

Developmental Transactions between Boys' Conduct Problems
and Mothers' Depressive Symptoms

Daniel S. Shaw

Heather E. Gross

Kristin L. Moilanen

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Despite the fact that child effects on parenting practices and subsequent child behavior have been postulated since Bell's seminal theoretical paper (Bell, 1968), and at a broader level by Sameroff and Chandler's (1975) transactional perspective, relatively few studies have explored transactional processes between maternal depression and child adjustment over time. The goal of this chapter is to examine bidirectional processes in the relationship between maternal depression and child conduct problems. This work was inspired by the plethora of research examining unidirectional associations between maternal depression and multiple types of child outcomes and the relative dearth of research examining the possibility that such associations might be bidirectional. The current chapter's focus is on testing Sameroff's original transactional model, but instead of focusing on parenting behavior per se, we chose to examine a more distal parental factor that has been consistently linked to both caregiving practices and child outcomes, maternal depression (Belsky, 1984; Conger, Patterson, & Ge, 1995; Patterson, DeGarmo, & Forgatch, 2004).

Maternal Depression and Child Adjustment

Parental psychopathology has been found to be a consistent and robust correlate of children's maladjustment (DelBello & Geller, 2001; Goodman & Brumley, 1990). Due to the prevalence of depression, especially in women, maternal depression has been the focus of numerous research studies on parental psychopathology and its association with child psychopathology. Findings in the extant literature provide substantial evidence for an association between maternal depression and negative child outcomes, including internalizing and conduct problems (for reviews of this literature, see Beardslee, Versage, & Gladstone, 1998; Cummings & Davies, 1994; Gelfand & Teti, 1990). In addition to research on the relationship between maternal depression and different forms of child psychopathology, associations have been found between child characteristics and parental behavior (Bell & Harper, 1977; Elgar, McGrath,

Waschbusch, Stewart, & Curtis, 2004). Rather than consider parent effects on children and child effects on parents to be separate processes, reciprocal models of socialization regard parenting behaviors and child characteristics as recurrent, transactional exchanges over time, where both parties affect the other (Bell, 1968; Sameroff, 1995). While there is an extensive body of research on reciprocal effects between child disruptive behavior and aspects of parenting (Bell & Harper, 1977; Johnston & Mash, 2001), substantially less attention has been paid to potential bidirectional effects between child disruptive behavior and parental mental health, such as depressive symptoms, over time. As both maternal clinical depression and sub-clinical, elevated levels of depressive symptoms have been found to be related to child maladjustment (Cummings, Keller, & Davies, 2005; Farmer, McGuffin, & Williams, 2002), the term maternal depression will be used throughout this paper to describe both criteria. Similarly, the term conduct problems will be the term used to describe a range of heterotypically similar externalizing symptoms, ranging from oppositional and aggressive behavior in early and middle childhood to more covert antisocial activities beginning in late middle childhood.

There have been consistent findings linking maternal depression to disruptions in both socio-emotional and instrumental functioning (Elgar et al., 2004; Gelfand & Teti, 1990), both when children of depressed mothers are studied across narrowly-defined developmental periods and broad age spans (Goodman & Gotlib, 1999). For example, during early childhood, maternal depression has been linked to fussiness and difficult child temperament (Cutrona & Trouman, 1986; Whiffen & Gotlib, 1989), insecure attachment (Campbell et al., 2004; Field et al., 1988), conduct problems (Marchand, Hock, & Widaman, 2002; Shaw, Keenan, & Vondra, 1994), and reduced mental and motor development (Murray, Fiori-Cowley, Hooper, & Cooper, 1996a; Sharp et al., 1995). Similarly, studies of school-age children and adolescents have documented associations between maternal depression and elevated rates of internalizing and externalizing

problems, more serious forms of antisocial behavior (Hay, Pawlby, Angold, Harold, & Sharp, 2003; Leve, Kim, & Pears, 2005), lower levels of self-esteem (Cummings et al., 2005; Wilkins et al., 2004), and academic problems (Sinclair & Murray, 1998).

Child Effects on Parents and Reciprocal Models

Child effects models emphasize the influence of children's attributes and behaviors on their parents. The literature on parenting is replete with theoretical and empirical evidence of child effects on parents. Belsky's (1984) landmark paper on the determinants of parenting provides a foundation for reciprocal parenting models by positing that characteristics of both the parent and child contribute to adaptive and dysfunctional parenting. This idea is expanded in Patterson's coercive model of parenting (1982), in which a cycle of negative reinforcement is established when child noncompliance is reinforced by the parent. Accordingly, parents unwittingly reinforce child's disruptive behavior by paying more attention to it than to child's prosocial behavior (Eddy, Leve, & Fagot, 2001; Prinzie et al., 2004). These types of coercive parenting practices have been linked back to long-term difficulties for children, particularly in rates of conduct problems (Campbell, Shaw, & Gilliom, 2000; Dishion & Patterson, 1997).

