., 2004; Brennan et al., 2003) and harsh discipline (Knutson et al., 2005), could play a critical role in the development of the disorders.

Poor parenting, defined broadly, may confer risk for a number of child difficulties including externalizing disorders, depression (Kazdin, Moser, Colbus, & Bell, 1985), and school difficulties (Dishion, 1990). Negative parent-child interactions, including poor communication, coercive parenting, and harsh discipline, can lead to poor child outcomes, such as externalizing disorders (Harnish, Dodge, & Valente, 1995, Lundy et

al., 1997). Parental anger, often occurring in the context of coercive parenting, plays a role in the development of antisocial behaviors as has been documented in social learning models of antisocial behavior (e.g. Conger, Neppl, Kim, & Scaramella, 2003). Thus, not only do parenting techniques (e.g., coercion, harsh discipline) and parent-child interactions confer risk for externalizing disorders, but also parental traits (i.e., anger) may play a major role.

Specific Risks for Externalizing Disorders

Coercive Parenting

Poor parenting has often been explored in tests of social learning models of antisocial behavior, which assert that children learn negative behaviors through interactions with parents, as well as through parental modeling (Patterson, 1982). Coercion theory (Patterson, 1982), based on empirical work regarding parent-child interactions, purports that learning of aversive behaviors and escalatory responding occurs through negative parent-child exchanges. In the initial interaction, one individual (e.g., the child) elicits some sort of demanding, irritating behavior (e.g., whining) toward the other person (e.g., the mother) to gain access to a preferred item or desire. The individual at whom the behavior was directed (e.g., mother) may in turn punish the behavior, for example, by ignoring it. Following that, the initial demanding behavior is increased, often at a greater intensity, until the demanding behavior results in compliance (Patterson & Reid, 1970). These interactions take place across time and lead to reciprocal coercive exchanges on the part of both the mother and child.

Two causal factors are thought to lead to coercive exchanges, which may escalate over time to include higher intensity behaviors. One is a history of negative

reinforcement for high intensity attacks, leading to traits supporting coercion, such as anger proneness. The second is irritable aggression, a combination of hostile attributions and anger, (Patterson, 1982), which may become trait-like over time, which contribute to the initial evocation of an escalated sequence. In the context of maternal depression and parenting, mothers who are at high risk for irritability associated with depression may be at risk for engagement in coercive exchanges due to irritable aggression. Moreover, the more a child is exposed to those coercive exchanges, the higher the probability that the child will learn to engage in coercion and aggressive behaviors, such as yelling and physical aggression, which are typical of high intensity coercive exchanges and also often observed in externalizing disorders.

Coercive family processes may begin early in the life of a child and that coercive parenting may result in learned antisocial behavior which may be displayed later in life (Lovejoy et al., 2000). Poor parenting quality (i.e. coercive parenting) during infancy and childhood may mediate risks associated with genetic (Kim-Cohen et al., 2005) and environmental factors (i.e. social adversity, Jaffee et al., 2006), which may play a role in the development of childhood disruptive behavior disorders. A study of infants and their mothers was conducted to determine whether coercive parenting in infancy led to executive dysfunction and in turn, led to later childhood externalizing disorders (Morrell & Murray, 2003). The research utilized the A not B task, in which an infant reaches for a hidden object in the A location on two trials. Then the object is switched to a B location and the infant should then to reach to the B location for a correct response. The study specifically looked for children who demonstrated emotional dysregulation (e.g., crying, back arching), delayed object reaching (slow to respond), or A trial errors (reaching to the

incorrect location when the object is hidden under the initial A cup). The authors hypothesized that each of these distinct behaviors would be related to executive functioning, and that the children who demonstrated emotional dysregulation, delayed object reaching, or A trial errors would demonstrate externalizing symptoms later in childhood. The authors also assumed that parenting factors, specifically early hostile rejection and coercive control, would moderate the relation between emotional dysregulation/poor A not B task performance and externalizing outcomes because emotionally dysregulated infants do not develop appropriate prefrontal cortex regulation which may lead to subsequent difficulties with inhibition.

Reaching time errors were found to be transiently associated with hyperactive symptoms at age five years but not at eight years, indicating no lasting effect of attentional dysregulation from infancy into childhood. Importantly, the role of parenting did not mediate the relation between A not B task performance and hyperactive symptoms beyond 9 months of age. Thus, coercive parenting did not play a role in the maintenance of ADHD symptoms. On the other hand, the authors found that emotional dysregulation at age nine months was associated with later conduct disorder at both five and eight years and that the relation was partially mediated by maternal hostile parenting and coercion, indicating that poor, harsh, hostile parenting, much like the parenting style of depressed mothers, was related to later childhood externalizing disorders. Thus, coercive parenting was found to be linked to later externalizing disorders, even if the original measurements occur in infancy.

Other Poor Parenting Processes Related to Coercive Parenting

Other negative parenting styles relevant to coercive parenting have also been investigated in the context of child externalizing outcomes. A study examining the relation between authoritarian mothering attitudes, classified as a component of harsh discipline, and consequent conduct problems was conducted within the British Cohort Study (Thompson, Hollis, & Richards, 2003). The cohort was followed longitudinally and assessed when the children were ages 5 and 10 years old to determine whether authoritarian parenting reported when a child is young would increase risk for conduct problems later in life. High maternal malaise scores, possibly related to maternal depression, were found to increase the risk for authoritarian parenting. In turn, those mothers from low socioeconomic status families who reported high malaise scores were later found to have children with increased conduct problems when their children were five years old. Those children demonstrating the worst conduct problems were noted to have mothers who reported high malaise scores and to be low SES. Over time, authoritarian parenting continued to lead to greater externalizing behaviors when the child was ten years old. Thus authoritarian mothering, led to CD problems as the child aged. These findings demonstrate that poor, overcontrolling parenting, especially when a mother is evidenced malaise, leads to increased risk for conduct problems in children until at least 10 years old.

Another negative parenting style, hostile parenting, defined as annoyance with child misbehavior, high disapproval of the child, anger when punishing the child, inconsistent punishment, and repeated discipline for the same act, was investigated in regard to the stability and change in antisocial behavior in children over a two year period

(Pevalin et al., 2003). Hostile parenting, which can be considered another type of poor parenting associated with irritability, was found to be a significant predictor of the highest levels of antisocial behavior in girls (in a group of children ranked as either high, moderate, or low on antisocial behavior) and was also found to be a significant predictor for boys demonstrating moderate levels of antisocial behavior. Hostile parenting also appeared to increase the amount of antisocial behaviors children displayed across time as those children who were initially ranked in the lowest level of antisocial behavior increased their levels of antisocial behavior over time when exposed to high levels of hostile parenting, irrespective of the gender of the child. Interestingly, unlike some studies (e.g. Fergusson & Lynskey, 1993), Pevalin et al. (2003) found negligible effects of socioeconomic factors on antisocial behavior. These findings suggest that hostile, irritable parenting, much like those reported for depressed mothers, may lead to increasing levels of antisocial behavior in the child, regardless of familial social status.

Besides hostile parenting, maternal interpretation of her child's behavior may play a role in the way she interacts with her child. A study was conducted assessing the impact of maternal negative attributions on her child's conduct problems concurrently when the child was three years old and later when the child was four years old (Wilson, Gardner, Burton, & Leung, 2006). Conduct problems demonstrated by three and four year olds are generally not as severe as those seen in diagnosed externalizing disorders, although some may be, but their symptoms can be considered early risk factors or precursors for later behavior problems. The authors hypothesized that mothers whose children had higher conduct problem scores at age three would make more negative attributions about the causes of their child's misbehavior than mothers whose children

scored lower on conduct problems, specifically assessing for attributions related to child internal locus of control, globality, and stability. They found that the mothers whose children demonstrated more conduct problems blamed the child and attributed the child's behavior problems to factors within the child (internal locus) and to unchangeable circumstances (global). It was also found that early child behavior predicted later maternal attributions.

These findings, relate strongly to the revised learned helplessness model of depression (Abramson, Seligman, & Teasdale, 1978), in which individuals believe that regardless of their effort to influence an outcome, they will be unable to do so. Individuals evidencing high levels of depressive symptoms have been noted to believe that negative events arise from internal, stable, and global causes (Fresco, Alloy, & Reilly-Harrington, 2006). Likewise, as the Wilson et al. (2006) study intimates, depressed mothers who have children with behavior problems tend to view their child in much the same way as depressed individuals view the world. If the depressed mother believes that her child's misbehavior is due to an internal locus of control in the child, it is possible that she may be more likely to express her irritability toward her child and attempt to change the child's behavior through coercive interactions.

Depression-distorted views of one's child may lead to feelings of inadequacy in one's ability to control child behaviors. Besides distorted views, maternal personality traits may also play a role in judging one's own ability to parent and control child behaviors. Low self-efficacy, one's personal judgment of their ability to succeed in reaching a goal, has been linked to maternal depression in parenting contexts (Bor & Sanders, 2004; Weaver, Shaw, Dishion, & Wilson, 2008), as well as to coercive

parenting (Bor & Sanders, 2004; Gross, Sambrook, & Fogg, 1999). In a study of self-efficacy mothers of children referred for behavior problems were less confident that they could handle child problem behaviors, especially non-compliance, than mothers of non-referred children (Sanders & Woolley, 2005). Feelings of low self-efficacy may lead to coercive parenting by depressed mothers who believe that they cannot handle child behavior problems, leading to an increased risk for child behavior problems (Gross et al., 1999).

Poor parenting practices, including coercive parenting, authoritarian parenting, and harsh judgment of one's child have all been found to lead to offspring conduct problems. Some studies (Morrell & Murray 2003; Thompson et al., 2003) indicated that coercive parenting by depressed mothers occurring early in the child's life, may have a later affect on the child's behavior. Although the studies reviewed above investigated behavior problems, the majority did not investigate behavior problems using DSM-IV diagnostic criteria. Many of the studies' analyses of child behavior were based solely on symptom level analyses of externalizing behaviors; however, a few studies did utilize the DSM-IV symptoms of CD and ODD (Morrell & Murray 2003; Pevalin et al., 2003; Thompson et al., 2003). Two of the reviewed studies assessed ADHD symptoms (Morrell & Murray 2003; Pevalin et al., 2003), but did not find those symptoms to be strongly related to parenting practices. However, poor parenting, especially irritable, hostile, and coercive parenting was found to lead to CD and ODD symptoms across studies. Although the relation between poor parenting and child conduct problems seems well established, Morrell and Murray (2003) also found that maternal depression played a role in the development of conduct problems and that those conduct problems were found

to be partially mediated by parental coercion. Findings such as these indicate that maternal depression likely plays a role in the development of conduct problems, though not in a direct linear fashion, as coercive parenting was found to be a partial mediator between maternal depression and child conduct problems. Since coercive parenting was found only to be a partial mediator, it is possible that other factors closely related to both maternal depression and coercion may also mediate the relation between maternal depression and child conduct problems.

In most cases, with some exceptions (i.e., Compton et al., 2003) poor parenting practices, including coercive parenting, authoritarian parenting, and harsh judgment of one's child, were linked to child CD/ODD, but not ADHD (i.e., Morrell & Murray, 2003; Pevalin et al., 2003). Moreover, it appears that poor parenting alone does not fully account for the transmission of offspring CD/ODD. Instead, it appears, based on the literature that maternal depression may play a role in poor parenting practices, which in turn lead to the development of CD and ODD, but not ADHD (Morrell & Murray, 2003). Moreover, that relation may be mediated by environmental risk factors, including coercive parenting (e.g., Morrell & Murray, 2003) and poor parenting (Harnish et al., 1995; Jaffee et al., 2006) in depressed mothers, which may lead to the development of child CD and ODD. When considered together, these reviewed studies suggest that research is needed to identify the factors that determine the links among child externalizing disorders, coercive parenting, and maternal depression.

