

The Effects of Parental Depression, Cognitions, and Discipline on
Later Child Externalizing Behavior

by

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Abstract

Examined a cognitive-behavioral pathway by which depression in mothers and fathers increases risk for later child externalizing problem behavior (aggressive, disruptive, oppositional, antisocial behavior), via parent appraisals of child behavior and parenting practices. Participants were 245 children (118 girls) at risk for school-age conduct problems, and their parents. Children were approximately 3 years old at Time 1 (T1) and 5 ½ years old at Time 2 (T2). At T1, mothers and fathers reported their depressive symptoms, perceptions of child's reciprocal affection and responsiveness, frequency of physical punishment, level of warmth, and child externalizing problems. Mothers, fathers and teachers provided ratings of externalizing behavior at T2. Structural equation modeling revealed that mothers' negative child perceptions mediated relations between maternal depressive symptoms and parenting practices, even while controlling for T1 ratings of externalizing behavior. More frequent maternal physical punishment, in turn, predicted child externalizing behavior two years later. Fathers' negative child perceptions mediated an association between paternal depressive symptoms and warmth, but not physical punishment. Fathers' parenting did not predict subsequent externalizing problems. In future research, mechanisms underlying effects of paternal depression on child conduct problems should be explored. In addition, restructuring depressed mothers' distorted perceptions about their children's behavior should be an important component of intervention programs.

The Effects of Parental Depression, Cognitions, and Discipline on
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Children of depressed mothers are at increased risk for a range of poor social, emotional, neurocognitive and behavioral outcomes (Goodman & Tully, 2006), including child externalizing problems such as disruptive, aggressive, defiant and oppositional behavior (Biederman et al., 2001; Boyle & Pickles, 1997; Chronis et al., 2007; Connell & Goodman, 2002; Luoma et al., 2001; Zahn-Waxler, Iannotti, Cummings, & Denham, 1990). There are many possible transactional pathways by which risk for these problems may be transmitted from symptomatic mothers to their children. For example, transmission may occur through inherited genetic risk, deviant social modeling, conflictual parent-child interactions, poor parenting practices, neuroregulatory deficits arising from prenatal insults, or exposure to more contextual stressors (Goodman & Gotlib, 1999). Additionally, co-occurring antisocial behavior in depressed mothers may amplify the risk for externalizing problems in children (Kim-Cohen, Moffitt, Taylor, Pawlby, & Caspi, 2005). Following the concept of equifinality, it is probable that all of these factors contribute to children's behavior outcomes in some capacity. However, some factors may be more influential than others. For decades, negative parenting, which is known to elevate risk for serious and persistent antisocial behavior in children, has garnered considerable research attention (Beauchaine, Webster-Stratton, & Reid, 2005; Gershoff, 2002; Johnson, Cohen, Chen, Kasen, & Brook, 2006; Lynch et al., 2006; Kendziora & O'Leary, 1993; Riggins-Caspers, Cadoret, Knutson, & Langbehn, 2003; Webster-Stratton & Hammond, 1988).

There is strong evidence that maternal depression disrupts healthy parenting practices (Cummings, Keller, & Davies, 2005; Elgar, Mills, McGrath, Waschbusch, & Brownridge, 2007; Lovejoy, Graczyk, O'Hare, & Neuman, 2000; Vostanis et al., 2006). However, relatively little is known about specific mechanisms underlying this association. Some studies have suggested that

this link may be partly explained by maternal social information processing. Depression is characteristically accompanied by cognitive distortions or misattributions that have been associated with deleterious parenting strategies such as harsh physical discipline and hostility (Haskett, Scott, Grant, Ward, & Robinson, 2003; Leung & Slep, 2006; Lorber & Leary, 2005). The main purpose of this study was to synthesize converging lines of evidence into a testable conceptual model that may explain how parental depression leads to child antisocial behavior via cognitive-behavioral parenting processes (see Figure 1). In what follows, I review empirical support for hypothesized associations among parental depression, dysfunctional cognitions and ineffective discipline in light of how these factors become associated with later child conduct problems.

The Association between Maternal Depression and Parenting

Major depression, marked by low mood, anhedonia, lethargy and feelings of hopelessness, is the leading cause of disability among women in the world (World Health Organization, 2008). The lifetime prevalence rate for major depressive episode is approximately 6 to 17% for women (Blazer et al., 1994), with similar rates found among mothers (Somerset et al., 2006). Furthermore, depression adversely impacts virtually all domains of parenting and parent-child interactions including social modeling, attachment, monitoring, and discipline (Elgar, McGrath, Waschbusch, Stewart & Curtis, 2004; Goodman, 2007). For example, maternal depression has been associated with reduced levels of parenting practices that promote healthy development in infants (e.g., feeding, playing and using routines) and ensure child safety (e.g., using electric outlet covers and car seats; McLearn, Minkovitz, Strobino, Marks, & Hou, 2006a; McLearn et al., 2006b).

The effect of maternal depression on parenting may vary in strength across parenting domains. For example, maternal depression has been most strongly associated with negative

parenting behaviors that reflect coerciveness and hostility toward the child; modestly associated with disengaged behaviors such as ignoring, withdrawal, silence during gaze aversion; and weakly associated with lower rates of pleasant and enthusiastic interaction such as play or praise (Kane & Gruber, 2004; see Lovejoy et al., 2000 for a review of 46 observational studies).

Depression in mothers has nonetheless been related to low levels of other forms of positive parenting, such as warmth or nurturance (Cummings et al., 2005). In a study comprised of 4,184 parents and 6,048 young adolescents, higher levels of concurrent parental depressive symptoms were associated with diminished parental monitoring and nurturance (but had no effect on parental rejection), even after controlling for possible confounding variables such as socioeconomic status (Elgar et al., 2007). Taken together, these studies suggest that specific parenting practices such as harsh discipline and parental warmth may be particularly impacted by maternal depression.

The association between depression and parenting may also vary depending on depressive symptom characteristics such as timing and chronicity. In the review conducted by Lovejoy and colleagues (2000), the timing of depressive episodes moderated the effect of depression on negative parenting behaviors, such that current depression had the largest effects. In an epidemiological survey, depressed mothers of 30-to-33 month old children were two to three times more likely to physically punish (i.e., slap a child in the face or hit a child with an object) and use other forms of more harsh discipline (e.g., yelling in anger, threatening) than mothers without depression (McLearn et al., 2006b). A previous diagnosis of depression did not solely predict these harsh disciplinary practices. However, a history of protracted depression has been shown to influence parenting. For example, low levels of positive mother-infant interactions were predicted by postnatal depression lasting 6 months, but not by postnatal depression lasting 2 months (Campbell, Cohn, & Meyers, 1995). Due to the episodic nature of

depressive symptoms, timing and chronicity are significant issues to consider when discussing the relation between depression and parenting.

Depressed Fathers and Parenting

Depression among men has shown similar patterns of recurrence and persistence as depression among women, occurring about half as often (Kessler, 2003). Until recently, research on parental depression and most other areas pertinent to child development, has largely neglected fathers (Cassano, Adrian, Veits, & Zeman, 2006; Phares, Lopez, Fields, Kamboukos, & Duhig, 2005). This is problematic because fathers make unique and sizeable contributions to children's development. For example, paternal psychopathology has been found to have a comparable risk effect on child and adolescent mental health outcomes as maternal psychopathology (Phares & Compas, 1992). In a meta-analysis encompassing over 100,000 parent-child dyads, paternal and maternal depression had an equivalent modest effect size on child externalizing problems, whereas maternal depression had a greater effect on child internalizing symptoms (Connel & Goodman, 2002). Furthermore, depression in fathers during the postnatal period has been shown to increase risk for hyperactivity and conduct problems in preschool-age children, even after controlling for maternal depression and social class (Ramchandani, Stein, Evans, O'Connor, & Team, 2005).

How paternal depression affects later child functioning has not been well studied, although some have proposed that fathers have a moderating effect on mothers' positive parenting practices (Goodman, 2007). However, these models may underestimate the increasingly direct role that fathers play in childrearing. In six cross-sectional studies, paternal depression was associated with heightened father-child conflict (Kane & Garber, 2004), yielding evidence that depressed fathers experience similar decreases in parenting competence as mothers with depression. Using a community sample, Cummings et al. (2005) showed that fathers who

experienced high levels of depressive symptoms tended to show lower levels of parental warmth and more psychological control (e.g., intrusiveness, use of guilt to control, instilling anxiety) than others. Thus, although most prior studies have focused on maternal depression and parenting, research on fathers has been steadily accumulating, reflecting an increased awareness of the importance of fathers in children's development. In order to advance our understanding of the association between depressive symptoms and poor parenting, it is critical to examine mechanisms that underlie these associations in both mothers and fathers.

Do Negative Appraisals Mediate the Link Between Parental Depression and Discipline?

In classic theories, cognition has been postulated as a key factor in the etiology, maintenance and treatment of depression (Abramson, Seligman, & Teasdale, 1978; Alloy, Abramson, Metalsky, & Hartlage, 1988; Beck, 1967). Depressotypic cognitions are thought to lead to negatively biased, cynical appraisals of the self and others. In depressed parents, these cognitions may color how they perceive their children (Cummings & Davies, 1994). For example, during episodes of parent-child conflict, depressed parents may erroneously interpret their children as having harmful intentions or devious dispositions. These beliefs may prompt frustration, anger or other negative feelings, which in turn may increase the likelihood that parents show harsh discipline and low warmth toward their children (Ateah & Durrant, 2005; Bugental & Happaney, 2004; Larrance & Twentyman, 1983)

Dix & Meunier's (2009) action-control model, which is based on social information-processing theory (e.g., Crick & Dodge, 1994), provides a useful framework for organizing the cognitive mechanisms underlying the association between parental depression and parenting practices. A similar framework has been proposed to explain the occurrence of child physical abuse (Bugental, 2009; Hasket et al., 2003; Milner, 2003). Under the action-control model, a five-step chain of cognitive processes determines parenting behavior: goal processing, input

processing, appraisal, emotion activation and response processing. Depressed parents' cognitive appraisals have been studied more than all of the other steps combined (Dix & Meunier, 2009), highlighting their salience as proximal influences on parenting behaviors. Across these studies, research has mainly focused on two types of child-related appraisals: faulty attributions about the intentions and causes of children's behavior (i.e., why children misbehave) and global judgments about children's feelings and behavior (i.e., how children behave). These cognitions may mediate associations between depressive symptoms and negative parenting practices.