Just as child behaviors are thought to influence parenting, a number of studies have found evidence for child effects on other adult behaviors, including marital quality (Cui, Donnellan, & Conger, in press; Leve, Scaramella, & Fagot, 2001), alcohol consumption (Pelham et al., 1997), social life (Donenberg & Baker, 1993), parenting self efficacy (Cutrona & Trouman, 1986; Teti & Gelfand, 1991) and stress (Baker & Heller, 1996; Feske et al., 2001). Moreover, there is a growing body of research on child effects and maternal depression. Coyne's interpersonal model of depression provides a theoretical basis for bidirectional effects of depression in describing how depressed adults elicit negative reactions from others that intensify their unhappiness and negativity in a cycle of mutual distress (Coyne, Kahn, & Gotlib, 1987). Nelson, Hammen,

Brennan, and Ullman (2003) speculate that maternal depression may create dysfunctions in the early parent-child relationship and elicit problems in the child, which would, in turn, maintain negative maternal attitudes.

Research findings that support a child effects model of maternal depression include higher rates of maternal depressive symptoms in samples of clinic-referred versus normal children (Brown, Borden, Clingerman, & Jenkins, 1988; Fergusson, Lynskey, & Horwood, 1993) and in mothers whose children have high levels of behavioral or emotional problems (Civic & Holt, 2000). Infancy is an interesting period in which to examine potential child effects because of the young child's dependence on parents coupled with the child's inability to communicate his/her needs verbally. For example, Field and colleagues (1988) found that when infants of depressed mothers interacted with non-depressed adults in avoidant and unresponsive ways, non-depressed adults began to exhibit depressed-like manners in these interactions. Other studies have found that behavior problems and irritability in infants are associated with the persistence (Ghodsian, Zajicek, & Wolkind, 1984) and onset of maternal clinical depression (Murray, Stanley, Hooper, King, & Fiori-Cowley, 1996b).

One study has addressed the methodological limitations of correlational studies of child effects research by utilizing an experimental design. Pelham and colleagues (1997) asked married couples and single mothers to interact with 5-12 year old boys who were trained to behave in either a normal or defiant manner. While waiting to have a second interaction with the same boy, the adults completed questionnaires, including one assessing depressive symptoms. Those who had interacted with the defiant boys reported significantly higher levels of depressive symptoms than those interacting with nondefiant children.

Another study used a longitudinal design to examine whether individual differences in initial child behavior and child frontal asymmetry (i.e., EEG) were associated with changes in

maternal report of depressive symptoms one year later (Forbes et al., in press). Results indicated that mothers whose 3 to 9 year old children had either below-average affect regulation and/or right frontal EEG asymmetry reported increased depressive symptoms one year later.

Timing of Effects

While the extant literature provides both theoretical and limited empirical support for a reciprocal effects model between maternal depression and child disruptive behavior, a key question remains about the timing of these effects. Specifically, it is unclear if there are developmental periods when bidirectional or unidirectional relations are more evident than during other periods. In general, when maternal depression has been examined in relation to child outcomes, early childhood and adolescence are thought to be times when children are particularly vulnerable (Cummings & Davies, 1994; Gelfand & Teti, 1990). From the perspectives of physical and social maturation, both early childhood and adolescence are times of major transition in such domains as hormonal changes and social expectations, which theoretically could be made more challenging by the presence of maternal depression. For example, during infancy and early childhood, basic psychological systems are being formed, including the ability to regulate emotions and behaviors. This is also a period when primary attachment relationships are being established, with disruptions in either physiological or social systems placing children at heightened risk for later psychopathology (Beardslee, 1986). In adolescence, individuals also face multiple challenges in physiological and social domains (e.g., sexual maturity, social roles, vocational decisions, peer influences), and maternal depression has been postulated to interfere with the developmental task of achieving a healthy separation from parents and an autonomous identity (Cummings & Davies, 1994).

In addition to early childhood and early adolescence, the transition to school, though marked by less pronounced physiological (Rimm-Kaufman & Pianta, 2000) or cognitive

(Nelson, 1996) maturation, is a time of social transition for children, particularly in the area of social networks. At formal school entry, children transition from networks comprised primarily of adults to ones with primarily other children (Rimm-Kaufman & Pianta, 2000). Parents typically become less familiar with peers and adults their children spend most of their day with and have less control over their children's activities (Pianta, Cox, Taylor, & Early, 1999). While children typically adjust to this transition in adaptive ways, for a subset of children, the transition to school may serve as a catalyst for the initiation or maintenance of externalizing trajectories (Reid, 1993). As a result, middle childhood and the transition to school also may be a time of vulnerability for both mother and child effects. To date we know of only one study that has examined reciprocal models of mother internalizing symptoms and children's anxious/depressed and antisocial behaviors in middle childhood (Jaffee & Poulton, 2006). The authors found support for reciprocal relationships between mother's internalizing symptoms and girls' but not boys' antisocial behavior as well as children's (girls' and boys') anxious/depressed behavior from child's age 5 to 15. When child effects were examined in middle childhood, children's (girls' and boys') anxious/depressed behavior and girls' but not boys' antisocial behavior were related to mothers' subsequent internalizing symptoms.