CHAPTER IV
MATERNAL DEPRESSION CONFERS RISK FOR POOR PARENTING

Parental psychopathology, both maternal and paternal, has been investigated as a contributor to poor parenting, which in turn leads to externalizing disorders in their offspring. Specifically, parental substance use, parental antisociality (during both childhood and as an adult), and parental depression throughout the child's lifespan have often been investigated in the context of poor parenting and offspring externalizing disorders.

In a meta-analysis of 46 studies assessing parenting by depressed mothers (Lovejoy et al., 2000), a moderate association between maternal depression and coercive parenting was found. The findings were strongest in studies where the mothers were experiencing a current episode of depression. Moreover, maternal depression was found to be most strongly associated with irritability and hostility toward her child, which may explain why mothers in the midst of a current episode of depression were more coercive than mothers who were not experiencing a current depressive episode. Although experiencing a current episode of depression led to higher levels of negative mother-child interactions, there is evidence to suggest that a lifetime history of depression also plays a role, as those mothers who had a lifetime history of depression were more coercive than mothers who had never been depressed.

Likewise, in the previously discussed study by Shay and Knutson (2008) the importance of measuring maternal depression in terms of both lifetime history and current state in studies of parenting was highlighted due to differing findings based on lifetime and current diagnoses of maternal depression. The study utilized both a dimensional measure (BDI-II) of current depression, as well as categorical measures

(SCID-Current MDE and Lifetime MDE), as indices of current and lifetime depression in the prediction of escalated physical discipline mediated by irritability. The study revealed that different measures of depression may result in differences in the degree to which depression is associated with harsh discipline. In that study, the strength of the association between maternal depression, irritability, and escalated physical discipline was strongest when maternal depression was measured as a lifetime history (SCID-Lifetime). Current depression, when measured on a dimensional scale (BDI-II), failed to predict the relation between maternal depression, irritability (trait anger), and escalated physical discipline, with findings only approaching statistical significance. The overall findings revealed that mothers with a history of depression were more irritable and rated themselves as being higher in trait anger than mothers with no history of depression. Also, those irritable, depressed mothers were more likely to escalate their punishment choice to physical punishment, a risk for physical child abuse. This finding, along with those of Lovejoy et al. (2000), lends support to the need for a comprehensive measurement of lifetime and current maternal depression studies of parenting and child outcomes, although many studies have failed to do so in the past (i.e., Foster, Garber, & Durlak, 2008; Lundy, Field, McBride, Abrams, & Carraway, 1997).

A study was conducted by Casady and Lee (2002) which investigated neglectful parenting in the context of current maternal depression. Two samples of mothers were obtained in the study, those with a case of substantiated neglect and those who were low income, in order to provide a range of neglectful parenting. Current maternal depression was found to be associated with neglectful parenting, regardless of sample, and that maternal depression was also related to other parenting difficulties such as a small social

network. These findings suggest that current maternal depression, may lead to poorer parenting abilities, possibly through a process of lethargy.

Another study utilizing two samples of families, one consisting of neglectful mothers and the other matched comparisons, investigated the relation between family functioning and neglect (Wilson, Kuebli, & Hughes, 2005). Cluster analyses were performed to create five clusters based upon maternal functioning. Regardless, of maternal functioning, maternal depression was related to neglect. Moreover, the sample was described as "depressed, isolated, and plagued by poverty." The findings suggest that depressed mothers are more likely to neglect their children, especially in the midst of poverty and that the depression may coincide with lethargic, isolated behavior. These studies, when considered in the context of the studies reviewed in the earlier chapters of this thesis, indicate that a study is needed that examines which specific aspects of poor parenting are critical in the relation between maternal depression and child externalizing disorders.

CHAPTER V
MATERNAL DEPRESSION, PARENTING, AND CHILD EXTERNALIZING DISORDERS

From the available research, it is possible to infer that there is a link connecting maternal depression, parenting, and subsequent externalizing disorders in children. That link, however, has not been clearly explicated. A number of mediators and moderators have been proposed, most based upon parent-child interaction quality (i.e., coercive parenting, authoritarian parenting) or social adversity. However, it is possible that there is some variable related to both maternal depression and parenting that leads to externalizing disorders that may not have been addressed up to this point in time.

A study investigating the relation among maternal depression, parent-child interactions, and subsequent child externalizing problems was conducted using parent report and direct observation (Foster et al., 2008). Higher levels of current maternal depressive symptoms were associated with lowered maternal positive behavior and affect, and increased maternal negativity toward her child and that those combined behaviors significantly predicted child externalizing symptoms. A lifetime history of chronic/severe maternal depression was also significantly related to lower maternal positivity toward her child, indicating that episodes of depression may affect parenting even when a mother is not in a state of current depression. Overall, the findings from this study suggest that the absence of positive mother-child relationships between depressed mothers and their children or increased negativity may result in an increase in risk for child behavior problems, suggesting that the link between maternal depression and child externalizing disorders may be related to the negativity associated with both depression and poor parenting.

In another study investigating the links among maternal depression, parenting, and child externalizing disorders, Brennan et al. (2003) evaluated children with early onset conduct disorder, adolescent onset conduct disorder, and no diagnosable disorder. The authors hypothesized that early onset, but not adolescent onset CD would be predicted by a combination of Patterson's coercion model (harsh discipline, permissiveness, poor monitoring, maternal hostility, negative attitude, poverty, and family transitions), biological risk factors proposed by Moffitt (perinatal and birth complications, maternal illness during pregnancy, temperament problems, low receptive vocabulary, and neuropsychological deficits), and parental psychopathology, including maternal depression. For children diagnosed with early onset conduct disorder, coercive parenting and parental psychopathology predicted an aggressive child outcome. Most of the risk factors assessed in the study did not differentiate the adolescent onset conduct disorder children from the nonaggressive children, although maternal depression was found to differentiate the two groups. It appears that for children with early-onset conduct disorder, coercive parenting plays a large role in the relation between maternal depression and child externalizing disorders. Specific aspects of coercive parenting, including poor supervision, harsh discipline, and negative attitude toward the child may account for that relation, as past studies have indicated a relation between poor supervision, harsh discipline, neglect, and child aggressive behavior (Knutson et al., 2004; Knutson et al., 2005). Moreover, coercive parenting has also been established to be associated with irritability (Greenwald, Bank, Reid, & Knutson, 1997) and maternal depression has also been found to be associated with irritability (Shay & Knutson, 2008). The irritability associated with both maternal depression and harsh discipline may thus,

be an, as yet, unstudied mediator in the relation between maternal depression, parenting, and child externalizing disorders.

Another study focused on coercive parenting, maternal depression and the consequent development of antisocial behavior in offspring (Compton et al., 2003) evaluated adolescents, parents, and siblings. In the previous discussion of this study the timing of depression exposure versus dose-response exposure to depression was discussed. The study also explored the putative links among maternal depression, parental coercion, and child externalizing disorders. The study was based on coercion theory as a social process model in which parental coercion mediates the relation between maternal depression and familial risk for antisocial behavior. The authors hypothesized that maternal depression and sibling antisocial behavior would be associated with increased risk for child antisocial behavior and that maternal depression and sibling antisocial behavior should be associated with aversive family exchanges. The development of antisocial behavior in the midst of exposure to maternal depression was found to be mediated by coercive interactions and that antisocial behavior in midadolescence was related to coercive family interaction for boys. Maternal depression was found to be related concurrently to antisocial behavior in boys at 10 to 12 years through the coercive process, suggesting that maternal depression may lead to harsh parenting, thus leading to child externalizing disorders.

Moreover, cross-sibling similarities in levels of antisocial behavior were also observed even when the siblings were reared a decade apart, possibly due to coercive family interactions. Importantly, those findings suggest that shared environment and parenting may remain stable across time. Because coercive parenting was found to be a

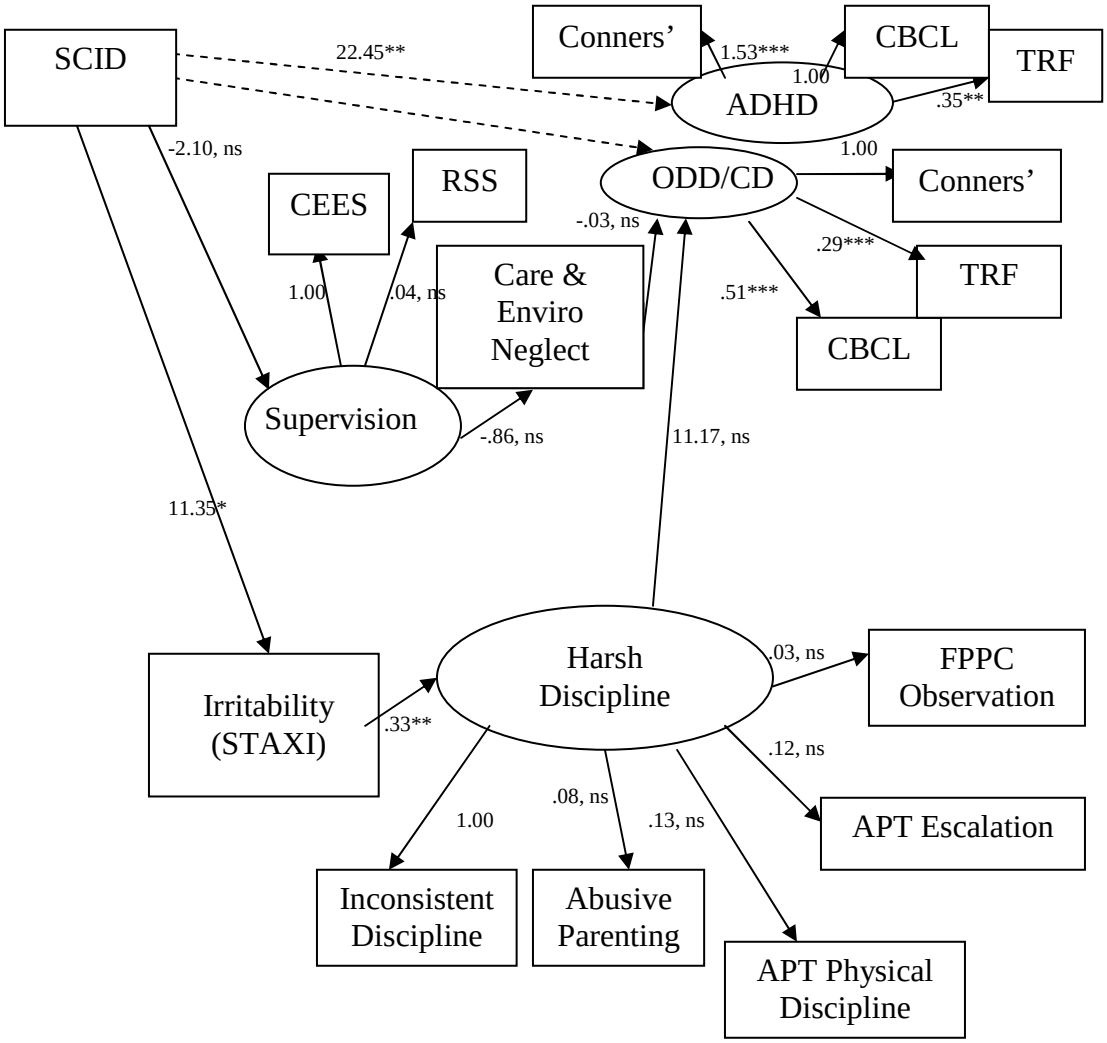
mediator, it is also likely that something related to the symptomatology of depression, such as anger or irritability, may also account for the demonstrated relation between maternal depression, poor parenting and the development of child externalizing disorders. Lifetime maternal depression and stable, bad parenting may both be linked to stable, trait-like coercive irritability, which in turn contributes to child antisocial behavior. A recent study supporting such assertions found that the relationship between maternal depression and harsh discipline was mediated by trait anger (Shay & Knutson, 2008), although the link to child externalizing disorders was not investigated. Thus, the hypothesis for the relation between maternal depression, parenting, and child externalizing disorders may be related to maternal trait anger as a reflection of irritability.