Effective parenting has been linked to appropriate understanding of *why* children misbehave. For example, mothers who attributed misconduct to causes outside of a child's control, such as fleeting moodiness or immaturity, were much less likely to use physical or harsh discipline than mothers who perceived misbehavior as calculated acts or stable characteristics of the child (Ateah & Durrant, 2005; Geller & Johnston, 1995; Montes, de Paul, & Milner, 2001; Snarr, Slep, & Grande, 2009). Furthermore, during episodes of child misbehavior, parents with high levels of depressive symptoms have been shown to blame children by attributing negative intentions to them (Bolton et al., 2003; Snarr et al., 2009). Generally, depressed mothers have been found to make more spontaneous and negative causal attributions about their children's behavior problems (e.g., attributing problems as stable, controllable and dispositional child qualities) than mothers who are not depressed (White & Barrowclough, 1998).

The associations among depressive symptoms, child-blaming attributions and ineffective discipline suggest a mediational relationship among the three variables. In a community sample of 451 mothers and 449 fathers, parents' child-centered responsibility attributions (e.g., believing that a child's misbehavior is controllable and intentionally harmful) were found to mediate the association between depressive symptoms and overreactive parenting for both mothers and fathers (Leung & Slep, 2006). Interestingly, depressed parents who attributed the cause of their

child's misbehavior as their (i.e., the parents') own faults, were more likely to display overly lax parenting than depressed parents who blamed their children. Despite these promising results, other studies have failed to support the mediational role of child-blaming attributions in the relation between parent depressive symptoms and discipline (e.g., Bolton et al. 2003; Slep & O'Leary, 2007).

It is also possible that skewed appraisals of *how* children actually behave (as opposed to why they may behave a certain way) mediate the depression-parenting association. Higher levels of depressive symptoms have been associated with maternal perceptions of infants as less responsive, affectionate, settled, and more difficult (Donovan et al., 1998; Field, Morrow, & Adlestein, 1993; Hart, Field, & Roitfarb, 1999; Whiffen, 1990). Additionally, parents with depression have been shown to evaluate their children more critically (e.g., to view their children as being less socially adept and less academically competent) than non-depressed parents (Goodman, Adamson, Riniti, & Cole, 1994; Pomerantz & Dong, 2006). These negative appraisals of children's behavior, like negative attributions about children's intentions and level of control, also have been linked to coercive and insensitive parenting practices (e.g., Lorber & O'Leary, 2005).

Although a plethora of evidence has supported the individual components of a mediational relationship among depressive symptoms, appraisal of child behavior, and poor parenting practices, very few investigators have expressly tested for mediation (Dix & Meunier, 2009). In one exception, Chi & Hinshaw (2002) found that depression-related distortions about general behavior problems only marginally mediated the positive association between maternal depressive symptoms and negative parenting (e.g., overuse of power assertion, corporeal punishment, and lack of supervision). Because the Sobel's test did not reach significance in the

study, further investigation is needed to establish whether appraisals of child behavior mediate the effect of depression on parenting.

Associations between Parenting and Child Conduct Problems

In summary, evidence has supported a sturdy relationship between parents' depressive symptoms and ineffective child discipline. Adverse parenting practices such as frequent physical discipline or lack of warmth may in turn lead to an array of poor child outcomes, including disruptive behavior disorders (Pfiffner, McBurnett, Rathouz, & Judice, 2005). Controlling for sociodemographic variables and dimensions of parental bonding (e.g., parents' protectiveness and authoritarianism), data from the nationally representative National Comorbidity Survey showed that physically punished children were approximately 1.3 times more likely than others to have externalizing problems (Afifi, Brownridge, Cox, & Sareen., 2006). A meta-analysis of 88 studies conducted by Gershoff (2002) revealed that parental corporal punishment was robustly associated with children's short-term and long-term aggression, criminality and antisocial behavior. Moreover, these associations may not be merely correlative; findings from a genetically informed study with a sample of 887 twin pairs and 2,554 children suggested that harsh forms of physical punishment were causally connected to child externalizing behavior and drug use outcomes (Lynch et al., 2006). Consistent with this claim, a longitudinal study revealed that more spanking predicted higher levels of antisocial behavior two years later, even after accounting for initial levels of child antisocial behavior, child gender, socioeconomic status, and extent to which the home provided a nurturing environment (Straus, Sugarman & GilesSims, 1996). The association between harsh discipline and child outcomes may be mostly one-sided. For example, an analysis of reciprocal effects found no evidence that children's externalizing behavior affected mothers' later overreactive discipline, even though discipline predicted later children's externalizing behavior (O'Leary, Slep & Reid, 1999). However, a more recent

longitudinal study using observational data and multiple informants found bidirectional and interactive effects between negative parenting and child externalizing behavior across time (Combs-Ronto, Olson, Lunkenheimer, & Sameroff, 2009).

Other forms of ineffective parenting, such as failing to provide a warm and responsive caregiving environment, also may contribute to undesirable child outcomes. In a community sample of 593 families, lack of parental warmth was associated with elevated risk for offspring antisocial personality disorder in adulthood, even after adjusting for parental psychopathology and childhood behavioral problems (Johnson et al., 2006). The study also demonstrated that lack of parental warmth mediated the positive associations between parental psychiatric disorders and risk for antisocial behavior in their offspring.

In contrast, the presence of mothers' and fathers' positive parenting may foster resiliency against pathology (e.g., Denham et al., 2000). After accounting for baseline child externalizing psychopathology and demographics, positive parenting measured using a structured parent-child interaction task predicted fewer conduct problems two to eight years following an initial assessment (Chronis et al., 2007). Additionally, Pettit, Bates & Dodge (1997) reported that supportive parenting (e.g., warmth and inductive discipline) assessed before kindergarten predicted better child adjustment (i.e., behavior problems, academic performance, social skills) in sixth grade even after controlling for previous maladjustment and harsh physical discipline. Supportive parenting buffered the effects of concurrent family adversity on child adjustment, indicating that positive parenting may be a protective factor for children at high risk for externalizing psychopathology.

More specifically, positive parenting may counterbalance the harmful effects of parental depression. Results from a large cross-sectional study revealed that high levels of maternal warmth (assessed by adolescents' reports and recorded parent-child interaction speech samples)

diminished the negative effects of maternal depression on adolescent behavioral outcomes (Brennan, Brocque, & Hammen, 2003). Although fathers' warmth was linked to better functioning in youths, it did not protect against the effects of maternal depression on child outcomes. In addition, child gender did not have a moderating effect on the associations examined in the study.

Child Gender

There are multiple ways in which child gender may affect how parental depression confers risk for child conduct problems. First, child gender may moderate how depressed parents appraise their children's actual behavior (Miller, 1995). For example, boys have shown more severe and frequent oppositional, aggressive, and disruptive behavior than girls (Maughan, Rowe, Messer, Goodman, & Meltzer, 2004), and thus may elicit more negative appraisals than girls. In addition, different socially constructed assumptions about gender may shape depressed parents' attributions about children's intentionality and level of responsibility. For example, boys are commonly perceived as being more assertive and deliberately mischievous than girls. In a study about parents' causal attributions of children with ADHD, parents presented with a vignette of a boy misbehaving rated the child as showing much higher levels of intentional misbehavior than parents presented with the same vignette of a girl misbehaving (Maniadaki, Sonuga-Barke, & Kakouros, 2005). Furthermore, higher ratings of intentionality correlated with higher stricter discipline responses, implying that boys who exhibit disruptive behaviors receive stricter disciplinary responses than girls who exhibit the same disruptive behaviors.

Thus, parents' use of negative discipline may differ depending on the child's gender. In a clinic-referred sample of children between the ages of 3 and 7, mothers hit, spanked and restrained boys more than girls, indicating that parents may resort to harsher discipline with boys than with girls (Webster-Stratton, 1996). Alternatively, parenting practices may have differential

effects on boys' and girls' behavioral outcomes. Hostile and harsh parenting strategies have been more related with externalizing problems among boys than among girls (Gordis, Margolin, & John, 2001; Webster-Stratton, 1996), indicating that boys may be more adversely affected by ineffective discipline than girls. Low parental warmth also has been more closely associated with higher levels of externalizing problems among boys than among girls (Kerr, Lopez, Olson, and Sameroff, 2004; Shaw, Keenan, & Vondra, 1994), especially prior to adolescence (Rothbaum & Weisz, 1994). Using a prospective design that tracked children from kindergarten and third grade, McFadyen-Ketchum, Bates, and Dodge (1996) found that maternal coercion and low warmth were related to increases in aggression over time for boys, but not for girls. Interestingly, among girls, more frequent coercive exchanges were related to decreases in aggression over time. These gender differences in exposure and sensitivity to risk factors for externalizing psychopathology may partly account for boys' disproportionately high rates of conduct problems (Rutter, Caspi, & Moffitt, 2003).

Notably, the effect of gender on the relation between parental depression and child conduct problems may not be straightforward. In a longitudinal study of 1,364 children who were followed from 24 months of age to first grade, maternal depression, negativity and low warmth were differentially associated with boys' and girls' externalizing behavior (Blatt-Eisengart, Drabick, Monahan, & Steinberg, 2009). During infancy, maternal depression and externalizing symptoms were more strongly linked for boys than for girls. Over time however, the relation between maternal depression and externalizing problems decreased for boys, and increased for girls, suggesting that boys' and girls' sensitivity to parental depression changes as they age. Similarly, exposure to maternal depression in infancy better predicted risk for externalizing problems in kindergarten for boys, and later internalizing problems for girls (Essex

et al., 2003). However, some studies have reported reverse associations (i.e., maternal depression associated with girls' but not boys' externalizing problems; Drabick et al., 2006).