In summary, the extant literature provides theoretical models and some empirical support for reciprocal effects models that postulate both parent and child effects between maternal well being and child problem behavior, respectively. While reciprocal models have been tested with respect to parenting practices and child problem behavior, they have been applied less often to more general parental functioning. In what follows we will offer a model for adding dimensions of parent's mental health to improve understanding of the consequences of parent-child interactions. We will describe two recent studies aimed at exploring the interplay between maternal depressive symptoms and child conduct problems from the toddler period through

adolescence using a sample of boys followed from infancy to adolescence. In study number one, we examine how toddler-age disruptive behavior might be associated with trajectories of maternal depression from the toddler to the school-age period, and whether such trajectories of depression are then related to child reports of antisocial activity during early adolescence. Where the first study focuses on how early child disruptive behavior might be related to the longitudinal course of maternal depression, the second study uses more closely spaced reports of maternal depression and child conduct problems to examine transactional effects over time. In both cases we chose to focus on child conduct problems as the child factor because of their greater frequency among boys (Keenan & Shaw, 1997) and their critical role in coercive transactional cycles of parent-child interaction (Patterson, 1982).

Both studies use data from the Pitt Mother & Child Project, for which participating families were recruited from the Allegheny County Women, Infants and Children (WIC) program in the Pittsburgh Metropolitan area (Shaw, Gilliom, Ingoldsby, & Nagin, 2003). The sample was restricted to boys because of the larger study's primary goal, to examine antecedents of antisocial behavior. Initially, 310 mothers and sons participated in the first assessment when the boys were 1.5 years old. As WIC serves income eligible families, the sample was predominantly low SES (i.e., at 1.5 years, mean Hollingshead status was 24.8, indicative of an unskilled working class sample well below the poverty level; per capita family income was \$241 per month and \$2,892 per year), included a diverse sample of European American (51%), African American (36%), biracial (5%), and other (6%, Hispanic, Asian) families. The retention rate has been fairly high, with 94% of the original sample of 310 families participating in at least one of the assessments from ages 10 and 15.

Procedures for both studies covered similar assessment points, with study one also including observations of child disruptive behavior at 1.5 years and teacher reports of conduct

Comment [s1]: AN AVERAGE INCOME OF LESS THAN \$3000 A YEAR IS WELL BELOW WORKING CLASS, AND WELL BELOW THE POVERTY LEVEL AS WELL.

problems during early adolescence, and study two including parent reports of child conduct problems from ages 2 to 8 and youth reports of antisocial behavior from ages 10 to 15. Mothers and target children were seen either in the laboratory and/or home when the children were aged 1.5, 2, 3.5, 5, 5.5, 6, 8, 10, 11, 12, and 15 years old.

Study One: Toddler Predictors of Maternal Trajectories of Depression and Adolescent Antisocial Behavior

In the first study we used a long-term perspective to identify early forms of child disruptive behavior that might be associated with trajectories of maternal depression that we hypothesized would be related to subsequent youth and teacher reports of child antisocial behavior during adolescence. These child behaviors were negative emotionality, non-compliance, and aggression (see Figure 1). We also examined adolescent internalizing problems as an outcome variable to address the issue of specificity of associations between maternal depression and later child adjustment. Trajectories of maternal depression were generated using a semi-parametric modeling technique (Nagin, 2005) covering an eight and a half year span when children were between 1.5 and 10 years old. Child disruptive behaviors at 1.5 years were selected based on their potential for affecting maternal well being during a time when parenting efficacy has been shown to be at a low point during early childhood (Fagot & Kavanagh, 1993). Finally, completing the transactional cycle, we tested whether more persistent and severe trajectories of maternal depressive symptoms would be associated with higher levels of boys' problem behavior during early adolescence. The structure of the design is depicted in Figure 1.

Step one in the analysis was to identify trajectories of maternal depression, following procedures recommended by Nagin (2005). As displayed in Figure 2, the best fitting model included four groups. Groups 1 and 2, comprising the majority of the sample, demonstrated Beck Depression Inventory (BDI) scores suggestive of minimal depressive symptomatology (Beck,

Steer, & Garbin, 1988). Group 1, which we term 'low,' consisted of 25.2 % of the sample who endorsed very few depressive symptoms across all time points averaging about two across the eight time points. Group 2, which we term 'moderate low,' included 45.7% of the sample and was characterized by a consistent pattern of moderately low depressive symptoms, averaging about six across eight time points. Group 3 included 21.8 % of mothers that were 'moderate high.' In number of symptoms averaging about 12 across the time points, but showing a slight decrease from 13 at age 1.5 to 11 at age 10. Group 4, which included only 7.3% of the sample, was termed the 'high chronic group', with scores suggestive of moderate to severe levels of depression at all time points averaging over 20 symptoms.

