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A LONGITUDINAL STUDY OF THE RELATION BETWEEN DEPRESSION AND PARENTING

A Thesis Presented

by

PAULA A. ERRAZURIZ ARELLANO

Submitted to the Graduate School of the
University of Massachusetts Amherst in partial fulfillment
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Clinical Psychology

A LONGITUDINAL STUDY OF THE RELATION BETWEEN

DEPRESSION AND PARENTING

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DEDICATION

Para Esteban y Lisa, por su apoyo, compañía y cariño.

ABSTRACT

A LONGITUDINAL STUDY OF THE RELATION BETWEEN

DEPRESSION AND PARENTING

MAY 2008

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Depression in mothers is an important risk factor for behavioral and emotional problems in their children (Elgar, McGrath, Waschbusch, Stewart, & Curtis 2004), and disrupted parenting is thought to mediate the influences of maternal depression on children. This 4-year longitudinal study examined whether mothers' depression predicted parenting of children with behavioral problems across the preschool years. This study attempted to tease apart the correlates of enduring, chronic maternal depressive symptoms from those of transient depressive symptoms on parenting during the preschool years. In particular, it sought to predict both changes in parenting across the preschool years as well as to predict parenting practices as parents and children emerge from the preschool years. Participants were 199 mothers of 3-year-old children, with behavior problems who completed measures of depression and parenting yearly until children were 6 years old. Mothers with higher average depressive symptoms across the preschool years reported more overreactivity and laxness, and showed less warmth when

their children were 6 years old. These mothers were also more likely to increase their self-reported overreactivity over time. Increases in depression were associated with increases in overreactivity and laxness, but not in warmth. These results provide stronger evidence than previous cross-sectional studies for a causal relation between depression and parenting, and point to the importance of providing adequate treatment and support to depressed mothers of preschool children.

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CHAPTER I

THEORETICAL FRAMEWORK

The strategies that parents choose for nurturing and controlling their children define their parenting style (Anderson & Sabatelli, 2003). Nurturance, which is the degree of warmth, support, and acceptance that parents display toward their children, runs on a continuum from the expressions of love, warmth, and affection, to expressions of rejection (Rohner, 1986). Control refers to how much control parents exert over their children's behavior, and how this control is achieved. Baumrind (1966) used these dimensions to categorize parenting style as authoritarian, permissive, or authoritative. Parents with an authoritarian style attempt to control their child's behavior to match a rigid set of standards, and tend to use punitive and forceful disciplinary methods. Permissive parents, on the other hand, exercise little or no control on their child's behavior, imposing little restrictions on children and giving them vast personal freedom. Finally, authoritative parents are nurturing, use mainly positive reinforcement to control their children, and are aware of the child's thoughts, feelings and developmental capabilities. These parents combine both emotional warmth and control, with reason and open dialogue (Baumrind, 1966). In 1983, Macoby and Martin expanded Baumrind's model to include neglecting parenting. Parents with neglectful parenting style were described as unresponsive to the needs, feelings, and activities of their child. These parents are disengaged from child rearing responsibilities and exert little control over the child's behavior.

There is evidence that different parenting styles are associated with different child outcomes. In a review of the research available at the time, Baumrind (1966) found that

punitive, hostile, and non-empathic disciplinary practices were associated with cognitive and emotional disturbances in children, including hostile withdrawal, hostile acting out, dependency, nervousness, personality problems, and reduced schoolroom efficiency. Later research has also linked both authoritarian (harsh, overreactive) discipline and permissive (lax) discipline to child behavior problems (see Kendziora & O'Leary, 1993 for a review). On the other hand, parenting styles that are warm, supportive, exercise logical reasoning, clear communication, appropriate monitoring and involvement, are associated with positive developmental outcomes in children (see Anderson & Sabatelli, 2003 for a review).

The parenting style that a particular parent will use with his or her child is determined by many different factors. Belsky (1984) organized the multiple determinants of parenting style into three domains: parent's psychological resources, characteristics of the child, and contextual sources of stress and support. Of the three domains, parents' psychological resources are thought to be the most effective in protecting the parent-child relation from stress, followed by contextual sources of support, which are in turn more effective than characteristics of the child (Belsky, 1984). Thus, the presence of psychological problems in parents diminishes the possibility of successfully meeting the physical, psychological, and social needs of their children.