Parent gender adds another layer of complexity to the association between parental depressive symptoms and child conduct problems. According to social learning theory, boys may be more affected by their fathers and girls may be more affected by their mothers (Bandura, 1973). In a community sample, paternal depressive symptoms had a stronger negative relationship with prosocial behavior outcomes of boys, whereas maternal symptoms had a stronger relationship with poorer peer relationship outcomes of girls (Cummings, Keller & Davies, 2005). Studies on parental depression have revealed a similar pattern, particularly for the father-son dyad. For example, paternal depression has been found to be associated with greater odds of conduct problems in boys, but not girls. Maternal depression, on the other hand, was linked to greater socio-emotional and behavioral problems for both boys and girls (Ramchandani et al., 2005). In another study, father's negative parenting correlated with boys' but not girls' conduct problems at home (Webster-Stratton, 1996). These findings underscore the need to consider both child and parent gender in an analysis of relations between the parenting of depressed adults and child behavioral outcomes.

Current Study

Inappropriate parenting behaviors, such as harsh discipline and absence of warmth, have been consistently shown to mediate the association between parental depression and child externalizing behavior (Burt, Krueger, McGue, & Iacono, 2003; Ghodsian, Zajicek, & Wolkind, 1984; Johnson et al., 2006; Elgar et al., 2007; McCarty & McMahon, 2003). Yet it remains unclear how depressive symptoms affect parenting practices within this mediational path. The main aim of this longitudinal study was to explore one of several possible cognitive-behavioral pathways by which risk for externalizing behavior is transmitted from depressed parents to their

children. Based on Dix & Meunier's (2009) action-control model and the literature on ineffective discipline, I proposed a mediation model with three parts: (1) depressive symptoms lead to negative appraisals of a child's level of responsiveness and reciprocal affection, (2) which in turn lead to more frequent physical punishment and lower warmth, (3) which in turn predict higher levels of subsequent externalizing behavior as rated by multiple informants. Parent ratings of concurrent externalizing behavior were statistically controlled for in all of the main analyses in order to minimize the confounding effect of T1 children's problem behavior on T1 parental depression, appraisals of child responsiveness and affection, and discipline.

Very few studies have examined how paths linking parental depression to child externalizing outcomes differ between boys and girls, or how they differ between fathers and mothers. It is important to take both parent and child gender into account, because these hypothesized linkages may vary based on interactions between parent and child gender. Thus, a secondary set of goals was to investigate whether the proposed model differed between girls and boys; mothers and fathers. Given evidence that boys experience greater susceptibility and exposure to harmful parenting, I hypothesized that boys would be more negatively affected by parental depression than girls. An explicit hypothesis about father and mother differences was not made, although I expected similar associations across parent genders.

Method

Participants

Participants were 245 children (118 girls) and their parents who took part in an ongoing longitudinal study of young children at risk for school-age conduct problems (Olson, Sameroff, Kerr, Lopez, & Wellman, 2005). Children were approximately 3 years old at Time 1 (T1) and 5 ½ years old at Time 2 (T2). Families were recruited from local and regional preschool centers, newspaper ads, and pediatrician referrals. Children were recruited at age three to represent the

full range of externalizing symptom severity on the Child Behavior Checklist/2–3 (Achenbach, 1992), with an oversampling of young children in the upper range of the Externalizing Problems scale. Children with high familial risk factors (e.g., in initial stages of divorce, facing severe economic hardship), serious chronic health problems, or cognitive impairments (I.Q. < 70) were excluded. Families were representative of the local population. The majority of children were of European American heritage (86%), and most others were identified as African American (5%) or biracial (8%). Most mothers were married (89%), 3% were living with a partner, 5% were single (never married), and 3% were divorced. The median annual family income was \$52,000, ranging from \$20,000 to over \$100,000.

Procedure

At T1 and T2, mothers and fathers were interviewed in their homes by a female social worker and then asked to complete a packet of questionnaires. Kindergarten teachers provided ratings of children's behavioral adjustment (T2). Families were paid for their involvement and teachers were given gift certificates for their participation.

Measures

Parental depression. Mothers' and fathers' depressive symptoms at T1 were measured by the Depression and Interpersonal Sensitivity scales from the Brief Symptom Inventory (BSI), a brief self-report instrument designed to measure psychological distress in clinical and nonclinical populations (Derogatis, 1993). Items were rated on a 5-point Likert scale (ranging from "not at all" to "extremely"), characterizing the intensity of symptoms experienced within the previous seven days. The 6-item Depression scale ($\alpha = .82$ for mothers and $.77$ for fathers) asked about the presence of suicidal thoughts, loneliness, disinterest, sadness, feelings of worthlessness, and hopelessness. The 4-item Interpersonal Sensitivity scale ($\alpha = .80$ for mothers and $.75$ for fathers) asked about symptoms that are theoretically linked to depression, such as

feeling easily hurt and disliked by others. Both scales have shown good convergent validity and evidence of construct validity (Derogatis & Melisaratos, 1983; Morlan & Tan, 1998).

Negative perceptions of child behavior. At T1, mothers and fathers separately rated 11 items from 1 (Strongly Agree) to 5 (Strongly Disagree) pertaining to their attitudes towards their child's level of social responsiveness and rewarding reciprocal affection towards the parent ($\alpha = .75$ for mothers and $.83$ for fathers). Six items reflecting perceptions of child unresponsiveness were adapted from the Unresponsiveness scale in the Maternal Perceptions Questionnaire (Olson, Bates, & Bayles, 1982). Sample items included: "My child seems to prefer spending time by himself/herself rather than with me," "I wish my child were more affectionate to me," and "When I speak to my child, he/she usually listens." Five items reflecting perceptions of child's lack of affection were taken from the Child Reinforces Parent subscale in the Parenting Stress Index (Abidin, 1995). Sample items included: "Sometimes I feel my child doesn't like me and doesn't want to be close to me," and "When I do things for my child I get the feeling that my efforts are not appreciated very much."

Use of physical punishment. Dodge, Pettit, and Bates' (1994) Harshness of Discipline scale was used to assess the frequency of physical punishment during the past three months (0 = Never, 1 = Once a month, 2 = Once a week, 3 = Every day, 4 = Several times a day) for each parent at T1. Physical punishment was defined as spanking, grabbing, or shaking. Although it would have been desirable to measure the quality and severity of corporeal discipline, frequency is widely accepted as a way to measure physical punishment (Gershoff, 2002).

Parental warmth. Parental warmth towards the child was assessed by the Parenting Dimensions Inventory (PDI; Slater & Power, 1987), a self-administered questionnaire designed to tap into three broad childrearing constructs: support, control, and structure. The Nurturance and Responsiveness subscales were aggregated to form a measure of warmth for mothers ($\alpha =$

.73) and fathers ($\alpha = .80$), because they covered theoretically salient aspects of warmth (e.g., Kerr et al., 2004). Sample items included "I encourage my child to talk about his or her troubles," "My child and I have warm intimate moments together," and "I encourage my child to be curious, to explore, and to question things."

Child externalizing behavior. At T1, mothers ($n = 235$) and fathers ($n = 157$) completed the Child Behavior Checklist for ages 2–3 (CBCL/2–3; Achenbach, 1992). At T2, mothers ($n = 215$) and fathers ($n = 155$) completed the CBCL for ages 6–18 (CBCL/6–18; Achenbach & Rescorla, 2001). The CBCL is a commonly used, 99 item, 3-point scale (from "2"=very true or often true of the child to "0"=not true of the child) rating inventory that measures a child's behavioral and emotional problems based on parents' observations over the previous two months. The CBCL consists of two empirically derived dimensions of child problem behavior: Externalizing (with subscales in Aggressive Behavior and Destructive Behavior) and Internalizing (with subscales in Anxious/Depressed Behavior and Withdrawn Behavior). The Externalizing scale was used to measure child externalizing behavior.

The Teacher Report Form for ages 6–18 (The TRF/6–18; Achenbach & Rescorla, 2001) was completed at T2 by kindergarten teachers ($n = 190$). The TRF and parent CBCL are structurally identical, except that the Externalizing factor subscale consists of Attention Problems (instead of Destructive Behaviors) and Aggressive Behavior. The Externalizing scale was used to create a multi-informant measure of later child externalizing behavior.

Analysis Plan

Data preparation. Structural equation modeling (SEM) was conducted separately for mothers and fathers using AMOS Version 16. Data were checked for multivariate normality, extreme outliers, and multicollinearity. Evidence of multicollinearity was not found.

Approximately 11 cases in mother analyses and 14 cases in father analyses were identified as

having multivariate outliers based on a Mahalanobis D^2 p-value cut off of .001. However, these cases were not excluded from analyses in order to reflect the real population distributions of the variables.

The data violated the assumption of multivariate normality (Mardia's coefficient = 56.70 for mother data and 85.11 for father data). Given these circumstances, model fit was primarily assessed using the Bollen-Stine bootstrap method (2,000 resamples; Bollen & Stine, 1992). Standardized regression coefficients and other indices of fit such as the chi-squared test, comparative fit index (CFI) and root mean square error of approximation (RMSEA) were calculated using asymptotically distribution-free estimation, which is preferred over maximum likelihood estimation methods when the data are not normally distributed in the population (Huba & Harlow, 1987; Muthen, 1989). AMOS requires full data to conduct asymptotically distribution-free estimation. Thus, missing data were imputed using maximum likelihood estimation, which is recommended over deletion and single imputation methods insofar as data are missing at random (Schafer & Graham, 2002).