Across studies it has been demonstrated that maternal depression and parenting are related to offspring externalizing disorders. The explanation given throughout the reviewed studies is that maternal depression contributes to poor parenting, although it is unclear to which specific aspects of poor parenting maternal depression may contribute. One specific aspect asserted by Marmorstein et al. (2004) was that the relation between maternal depression and parenting may be due to lax monitoring or lethargy. More specifically, the relation may be due to supervisory neglect or care neglect brought on by the vegetative symptoms of depression. It is also possible that the relation between maternal depression and poor parenting exists due to irritability and trait anger associated with depression, which can lead to harsh discipline. Thus, the irritability and anger symptoms associated with depression may also be associated with the tendency to use coercive parenting. The current study will attempt to elucidate the relation between maternal depression and externalizing disorders, specifically CD and ODD, and

determine whether ADHD is related to maternal depression and parenting practices. The proposed model (See Figure 1) purports that maternal depression mediated by trait irritability, which then leads to harsh discipline, will result in the development of ODD and CD, but not ADHD. The model also purports that maternal depression, mediated by poor supervision will be associated with care neglect, as found in Knutson et al. (2005), leading to the development of ODD and CD, but not ADHD. Thus, if maternal depression confers risk on parenting and child outcome, this study will attempt to reveal the specifics of how maternal depression relates to the development of child externalizing disorders. The study is designed to test a theoretical model to understand the role of maternal depression and parenting in the development of externalizing disorders. Specifically the primary proposition of the model is that maternal depression, mediated by trait irritability, leads to poor parenting characterized by harsh punitive discipline, and that this poor parenting leads to the development of child ODD and CD. Moreover, the model also asserts that maternal depression, mediated by supervisory neglect, which in turn leads to care neglect, will lead to the development of child ODD and CD. A corollary of the model is that the maternal depression—irritability—poor parenting pattern or maternal depression—supervisory neglect—care neglect does not contribute to ADHD.

Figure 1

The Hypothesized Mediated Model of the Relation between Lifetime Depression, Parenting, and Externalizing Disorders (Unstandardized Beta Weights)



*$p < .05$ **$p < .01$ ***$p < .001$

CHAPTER VI
METHOD

Participants

One hundred-thirty-four economically disadvantaged biological mothers who were previously enrolled in a three-year longitudinal study of parenting and children's social development participated in the current study, with 111 providing complete data. Because the current study commenced after the parent project had been underway, all of the participants in the present study participated during either the initial follow-up year or the second follow-up year, depending on their enrollment status when the present study commenced. Participation in the current project was determined by the timing of the follow-up appointments and no subject selection process was followed. The attrition of participants in the parent study was virtually all attributable to families locating outside of the area---only 8 participants from the Year 1 sample actively withdrew from the parent project. Analyses contrasting those potential participants who were lost-to-follow-up and those who continued to participate were conducted to assess for differences in the sample to ensure that the present study can be considered representative of the full sample from which they were recruited. No statistically significant differences ($\alpha > 0.10$) on any demographic variables (e.g., race, maternal age, child age) or other variables that might be directly or indirectly related to the current study (e.g., maternal IQ, child IQ, maternal reading level, child behavior ratings) were found when utilizing a liberal statistical test for establishing differences.

To be eligible for inclusion in the original longitudinal study, the participants had to be recipients of some form of government-based assistance (e.g., Temporary Assistance for Needy Families, Medicaid, Food Stamps) or other social services some

form of government-based economic assistance (e.g., Temporary Assistance for Needy Families, Medicaid, Food Stamps) or other social services and as such were considered low socioeconomic status (SES). Alternatively, families in which founded cases of domestic violence were known to have occurred were invited to participate in the study. A low SES sample was selected for the current project due to the increased risk for childhood behavior problems associated with poverty (Hinshaw, 1992).

To achieve a sample that was diverse with respect to degree of urbanization, participants were recruited from small urban, suburban, and rural areas of Southeastern Iowa and rural and small town areas of North Central Wisconsin. The recruitment area of Iowa included two counties that included two urban/suburban metropolitan areas, as well as a number of rural areas. The recruitment area of Wisconsin encompassed one county that included rural areas and small towns. Because some of the families involved in the study had relocated from larger metropolitan areas such as Chicago, Detroit, and Milwaukee, some of the children in the sample had previously been exposed to inner city living.

At each of the recruitment sites, sentinel agencies identified potential participants and provided a list of eligible families at quarterly intervals. Those families who had recently been identified as having substantiated cases of neglect, abuse, or domestic violence or were receiving some form of government-based economic assistance (e.g., Temporary Assistance for Needy Families, Medicaid, Food Stamps) or other social services were included on the agencies' lists. Eligible families first received a letter from an administrator, who had no connection to the study at the social service agency, inviting them to participate in a voluntary research study on parenting and children's

social development, for which they would be compensated $50 per session plus any out of pocket expenses (i.e., babysitting and transportation). Parents who did not respond to the initial letter received a follow-up letter. It was noted in the letters that participation or non-participation would have no influence on receipt of their social services.

All participants in the larger longitudinal project were required to meet a number of criteria for eligibility beyond economic disadvantage. First, the family had to consist of at least one parent and a child between the age of 4 and 8 years at the time of enrollment. When more than one child in the family was in the age-range for enrollment, only one child was enrolled (random selection) per family to eliminate the problem of statistical non-independence that would occur with more than one child per family in the analyses. Although only one child was enrolled in the original study, many of the mothers in the present study had other children in the home who were younger (28%) or older (29%) or both younger and older (27%) than the enrolled child. Second, because the longitudinal study was focused on parent-child relations, families in which the children had been in an out-of-home placement (i.e. foster care, kinship care) were not eligible to participate. Children known to have been sexually abused were also not eligible for inclusion; however, families who had been identified as physically abusive or neglectful were eligible.

When a parent indicated interest in the study, an initial home visit was scheduled at the family home. At that time, the research protocol was introduced to the parent, along with informed consent. If the parent consented to participation in the project, an initial structured interview was conducted in the home immediately following the informed consent.

The mothers who participated in the study described themselves as 70.2% Caucasian, 17.2% African American, 8.2% Latina, and 4.4% other races; 43.3% were single mothers with no partner in the home. The mothers' occupational levels consisted of 6.7% unemployed, 17.2% homemakers, 22.4% unskilled laborers, 11.2% semiskilled laborers, 19.4% skilled laborers, 7.5% professionals, and 14.9% students. Occupational level was unknown for 1 participant (0.7%). Education levels were varied with 5.2% having less than a high school diploma, 28.4% having a high school diploma or GED, 44% having attended some college, 11.2% with an associate's degree, and 11.1% with a bachelor's degree or higher. The study was conducted under approval of The University of Iowa IRB-02 and with a Certificate of Confidentiality issued from the NICHD Office of the Department of Health and Human Services. Mothers were compensated $50 for each session in which they participated and child participants were compensated with a toy worth at least $10, or $10 cash, for each session in which they participated.

Within a mean of 35 days after the home visit, the first of a series of laboratory sessions was completed. Subsequent visits were arranged as soon as possible following that appointment. During the first session the Reading and Spelling subtests of the Wide Range Achievement Test-III was administered to establish literacy. Three to four sessions were conducted in the first year of the longitudinal project. One year following the initial laboratory appointment, the first year follow-up visits were scheduled. One year following the first year follow-up visits, the second year follow-up visits were scheduled.

Instruments

Child externalizing behavior was measured both dimensionally and categorically. The Child Behavior Checklist (Achenbach, 2001) is a widely used parent rating form pertaining to child behavior. The CBCL has two separate age-based forms, one for 1½ to 5 year children which consists of 100 Likert-scale items and one form for 6 to 18 year children which consists of 112 items. The CBCL, when used as a dimensional measure, can assess externalizing symptoms on a number of different scales including attention problems, aggressive behavior, rule-breaking behavior, a derived aggression score, and an overall externalizing score. Categorically, ADHD, ODD, and CD diagnoses based on DSM-IV criteria can also be extracted from the reported symptoms on the CBCL.

The second measure that was used to assess externalizing disorders was the Teacher Report Form (Achenbach, 2001), which is a parallel form to the CBCL, with the child's teacher as the informant rather than the parent. The TRF is advantageous because some behaviors that occur in the school setting may not be noted by the parent on the CBCL. The TRF is also a dimensional measure which assesses externalizing symptoms on a number of subscales. There are again two different forms based upon the same child age groups as the CBCL.

Finally, to assess ADHD symptoms and oppositional behavior for ODD/CD, the 27 item Conners' Parent Rating Scale-Revised Short Form (Conners, 1996) was utilized. The Conners' parent report form is a parent-rated checklist of child behaviors which assesses oppositional behaviors, cognitive problems/inattention, hyperactivity, and includes an overall ADHD Index. The Conners' has been found to provide distinct information not redundant with that obtained from the CBCL and TRF due to the specific

scales regarding hyperactivity and cognitive/inattention problems (Guevremont & Barkley, 1993). Moreover, the Conners' has been found to discriminate ADHD from non-ADHD children even when they are taking psychostimulant medication (citation). Another advantage of the Conners' is that it includes an ADHD Index which is directly linked to DSM-IV diagnostic criteria, as well as allowing for a dimensional analysis of symptoms of ADHD behaviors.

To assess maternal depressive symptoms in the past two weeks, the Beck Depression Inventory-II (BDI) (Beck, 1996) was used. The BDI, a 21-item self-report measure, is the most frequently used screening instrument in research on depression, with potential scores ranging from 0 to 63. The BDI total score correlates significantly with diagnoses of clinical depression (Archer, Maruish, Imhof, & Piotrowski, 1991; Beck & Steer, 1987; Beck, Steer, & Garbin, 1988; Piotrowski & Keller, 1992; Piotrowski, Sherry, & Keller, 1985; Steer, Beck, & Garrison, 1986), and it has well-established psychometric properties in both psychiatric and non-psychiatric samples (Beck et al., 1988).

Because it is important to measure maternal depression both in a lifetime and a current context, and because differences in parenting (i.e., use of physical discipline) were found between mothers who were currently depressed and those who were not currently depressed, but had a lifetime history of depression (Shay & Knutson, 2008), participants were interviewed to assess depression using the Current Depressive Episode (the past month) and Past Depressive Episode (lifetime prevalence) portions of the Structured Clinical Interview for DSM-IV (SCID; First et al., 1998). The SCID is the most commonly used DSM-IV diagnostic interview, with evidence of high reliability and validity when administered by properly trained interviewers (Riskind, Beck, Berchick, &

Brown, 1987). Four trained Ph.D. students enrolled in a clinical psychology program, and 3 trained research assistants conducted all interviews. The interviews were videotaped and then randomly checked for reliability by the author who has been trained in SCID interviewing and scoring. The kappa scores for agreement between the interviewers and the calibrating clinician on the presence or absence of current major depression and past major depression were all 1.0.

The Inventory of Depression and Anxiety Symptoms (IDAS; Watson, O'Hara, Simms, Kotov, Chmielewski, McDade-Montez, et al., 2007) was also administered as a screener of current depressive and anxious symptoms. The IDAS is a 64 item empirically constructed and validated measure that includes ten specific symptom subscales, including an overall general depression scale.

A trait measure of irritability was employed to assess irritability as a personality factor and not directly related to circumstances of parenting. Thus, to assess maternal irritability the Spielberger Trait Anger Expression Inventory (STAXI; Spielberger, Johnson, Russell, Crane, Jacobs, & Wordent, 1985) was used. The STAXI is an objective inventory asking participants to rate their anger in a variety of contexts on 4 point Likert scales. Adequate to high reliability has been established in both normal and psychiatric populations (Deffenbacher, 1992; Moses, 1992).