Research has consistently found that depression, which is a common mental disorder among mothers of young children, increases the risk of emotional and behavioral problems in children (Elgar, McGrath, Waschbusch, Stewart, & Curtis, 2004). Children of depressed mothers are at increased risk for a full range of adjustment and socioemotional problems, including depression, internalizing problems, poor cognitive

development, and attachment insecurity (Cicchetti, Rogosch, & Toth, 1998; Downey & Coyne, 1990; Marchand & Hock, 1998; Murray, Hipwell, Hooper, Stein, & Cooper, 1996; Teti, Gelfand, Missinger, & Isabella, 1995). Maternal depression is also associated with externalizing behavior problems, including ADHD (Befera & Barkley, 1985; Elgar et al., 2004). Although most research linking maternal depression with child outcomes has been correlational, a small body of experimental research has documented the effects of maternal negative mood on infant and toddler behavior (Cohn & Tronick, 1983; Seiner & Gelfand, 1995; Zekoski, O'Hara, & Wills, 1987). Note, however, that although this relationship is typically conceptualized as maternal depression influencing children's emotional and behavioral problems, there seem to be different mechanisms through which maternal depression and child adjustment problems may influence each other. These include biological mechanisms (genetics, in utero environment), psychosocial mechanisms (attachment, child discipline, modeling and family functioning), and social capital mechanisms (social resources, social support) (Elgar et al., 2004).

Parenting has received a great deal of attention in the literature as a possible mediator between depression and child outcome, which has been supported by empirical studies. Research has demonstrated that depressed caregivers demonstrate impairment in parenting, showing deficient modeling of social skills and constructive coping; relational disturbances; low nurturance and sensitivity; angry, negative and retaliatory behavior; intrusiveness; and ineffective conflict resolution (see Zahn-Waxler, Duggal, & Gruber, 2002, for a review). The association between depression and parenting appears to be strongest for negative maternal behavior toward the child, such as hostility and irritability, with weaker links with disengagement from the child (Lovejoy, Graczyk,

O'Hare & Newman, 2000). Observational studies have corroborated mothers' self-report, demonstrating that depressed mothers tend to be more hostile and negative toward their children (e.g., Cohn, Campbell, Matias & Hopkins, 1990; Lovejoy, 1991), and are more likely to use harsh, hostile, and coercive parenting styles, sometimes alternating with lax under-control, and anxiety and guilt-induction (Zahn-Waxler et al., 2002). Moreover, there is some experimental evidence supporting a causal relation between depressed mood and parenting. When negative mood is induced in mothers, they issue fewer positive statements toward their children, engage in less verbal interaction (Jouriles, Murphy, & O'Leary, 1989), and are less successful in eliciting positive responses from their infants (Zekoski et al., 1987).

The relation between depression and parenting may depend on the depression's timing and chronicity. Cross sectional studies show that timing of depression appears to moderate the effects on negative maternal behavior, with current depression having larger effects than past depression. Nevertheless, prior depression appears to have enduring effects on mothers' parenting behavior. Mothers who reported lifetime depression and were not currently depressed were found to be more negative and coercive in their parenting than women with no history of depression (Lovejoy et al., 2000). At the same time, depression is more strongly associated with difficulties in parenting when the depression's duration is longer (Campbell, Cohn, & Meyers, 1995). Since general impairments do not necessarily disappear between depressive episodes, parenting of depressed mothers may be continuously problematic despite the episodic nature of depression (Zahn-Waxler et al., 2002).

There are a number of possible mechanisms that may account for the relation between depression and parenting. Depression, as well as other mental disorders, may make it difficult for the mother to meet her own increased needs, while at the same time meeting the child's needs with warmth and sensitivity (Zahn-Waxler et al., 2002). Negative emotions, such as anger and sadness, may play an important role in how depression affects parenting, increasing parents' tendency to withdraw and resist their children, and decreasing their connection and responsiveness (Dix, Gershoff, Meunier, & Miller, 2004). In addition, evidence suggests that depressed mothers' negative social cognitions may partly explain their parenting difficulties (Zahn-Waxler et al, 2002), and that negative attribution of child behavior may mediate the relations between maternal depressed mood and children's psychological problems by promoting "harsh parenting practices" (Geller & Johnston, 1995). The relation between depression and parenting may also be partly accounted for by third variables. For example, child effects may elicit both negative parenting practices (Elgar et al., 2004) and depression (Marchand, Hock, & Widaman, 2002).