Missing data were more of an issue for father variables than mother variables. Data were nearly complete for mother variables (e.g., T1 variables had no more than 5% of data missing, and ratings of T2 externalizing behavior were missing for only 12% of cases). On the other hand, 55% ($n = 135$) of fathers did not report frequency of physical punishment; between 35% and 40% of data were missing for all of the other father variables. In order to determine the appropriateness of data imputation, patterns of missing values were analyzed using Little's MCAR test. Results showed that the data could be assumed to be missing completely at random, $\chi^2(568, N = 245) = 545.61, p > .7$.

Measurement model. Structural equation modeling is generally conducted in two steps. Before testing the structural model, the measurement model, which deals with the latent

variables and their indicators, should be validated using confirmatory factor analysis. The measurement model included BSI measures of depression and interpersonal sensitivity as indicators of parental depressive symptoms; parent ratings of child unresponsiveness and lack of reciprocal affection as indicators of negative perceptions of child behavior; and T2 mother, father and teacher ratings of externalizing behaviors as indicators of later child externalizing behavior. Both factor loadings on the latent depression variable were set to equal 1, in order to reflect their equal contribution to the construct of depression. Similarly, both factor loadings on the latent negative perceptions variable were set to 1. The measurement model fit adequately for both mothers (Bollen-Stine bootstrap $p = .15$, $\chi^2(25) = 47.38$, CFI = .83, RMSEA = .06 [90% CI: .03 to .09]) and fathers (Bollen-Stine bootstrap $p = .30$, $\chi^2(25) = 41.93$, CFI = .88, RMSEA = .05 [90% CI: .02 to .08]).

Structural model. Structural models were separately constructed for mothers and fathers. The full path model, in which no paths were constrained, was tested first. Next, two alternative nested models and their relative fit were tested for mothers and fathers (See Figure 2 for illustrations of the models). The *spuriousness model* assumed that parental depression accounted for the relation between negative appraisals of child behavior and adverse parenting (i.e., physical punishment and lack of warmth), and that negative appraisals accounted for the relation between ineffective parenting and later child conduct problems. The *mediation model* reflected the hypothesis that perceptions of child behavior mediate the relationship between parental depression and discipline, and that discipline in turn mediates the relationship between child-related perceptions and later child behavior problems. Moderation by gender was tested using multiple group analysis. Mother models were controlled for mother-rated externalizing behavior at T1, and father models were controlled for father-rated externalizing behavior at T1.

Mediational relationships. Mediation was assessed using three converging methods. First, the mediated association between parental depressive symptoms and child externalizing behavior were assessed using the joint significance test (Taylor, MacKinnon, & Yein, 2008). The joint significance test provides evidence for mediation insofar as all paths involved in the mediated effect are significantly non-zero. Second, mediation was assessed by comparing the relative fit of the mediation model to the full path and spuriousness models. Evidence for a mediating effect was present if the mediation model fit as well as the full path model, and better than an alternative (i.e., spuriousness) model. Third, the mediating effect size of child behavior appraisals on the association between parental depressive symptoms and discipline practices was assessed with non-imputed data (i.e., listwise-deleted) by generating bias-corrected bootstrap confidence intervals (Preacher & Hayes, 2008). This non-parametric method is recommended over the Sobel test, because it provides higher power while not drastically inflating the Type I error rate (MacKinnon, Lockwood, Hoffman, West, & Sheets, 2002; MacKinnon, Lockwood, & Williams, 2004).

Results

Descriptive Statistics

Means, standard deviations and child gender differences for study variables are presented in Table 1. Boys ($M = 1.18$, $SD = .94$) were significantly more likely than girls ($M = .94$, $SD = .80$) to be physically punished by their mothers within the past three months, $t(238) = 2.08$, $p < .05$. Boys received higher father ratings of T1 externalizing behavior ($M = 11.72$, $SD = 7.08$) than girls ($M = 9.57$, $SD = 6.06$), $t(155) = 2.15$, $p < .05$. Additionally, kindergarten teachers rated boys as having higher levels of T2 externalizing problems ($M = 5.59$, $SD = 9.10$) than girls ($M = 3.09$, $SD = 6.65$), $t(188) = 2.50$, $p < .05$. Mothers of girl participants had slightly higher levels of

depressive symptoms ($M = .35$, $SD = .50$) than mothers of boy participants ($M = .24$, $SD = .37$). However, this effect was not significant, $t(232) = -1.84$, $p = .07$.

Mother-father differences in study variables within parent pairs were tested using paired samples t -tests. Surprisingly, father ($M = .24$, $SD = .36$) and mother ($M = .25$, $SD = .37$) levels of BSI depressive symptoms did not significantly differ, $t(151) = -1.84$, ns . Mother and father pairs differed on only one study variable: Fathers perceived their child as being less responsive ($M = 1.90$, $SD = .59$) than mothers ($M = 1.78$, $SD = .56$), $t(151) = -1.99$, $p < .05$.

Table 2 shows Spearman correlations among study variables included in father and mother models, separately. Note that the table displays correlations among imputed data in order to allow for comparison with the multivariate relationships observed in the structural models. Spearman correlations comparing mother and father variables to one another were also conducted. Mothers' levels of depressive symptoms and interpersonal sensitivity were positively correlated with fathers' levels, $r_s = .14$, $p < .05$, and $r_s = .17$, $p < .05$, respectively. Mothers' and fathers' use of physical punishment were also correlated, $r_s = .26$, $p < .001$.

Association between Parental Depression and Child Externalizing Behavior

Holmbeck (1997) recommended that a direct effect model be tested prior to testing a mediation model in SEM. Thus, the effect of parental depression on later child externalizing behavior without the inclusion of the cognitive and parenting mediators was tested for mothers and fathers. The model for the direct effect of maternal depression on child externalizing behavior at T2 fit the data well, Bollen-Stine $p = .70$, $\chi^2(5) = 3.23$, CFI = 1.00, RMSEA = 0 (90% CI: 0 to .07). Greater maternal depressive symptoms significantly predicted higher levels of T2 child externalizing problems, $\beta = .18$, $p < .01$. Group analysis showed that this effect did not differ significantly by child gender, $\Delta\chi^2(1) = .47$, ns . The model of the direct effect of paternal depression on T2 child externalizing behavior also fit the data well, Bollen-Stine $p = .48$, $\chi^2(5) =$

5.10, CFI = 1.00, RMSEA = .01 (90% CI: 0 to .09). Greater paternal depressive symptoms significantly predicted higher levels of T2 child externalizing problems, $\beta = .25, p < .05$. This effect also did not differ by child gender, $\Delta\chi^2(1) = .34, ns$.

The direct effects of maternal and paternal depression on later child conduct problems were tested simultaneously using a third model, Bollen-Stine $p = .86, \chi^2(13) = 9.41, CFI = 1.00, RMSEA = 0$ (90% CI: 0 to .05). Results showed that maternal depression predicted higher levels of later child externalizing problems even after controlling for paternal depression, $\beta = .19, p < .01$. Additionally, paternal depression predicted higher levels of externalizing problems, even after accounting for maternal depression, $\beta = .18, p < .05$.

Mediation among Mother Variables

The full path model for mother data fit adequately according to most indices, Bollen-Stine $p = .16, \chi^2(26) = 48.76, CFI = .82, RMSEA = .06$ (See top panel of Table 3 for a summary of fit indices for mother models). Within the model (Figure 3), greater maternal depressive symptoms was related to more negative appraisals of their child's behavior, $\beta = .32, p < .05$. More negative appraisals of their child's behavior was in turn related to more frequent maternal physical punishment ($\beta = .36, p < .01$) and lower levels of maternal warmth ($\beta = -.52, p < .001$). More frequent maternal physical punishment predicted higher levels of child externalizing problems two years later ($\beta = .18, p < .05$), whereas maternal warmth did not ($\beta = -.01, ns$). Higher mother ratings of externalizing behavior at T1 (the control variable) was associated with more negative perceptions about child behavior, $\beta = .53, p < .001$, as well as T2 child externalizing behavior, $\beta = .32, p < .001$. In support of full mediation, all other structural paths were non-significant.

The full path model accounted for 39% of the variance in T2 child externalizing behavior factor, 13% of the variance in mothers' use of physical punishment, 28% of the variance in

maternal warmth and 50% of the variance in negative mother perceptions of child behavior. However, the R^2 estimate of maternal warmth seemed largely influenced by the covariate. A model that did not include T1 mother ratings of child externalizing behavior accounted for less variance in negative maternal perceptions (16%), but maintained similar variance in other factors, Bollen-Stine bootstrap $p = .16$, $\chi^2(22) = 36.52$, CFI = .86, RMSEA = .05 [90% CI: .02 to .08]).

The nested mediation model adequately fit the mother data, Bollen-Stine $p = .29$, $\chi^2(30) = 51.82$, CFI = .83, RMSEA = .05. Moreover, the mediation model fit the data as well as the full path model ($\Delta\chi^2(4) = 3.06$, *ns*), whereas the spuriousness model fared significantly worse than the full model, $\Delta\chi^2(5) = 15.06$, $p < .01$. Akaike's information criterion (AIC) was smaller for the mediation model (101.82) than the spuriousness model (111.81), indicating that the former was a better model than the latter. These results further support the hypothesized mediated relations among mother variables.

Bootstrapping was conducted with non-imputed data ($N = 233$; 5,000 resamples) to quantify the mediating effect of negative maternal perceptions of child behavior on the association between 1) maternal depressive symptoms and physical punishment, and 2) maternal depressive symptoms and warmth. Gender was entered as a covariate. Negative child perceptions significantly mediated the positive association between maternal depressive symptoms and physical punishment, with a (non-standardized) total indirect effect of .18 and a 95% bias-corrected bootstrap confidence interval of .05 to .37. Negative child perceptions also significantly mediated the negative association between maternal depressive symptoms and warmth, with an indirect effect of -.26 (95% bias-corrected CI: -.62, -.001).