Coercive and neglectful parenting were measured through a variety of measures, including measures specifically focusing on supervisory neglect, associated with poor monitoring and tracking, and harsh discipline, associated with punitive discipline. Two indicators of supervisory neglect were obtained and aggregated following the procedure of Knutson et al. (2005). One indicator of supervisory neglect included the derived

congruence score from the Children's Experience and Excitement Scale (CEES: Selner, 1992; Selner & Knutson, 1990). The parent and the child independently completed the CEES questionnaire. The CEES is a measure which includes 44 slides in which children are depicted engaging in a range of activities. To Two separate forms exist, one for girls with female actors, and one for boys with male actors, to reduce sex-role responding. Child participants viewed the slides and were asked if they had ever engaged in each of the depicted activities. It the child had not engaged in the depicted activity, they were then asked if they had ever had the opportunity to do so. Parents also viewed the slide show without knowledge of their child's responses. Parents responded to the CEES in a self-report format, indicating whether their child had engaged in the depicted activities and whether they would allow their child to engage in the depicted activity. The concordance between mother and child report of engagement in the depicted activities was ascertained by adding affirmative mother-child matched pairs and negative mother-child matched pairs across all slides.

The second measure of supervision was the correspondence between child report and parent report on the Children's Reinforcement Survey Schedule (RSS; Clement & Richard, 1976). The RSS was administered in an interview format to the child, asking the child to identify the people with whom he or she spends the most time, his or her favorite foods, the toys he or she plays with most often, and the places he or she spends the most time. The child was also asked to identify with whom they would like to spend more time, toys that they do not have but would like to own, and places that they would like to spend more time than they are currently able. The parent completed a parallel paper-and-pencil form of the RSS that included the same questions regarding activities

and preferences of their child. Again, the correspondence between parent and child report was used to assess supervision.

Harsh discipline was measured using four separate indicators. The first measure included 11 self-report items obtained in an initial in-home interview with the parent in which the parent indicated their use of harsh, punitive, or inconsistent discipline. Some example item topics include, "Getting angry when punishing their child" and "frequency of not following through on discipline." The scale has been used in a number of past studies (Knutson et al., 2004; Knutson et al., 2005) and has been found to have a Cronbach's alpha of .98. A second parent-report indicator was an index of abusive parenting administered in an interview format. These item topics include such things as "Bruises after being disciplined, long lasting red marks after being spanked, and child spanking with an object other than hand."

The third measure of harsh discipline was a score of physical discipline in response to depicted child behavior in the Analog Parenting Task (APT; Zaidi, Knutson, & Mehm, 1989). The APT is a slide show consisting of 28 slides in which each slide depicts a child engaging in a developmentally appropriate or developmentally inappropriate activity with the inappropriate activities potentially being interpreted as irritating or concerning to a child's caretaker. Destructive acts are depicted in seven scenes (e.g., destroying tapes, tearing pages from a book), dangerous activities are depicted in seven scenes (e.g., loading a revolver, hanging out the window of a moving car, sitting on the edge of a roof), and rule-violating behaviors are depicted in seven scenes (e.g., theft, drinking an alcoholic beverage, smoking). The remaining scenes include age-appropriate acts (e.g., spilling a jar of salsa, making a mess with toys). In

response to each scene, each mother was asked to pretend that she was responsible for the care of the depicted child and to indicate how she would react to the depicted child (e.g., anger, worry, annoyance, amusement). She was then asked to categorize the child's behavior (e.g., sloppy, destructive, dangerous, fine). After the mother rated the behavior of the depicted child and her own response to the depicted behavior, she was asked to select a disciplinary response from ten choices that she would use if she were attempting to change the child's behavior. Disciplinary options included ignoring the behavior, verbal reprimanding the child, restricting privileges, spanking the child, striking the child (other than spanking), and hitting with objects. Although the more severe acts could injure a child, the possibility of injury due to the acts are not reflected in the response choices. After the disciplinary strategy was chosen, the mother noted how many times she would allow the child to participate in the depicted behavior before she changed her disciplinary response. Those mothers who indicated that they would change their disciplinary response were asked to identify what alternative disciplinary response they would use to change the child's behavior.

There were two measures obtained from the APT. The first was the frequency with which a mother indicated that she would use physical discipline as her first choice disciplinary tactic (cf, Knutson et al., 2005). The second dependent measure was based on the notion of escalated discipline as described by Patterson and Reid (1984). Escalated discipline is a circumstance in which a parent shifts from a low intensity form of discipline to a high intensity form of discipline. Escalated discipline in the APT can reflect a shift from a nonphysical form of discipline to physical discipline or escalated discipline can also occur when the participant shifts from minor physical discipline (e.g.,

spanking) to potentially injurious discipline (e.g., striking with an object) in response to persistent depicted behavior.

The final indicator came from the coding of a video-taped observation of mother-child interactions during a 45-minute structured laboratory task. The laboratory task was conducted in a living room-like setting appointed with a loveseat, comfortable stuffed chair, an end table, and a coffee table. The interaction rooms at the Iowa and the Wisconsin sites were furnished and appointed identically to keep the coders uninformed as to the source of the families. The task begins with a communication task in which the child first plays an unfamiliar game with a research assistant while the mother is occupied completing a questionnaire in another room. After the game is completed, it is removed from the room and the mother is brought into the room with her child with the instruction to learn from the child what had transpired between the child and the research assistant. The intention is for the parent to learn as much about the game and what transpired in five minutes in order to explain to the researcher what had happened. The second component of the task is a social-problem solving task in which the mother must role-play with the child what she would want the child to do in a pretend situation (e.g., going to eat at a fancy restaurant). The third component is a mother-led discussion in which she talks with her child about an area of conflict with her child, or some child behavior that concerns her. The topic was established during the time immediately before the session, so it was always a topic that had currency. The last component is free play in which the parent and child are allowed to play together however they wish for a 10 minute period of time. At the end of the play period, the parent is to direct the child to help put away the toys and straighten the room. All videos were coded at the Oregon Social Learning

Center (OSLC) using the Family Peer Process Coding system. The FPPC provides a real-time assessment of virtually all verbal and nonverbal interactions among family members by recording the Activity or Withdrawal (the global context or setting in which the interactions occur or from which an individual withdraws), Content (a description of each verbal, nonverbal, and physical behavior), and Affect (the emotional tone accompanying each content code) of mother-child interactions. Two scores from the coded observation records constituted the indicators of harsh discipline, the log-transformed frequency count of total aversive behaviors (contempt, anger, etc.), and the log-transformed count of total negative physicals (e.g., hit, pinch, slap, etc.) of the mother directed to the child.

Care neglect was assessed utilizing a 55-item measure that has been previously used as a comprehensive index of care neglect (Knutson et al., 2005). The measure included parent report and research assistants' ratings of care neglect (e.g.,child shares a toothbrush), household social difficulties (e.g., too many people living in an inadequate space, noisy household) and physical danger to the child (e.g., clogged plumbing, chemicals within reach of the child). Items were scored directionally to indicate circumstances of neglect. Items were originally chosen for inclusion in the study based on the research literature or recommendations from the Interagency Task Force on Defining Child Maltreatment (see Sternberg et al., 2004). All items responses were obtained from parent interviews or from research assistant ratings of the home environment. Dangerous situations surrounding the home which were observed by the research assistants during the home visit were also included in the index (e.g., drug paraphernalia, glass).

Procedure

When a parent agreed to participate in the parent research project, a home visit was conducted in which a structured interview designed to obtain background, demographic, and parenting information was completed by a research assistant. Participants in the current study participated in the previously described video-taped parent-child interaction task during the first session of the first year of the parent research project. The CEES was also completed during that first session, with the mother and the child completing the measure on the same day. Participants then completed a series of sessions during the first year of participation during which other data unrelated to the current study was obtained. Each participant in the parent project was then asked to return the following year (one year after the initial home interview) to participate in three or four sessions (first year follow-up). One year after the first year follow-up, participants were asked to return to participate in a final three or four sessions (second year follow-up). Because families were at different stages in the parent research project when the current study commenced, some families participated in a first year follow-up, while others participated in a second year follow-up. Regardless, the measures for the current project were collected in an identical fashion. During the first session of the follow-up year, the mother participant completed the BDI-II questionnaire. The two sections of the SCID interview were administered during the second or third session of the follow-up year, which was typically scheduled within 30 days of the first session. The STAXI questionnaire, CBCL questionnaire, Conners' questionnaire, IDAS questionnaire, Analog Parenting Task, and RSS questionnaire were administered to the mother during any of the laboratory sessions during the follow-up year, depending upon

the speed of the participant and time constraints. The corresponding RSS was administered to the child in interview format on the same day the mother completed her RSS. The TRF was sent to the child's classroom teacher during the follow-up year to be completed and returned. If the teacher did not return the completed forms within 6 weeks, she or he was contacted by phone. The teacher was compensated $20 for her or his time.

CHAPTER VII
RESULTS

Preliminary analyses were conducted to identify potential problems related to violations of assumptions of statistical tests, such as normal distributions. Thus, the distribution of each variable was examined to identify distributional tendencies and to determine whether important violations of assumptions exist. Specifically, analyses were conducted to determine whether variables were normally distributed with skewness < 2 and kurtosis < 5. When departures were identified, appropriate transformations were applied to the raw scores, using natural log (ln (X+1)) transformations recommended by Winer (1972). All variables that required transformation, except one (FPPC aversive physical interactions), fell within the limits of skewness and kurtosis outlined above after appropriate transformations were applied. That skewed variable was not included in the analyses, given its extremely high rate of zero scores. Distributions of each variable were also examined for outliers. Apparent outliers that were identified were determined to be properly included as part of the population from which sampling was intended.

In the following sections, data will be described descriptively. Following the descriptive data, testing of the hypothesized relations among the variables is addressed.

Child Externalizing Symptoms

Overall, the mean scores for all externalizing symptom scales fell near the population mean (within 1 *SD* of the mean), suggesting that the sample is normative in terms of externalizing behaviors and is not an overly deviant sample (See Table 1 for descriptive statistics). However, the number of children who met criteria for externalizing disorders on the DSM-IV scales of the CBCL and on the Conners' scales was higher than the base rate found in the population. Based on the Conners' ADHD

Index, a measure providing information consistent with, but not redundant with that of the CBCL, 23 (20.1% of complete data) children met criteria for ADHD ($M \geq 65$). Based upon DSM-IV scales on the CBCL, 34 (25.6% of complete data) of the children met criteria ($M \geq 65$) for ADHD, 18 (13.6% of complete data) met criteria for ODD, and 15 (12.4% of complete data) met criteria for CD. Moreover, most children who met criteria for ADHD also met criteria for either ODD or CD and a few children met criteria for both ODD and CD. Of those children who met diagnostic criteria, 19 children met criteria for comorbid ADHD and either ODD or CD, thus bringing the number of children with "pure" ADHD to 5. Seven children met criteria for both ODD and CD. For those children that met criteria for both ADHD and ODD or CD (comorbid disorders), those children are included in the ODD/CD group because of the likely contribution of maternal anger to the development of those disorders.

Only 45.5% of the teachers returned the behavior rating scales and school-related information. Teacher ratings of child externalizing disorders were near the population mean (within 1 *SD* of the mean), again indicating that the sample is not overly deviant (see Table 1 for descriptive statistics). Teachers identified far fewer children as evidencing externalizing disorders than did mothers, much closer to base rates. However, teacher and mother report for CD was consistent when based upon percentage of children meeting criteria. On the TRF, 8 children (13.1% of complete data) met criteria for ADHD, 6 children (9.8% of valid data) met criteria for ODD, and 8 children (13.1% of valid data) met criteria for CD. Again, high comorbidity for ADHD and either ODD or CD was evidenced, with 5 of the 8 children meeting criteria for ADHD on the TRF also

meeting criteria for either ODD or CD, indicating that only 3 children met criteria for ADHD.

Correlations of the measures that were proposed to be included in the ADHD construct were conducted to determine how well they related to one another (See Table 2). ADHD measures from the Conners', the CBCL, and the TRF were found to be related and will consequently be included as measured variables forming the latent variable ADHD in the full model.

Correlations of the measures included in the ODD/CD index indicated that teacher data do not appear to be strongly correlated with parent report of ODD/CD behavior, which may be due to the poor return rate of the teachers (See Table 2). Although teacher report demonstrates nearly equal base rates for ODD and CD, teacher data represent a different distribution than do the mother data, based upon part-whole comparisons.