With trajectory groups of maternal depression identified, we then sought to test the first path in the model in Figure 1, examining associations between the different indices of observed child disruptive behavior (i.e., aggression, noncompliance, negative emotionality) observed at age 1.5 and trajectories of maternal depression from ages 1.5 to 10. Initially, we conducted a series of ANOVAs to examine associations between trajectory group membership and individual child risk factors. Although there were significant group differences in the expected direction for each of the three types of child disruptive behavior, noncompliance showed the most consistent pattern of results, with children of mothers in the high chronic and moderate high depression groups found to have significantly higher noncompliance scores than children of mothers in the low group .

We then explored the second path in the model, between trajectories of maternal depression and adolescent problem behavior, using a series of ANCOVAs, in which youth reports of antisocial behavior and teacher reports of externalizing and internalizing symptoms were explored with respect to maternal depression group, controlling for observed child noncompliance at 1.5 years. The pattern of results revealed that for both youth and teacher

reports of antisocial/externalizing, sons of mothers in the moderate high depression group showed significantly higher levels of problem behavior than sons of mothers in the low and moderate low depression groups. Although means were in the expected direction, differences between the persistent high depression group and child externalizing failed to attain statistical significance. No significant differences were found with respect to teacher reports of internalizing for the persistent high or moderate high in relation to the low and moderate low depression groups.

The results from this study were consistent with a transactional perspective of developmental psychopathology that has emphasized the dynamic interplay between child and parenting characteristics, and subsequent increased risk for child maladjustment (Bell, 1968; Patterson, 1982; Sameroff & Chandler, 1975). When different types of disruptive child behaviors were examined at age 1.5 within a multivariate framework controlling for family SES and income, observed child noncompliance contributed significant variance to high and persistent trajectories of maternal depression trajectory group. In turn, moderately high trajectories of depression were related to subsequent youth reports of antisocial behavior and teacher reports of externalizing, but not internalizing symptoms. While there were some caveats to the consistency of the pattern of findings discussed below (i.e., why were not persistently high trajectories of maternal depression related to boys' later antisocial behavior?), the overall pattern is consistent with Sameroff's model of development emphasizing mutually constructive dynamic interplay between children and their primary socializing agents.

Study One: Child Effects on Trajectories of Maternal Depression

In Study One, child noncompliance was found to be the most consistent predictor of maternal trajectory group status, with child aggression and infant negative emotionality showing few or no significant effects when examined within a multivariate framework. In studies of

preschool and school-aged hyperactive children, many of whom exhibit high rates of noncompliance, noncompliant and oppositional behaviors in children have been found to create substantial distress for parents (Barkley, Karlsson, & Pollard, 1985; McKee, Harvey, Danforth, Ulaszek, & Friedman, 2004). In addition, in interactions with hyperactive and noncompliant children, parents display more disapproval, are more negative and reprimanding, use more physical punishment, and are less responsive (Johnston & Mash, 2001; Woodward, Taylor, & Dowdney, 1998).

Although it was not surprising to find oppositional behavior to be associated with trajectories of maternal depression, we were somewhat surprised that child aggression and negative emotionality were less consistently associated with trajectories of maternal well being. Part of the reason for the difference may involve the greater frequency of noncompliance demonstrated by toddlers compared to rates of aggression and severe bouts of negative emotionality, a difference that has been corroborated in our laboratory-and home-based assessments with toddlers and parents. Thus, we suspect that oppositional and defiant child behaviors are likely to have a greater cumulative effect on parental mood than less frequent incidences of physical aggression or less intense bouts of negative emotionality during the second year. The timing of our assessment might have also affected the magnitude of effect for negative emotionality, as previous research has shown it to be a correlate of elevated maternal depressive symptoms during the first year of life before children show increased levels of aggressive and noncompliant behavior (Gelfand & Teti, 1990; Murray et al., 1996b).

Study One: Effects of Maternal Depression on Later Youth Antisocial Behavior

Turning to the analyses that linked trajectories of maternal depression to boys' later antisocial behavior, consistent with the extant literature, we found that higher levels of maternal depressive symptoms were associated with both youth and teacher reports of antisocial outcomes

at ages 11-13 (Munson, McMahon, & Spieker, 2001; Zahn-Waxler et al., 1990). Although sons of mothers with high chronic trajectories of depressive symptoms showed somewhat higher levels of youth- and teacher-reported antisocial behavior in early adolescence, it was only the sons of mothers in the moderate high group who consistently demonstrated significantly higher levels of antisocial outcomes when compared to boys whose mothers had low and moderate rates of depressive symptoms. While somewhat paradoxical, this finding is consistent with a model posited by Rutter (1990), who has suggested that children with chronically depressed parents may be less impaired than those with chronic but more moderate symptom levels. Accordingly, Rutter has suggested that offspring of mothers who are chronically depressed are better able to understand their parents as 'ill' and as result may learn to rely more heavily on others and themselves to develop adaptive coping skills and better social functioning (Petersen et al., 1993). In contrast, when parents show a less severe, albeit a persistent and moderate course of symptoms, children may continue to expect mothers to be the primary source of support and model for developing emotion regulation skills.