Even though research has advanced greatly in understanding the relationship between depression and parenting, every study has compared groups of depressed mothers to groups of non-depressed mothers. Many of these studies control for socioeconomic status, child characteristics, and contextual sources of stress and support. However, there may be differences between depressed women and non-depressed women that have not been considered, such as early experiences and personality patterns. For example, research has shown that women who experienced maternal or paternal separation in childhood or adolescence have an increased risk for major depression

(Kendler, Neale, Kessler, & Heath, 1992). In addition, women who have suffered early childhood abuse, neglect or sexual abuse are more likely to suffer depression (Gabbard, 2001). Moreover, personality patterns, such as inhibited expression of anger and guilt, poor psychological communication with significant others, and difficulty with self-esteem, form part of a person's predisposition to depression (Weissman, Markowitz, & Klerman, 2000). Thus, women with more depressive symptomatolgy may be different from women who experience lower levels of depressive symptomatology in various ways that may affect their parenting. Therefore, the differences in parenting between depressed and non-depressed mothers may be partly explained by these variables and not depression itself. Cross-sectional, between-subjects designs cannot tease this apart. Thus, a longitudinal study is important to determine whether parenting changes as a function of depression and would provide stronger support for a causal link between depressive symptomatology and parenting.

Understanding the relation between depression and parenting in a group of children at risk of developing behavior problems is particularly important. Research has found that developmentally abnormal levels of behavioral problems are present in pre-school children (Keenan & Wakschlag, 2004), and that approximately half of young preschool-aged children will go on to meet criteria for a behavior disorder at school-entry (Campbell, Ewing, Breaux, & Szumowski, 1986). Furthermore, behavioral problems during the preschool years are associated with parenting difficulties (e.g., Wakschlag & Keenan, 2001). Parents of children with behavioral problems have been found to use more rejection, coercion, lax, inconsistent, controlling, restrictive, and overreactive parenting than parents of non-problem children (Cunningham & Boyle, 2002; Goldstein,

Harvey, & Friedman-Weieneth, in press; Keown & Woodward, 2002; Lindahl, 1998; Stormont-Spurgin & Zentall, 1995;). Research has shown that the preschool period is a critical time during which some children outgrow their problems while others don't (Campbell et al., 1986), and parenting may be a key determinant of who outgrows problems. Since maternal depression has been found to predict future conduct problems in young children with behavioral problems (Chronis, Lahey, Pelham, Williams, Baumann, Kipp, Jones, Rathouz, 2007), understanding how maternal depression may affect the parenting of preschool aged children who are at risk for behavior disorders is particularly important.

The Present Study

The present study examines for the first time how depressive symptomatology in mothers relates to parenting over time using longitudinal data. The main question of this study is: *Does mothers' self-report of depression predict self-reported overreactivity, self-reported laxness, observed warmth, observed laxness, and observed negative affect in parenting of children with behavioral problems across the preschool years?* In examining this question, we distinguish between the effects of enduring depression that may represent more stable, chronic depression, from the effects of more transient episodes of depressive symptoms that mothers may experience. In particular, the following questions are addressed:

a) *Do mothers' average depression levels (enduring depression) across the preschool years predict their later parenting at age 6?* It was predicted that mothers with higher levels of depression across the preschool years would show more overreactivity, laxness, and negative affect, as well as less warmth, at age 6.

b) *Do mothers' average depression levels (enduring depression) across the preschool years predict changes in parenting over this period?* We predicted that less depressed mothers would be more likely to show positive changes in parenting over time, including decreases in overreactivity, decreases in laxness, decreases in negative affect, and increases in warmth.

c) *Do mothers' changes in depression symptomatology predict changes in parenting over time?* It was predicted that increases in depression over time would be associated with increases in overreactivity, laxness, and negative affect, and decreases in warmth.

CHAPTER II

METHOD

Participants

Participants were 199 children and their mothers who had been taking part in a 4-year longitudinal research project investigating the early development of ADHD and ODD. Target children were 3 years old at the time of the first assessment, and were assessed every year until they were 6 years old. One hundred and seven children were male (53.8%) and 92 children were female (46.2%). Fifty-nine percent of the mothers identified themselves as European-American (non-Hispanic), 25% as Latino (predominately Puerto Rico), 13% as African American, 1% as Asian, and 2% as multi-racial (i.e., identified with two or more races/ethnicities). At the beginning of the study, 31% of the mothers were single, with an average age of 32 (SD = 6.99), average years of education of 13.29 (SD = 2.87), and a median combined family income of $47,108. Parenting and depression data were collected from 184 of these mothers at Time 2, 161 at Time 3, and 164 at Time 4.