Mediation among Father Variables

The full path model for father data also showed acceptable fit, Bollen-Stine bootstrap $p = .35$, $\chi^2(26) = 42.34$, CFI = .88, RMSEA = .05 (see Table 3, bottom panel). As depicted in Figure 4, greater paternal depressive symptoms was associated with more negative appraisals of their child's level of responsiveness and reciprocal affection, $\beta = .23$, $p < .05$. Fathers' negative appraisals of child behavior, in turn, predicted lower levels of paternal warmth, $\beta = -.70$, $p < .001$. In addition, higher T1 father ratings of child externalizing behavior (the control variable) predicted more negative perceptions of their child ($\beta = .42$, $p < .001$), more frequent physical punishment ($\beta = .42$, $p < .001$) and higher levels of child externalizing behavior at T2 ($\beta = .65$, $p < .001$). No other paths were significant.

The full path model explained 62% of the variance in the T2 child externalizing behavior factor, 24% of the variance in fathers' use of physical punishment, 42% of the variance in paternal warmth, and 26% of the variance in fathers' negative perceptions of child behavior. However, like in the mother model, some of these estimates were largely impacted by father ratings of externalizing behavior at T1. A model without this covariate explained 33% of the variance in later child externalizing behavior, 9% of the variance in fathers' use of physical punishment, 38% of the variance in paternal warmth, and 8% of the variance in fathers' negative perceptions of child behavior, Bollen-Stine bootstrap $p = .37$, $\chi^2(22) = 34.57$, CFI = .88, RMSEA = .05 [90% CI: .01 to .08]).

The nested mediation model for fathers fit the data as well as the full path model, $\Delta\chi^2(4) = 5.49$, *ns*. Additionally, the spuriousness model fit the data significantly worse than the full path model, $\Delta\chi^2(5) = 33.42$, $p < .001$. The mediation model (AIC = 97.83) also fit better than the spuriousness model (AIC = 123.75). Nonetheless, mediation in the father model could not be

inferred, because the paths necessary for the mediating effect (i.e., from parenting variables to later child externalizing outcomes) were not significantly different from zero.

Bootstrapping with non-imputed data ($n = 147$; 5,000 resamples) showed that fathers' negative child perceptions significantly mediated the negative relation between paternal depressive symptoms and warmth, with a non-standardized total indirect effect of $-.43$ (95% bias-corrected bootstrap CI: $-.96$ to $-.03$). However, negative child perceptions did not significantly mediate a relation between paternal depressive symptoms and frequency of physical punishment ($n = 95$ used for this analysis due to missing father data on physical punishment). Gender was entered as a covariate for both tests.

Child Gender Differences

Child gender differences were analyzed by comparing the fit of the unconstrained full path model to two constrained models for mothers and fathers. The first model examined the gender invariance of the measurement portion of the model by constraining the factor loadings to be equal across boys and girls. The second model examined the gender invariance of measurement and structural portions of the model by constraining both the factor loadings and structural paths to be equal across genders (see Table 3).

For mothers, the factor loadings-only gender invariant model did not show a significant decrease in fit relative to the full path model, $\Delta\chi^2(4) = 8.32$, *ns*. However, the model constraining both factor loadings and mediating paths showed a significant decrement in fit, $\Delta\chi^2(13) = 27.62$, $p < .01$. This showed that there were child gender differences in at least one of the paths mediating the effect of maternal depression on later child externalizing behavior. To detect gender differences with more precision, nine models (each with a different structural path constrained to be gender invariant) were compared to the full path model. Bonferroni-adjusted results (alpha-level set to $.006$; $.05$ divided by 9 tests) showed that mothers' negative perceptions

predicted later child externalizing behavior for boys ($\beta = .97, p < .001$), but not girls ($\beta = -.14, ns$), $\Delta\chi^2(1) = 7.95, p = .005$. Additionally, more frequent maternal physical punishment predicted later child externalizing behavior for girls ($\beta = .33, p < .001$), but not boys ($\beta = -.17, ns$), although these results were not significant when controlling for multiple testing, $\Delta\chi^2(1) = 6.88, p = .01$. None of the other mediation paths differed significantly across genders. For fathers, neither gender invariant model showed a significant decrease in fit, suggesting an absence of child gender differences (see Table 3, bottom panel).

Discussion

In this study, I proposed a three-part mediational model that addressed mechanisms of association by which parental depressive symptoms may lead to later externalizing psychopathology in young children. According to the model, (1) depressive symptoms lead to negative appraisals of child behavior, (2) which lead to more negative parenting and less positive parenting, (3) which in turn result in higher levels of child conduct problems (see Figure 1). Parenting has been shown to mediate the effect of depression on child outcomes (e.g., Burt et al., 2003; Johnson et al., 2006; Elgar et al., 2007; McCarty & McMahon, 2003), and in separate studies, distorted cognitions have been shown to mediate the effect of depression on parenting (e.g., Chi & Hinshaw, 2002; Leung & Slep, 2006). Importantly, this was the first study to test how relations among parents' depressive symptoms, cognitions and discipline longitudinally affect child outcomes under a cohesive model. Associations were studied among both mothers and fathers, which is rare in research on young children's development (Cassano et al., 2006; Phares et al., 2005).

Findings largely substantiated the proposed model for mothers: Mothers' negative perceptions of their child's responsiveness and affection mediated associations between mothers' depressive symptoms and poor parenting practices. More frequent maternal physical punishment

during early preschool years, in turn, predicted higher levels of child externalizing problems two years later in kindergarten. These mediated associations did not hold as well among father variables: Fathers' negative child perceptions mediated an association between paternal depressive symptoms and warmth, but not physical punishment. Fathers' parenting did not predict subsequent child externalizing problems after initial levels of externalizing problems were accounted for. In what follows, I elaborate on possible explanations for these findings. Next, I consider gender-specific associations, which add a layer of complexity to the hypothesized associations. I end with a discussion of the study's broader theoretical and clinical implications.

How Do Appraisals of Child Behavior Alter Parenting?

Notably, this study provided support for Dix & Meunier's (2009) action-control theory, which explains how depression undermines parenting via skewed cognitive processing. However, because only one type of cognitive mediator was tested, the specific mechanisms linking depression and parenting remain an open question. How might appraising a young child as unresponsive and unaffectionate adversely influence discipline in depressed parents? One possible explanation highlights deviations in the development of healthy parent-child relationships. Child responsiveness and affection are rewarding to parents, and thus may play key roles in maintaining healthy parent-child bonds (Abidin, 1995). Parents with depressive symptoms may fail to perceive positive bids for attention and therefore be more likely to develop indifferent or hostile attitudes toward their child, as reflected by low warmth (i.e., low maternal responsiveness and nurturance) and harsher discipline toward their child. Antagonism and emotional distance between depressed parents and their child may also lead to disrupted attachment relationships, which have been shown to predict child externalizing problems (Belsky & Fearon, 2002; Shaw & Vondra, 1995). Consistent with this notion, insecure attachment

relationships have been found to be elevated in depressed mother-toddler dyads (Carter, Garrity-Rokous, Chazan-Cohen, Little, & Briggs-Gowan, 2001; Teti, Gelfand, Messinger, & Isabella, 1995).

It is normative for young preschoolers to have bouts of defiant, disruptive, oppositional, and aggressive behavior (Earls, 1980; Tremblay, 2004). Parents who feel insecure or depressed have been found to personalize their child's challenging behaviors (e.g., Bugenthal, 2009). Antagonistic attitudes fostered by these negative appraisals may prime parents to emotionally overreact to common forms of child misbehavior with brash methods such as corporeal punishment (Slep & O'Leary, 1998). This problematic parent-driven bidirectional process may be further exacerbated in parent-child dyads where the child has a difficult temperament, resulting in a cascade of parent-child conflict (Olson, Bates, Sandy, & Schilling, 2002; Olson, Sameroff, Lunkenheimer, & Kerr, 2009).

Parents' appraisals of reciprocal child responsiveness and affection explain a fraction of the association between depressed mood states and adverse or ineffective parenting. The mechanisms by which depressive symptoms influence parenting also involve other cognitive processes that modulate parents' moment-by-moment appraisals of their child's behavior. For example, dysfunctional encoding of social stimuli has been found to moderate the relation between negative parental appraisals of child behavior and adverse disciplinary responses to misbehavior. In an observational study of mothers and their toddlers, a positive relation between negative appraisals and overreactive discipline was only present in mothers with a strong preference for encoding negative information over positive or neutral stimuli (Lorber, O'Leary, & Kendziora, 2003). In sum, although parents' appraisals of their child's behavior are salient mediators, they also must be conceptualized as part of an extensive cognitive network that involves processing of goals, inputs, emotions and responses (Dix & Meunier, 2009).

Comparing Fathers and Mothers

Fathers have too commonly been characterized as having a secondary impact on child outcomes. For example, the presence of supportive and available fathers has been thought to affect children indirectly by promoting mothers' positive parenting (Crnic, Greenberg, Ragozin, Robinson, & Basham, 1983). More recent research has begun to reveal that fathers have highly significant and direct influences on child behavior (e.g., Denham et al., 2000; Kerr, Olson, Lopez, & Sameroff, 2004; Ramchandani & Psychogiou, 2009). The current findings affirmed these studies by demonstrating that parental depression, cognitions and discipline had potent effects on child mental health outcomes across parent genders. Consistent with previous research (e.g., Ramchandani et al., 2005), paternal depression predicted child conduct problems even after accounting for the effects of maternal depression. Fathers' appraisals and behaviors were also as influential as mothers' in explaining early child conduct problems; both mother and father versions of the proposed model explained over one-third of the variance in later child externalizing problems.