Regarding child effects on maternal depressive symptoms, while we do not wish to advocate that early forms of disruptive child behavior are a primary cause of maternal depression, the findings do suggest that aversive child behaviors might merit consideration as one of a constellation of intrapersonal (e.g., rumination) and interpersonal (e.g., social support) factors previously found to affect the course of depression (e.g., Nolen-Hoeksema, 1991). Of course, without reports of maternal depression during their child's infancy or the prenatal period, it also remains unclear how early maternal depressive symptoms might have been associated with negative emotionality, noncompliance, or aggression at age 1.5. As there is no correct "starting point" in capturing the genesis of reciprocal effects between mothers and their children, this study should be considered only a representative "slice" of a transactional process.

Nonetheless, as previous literature has placed little emphasis on how child factors might have an impact on the course of maternal depression after the first year of life (Forbes et al., 2006; Murray et al., 1996b), the findings suggest child disruptive behavior might be an informative risk factor to assess among mothers showing high levels of depressive symptoms. It is somewhat surprising that child effects are not considered more heavily in assessing risk of maternal depression for families with toddler-age children based on the high levels of oppositional and defiant behaviors exhibited during the ‘terrible twos’ (Shaw & Bell, 1993).

Study Two: Transactional Effects between Maternal Depression and Child Conduct Problems and Antisocial Behavior from Toddlerhood to Adolescence

In study one, we used more of a macro approach to examine how early child disruptive behavior may be related to trajectories of maternal depression and in turn, subsequent adolescent antisocial behavior. In contrast, the second study was designed to more explicitly examine the validity of Sameroff’s original transactional model, exploring parent and child effects of maternal depression and child conduct problems, respectively, between ages 1.5 and 8, and using a youth report measure of antisocial activities to examine similar transactional processes between ages 10 and 15. As depicted in Figure 3 for the earlier age period, the model controls for autoregressive effects of maternal depression and child externalizing at each age and simultaneously addresses how much variance is contributed across variables to the next assessment of maternal depression and child conduct problems. Latent growth curve modeling (LGCM) and structural equation modeling were used to carry out these analyses. LGCM was used initially to identify whether there were changes in maternal depression or boys’ conduct problems over time for both age periods (Bryk & Raudenbush, 1987). We then investigated whether sons’ externalizing and mothers’ depression were related to one another over time, generating cross-lagged associations between maternal depression and boys’ externalizing in an

autoregressive path model, controlling for stability of each construct by simultaneously regressing temporally-later scores on earlier ones (e.g., maternal depressive symptoms at age 10 were regressed upon child externalizing symptoms at age 8). Significant cross-lagged paths indicate the timing of child effects on maternal symptoms, and maternal effects on child problem behaviors.

Model 1: Ages 1.5 to 10

Initially, the best fitting model for growth in maternal depression from child ages 1.5 to 10 was found to be quadratic, with mothers reported initially moderately high levels of depression, followed by gradual declines by age 10. For boys' growth of conduct problems, a cubic model was found to have the most optimal fit. On average, boys' initially high levels of externalizing problems at age 2 increased further by age 3.5, then subsequently declined to age 10.

Second, an autoregressive path model was fitted to examine the potential for child effects on maternal depression and of maternal effects on sons' conduct problems. In this model, which controls for the stability of each construct, we examined the cross-lagged associations between maternal depression and child conduct problems. As displayed in Figure 4, the results indicated that five of the six paths from maternal depression to boys' subsequent conduct problems were significant. Maternal levels of depression at ages 1.5, 2, 3.5, 5, and 6 years were positively related to higher levels of boys' later conduct problems at ages 2, 3.5, 5, 6, and 8 years, respectively. In contrast, only two of six paths from boys' conduct problems to maternal depression were significant; boys conduct problems at ages 3.5 and 5 were positively related to maternal depression at 5 and 6 years, respectively.

Model 2: Ages 10 to 15

The same procedures were then used to examine growth curves and auto-regressive

models between maternal depression and boys' reports of antisocial behavior between ages 10 and 15. The best fit of growth in maternal depression during this period was a linear model, with a modest positive, albeit nonsignificant, slope between ages 10 and 15. For boys' antisocial behavior, a quadratic function provided the best fit; boys' average initial antisocial behavior was low, remained relatively stable through age 12, and then increased markedly between ages 12 and 15.

Results of the autoregressive model during the early adolescent period were similar to those found in early and middle childhood. As shown in Figure 5, two of the three paths from maternal depression to boys' antisocial behavior were significant predictors, such that higher levels of maternal depression at ages 11 and 12 were predictive of boys' later self-reported antisocial behavior at ages 12 and 15, respectively. In comparison, only one of three paths from boys' antisocial behavior to maternal depression was significant; higher levels of boys' ASB at age 11 were associated with higher levels of maternal depression at age 12.