Maternal Depression

A varying number and severity of symptoms of current depression were identified by mothers on the BDI, with a mean score of 11.31 (*SD* = 10.06), in the non-depressed range. Although, the mean fell within the non-depressed range, the distribution of the number and severity of symptoms women were reporting covered the range from non-depressed to severely depressed, with a relatively large portion indicating symptoms in the mild range. Based on BDI normative standards provided in the BDI manual (Beck, Steer, & Brown, 1996), 10 participants (7.46%) indicated their current depressive symptoms as being in the severe range (BDI score greater than 28), 12 participants (8.96%) indicated symptoms in the moderate range (BDI score between 20 and 28), and

26 participants (19.4%) indicated symptoms in the mild range (BDI score between 14 and 19).

Based on the SCID diagnostic data, the proportion of women meeting criteria for current depression or lifetime history of depression well exceeded the population base rate, indicating that nearly 50% of the women in the study had or were currently experiencing a depressive episode. It was found that 14.2% of the 131 participants providing complete data were classified as having a current episode of depression and an additional 32.8% of the mothers (not including those currently depressed) were classified as having a past depressive episode. Classification of a current episode was based on DSM-IV criteria being met in the past month, whereas classification of past depression was based on meeting DSM-IV criteria anytime during one's lifetime, excluding the past month. None of the mothers who were experiencing a current depressive episode were experiencing their first depressive episode. That is, all mothers who met criteria for current depression reported a previous history of depression.

Based on the IDAS General Depression scale, women were reporting a wide range of severity of depressive symptoms, with some women indicating significant distress. Scores ranged from 24 to 75, M = 40.82, SD = 12.52, with possible scores ranging from 20 to 100. These findings indicate that although some participants were indicating few current symptoms of depression, there were women who were reporting being significantly depressed.

In order to determine whether all three indices of maternal depression (SCID, BDI, and IDAS) were measuring the same hypothesized construct, correlations were conducted and were found to be significant (Table 2). The BDI was found to be most

strongly related to IDAS General Depression. Both the BDI and IDAS General Depression were more strongly related to Current Depression than to Lifetime Depression, as expected.

Maternal Irritability

Participants tended to report low levels of trait irritability with the mean score of the sample on the trait subscale of the STAXI falling at 15.82, *SD* = 5.27. The scores of only 28.6% of the sample fell above the mean reported in the manual. Furthermore, only 10.5% of the sample fell one standard deviation above the mean. These findings are atypical in that this sample of participants indicated that they experience little anger, as studies have demonstrated that low SES samples tend to evidence higher levels of anger than less disadvantaged samples (Matthews, Räikkönen, Gallo, & Kuller, 2008).

Supervisory Neglect

On the CEES, the concordance between child report of engagement or non-engagement in activities and mother report of the child's engagement or non-engagement in those same activities was ascertained. In general, the mothers and children participating in the study evidenced relatively good agreement regarding what a child had and had not done with mother-child concordance for child behavior ranging from 20 to 42, with a mean of 33.54, *SD* = 4.07. The possible maximum concordance score was 44. Thus, there was little variance and concordance was quite high, leading to a truncated distribution of scores.

On the second measure of supervisory neglect, the RSS, parent-child agreement for what the child does with her time, with whom the child spends time, where the child spends time most frequently, and the child's favorite foods was only fair. The parent-

child agreement for occurrence fell at $M = 0.40$, $SD = 0.09$, with a possible range of 0 to 1.0. Concordance on this measure was low, and again, little variance was noted in the scores, with a range of scores between 0.11 and 0.57.

To determine whether the CEES and the RSS measure the same construct, a correlation was conducted and was found to be non-significant ($r = 0.11$), indicating that these measures are unlikely to be measuring the same construct, although past studies have found these two to be related and to be appropriate measures of supervisory neglect (Knutson et al., 2005). The CEES and the RSS are measures that tap different facets of neglectful behavior. Thus, the CEES tends to tap knowledge of past child engagement in a variety of activities including more deviant acts, while the RSS taps current knowledge of child preferences, as well as supervisory issues of where and with whom the child is spending time. Due to their weak relation, it is not possible to use both measures as indicators of the latent variable of supervisory neglect. Furthermore, the CEES and the RSS were found to be related to few of the other variables in the model (Table 3), and unrelated to maternal depression and all measures of externalizing disorders with the exception of the RSS being related to CBCL ODD. Because the CEES and RSS were each individually unrelated to the rest of the overall model, they were each removed from the overall model.

Harsh Discipline

The hypothesized harsh discipline latent variable consists of a variety of measured variables assessing different disciplinary strategies. Inconsistent discipline was reported to occur in most families, with a raw score mean of 3.38, $SD = 2.46$, on the 11-item index

of inconsistent discipline. Participant raw scores ranged from 0 to 9, with only 10.8% of the mothers indicating that they never engage in any inconsistent discipline.

On the 10-item index of abusive discipline most participants reported engaging in some types of abusive discipline. Raw scores ranged from 0 to 6 (M = 2.13, SD = 1.30). Again, only 10.8% of the mothers indicated that they never utilize any abusive punishment, but 65.4% reported using only two or fewer types of abusive punishment, indicating that most mothers either do not use or do not admit to using many different forms of abusive punishment.

Although most participants report that they use at least one type of abusive discipline, nearly half of the mothers participating in the study indicated on the APT that they would never escalate their punishment strategies (52.2%) from a nonphysical to physical punishment, although the total range for all participants was highly variable, ranging from 0 to 26 (M = 2.79, SD = 4.89). Moreover, 59% of the mothers indicated on the APT that they would never engage in any physical discipline, with a mean number of incidents of physical discipline on the analog measure of 2.60, SD = 4.35. Nonetheless, the range number of number of times a mother opted for physical discipline on the APT was highly variable, from 0 to 21 times. Owing to the presence of a large number of zero scores and the resulting lack of variance, as well as kurtosis and skewness, a transformation was applied to all APT data.

On the FPPC coded mother-child interactions, it was noted that the rate per minute of negative interactions was low. Again, all FPPC data were transformed due to high kurtosis and skewness. The mean rate of mother to child aversive verbal interactions was fairly low, coded at a mean rate of 0.18 per minute (SD = .16), although

in some individual cases was found to be quite high, with a maximum of 0.72 per minute being coded in the laboratory task. Mother to child negative engagements were noted to occur at a similar rate of 0.18 per minute (*SD* = .12), with a maximum of 0.64 per minute. Mother to child aversive physical behavior (i.e., hitting, pulling) was noted to occur at a much lower rate (*M* = 0.01, *SD* = 0.03) with a maximum of 0.18 aversive physical behaviors per minute. Mother to child aversive physical behavior will not be included in the SEM tests due to extremely low occurrence of the behavior. Moreover, the direct observation data were found to be not missing at random, and instead were missing systematically, likely due to all data not being coded.

Correlations between each of the indices included in the hypothesized construct of harsh discipline were conducted. Correlations revealed that some indicators were strongly correlated while others demonstrated no significant correlation. Findings showed that mother's initial response of physical discipline on the APT was related to the Abusive Parenting Index ($r = 0.22$, $p < .05$). Moreover, APT physical discipline was related to APT escalation ($r = 0.67$, $p < .01$), although APT escalation was unrelated to the Abusive Parenting Index ($r = 0.15$, n.s.). All other correlations between the measures of the hypothesized latent variable of harsh discipline were found to be nonsignificant.

Care and Environmental Neglect

On the 55-item index of neglectful parenting, no mother scored a zero, indicating that all of the mothers in the study have reported some neglectful parenting. A wide range of scores on the neglect index was obtained, from 5 to 20, with a mean of 11.28 (*SD* = 3.21). Such high scores, like those near the top of the range, are indicative of children who are truly not having their needs met.

Because the relation between maternal depression and ODD or CD was hypothesized to be mediated by maternal irritability, the first analysis was to determine whether maternal depression, as measured by SCID diagnosis, BDI score, or IDAS General Depression scale, is associated with greater irritability, as measured by the STAXI. Pairwise Spearman correlations indicate that current depression and past depression, as measured by the SCID are related to the STAXI (Current: $r = .22$, $p < .05$; Past: $r = .22$, $p < .05$), as is the BDI total score ($r = .35$, $p < .01$), and the IDAS General Depression Scale ($r = .41$, $p < .01$). Analyses were conducted to determine whether the group of currently depressed mothers, the group of mothers who had been depressed in the past, and the group who had never been depressed differed in their mean STAXI score. A one-way ANOVA contrasting the three groups indicated that the differences among groups were statistically significant $F(2, 128) = 4.63$, $p < .01$. Follow-up comparisons of group means using the Tukey HSD test indicated that the group of currently depressed mothers had higher STAXI scores than did the mothers who were never depressed ($p < .01$) but that they did not differ from the mothers who were depressed in the past. The group of mothers who were depressed in the past did not significantly differ from the group of nondepressed mothers. Thus, current depression was most strongly associated with elevated STAXI scores, then past depression, and finally never depressed mothers.

Analyses were conducted to determine the internal consistency of each of the measured variables amenable to such analysis (Table 4). Due to the methods of obtaining some data (e.g., observation), a few variables were unable to be assessed for internal consistency (FPPC observational data). For those variables which demonstrated poor

internal consistency, attempts were made to create more internally consistent scales by eliminating items that led to problems with the scale. Nonetheless, some of the measured variables were unable to obtain $\alpha \geq 0.70$ and could not be included in the models due to poor reliability (Table 4).

The inconsistent discipline scale was amenable to mathematical improvement in internal consistency with the measure demonstrating poor internal consistency when utilizing 11 items ($\alpha = 0.45$). When the measure was reduced to 7 items, the internal consistency significantly improved ($\alpha = 0.80$).

Structural Equation Modeling

Structural equation modeling (SEM) in AMOS 7.0 was utilized to test the hypothesized model and alternate models. The hypothesized model purported that maternal depression mediated by trait irritability, which then leads to harsh discipline, will result in the development of ODD and CD, but not ADHD. The model also purports that maternal depression, mediated by poor supervision will be associated with care neglect, as found in Knutson et al. (2005), leading to the development of ODD and CD, but not ADHD (See Figure 1). Alternate models, more parsimonious versions of the original model, were also assessed using SEM. The more parsimonious versions were created based upon poor model fit. SEM is a latent variable regression technique that estimates hypothesized paths simultaneously and combines factor analyses with path analyses under the postulation of multivariate normality. The SEM path models were estimated using a Full Information Maximum Likelihood (FIML) approach. The advantage of FIML is that it allows for the use of all subjects without listwise deletion due to missing data. When data are missing, the FIML approach permits an estimation of

scores from the distributions of the available data using predetermined algorithms. Thus, FIML utilizes a covariance matrix to take advantage of all available data assuming that data are missing at random, producing efficient estimates of standard errors (Arbuckle, 1996; Wothke, 2000). For all models proposed, error variances of measures using common methods (self-report, observational data) were allowed to co-vary as necessary. Adequate model fit was indicated by a non-significant χ^2 at $p < 0.05$, CFI greater than 0.90 and RMSEA less than 0.10 (Browne & Cudeck, 1992).

First, measured variables with poor internal consistency were eliminated from the proposed model. That is, the Neglect Index and Abusive Parenting Index were removed from the model being analyzed. Measured variables that were unrelated to the model, that is, those variables that did not significantly correlate with any other measures in the model, were also eliminated from the proposed model. The variables removed included the CEES and the RSS. Next, the proposed model and alternative models (which used the various measures of maternal depression) were tested to determine whether a sufficient number of observed variables contributed to each latent construct. If the model were not identified due to latent variables having too few observed variables, observed variables that were highly correlated with those already in the model were added as measures of the latent construct (i.e., IDAS Lassitude). Alternatively, the best measure of the construct, as determined by model fit indices, was used as an observed construct in place of the latent variable.