Despite these similarities in effect sizes, our findings suggest that mothers' and fathers' cognitions and behaviors may be associated with children's behavioral adjustment through different mechanisms. For example, mothers' negative perceptions of their children's responsiveness mediated an association between depressive symptoms and physical punishment, whereas fathers' perceptions did not mediate this link. This discrepancy may be in part explained by differences in family and childrearing roles commonly assumed by fathers and mothers (Acock & Demo, 1994; Simon, 1992). A depressed father who perceives his child as being unresponsive or contentious may be more inclined to withdraw from childrearing duties (i.e. show low warmth, but not use physical punishment) than mothers, because fathers may not feel as responsible for childrearing as mothers do. Depressed mothers, who often assume the roles of

primary caretakers without much help from their partners, may feel more strained about parenting and more pressured to try to change their child's behavior. Under these circumstances, mothers may be more likely to use overreactive forms of discipline, such as physical punishment (Conger, Patterson & Ge, 1995). Compatible with this line of reasoning, depression in mothers has been strongly linked to harsh and coercive discipline (Kane & Gruber, 2004; Lovejoy et al., 2000), and depression in fathers has been linked to withdrawal in parental involvement and lower levels of warmth (Bronte-Tinkew, Moore, Matthews, & Carrano, 2007; Cummings et al., 2005).

Depressive symptoms were found to be associated with low warmth in fathers as well as mothers. Yet in two-parent families, the effect of one parent's lack of warmth on child outcomes is not entirely clear. Several studies have supported a link between low levels of parental warmth and later child behavioral problems (Chronis et al., 2007; Denham et al., 2000; Johnson et al., 2006). However, in the current study, neither maternal nor paternal warmth predicted later child conduct problems. The effect of low paternal warmth may have been compensated by mothers' positive parenting. For mothers, it seems more plausible that the effect of maternal warmth was diminished by the effect of physical punishment. According to the data, physical punishment was a stronger predictor of later child externalizing behavior than maternal warmth. In fact, physical punishment has been found to predict later problems over and above parental warmth and a nurturing home environment (Afifi et al., 2006; Straus et al., 1996). Thus, adequate levels of parental warmth may be better conceptualized as protective factors that moderate, but do not mediate, the association between parental depression and child outcomes (Pettit et al., 1994).

The Role of Child Gender

Comparisons between mothers' and fathers' predictive models only partially inform our understanding of complex associations between parental depressive symptoms and child conduct

problems. In order to better understand how parental depression leads to later child conduct problems, comparisons between boys and girls must also be scrutinized. Consistent with most prior studies, boys were generally rated as having higher levels of externalizing problems than girls (Crick & Zahn-Waxler, 2003; Leadbeater, Kuperminc, Blatt, & Hertzog, 1999; Maughan et al., 2004; Webster-Stratton, 1996). However, contrary to my hypothesis, parental depression did not place boys at higher risk for externalizing problems than girls. Interestingly, there was a strong relation between mothers' corporal punishment and later conduct problems in girls, even though boys were more frequently physically punished by their mothers than girls.

Physical punishment fully mediated the relationship between appraisals and outcomes for girls but not for boys. In the case of boys, the robust association between mothers' negative appraisals and later externalizing behavior may have overshadowed the association between maternal physical punishment and externalizing outcomes. Perhaps frequency of physical punishment was simply a poor mediator for boys; taking into account the severity of corporal punishment may have improved the model's ability to explain associations between mothers' appraisals and boys' later conduct problems.

Strengths and Limitations

This study had a number of significant strengths. It is one of the few studies to have included simultaneous assessments of fathers' depressive symptoms, child-related cognitions, and parenting behavior. The study not only showed the significance of fathers, but also generated important questions about depressed fathers' parenting that warrant further study. For example, are depressed fathers less apt to physically punish their young children? If this is the case, what accounts for apparent discrepancies between maternal and paternal influences? As pointed out by several scholars, there continues to be a great need for developmental research on fathers' caregiving behaviors and their long-term sequelae (Cassano et al., 2006; Phares et al., 2005).

A second set of strengths was marked by the careful and stringent handling of the data and the use of sophisticated analytic techniques. Statistical assumptions such as multivariate normality, absence of multicollinearity, lack of outliers, and ample sample size are often taken for granted, even though they are rarely met by real data. Assumption violations in this study were screened for and dealt with appropriately based on guidelines set by prior research. Structural equation modeling allowed for estimation of relations with latent variables, thereby minimizing the effects of measurement error. Tests for alternative models were included in order to verify the legitimacy of hypothesized mediating relationships over spurious associations. In addition, the mediating effect of appraisals on depressive symptoms and parenting variables was reanalyzed and quantified using bootstrapping, which is more flexible and powerful than classic mediation tests (MacKinnon et al., 2002).

Third, the possible confounding effect of concurrent problem behavior was minimized by controlling for parents' T1 ratings of externalizing problems. As a result, the model was able to better capture parent-driven effects on child outcomes. Although causality cannot be inferred, the temporal order and direction of effect of parent factors on child outcomes *can* be inferred because child behavior problems were assessed longitudinally two years after the parenting variables were assessed.

The use of multi-informant assessments of later child externalizing problems was a fourth major study strength. For example, it prevented problematic issues raised by the depression → distortion hypothesis. According to this hypothesis, the association between depression and child externalizing problems is mostly an artifact of depressed parents' rating errors (Richters, 1992). The validity of depressed parents' ratings has been called into question by several studies (Boyle & Picklers, 1997; Chi & Hinshaw, 2002; Najman et al., 2000). However, this issue was offset by

obtaining ratings of later child externalizing outcomes from multiple informants: mothers, fathers and teachers.

Four main limitations of this study also should be noted. First, study participants were drawn from a constrained community sample comprised of mostly middle class, Caucasian, intact families. Thus, results may not generalize to low-income families or to those with greater levels of ethnic diversity. Second, the parent variables (e.g., depressive symptoms, appraisals, and discipline) were concurrently measured, and therefore may not affect one another in the directions specified by the model. Nonetheless, the associations hypothesized by the model made the most sense according to theory (Dix & Meunier, 2009). Third, measurements of study variables were somewhat restricted: The measure of corporal punishment did not take severity into account, which may have resulted in underestimation of parents' actual discipline practices. In addition, depressive symptoms were briefly assessed, so the data may have lacked information on key aspects of depression such as chronicity (Brennan et al., 2000).

Lastly, parents' appraisals of child behavior were assessed using self-report and focused on only one of many possible content areas. Cognitive appraisals are inherently difficult to assess, and some have contended that self-reports are not sufficient (Bugental, Johnston, New, & Silvester, 1998; Holden & Edwards, 1989). More recently however, others have promoted the use of self-report instruments for measuring parent attributions (Snarr et al., 2009). In future research, investigators should strive to measure a variety of appraisals (e.g., attributions about intentionality, causality, and seriousness of behavior) using multiple methods (e.g., observational paradigms and self-reports).

Implications for Research and Practice

This study provided evidence for a model that elucidates how parental depressive symptoms may lead to later child conduct problems via parents' cognitive appraisals of their

child and approaches to discipline. In order to fully appreciate the implications of the study, this model should be considered within the context of the specific developmental time periods examined. The transition from toddlerhood to the preschool-age period may mark a special window of opportunity for studying the associations among parenting processes (Campbell, 1995; Olson et al., 2005; Shaw & Bell, 1993). During these early years, global attributions and disciplinary habits are still forming, as parents must adapt to new challenges brought by children's burgeoning abilities to have a greater impact on their surroundings.

Additionally, the preschool years may provide an optimal window for examining the effects of depressed parenting on child outcomes, because it is a period in which parents are the primary socializing agents of their children (Campbell, Shaw & Gilliom, 2000). Depressed parents' childrearing during the early preschool-age period may be particularly informative predictors of later conduct problems because negative discipline during that time is typically more pronounced than negative discipline at later ages. For example, parents deem corporal punishment to be most appropriate during the preschool age, and are more apt to resort to physical discipline for preschool-aged children than children who are in infancy or over 5 years old (Gershoff, 2002). In future research, it would be fascinating to determine how associations among parents' depressive symptoms, appraisals and discipline may be differentially related to child conduct problems across diverse periods of development.

While the model under discussion was useful in delineating parent-driven effects on child behavior, future research should encompass transactional models of parent-child socialization processes. Transactional models take into account bidirectional influences of parents and children on one another over time (Sameroff, 2009). Albeit more difficult to test, transactional models may be the best way to understand the relationship between parents' depressive symptoms and externalizing psychopathology in children (e.g., Larsson, Viding, Rijdsdijk, & Plomin, 2008). For

example, child conduct problems may precede the formation of parents' negative appraisals. In a longitudinal study conducted by Snyder, Cramer, Afrank & Patterson (2005), child conduct problems in kindergarten predicted later maternal hostile attributions of child misbehavior and use of ineffective discipline. Also, hostile attributions and ineffective parenting interactively predicted growth in child conduct problems. The idea that consistent exposure to early child externalizing problems shape negative parental attributions has been well supported in other longitudinal studies (e.g., Wilson, Gardner, Burton, & Leung, 2006), as well as studies using observational assessments of attributions (e.g., Johnston, Chen, & Ohan, 2006).

Given the large influence of negative appraisals on the maintenance of ineffective discipline and development of child conduct problems, behavioral parent treatments for child externalizing psychopathology should include parents' cognitions about their child as targets for change. Restructuring parents' distorted attributions of their child's behavior may improve the parent-child attachment relationship and increase the likelihood that parents administer the skills they are instructed to practice. Incorporating an appraisal-modifying treatment component has met with success in treatments for parents at risk for child maltreatment. For example, in a randomized trial of the Triple P-positive parenting program, Sanders et al. (2004) found that parents treated with attributional retraining and anger management showed significantly lower levels of negative parental attributions for children's misbehavior, decreased potential for child abuse and improved (i.e., more realistic) parental expectations than parents who received training in parenting skills alone. This component may be especially important for depressed mothers, because they are more highly prone to harbor negative appraisals of their children than others. Moreover, children of depressed mothers tend to respond more poorly to behavioral parent treatment than children of non-depressed parents (Beauchaine et al., 2005).