These results were less consistent, albeit not absent, in demonstrating that child conduct problems in early childhood and antisocial activities in early adolescence were related to crossing the intrapersonal barrier and affecting later maternal depressive symptoms. In contrast and in accord with previous research, current levels of maternal depression were a consistent predictor of subsequent child conduct problems (Beardslee et al., 1998; Gelfand & Teti, 1990). While the percentage of significant associations between maternal depression and later child behavior might have been inflated because of reporter bias in the early-middle childhood model (i.e., 5 of 6 correlations were significant) when mothers reported on both their own depressive state and child conduct problems (Fergusson, Lynskey, & Horwood, 1993), a similar percentage (i.e., 2 of 3) of significant cross-lagged correlations emerged during early adolescence when youth reported on their antisocial activities. In contrast, in only 33% of cases during early-middle

childhood and early adolescence (i.e., 2 of 6 and 1 of 3 instances, respectively) were child effects evident in relation to the next assessment of maternal depression using the same and different reporters of child disruptive and antisocial behavior.

Study Two: The Timing of Reciprocal Effects of Maternal Depression and Child Conduct

Problems

In Study Two, we expected that parent and child effects would be more prominent in periods of physical and social transition than was supported by the data. Maternal depression was most strongly related to child externalizing behavior in toddlerhood. Parent effects were still significant, although slightly weaker, during the transition to middle childhood. Finally, during the transition to early adolescence, associations between maternal depression and boys' delinquent behavior were once again evident.

The current findings were generally consistent with the premise that child effects would be found during times of physical and social transition for children, but there were exceptions to this expected trend. For instance, consistent with the results from Study One, we expected to see child effects on maternal depression during the 'terrible twos,' but such associations were not evident until later in the preschool period (i.e., age 3.5). The discrepancy in findings might be at least partially due to the measurement of different behaviors (narrow versus broader indices of disruptive behavior), the use of different informants (i.e., observers versus mothers) and different periods of time to assess child disruptive behavior (i.e., several minutes versus several months) in the two studies. Future studies examining child effects on maternal well being may want to focus on a narrower range of child disruptive behaviors that are aversive, frequently occurring (i.e., noncompliance is the hallmark of the terrible twos), and possibly more sensitive to mothers prone to experience elevated rates of depressive symptoms.

Discussion

In describing the process of raising a son by herself, a mother participating in Mavis Hetherington's study on divorce and children's adjustment described the process akin to 'being pecked to death slowly by ducks' (M. Hetherington, personal communication, 1984). Indeed, much of the research on coercive processes was developed based on anecdotal and scientific reports of noxious interactions male children have with their mothers (Patterson, 1982). Similarly, theories on the determinants of parenting have postulated that the quality of caregiving practices can be compromised by individual differences in child problem behavior and maternal well being (Shaw & Bell, 1993). Our work sought to expand our understanding of dyadic processes between mothers and sons by applying a bidirectional perspective to the issue of maternal depression and child disruptive behavior from early childhood through adolescence. In essence, we sought to address the question of whether having a disruptive child affected internal states of maternal well being, and in turn whether levels of maternal depression were associated with later indices of child disruptive and antisocial behavior. In accord with Bugental's work (see Chapter 3), we are fairly confident that maternal depression bodes poorly for parenting competence and in early childhood is associated with risk of conduct problems in middle childhood (Shaw, Bell, & Gilliom, 2000). The question then becomes whether living with a disruptive child appears to cross the intrapersonal boundary of being more than an irritant for mothers, and actually is related to future levels of depressive symptoms. In accord with reciprocal (Bell, 1968) and transactional (Sameroff, 1995) models, we designed these two studies with the expectation that child effects would prove to be consistent predictors of later maternal depression. Some of the results from both studies were consistent with our hypothesis; however, this was not uniformly the case particularly in Study Two, which represented a more proximal test of the original transactional model.

Broader Issues and Future Directions

While results from Study One indicate support for transactional effects across broad periods of time and results from Study Two provide a more micro-level perspective across one- to two-year periods, the current results do not address specific mechanisms by which symptoms of maternal depression and child conduct problems might affect one another. Such mechanisms may be evident by examining moment-by-moment observations of parent-child behavior (see Chapter 2). A number of investigators have suggested and found support for the notion that associations between parental depression and child adjustment are mediated by parenting, specifically tendencies for depressed mothers to be negative, critical, unresponsive, helpless, and low on positivity towards offspring (Goodman & Gotlib, 1999; Zahn-Waxler, Iannotti, Cummings, & Denham, 1990). More intensive examinations of this process also provide some support for this notion. For example, a recent study by Shaw and colleagues (2006b) explored mothers' contingent responses to their children's expression of emotions. They found that mothers with a history of childhood-onset depression (COD) showed less contingent responsiveness to their child's expression of sadness and distress than non-COD mothers. Additional research is needed to more intensively uncover the processes by which parent-to-child *and* child-to-parent effects influence child conduct problems and maternal well being, respectively, as well as child (see Fontaine & Dodge chapter in this volume) and maternal (see Bugental chapter in this volume) interpretations and representations of their partner's behavior.