The current depression model based on the use of the BDI/IDAS was found to be underidentified (i.e. to not have enough measured variables to create a latent construct), when including only the BDI and the IDAS General Depression scale as the observed

variables for the latent construct of maternal depression. Consequently, the IDAS Lassitude scale, which correlated well with both the BDI (r = 0.55, p < .01) and the IDAS (r = 0.82, p < .01), but was also noted to provide additional information in the model, was included in the model for identification purposes. The BDI/IDAS model was found to demonstrate poor fit (see Figure 2) $\chi^2_{(42)} = 162.55$, p = n.s., CFI = 0.81. The model based on the SCID index of maternal depression, depicted in Figure 3, also demonstrated lack of fit $\chi^2_{(26)} = 148.87$, p = n.s., CFI = 0.68.

Because the models in Figures 2 and 3 were found to have poor fit, follow-up diagnostic analyses were conducted to determine why the proposed models failed. The analyses were conducted in a step-by-step fashion by adding one latent variable or observed variable to the model at a time to determine where the model fit deteriorated. It was found that the harsh discipline latent variable was a source of difficulty due to the heterogeneity of the observed variables. Thus, combinations of the observed variables of harsh discipline, as well as individual observed variables of harsh discipline were tested in replications of the full model until appropriate fit was achieved. Due to the heterogeneity of the variables in the harsh discipline construct, a single observed measure, inconsistent discipline, was most strongly related to the other latent variables included in the model. Moreover, no other observed measure was as strongly related to the rest of the model.

Results indicated that when the SCID was utilized as an indicator of lifetime maternal depression (Figure 4), there was no relation between lifetime maternal depression and child ADHD. The rest of the model, however, was found to have adequate fit $\chi^2_{(9)} = 22.25$, p < .01, CFI = 0.93, RMSEA = 0.11. The findings indicated

that a lifetime history of maternal depression is related to child CD/ODD through a process of maternal irritability leading to inconsistent parenting, which in turn led to child CD/ODD.

Analyses of the current depression model (Figure 5) were conducted and showed the model achieving adequate fit $\chi^2_{(25)} = 74.6$, $p < .01$, CFI = 0.90, RMSEA = 0.12. In this model, current maternal depression leads to child ADHD, but that it does not function through a process of maternal irritability. Instead, it appears that current maternal depression is directly related to child ADHD. The model also indicates that current maternal depression, leads to child CD/ODD through a process of maternal irritability which leads to inconsistent discipline, and in turn leads to child CD/ODD outcomes.

Table 1. Child Externalizing Descriptives

Measure	N	Mean	SD
CBCL DSM-IV ADHD T score	133	59.21	7.58
CBCL ODD raw score	132	3.03	2.26
CBCL CD raw score	121	2.46	2.94
TRF DSM-IV ADHD T score	61	57.26	6.14
TRF DSM-IV ODD T score	61	55.61	6.89
TRF DSM-IV CD T score	61	56.31	7.32
TRF ADHD raw score	61	8.13	6.18
TRF ODD raw score	61	1.62	2.18
TRF CD raw score	61	2.92	3.92
CBCL ADHD raw score	133	4.54	3.13
CBCL DSM-IV ODD T score	132	56.72	6.72
CBCL DSM-IV CD T score	121	55.74	6.25
Conner's ADHD T score	114	55.17	11.19

Table 2. Zero Order Correlations

Measure	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1. IDAS	-	.76	.41	.22	-.18	-.05	-.01	-.04	-.06	-.04	-.10	.08	.38**	.13	.38**	-.03	.42**	.43**	.18	.43**
2. BDI		-	.35**	.24**	-.10	-.01	.02	-.09	.03	-.01	-.04	.01	.29**	.22	.30**	.14	.27**	.32**	.12	.27**
3. STAXI			-	.24**	-.03	.22*	.18*	.02	.10	.07	-.08	.02	.36**	.36**	.33**	.29*	.28**	.40**	.17	.34**
4. Incon. Disc.				-	-.03	-.05	-.09	.07	.13	-.17	-.20*	.06	.28**	.22	.24**	.17	.31**	.35**	.32*	.19*
5. Abusive Disc.					-	.13	.09	-.16	-.15	-.04	.01	-.02	.08	-.18	.10	-.05	.04	-.11	-.15	-.06
6. APT Phys. Disc.						-	.82**	-.04	-.03	-.14	-.03	.05	.05	.25	.02	.25	.10	-.02	.10	.13
7. APT Escalation							-	-.13	-.07	-.07	.01	.04	.06	.23	.05	.17	.14	.01	.01	.14
8. FPPC Neg. Eng.								-	.72**	-.03	-.01	-.01	.01	.02	.09	.06	.15	.10	.02	.20
9. FPPC Aver. Verb.									-	-.02	-.08	.09	.05	.31*	.11	.36**	.20	.20*	.18	.20
10. CEES										-	.11	-.05	-.13	.03	-.09	.14	-.13	-.08	-.06	-.15
11. RSS											-	.02	-.11	-.30*	-.25**	-.17	-.10	-.09	-.08	-.07
12. Care Neglect												-	.21*	.05	.02	.14	.05	.17*	-.04	.06
13. CBCL CD													-	.34**	.67**	.30*	.61**	.57**	.17	.49**
14. TRF CD														-	.26*	.72**	.27	.25	.69**	.11
15. CBCL ODD															-	.15	.71**	.55**	.14	.39**
16. TRF ODD																-	.21	.16	.62**	.19
17. Conners' Opp.																	-	.59**	.35*	.68**
18. CBCL ADHD																		-	.23	.71**
19. TRF ADHD																			-	.40**
20. Conners' ADHD																				-

Table 3. CEES and RSS intercorrelations with model variables

Variable	CEES	RSS
BDI total score	-0.01	-0.04
SCID	0.00	-0.04
IDAS General Depression	-0.04	-0.10
Conners' ADHD	-0.15	-0.07
CBCL ADHD	-0.08	-0.09
Conners' Oppositional	-0.13	-0.10
CBCL ODD	-0.09	-0.25**
CBCL CD	-0.13	-0.11
APT Physical Discipline	-0.14	-0.03
APT Escalation	-0.07	0.01
IPC Aversive Verbals	-0.02	-0.08
IPC Negative Engagement	-0.03	-0.01
Inconsistent Discipline	-0.20*	-0.21*
Abusive Discipline	-0.10	0.01
Neglect Index	-0.05	0.02

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

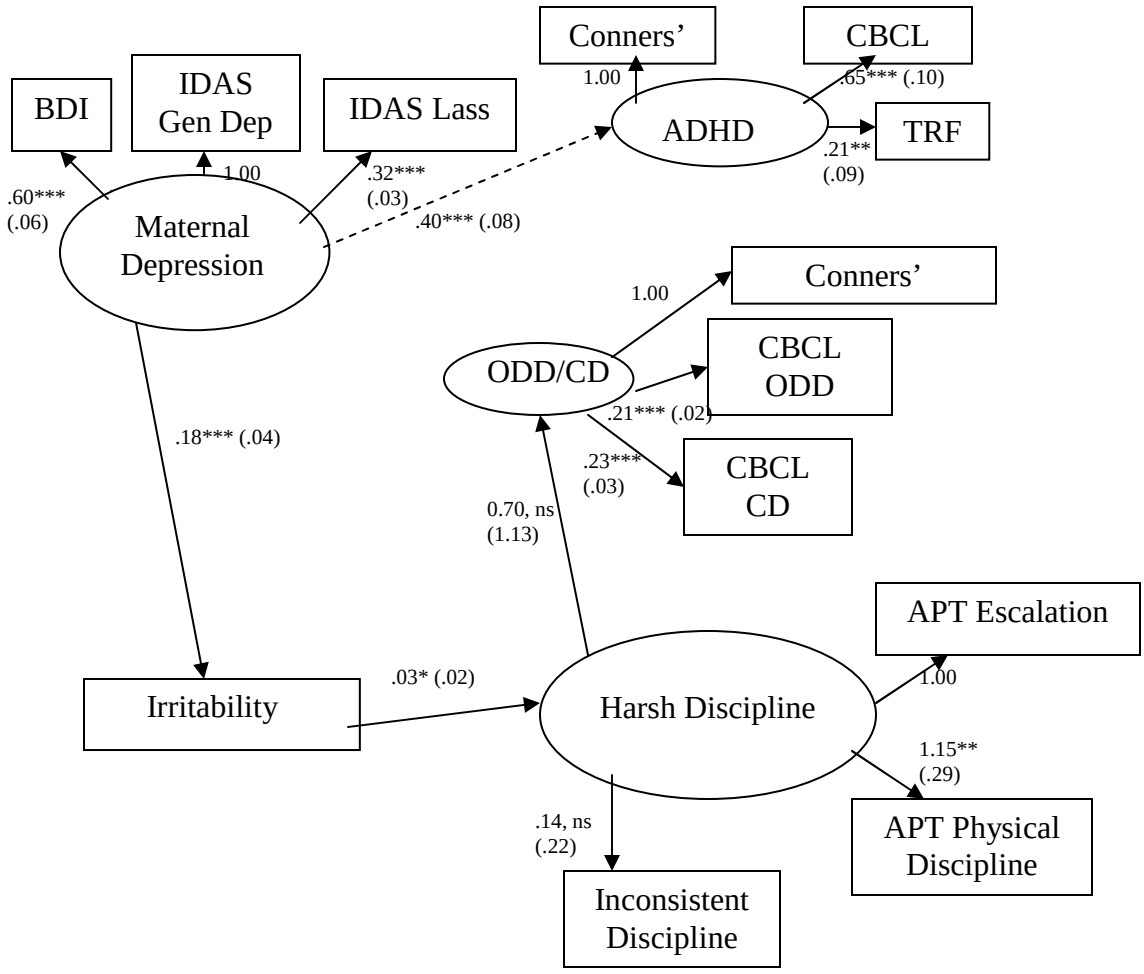
Table 4. Internal Consistency of Measured Variables in the Model

Measure	α	Revised α
BDI	0.93	
IDAS General Depression	0.92	
STAXI	0.90	
Conners' ADHD	0.88	
CBCL ADHD	0.70	
Conners' Oppositional	0.93	
CBCL ODD	0.79	
CBCL CD	0.82	
CEES*	0.60	0.60
RSS*	0.30	0.33
Neglect Index*	0.29	
Environment Neglect*		0.47
Care Neglect*		0.29
Inconsistent Discipline	0.45	0.80
Abusive Parenting*	0.32	0.34