By treating depressed parents when children are young, it may be possible to prevent the emergence of serious conduct problems. Interventions designed to improve the quality of depressed parents' childrearing and parent-child relationships have evinced long-term effectiveness in thwarting negative child outcomes in stages ranging from infancy through adolescence (Beardslee, Wright, Gladstone, & Forbes, 2007). Treatment benefits may extend well beyond one child's lifetime. Adverse parenting practices, such as harsh discipline, tend to be passed on from generation to generation (Bailey, Hill, Oesterle, & Hawkins, 2009). Hence, successful treatment of one depressed parent may prevent the transmission of deleterious parenting practices to countless future generations.

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Table 1

Means and Standard Deviations of Non-Imputed Study Variables

	<i>M</i>		<i>SD</i>		Gender Differences
	Boys	Girls	Boys	Girls	
Parental Depressive Symptoms					
BSI maternal depression	.24	.35	.37	.50	G > B, $p < .10$
BSI paternal interpersonal sensitivity	.40	.42	.45	.65	
BSI maternal depression	.23	.25	.35	.37	
BSI paternal interpersonal sensitivity	.27	.35	.39	.51	
Parent Appraisals of Child Behavior					
Unresponsiveness (mother-rated)	1.76	1.78	.51	.54	
Lack of affection (mother-rated)	1.83	1.80	.55	.60	
Unresponsiveness (father-rated)	1.91	1.90	.61	.56	
Lack of affection (father-rated)	1.93	1.83	.62	.61	
Parent Discipline					
Maternal physical punishment	1.18	.94	.94	.80	B > G, $p < .05$
Maternal warmth (z-score)	-.11	.15	1.80	1.59	
Paternal physical punishment	1.07	.81	.92	.87	
Paternal warmth (z-score)	.04	.04	1.61	1.75	
Child Externalizing Behavior					
T1 CBCL externalizing (mother)	11.84	11.17	7.37	7.27	
T1 CBCL externalizing (father)	11.72	9.57	7.08	6.06	B > G, $p < .05$
T2 CBCL externalizing (mother)	7.25	5.98	6.69	5.10	
T2 CBCL externalizing (father)	6.59	5.06	5.68	4.85	B > G, $p < .10$
T2 TRF externalizing (teacher)	5.59	3.09	9.10	6.65	B > G, $p < .05$

Table 2

Correlations Among Parental Depression, Appraisals, Discipline, and Child Externalizing Behavior

	1	2	3	4	5	6	7	8	9	10
(1) BSI depression	—	.52***	.27***	.31***	.13*	-.20**	.32***	.25***	.15*	.17**
(2) BSI interpersonal sensitivity	.60***	—	.17**	.21**	-.05	-.22***	.25***	.18**	.11	.19**
(3) Perceived unresponsiveness	.22***	.25***	—	.45***	.22**	-.35***	.41***	.27***	.22***	.27***
(4) Perceived lack of affection	.24***	.34***	.56***	—	.21**	-.22**	.44***	.34***	.24***	.20**
(5) Physical punishment	.23***	.19**	.24***	.22**	—	-.16*	.20**	.20**	.14*	.22***
(6) Warmth	-.24***	-.29***	-.55***	-.42***	-.27***	—	-.23***	-.12	-.06	-.10
(7) T1 CBCL EXT	.23***	.30***	.40***	.38	.57***	-.32***	—	.53***	.28***	.20**
(8) T2 CBCL EXT (mother)	.16*	.14*	.36***	.15*	.24***	-.14*	.43***	—	.48***	.31***
(9) T2 CBCL EXT (father)	.33***	.35***	.38***	.34***	.55***	-.32***	.75***	.48***	—	.50***
(10) T2 TRF EXT (teacher)	.17**	.20**	.23***	.21**	.37***	-.19**	.41***	.31***	.50***	—

Note. Spearman correlations of imputed data used for SEM are reported. $N = 245$ for all variables.

Values above the diagonal show correlations among mother-rated variables; values below the diagonal show correlations among father-rated variables. Variables 8, 9, and 10 were rated by mothers, fathers and teachers, respectively.

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

Table 3

Fit Indices for the Full Unconstrained Model, Alternative Reduced Models, and Gender-Invariant Models

Model	Bollen-Stine <i>p</i>	χ^2	<i>df</i>	$\Delta\chi^2$	Δdf	CFI	RMSEA (90% CI)	AIC
Mothers								
Full path model	.16	48.76**	26			.82	.06 (.03 to .09)	106.76
Spuriousness model	.18	63.81***	31	15.06**	5	.74	.07 (.04 to .09)	111.81
Mediation model	.29	51.82**	30	3.06	4	.83	.05 (.03 to .08)	101.82
Gender-invariant model								
Factor loadings	.85	85.32**	52	8.32	4	.85	.05 (.03 to .07)	201.32
Structural paths	.87	104.62***	57	27.62**	13	.80	.06 (.04 to .07)	202.62
Fathers								
Full path model	.35	42.34*	26			.88	.05 (.02 to .08)	100.34
Spuriousness model	.04	75.75***	31	33.42***	5	.67	.08 (.06 to .10)	123.75
Mediation model	.41	47.83*	30	5.49	4	.87	.05 (.02 to .08)	97.83
Gender invariant model								
Factor loadings	.98	59.15	52	3.34	4	.97	.02 (0 to .05)	175.15
Structural paths	.99	69.43	61	13.62	13	.96	.02 (0 to .05)	167.43

Note. *Ns* = 245 mothers and 245 fathers. Bollen-Stine bootstrap *p* values > .05 indicate acceptable model fit.

χ^2 = chi-square goodness-of-fit statistic; $\Delta\chi^2$, Δdf = change in chi-square and degrees of freedom from full path to alternative reduced or gender-invariant models; nonsignificant change in chi-square represents comparable fit to the full path model. CFI = comparative fit index; CFI > .90 conventionally indicates acceptable model fit. RMSEA = root mean square error of approximation; RMSEA < .06 indicates adequate fit. AIC = Akaike's information criterion; smaller AIC values indicate better relative fit.

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

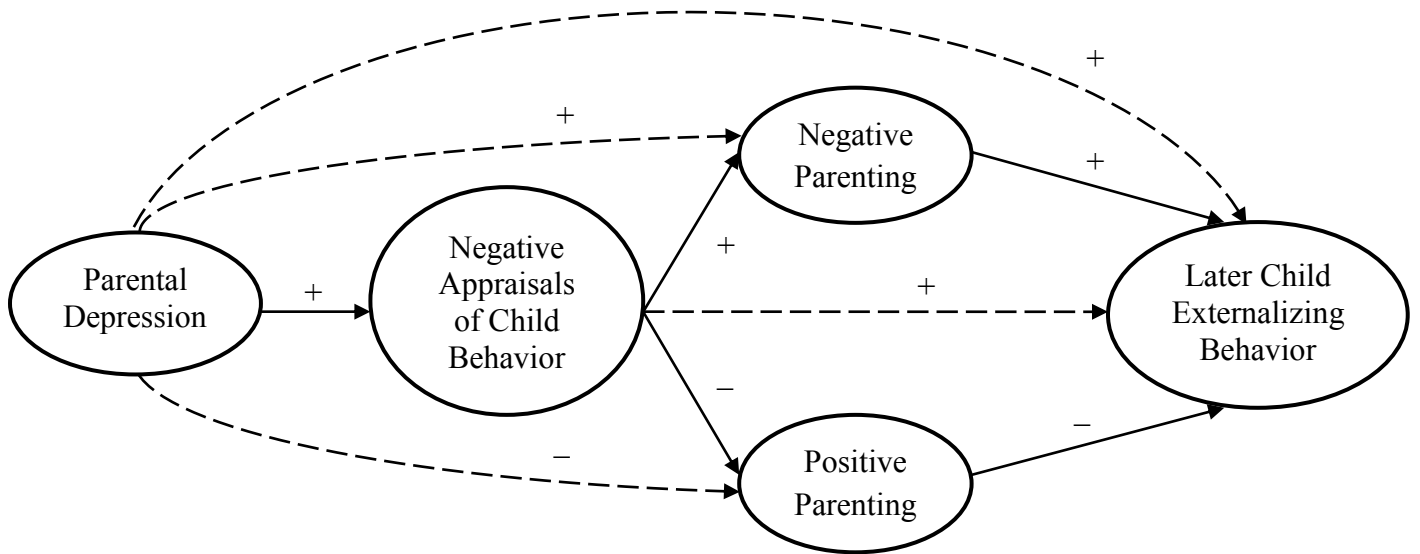


Figure 1. Proposed conceptual model: The effect of parental depression on later child externalizing behavior via child-related cognitions and parenting practices. Pluses indicate expected positive relationships; minuses indicate expected negative relationships. Dashed lines represent paths that may be explained by factors external to the model.