In addition, as children spend more and more time outside of the home interacting with peers and nonrelated adults and relatively less time interacting with parents with the onset of formal schooling, it is logical that transactional models target changes of emphasis in children's developmental stepladder of socialization by focusing on interactions children have with peers and other important adults in their daily lives. Dishion and colleagues' (1999) work on peer contagion in relation to deviancy training with adolescents and Snyder and colleagues' (in press)

recent extension of this work to school-age children using playground observations, provide examples of extending a transactional perspective to developmentally critical phenomena. Future research on school-age children and adolescents would benefit by incorporating the study of interpersonal exchanges with peers (e.g., reinforcement of deviant behavior) with children's intrapersonal representations, *and* observing these reciprocal processes unfold longitudinally (e.g., examining the effects of social information processing on later deviancy training, and exploring the effects of deviancy training on later social information processing).

Another question raised by these findings is whether there are other child behaviors in addition to child externalizing symptoms that are related to increases in maternal depression. For example, Jaffee and Poulton (2006) found boys' symptoms of anxiety and depression to be related to maternal internalizing symptoms, rather than externalizing problems. Other unexplored child characteristics that may affect maternal well-being and warrant investigation include medical or pervasive developmental disorders (e.g., mental retardation, autism), and child academic and peer-related difficulties.

Limitations

There are a few significant methodological limitations to both studies. First, participants were primarily low-income European and African American boys living in an urban setting. Some research suggests that there are gender differences in how children are affected by maternal depression. For example, Leve et al. (2005) found that the association between maternal depressive symptoms and later outcomes varied by gender, with elevated maternal depressive symptoms uniquely predicting increases in internalizing symptoms for girls and increases in boy's externalizing symptoms when boys' impulsivity was low. Similarly, child effects on maternal depression may vary by gender. Steinberg (2001) found that in adolescence, parental distress from parent-child conflict was more intense for parents whose adolescent is the same

sex. Jaffee and Poulton (2006) found that in middle childhood and early adolescence, girls' antisocial behavior predicted increases in maternal depression but boys' antisocial behavior did not. Moreover, it is not clear if these results would have been replicated for children living in rural or suburban contexts. Finally, we cannot rule out the role of possible 'third variables' at age 1.5 or during the age period from ages 1.5 to 10 when maternal depressive symptoms were measured. Incorporating measurement of other child (e.g., inhibitory control) or parent (e.g., caregiving quality) factors, or extra-familial socializing agents (e.g., teachers at school, peers in the neighborhood or at school) might provide additional insight into the underlying mechanisms by which reciprocal and transactional associations emerge.

Clinical Implications

The results of both studies are consistent with the robust finding in the existing literature that higher levels of maternal depressive symptoms are associated with poor outcomes in children. This finding coupled with our finding that maternal depressive symptoms were relatively stable over time and related to more serious forms of antisocial behavior in adolescence indicate the need for early identification and preventive interventions (Olds, 2002; Shaw, Dishion, Supplee, Gardner, & Arnds, 2006). In addition, the significant child effects of externalizing problems on increases in maternal depressive symptoms during the terrible two's in Study One and during the transition to middle childhood (ages 3.5 to 5) and adolescence (ages 11 to 12) in Study Two, suggest that mental health clinicians working with depressed mothers include an assessment of child behavior and its impact on maternal well being for mothers of youth approaching school-age and adolescence.

In sum, these findings provide novel information about the transactional processes between child conduct problems and maternal depression examining both relatively short- and long-term bidirectional effects spanning from early childhood through early adolescence. The

results shed new light on transactional processes in a sample of mothers who showed above average rates of depressive symptoms and boys who exhibited elevated rates of problem behaviors throughout childhood and adolescence.

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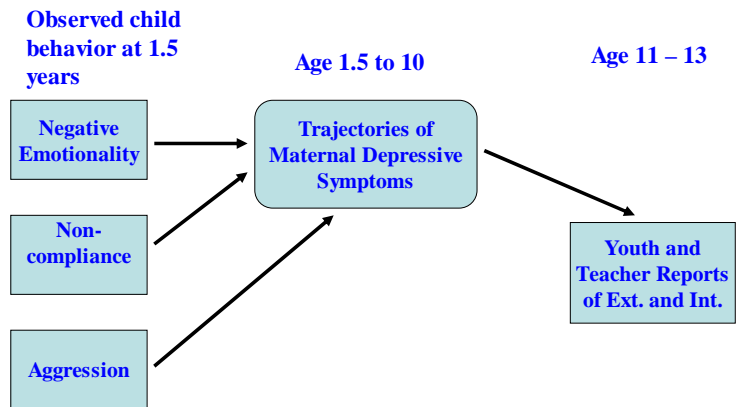
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Study 1: Transactional Processes between Child Disruptive Behavior and Maternal Depressive Symptoms