*Variable could not be included in the model due to poor internal consistency

Figure 2

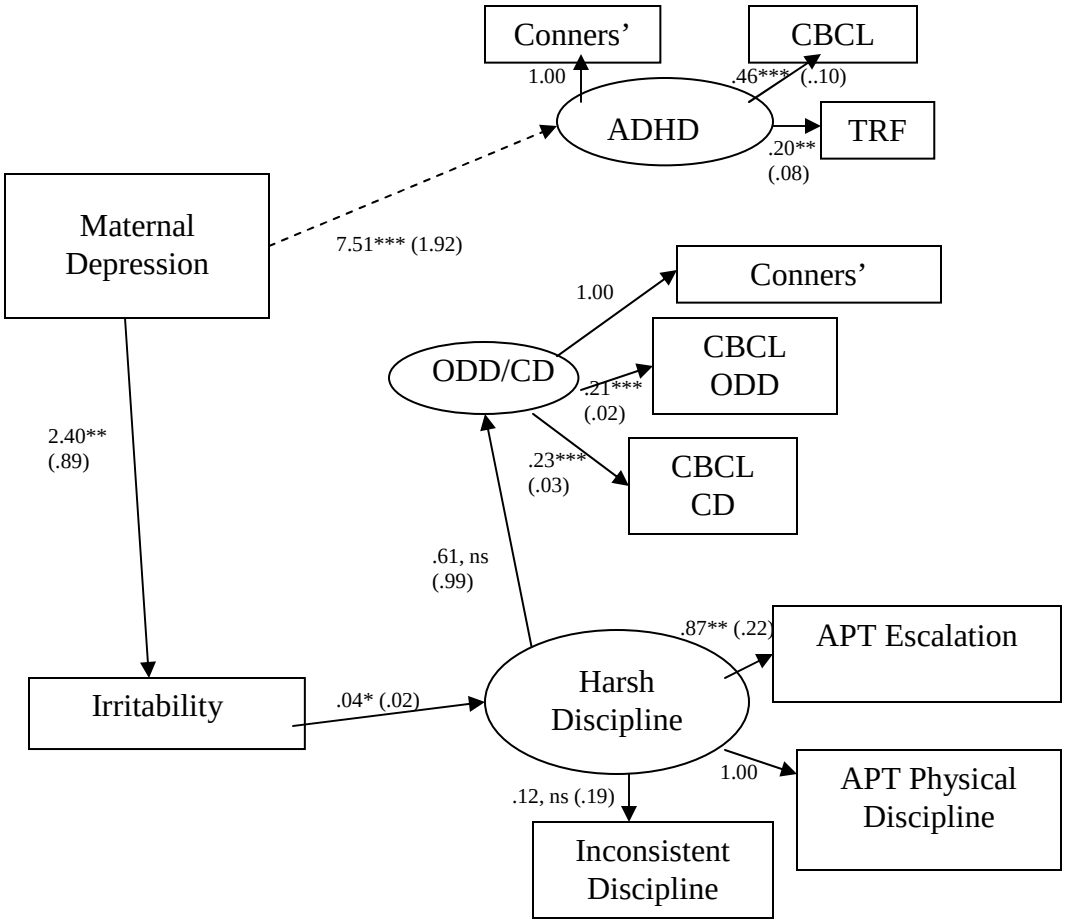
The Improved Mediated Model of the Relation between Current Depression, Parenting, and Externalizing Disorders (Unstandardized Beta Weights)



*$p < .05$ **$p < .01$ ***$p < .001$

Figure 3

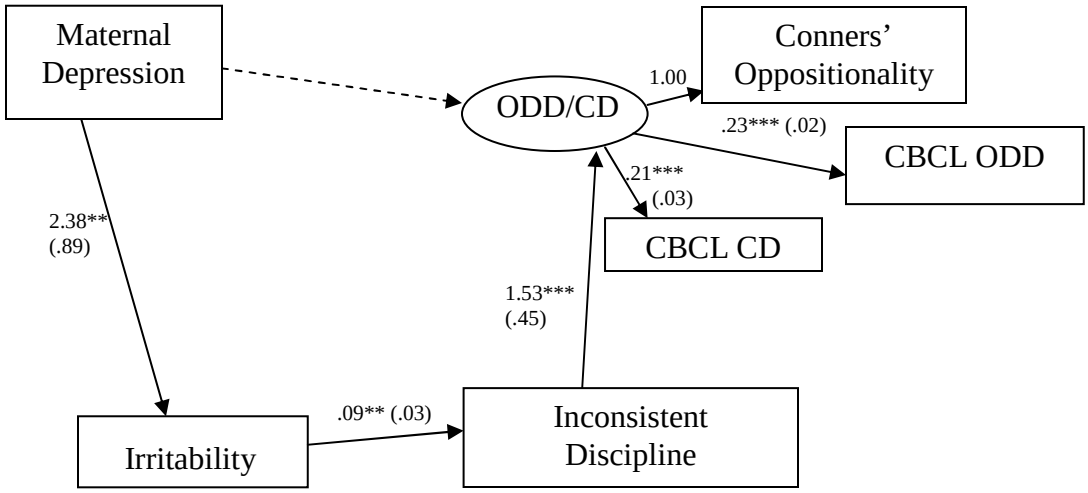
The Improved Mediated Model of the Relation between Lifetime Depression, Parenting, and Externalizing Disorders (Unstandardized Beta Weights)



*$p < .05$ **$p < .01$ ***$p < .001$

Figure 4

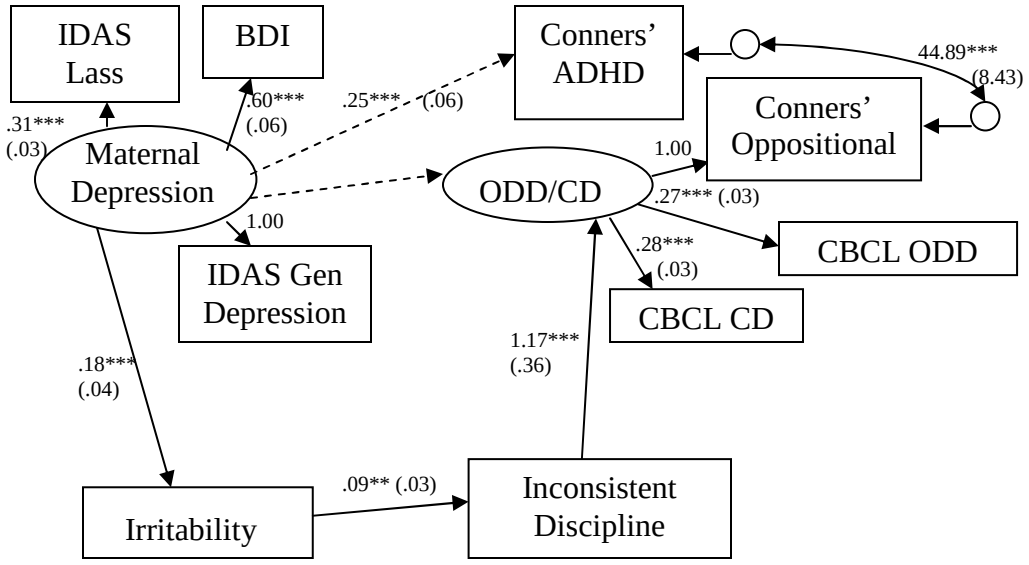
The Final Mediated Model of the Relation between Lifetime Depression, Parenting, and Externalizing Disorders (Unstandardized Beta Weights)



*$p < .05$ **$p < .01$ ***$p < .001$

Figure 5

The Final Mediated Model of the Relation between Current Depression, Parenting, and Externalizing Disorders (Unstandardized Beta Weights)



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*$p < .05$ **$p < .01$ ***$p < .001$

CHAPTER VIII
DISCUSSION

Replicating the findings of past studies, in the current study, child externalizing disorders were related to maternal depression. Importantly, however, the findings of the current study indicate that the relation is not simple or direct. Past research indicated that children who are exposed to maternal depression are more likely to develop antisocial behavior through a risk process that operates through unknown environmental processes proximal to both the mother and the child (Kim-Cohen et al., 2005). That previously unknown risk process was identified in the current study as maternal depression, mediated by trait irritability, leading to poor parenting characterized by inconsistent discipline, which in turn led to the development of child ODD and CD. These findings support the notion that environment plays a major role in the development of child ODD and CD (Tully et al., 2008) and that poor parenting is a mediator between maternal depression and child behavior problems (Jaffee et al., 2006). Moreover, the findings suggest that depressed mothers are ineffective and inconsistent in their use of discipline, consistent with previous research (Lundy et al., 1997).

When the index of depression was dimensional and based on the mother's report of current depression, the results of the analyses supported the hypothesized relation between maternal depression and child ODD/CD, but, contrary to the hypotheses developed in the introduction, the analyses identified a direct relation between current maternal depression and child ADHD. Importantly, the relation between maternal depression and child ADHD did not follow the same pattern as the relation between maternal depression and child ODD/CD, as parenting did not play a role in the development of child ADHD. These findings support the notion of Drabick, Gadow, &

Sprafkin (2006) that the development of child ODD and CD are highly dependent upon parenting, but that the development of child ADHD is not as dependent on parenting. It is important to note, however, that the latent construct of current depression, although based on maternal reports of their current status, actually represents both current and past depression. That is, because all mothers experiencing a current episode of depression in the current study also had a past history of depression, in some ways it is impossible to truly separate the influence of current depression from past depression. Thus, the results of the study capture the stability of depression, and the influence that maternal depression can have on the development of child externalizing disorders across time.

Findings based upon the relatively stringent criterion of meeting a DSM-IV lifetime diagnosis from the SCID interview, largely paralleled the findings that were based upon indices of current depressive symptomology. That is, th results of the analyses support the hypothesized indirect effect of maternal depression contributing to child ODD/CD as a function of the mediational process of trait anger leading to harsh, inconsistent discipline. However, as hypothesized and somewhat inconsistent with the analyses based on the indices of current depression, there was no relation between lifetime history of maternal depression and child ADHD. Thus, those findings supported past research which indicated no relation between maternal depression and child ADHD (Drabick et al., 2006). The findings of a relation between maternal depression, trait irritability, inconsistent parenting, and child CD/ODD are consistent with past research indicating that the negative affectivity associated with depression could play a central role in child physical abuse (Mammen, Kolko, & Pilkonis, 2002), as well as research indicating that maternal depression may lead to harsh parenting and in turn lead to

externalizing disorders in children (Compton et al., 2003). The findings of the current study mirror past work (see Shay & Knutson, 2008), with the indirect effect of maternal depression contributing to harsh discipline. Furthering those findings, the current study found that irritability/trait anger led to hostile parenting, which in turn led to ODD/CD behaviors, as hypothesized by Morrell & Murray (2003) and Conger et al. (2003).

The corollary of the model that the maternal depression—>irritability—>poor parenting pattern does not contribute to ADHD was supported regardless whether the measure of maternal depression was based upon current or past symptoms of depression. The findings reinforced past research which indicated that parenting does not play a role in the development of ADHD (Morrell & Murray, 2003).

Importantly, contrary to the study hypotheses, findings indicated that supervisory neglect and care/environmental neglect did not mediate the relation between maternal depression and the development of ODD and CD, irrespective of the instrument utilized to assess maternal depression. These findings are consistent with the hypotheses advanced by Chaffin, Kelleher, & Hollenberg (1996), purporting that maternal depression is associated with increased risk for physical abuse, but not neglect. However, the findings are inconsistent with research indicating that poor supervision and lax monitoring, often thought to be associated with maternal depression, may lead to neglectful parenting (Brennan et al., 2003; Marmorstein et al., 2004). Additionally, some past research has indicated that current depression can lead to neglectful parenting (Casady & Lee, 2002; Wilson et al., 2005) and this too was not found in the current study. In CPS records, poor supervision is typically included under the rubric of neglect. More recently, efforts have been made to distinguish between poor supervision and other

forms of neglectful parenting (e.g. Coohey, 2003; Knutson et al., 2007). The current study attempted to test the relation between maternal depression and both care neglect and poor supervision, but found no support for either relation. Thus, the findings are inconsistent with either the assertion that maternal depression is related to poor supervision or that depression is related to care neglect. It should be noted that the indices of poor supervision utilized in the current study were problematic with respect to their distributions and the fact that they were not related to other variables of interest in the model in a manner that would be expected from previous research (i.e. Knutson et al. 2007). Thus, it is possible that the failure to establish a link between maternal depression and poor supervision or lax monitoring is due to the index of supervision that was used rather than the falsity of the hypothesized relation. A number of past studies indicated that the timing of maternal depression tended to play an unimportant role in the subsequent development of child externalizing disorders (Ashman et al., 2008; Brennan et al., 2000; Fergusson & Lynskey, 1993; Foster et al., 2008; Kim-Cohen et al., 2005). Although no direct test of a timing effect was possible in the current study, all of the depressed mothers in the study had a lifetime history of depression (e.g., no one was experiencing their first episode), with the mean number of episodes being 13.07 (*SD* = 31.52), indicating that it is likely that the depressed mothers' children had been exposed to multiple depressive episodes over the course of their life. Thus, it is unlikely that there was a distinct period of time during which children were exposed to a single determinant episode of maternal depression that led to the subsequent development of child ODD/CD. Moreover, externalizing symptoms of children of currently depressed mothers were not different than those of children of mothers with a lifetime history of depression who were

not currently depressed. Such findings provide suggestive evidence that the timing of depression is unlikely to play a role in the development of ODD and CD, with the critical caveat that age-range of the sample and the stability of maternal depression preclude drawing strong inferences.