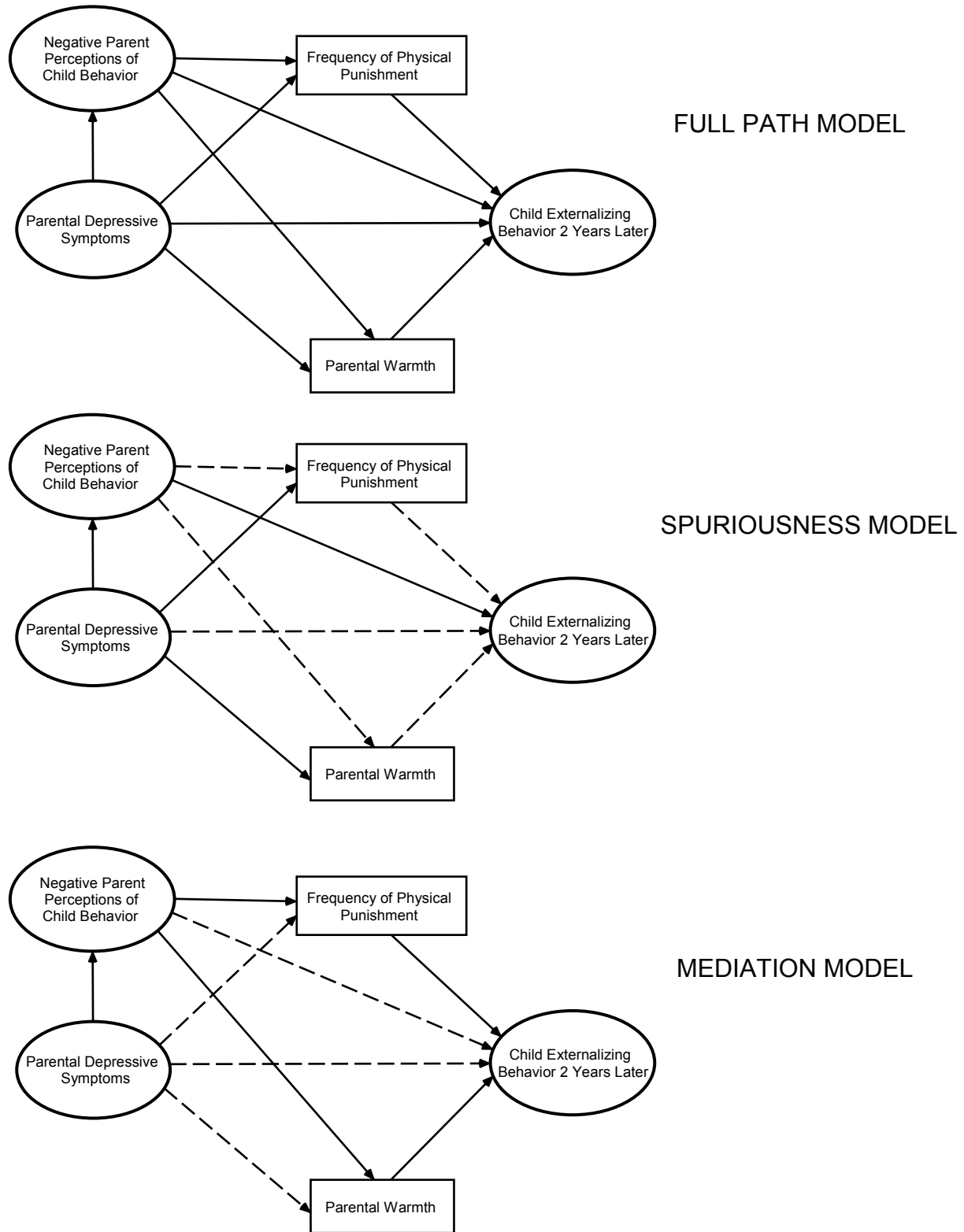


Figure 2. Illustrations of the full path model and alternative nested models (spuriousness and mediation). Dashed lines indicate where path coefficients were constrained to equal zero.

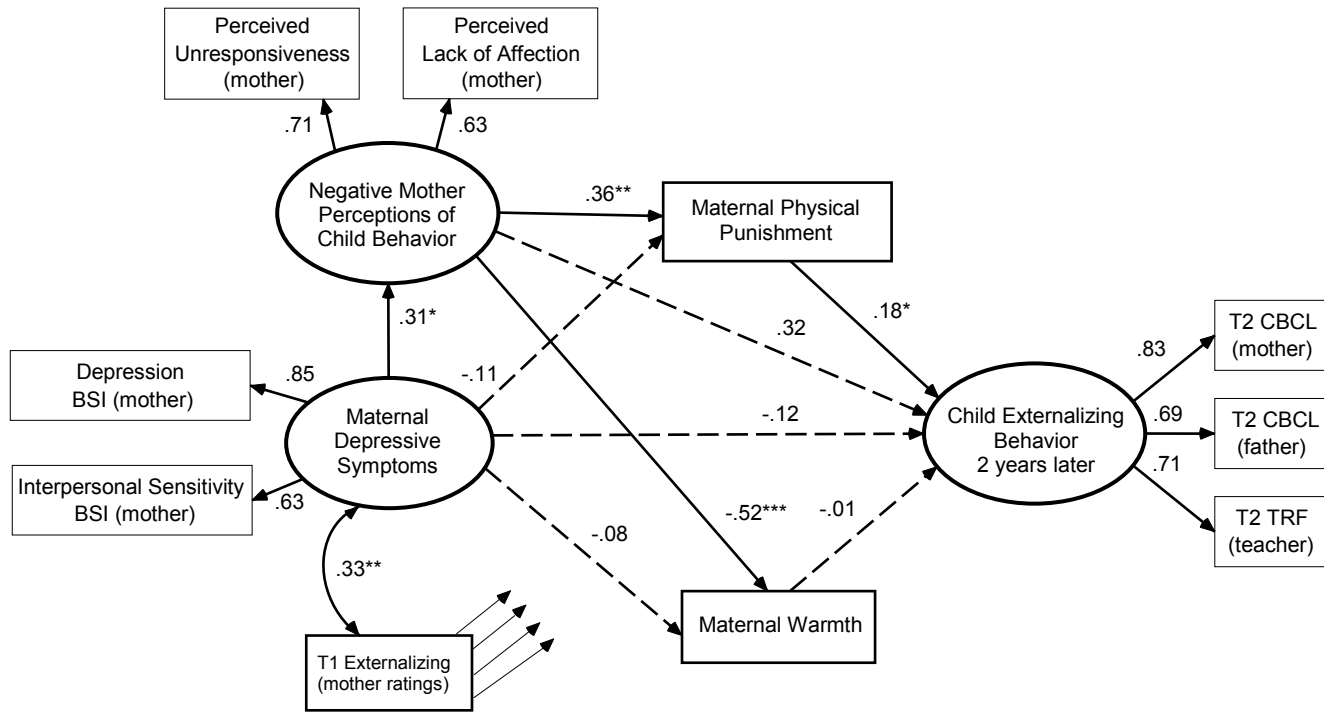


Figure 3. Full structural model of the effects of maternal depression on later child externalizing behavior via appraisals and parenting practices. All four endogenous variables were controlled for mother ratings of externalizing behavior at T1. Numbers on structural paths represent standardized regression coefficients. Dashed lines indicate non-significant effects. * $p < .05$. ** $p < .01$. *** $p < .001$.

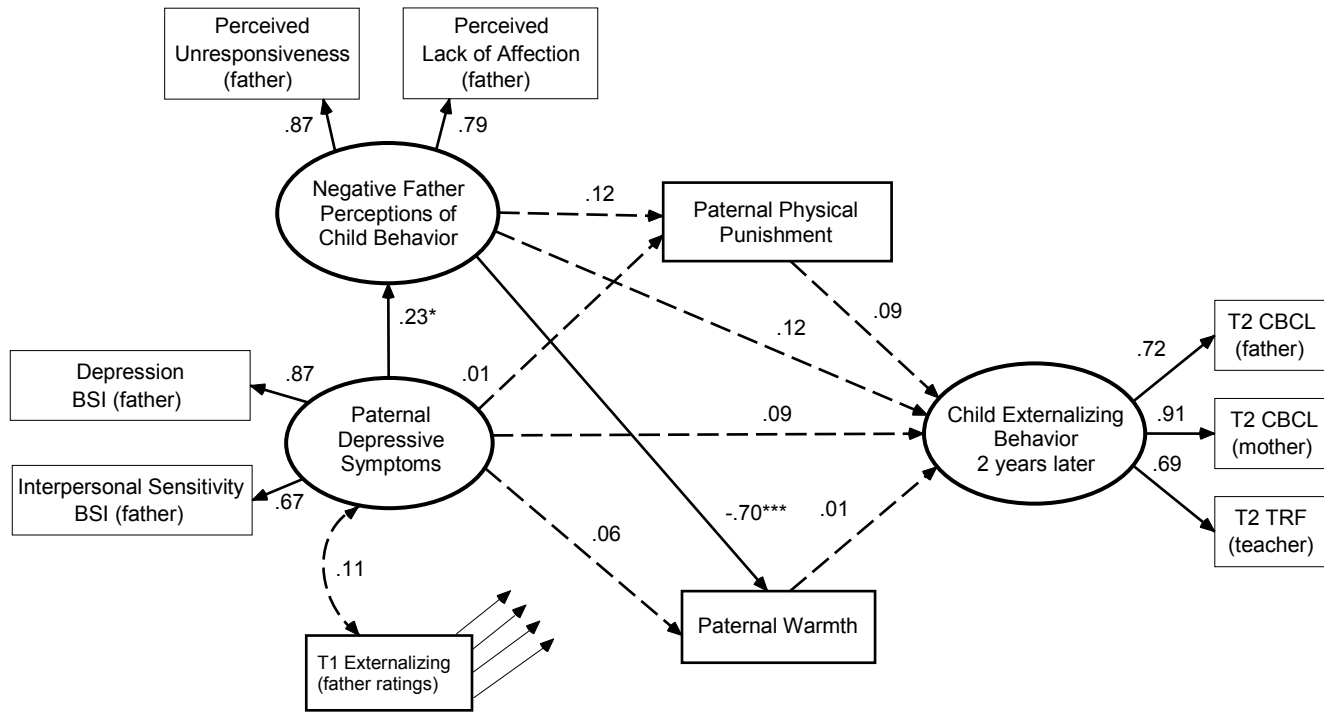


Figure 4. Full structural model of the effects of paternal depression on later child externalizing behavior via appraisals and parenting practices. All four endogenous variables were controlled for father ratings of externalizing behavior at T1. Numbers on structural paths represent standardized regression coefficients. Dashed lines indicate non-significant effects. * $p < .05$. ** $p < .01$. *** $p < .001$.