Trajectories of Maternal Depressive Symptoms from ages 1.5 to 10 (Beck Depression Inventory)

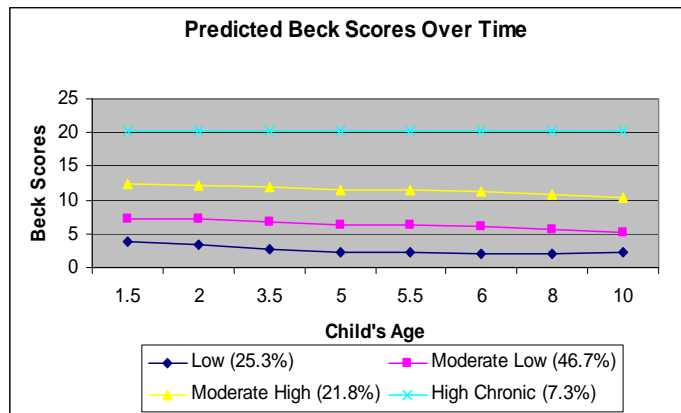


Figure 3

Hypothesized Transactional Model between Maternal Depression and Child Conduct Problems: Ages 1.5 to 10

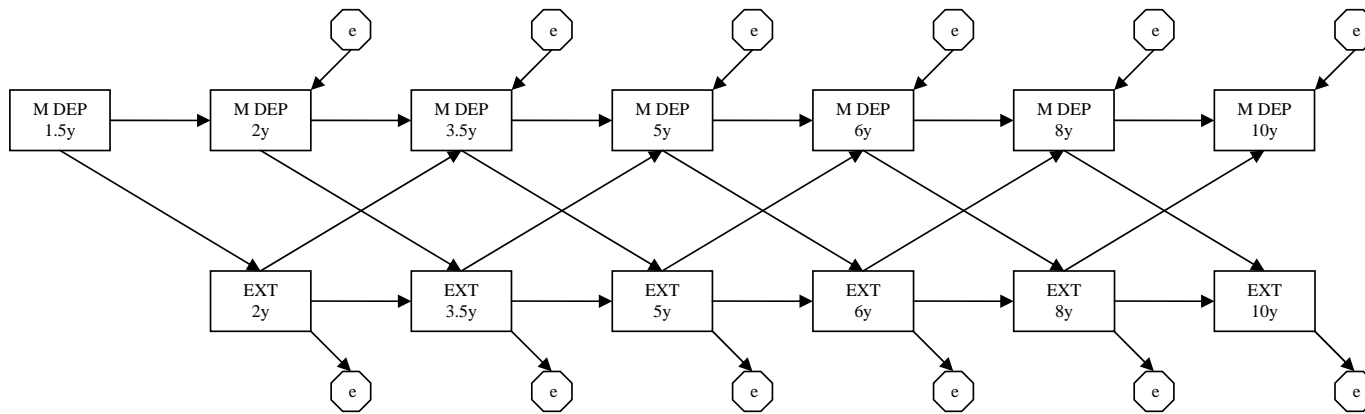
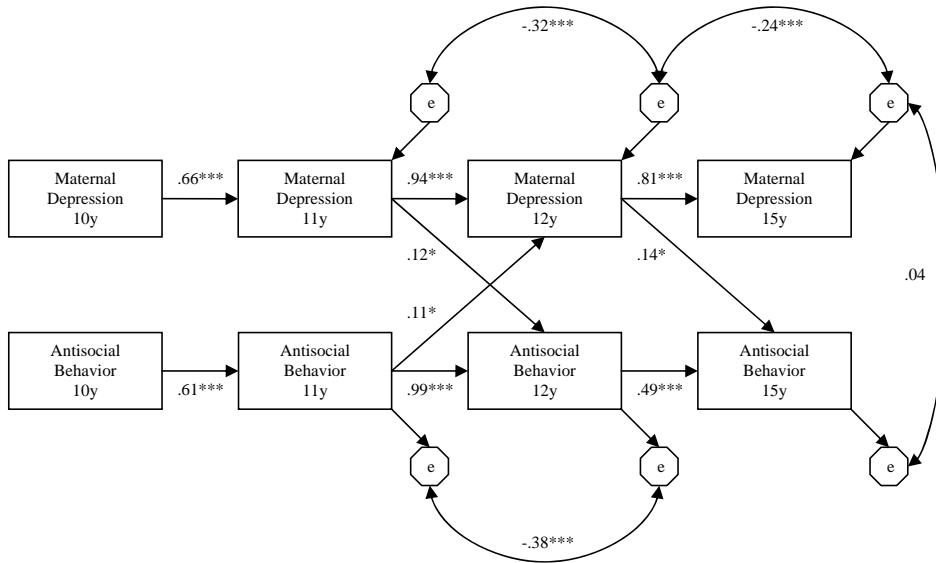


Figure 5

Autoregressive Model (Replication from Boys' Ages 10 to 15 Years)



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