Although no relation was found between timing of maternal depression and child ODD/CD, there also appears to be little effect of timing on the development of child ADHD. In the current study, as discussed, current maternal depression is more a reflection of chronic depression in mothers, whereas lifetime history is more a reflection of a history of past depression rather than continuing and chronic depression. Past studies have also found that chronicity of exposure to maternal depression, not discrete episodes, contributed to the development of child ADHD (Fergusson & Lynskey, 1993). Thus, in the current study a current history of maternal depression, including both current and chronic depression, led to child ADHD, suggesting that chronicity of exposure does play a role in the development of ADHD symptoms, not a particular period of time. Moreover, because current maternal depression was associated with child ADHD, but a lifetime history of maternal depression was not, it is possible that behaviors of currently depressed mothers may lead to either more inattentive, hyperactive behaviors in their children or that depression related distortions may play a role in depressed mothers behavioral ratings of their children. Currently depressed mothers may be more sensitive to the behaviors of their children and therefore, may be more likely to pathologize normative, active behaviors of young children. Depression related distortions of perceptions of child behavior may then lead to harsher ratings of child behavior in

mothers who are currently depressed, as has been found in previous studies (Chi & Hinshaw, 2002).

Importantly, the present findings make it possible to place the role of maternal depression in the development of externalizing disorders in the broader context of models of coercive parenting and externalizing disorders (cf. Knutson et al., 2005) and models of family coercion (cf. Patterson, 1982). Past studies have found that inconsistent discipline is one component of harsh discipline (Knutson et al., 2005) and that inconsistent discipline is important in coercive parenting. Studies have also shown that currently depressed mothers are at increased risk for coercive behavior (Lovejoy et al., 2000) and the findings of the current study support the notion that mothers with any history of depression, past or current, are more likely to use inconsistent discipline, associated with coercive parenting. Moreover, coercive parenting, although not considering inconsistent discipline, and irritability have been found in the past to be related (Greenwald et al. 1997), as was again found in the current study. When the current findings are considered in the context of the Knutson et al. (2005) findings, it suggests that maternal depression, maternal irritability, and child misbehavior could interact in a reciprocating coercive process to yield inconsistent discipline and to further compromise both child behavior and maternal affect. Moreover, maternal depression has been found to wax and wane as a function of child externalizing behaviors (DeGarmo, Patterson, & Forgatch, 2004), possibly leading to increased inconsistent parenting. The results of the current study contribute to a conceptualization of maternal depression as a non-static process variable affected by interactions with one's child, rather than as a static diagnostic risk factor, dependent only upon a diagnosis of depression.

The findings of the study also fit well into developmental models of children's socialization. Children who are not strongly attached to their parent are more likely to demonstrate poorer internalization of social values (Kochanska, Barry, Stellern, & O'Bleness, 2009). Children reared by irritable, depressed mothers who tend to use inconsistent punishment are more likely to be poorly attached to their mother (Wan & Green, 2009), and thus, do not internalize such concepts as conscience and internalization of values. Poor parenting may lead to a lack of internalization of appropriate behaviors. Moreover, depressed mothers may not reinforce appropriate behaviors or model appropriate behaviors (Garstein & Fagot, 2003). The underdevelopment of effortful control, the ability to restrain and inhibit behavior, and guilt, both associated with behavioral inhibition (Kochanska, Barry, Jimenez, Hollatz, & Woodard, 2009), may lead to the development of externalizing disorders in children. Generally, effortful control and guilt are thought to prevent wrongdoing by children and to protect children from engaging in externalizing behaviors. Thus, the underdevelopment of such inhibitory behaviors may result in the development of externalizing behaviors.

The findings of the current study contribute to a further understanding of the literature on maternal depression and child externalizing disorders. The current study included a number of advantages related to the sample of participants that were studied. First, it was advantageous to use a moderate-sized low SES, high-risk sample. Moreover, the sample of parents and children that participated in the study tended to be somewhat more representative of the United States population than the population of the community from which it was drawn. That is, the enrolled sample had a higher rate of minority participation than would be expected in a study from the upper the Midwest. Although

the strength of the associations between maternal depression and externalizing disorders was modest, it is likely that the associations would not have been identified in smaller samples with more limited power. It is also possible that the strength of the associations could have improved given a larger sample and less missing data.

Second, it was advantageous that the sample was nonreferred. The current study did not merely focus on children already deemed to have psychological problems as other studies have (i.e., Lundy et al, 1997; Sanders & Woolley, 2003), but instead was based upon children who had not necessarily been diagnosed with an externalizing disorder. Utilizing a nonreferred sample, or "natural collectivity" (Browne & Finkelhor, 1986), that was not selected on the basis of any of the variables of interest including maternal depression, child externalizing disorders, or parenting, provided for more generalizable results to the population from which the sample comes. Such an approach allows the results to be more strongly related to the general population. In addition to not having any criterion-based sampling biases, the study also did not have any method-based sampling biases such as utilizing administrative records or analyzing case studies (Widom, 1986), allowing for a more generalizable sample. Criterion-based sampling biases (Widom, 1986), such as restriction of the sample due to such issues as living with biological parents, exclusion or inclusion of children due to externalizing disorder status, or exclusion or inclusion of mothers based upon maternal depression status, amongst others, was not an issue in the current study, again allowing for greater generalizability. Although the sample was unbiased, findings are not necessarily fully generalizable to higher SES families.

An important feature of the sample of children utilized in the study was their somewhat truncated age range (ages 5 to 10 years), during the early elementary school years. Past studies have tended to focus on the early years (i.e., Morrell & Murray, 2003) or the adolescent years (i.e., Compton et al., 2003), but have tended to ignore the early elementary school years and the important role that those elementary school years may play in the development of later externalizing disorders. Moreover, utilizing a sample with a very specific age range avoided problems that other studies (i.e., Lovejoy et al., 2000) have faced regarding the variability in the amount of possible maternal depression to which a child could have been exposed. Although investigating the early elementary school years had advantages, it also limited the amount of observed CD behaviors, as CD is not fully evidenced until the later elementary school to middle school years.

Another advantage of the sample was that the families in the study included both one-parent and two-parent households. Some previous studies did not consider children from single parent homes which limited the findings (i.e., Brennan et al., 2002). Thus, the current study provides information on the role of maternal depression and parenting in households that are more representative of the range of household composition found in the U.S..

The current study also includes a number of strengths that expand on previous research methodologies. Firstly, the use of multisource, multimethod data collection went beyond single source questionnaire collection as seen in many studies (i.e., Kiliç & Şener, 2005). Secondly, continuing with previous work conducted by Shay & Knutson (2008), maternal depression was evaluated both dimensionally (BDI/IDAS) and categorically (SCID), as well as being assessed with respect to current symptomology,

current episode, and lifetime history. Investigating maternal depression in this manner allowed for in depth analyses in two parallel models in order to determine whether current or lifetime depression played a greater role in the development of child externalizing disorders, as well as if subthreshold depressive symptoms played a role in the development of child externalizing disorders. With largely parallel findings using different measures of depression, the ODD/CD findings cannot be attributed to differences in methodology used to assess maternal depression. Moreover, there was considerable variance in symptoms of maternal depression, indicating that the entire spectrum from no depression to severe depression was included in the sample..

Investigating the externalizing disorders as separate entities (i.e., ADHD, ODD, and CD) was a major improvement upon past research which tended to investigate these disorders as one entity, although they are different based upon their DSM-IV criteria and their presentation. Moreover, there was wide variance of the sample on each of the externalizing disorders, although the mean score of each of the disorders closely approximated that of the population mean, implying that the sample was not overly deviant. Unfortunately, due to the low incidence of CD which was related to the young age of the children who participated in the study, ODD and CD were investigated as one construct. Moreover, there were only 5 incidents of "pure" ADHD, leading to an inability to conduct categorical analyses. This finding of the relatively low incidence of "pure" ADHD indicates that many previous studies investigating ADHD may also have unknowingly been investigating ODD/CD as well.

By using a measure of irritability that was not derived from a measure of parenting or discipline, the mediational analyses were based on a general measure of

maternal irritability rather than discipline-specific irritability or emotional reactivity to child-care circumstances (c.f. Lorber & O'Leary, 2005). Thus, the mediational role of irritability is not compromised by method variance shared with the measure of parenting and discipline and it parallels the more general (i.e. not specific to parenting) diagnosis of maternal depression.

There are several limitations of the study that must be addressed. First is that the design of the study, although based on longitudinal work, is cross-sectional in nature. Thus, the findings do not necessarily provide a complete picture of how maternal depression relates to externalizing disorders across time, especially as children grow into the high-risk age range for all externalizing disorders. It is crucial to follow families through time to determine whether there is an increase across time in the number of children of depressed mothers developing externalizing disorders. It is also important to investigate factors across time, such as temperament, biology, or father influence, which may buffer children or lead to increased or later development of externalizing disorders, which cannot be determined from the current cross-sectional study.

It is very important to note that a number of observed variables that were originally thought to be part of the hypothesized models were eliminated from the final models. Some of the variables had to be eliminated due to poor internal consistency that could not be repaired even with the trimming of items (i.e., Abusive Discipline). Other variables were eliminated from the models due to their poor relation to other variables in the model (i.e., RSS, CEES). Latent constructs that had been supported in previous studies (i.e., harsh discipline, supervisory neglect) (DeGarmo et al., 2004; Knutson et al., 2005) were not supported in the current sample. These latent variables may have been

unsupported in the current study due to the smaller sample size used in the current study, due to poor internal consistency of the observed variables, or due to the restricted range of scores on some measures. For example, on the CEES many parents and children did not endorse the more deviant items, thereby creating a high rate of agreement. Moreover, on such measures and the FPPC observations, it is possible that self-presentation may have factored into the results and may have resulted in skewed data. The low return rate (less than 50%) of teacher data likely led to the poor correlations with mother-report data. Due to the high rate of missingness of data, the TRF was eliminated from the model, following the guidelines of Graham, Olchowski, & Gilreath (2007) which indicated that at least 40 imputations are required when 50% or more of the data is missing to avoid a falloff in power. In the models purported in the current study, 40 imputations could not be reached.

Although the findings of the current study offer data supporting the relation between maternal depression, parenting, and externalizing disorders, the findings indicate the relation is not a simple direct process whereby maternal depression leads to poor parenting, leading to child externalizing disorders. Instead, the findings indicate that maternal depression functions through a mediated process wherein trait anger leads to harsh, inconsistent discipline, which then leads to ODD and CD behaviors. On the other hand, the findings indicate that maternal depression does not lead to ADHD in the same manner. Instead, ADHD is related solely to concurrent symptomology of maternal depression, not a lifetime history of depression, and that maternal depression does not function through a process of irritability and parenting.

The findings of the current study are important in clinical contexts and in treatment outcomes. The link between maternal depression and externalizing disorders is often presumed to be well-established, strong, and direct. However, based upon findings of the current study, when integrated with the reviewed literature, new evidence emerges that suggests that although maternal depression is a risk factor in the development of externalizing disorders, it is the irritability and harsh, inconsistent discipline of the depressed mother that actually leads to ODD or CD.

To reduce the risk of ODD and CD, depressed mothers should be treated and parent training should be an additional focus, given that just treating depression does not improve parenting. Treatment regimens could include components such as parent management training to reduce the risk of harsh, inconsistent discipline. Treatment may also focus on methods to teach depressed mothers how to improve the behavior of their children appropriately (cf., DeGarmo et al., 2004) and how to use consistent punishment strategies. Utilizing methods that focus on learning to cope and tolerate annoying behaviors of children, as well as general anger-management training (e.g., Digiuseppe & Tafrate, 2001) may be useful. Psychiatric medication may also be useful in reducing symptoms of maternal depression and anger, therefore leading to reduction in risk for parenting problems (cf. Jones, Finkelhor, & Halter, 2006) and subsequent development of ODD/CD. Reducing maternal symptoms of depression through either therapy or pharmacotherapy would be useful in reducing the risk for child development of ADHD.

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