Procedure

All participants were recruited through state birth records, pediatrician offices, childcare centers, and community centers throughout western Massachusetts. Letters describing the study and questionnaires were distributed to parents of 3-year-old children during visits to their pediatricians' offices, and mailed to parents of 3-year-old children using information from state birth records. One hundred ninety-nine children with significant externalizing (hyperactivity and/or aggression) problems were recruited from the 1752 families who completed the screening and agreed to participate in a 4-year

longitudinal study of young children's behavior problems. Eligible families were assessed during yearly home visits, and each parent was paid for their time. During home visits, doctoral students in clinical psychology and undergraduate research assistants collected data from the families through parent interviews, questionnaires, child cognitive testing, and observation of parent-child interaction. For Spanish-speaking families, bilingual staff conducted home visits and questionnaires were in Spanish. The following measures were the focus of the present study:

Measures

Demographic Information. Mothers provided information about their race/ethnicity, education, age, marital status, and family income. Education level was coded in terms of years of education completed.

Assessment of Parenting. Mothers' self-report of parenting was assessed using the Parenting Scale (Arnold, O'Leary, Wolff, & Acker, 1993), which is a 30-item self-report scale of parental discipline. This measure has demonstrated good validity and reliability (Coefficient alpha of .84, and test-retest correlation of .84, for Total scores) both in a preschool sample (Arnold et al., 1993) and an elementary school sample including children with ADHD (Harvey, Danforth, Ulaszek, & McKee, 2001). Factor analyses from these two studies reveal both Overreactivity and Laxness factors for parents of both younger and older, in both clinical and non-clinical samples. Arnold et al. (1993) found that both Overreactivity and Laxness factors correlated significantly with observations of parents' behavior (Spearman Rank-Order Correlations of .65, $p<.01$, for Overreactivity and .61, $p<.05$, for Laxness). In the present study, mothers' scores on overreactivity and

laxness were computed using the factor structure cited in Arnold et al. (1993). On these subscales, higher scores indicate greater difficulty in the parenting role.

Observational assessment consisted of a videotaped structured parent-child interaction. Mothers[1] and their children were videotaped in their homes engaging in a five-minute free play with duplos, followed by clean-up time in which mothers were asked to have their child clean-up the duplos. Trained research assistants coded the warmth, laxness, and negative affect observed in mothers' interaction. Ratings of warmth measure the extent to which the mother is positively attentive to the child, and displays affect, enthusiasm, approval, encouragement and support toward the child. Ratings of laxness reflect a mothers' display of the following behaviors: allowing the rules of the situation to go unenforced, failing to follow through on directives that were met with noncompliance, coaxing or begging the child to behave, and failing to use firm commands and reprimands. Ratings of negative affect indicate mothers' irritation, annoyance, frustration and anger toward the child. Two independent raters, who were unaware of the children's group status, coded each videotape. Ratings were averaged across the two parent-child interaction tasks to obtain a series of parenting scores. Intraclass correlations (ICCs) across the four time points suggested good reliability (average ICCs were .71 for warmth, .70 for laxness, and .74 for negative affect).

Assessment of Maternal Depression: The MCMI-III (Millon, Davis, & Millon, 1997), which is a self-report questionnaire that measures a wide range of adult psychopathology, was used to assess maternal depression. The internal consistency for the MCMI-III scales in a clinical population ranged from .66 to .90; test-retest

[1] For some families, it was the father, who participated in the videotaped interactions. Therefore, we did not have observational assessments for all mothers in the study.

reliabilities ranged from .84 to .96 (Millon et al., 1997). In our study, the full MCMI-III was administered at time 1, and only subscales that assess Major Depression, Dysthymia and Depressive personality were administered at times 2, 3 and 4. A meta-analytic study by Lovejoy et al, (2000) concluded that studies which used diagnostic interviews and self-report measures to define depression yielded similar effect sizes for the association between depression and parenting. The authors suggested that parenting deficits may not be specific to depressive syndrome, and may characterize the difficulties that mothers with subsyndromal depression and/or other psychiatric disorders have with parenting. In order to include less severe depressive symptoms, items from the Major Depression, Dysthymia and Depressive personality scales were included, instead of only using the Major Depression scale. Since the objective of the current study was to analyze changes in depression over time, 8 of the 33 items were not included because they assess symptoms over a long time-frame. Following instructions from MCMI-III manual (Millon et al., 1997), items considered prototypical for the Major Depression scale were double-weighted. Prototypical items from the Dysthymia and Depressive personality scales were not double weight since they represent less severe symptoms. Combined raw scores of these three scales were used, with higher scores indicating greater levels of depressive symptomatology. Since some items were omitted, raw scores (which could range from 0 to 31), instead of base rate scores, were used. Raw scores allowed for an assessment of the absolute change in depression over time rather than relative change.

Analytic Overview

Variable distributions and descriptive statistics were first examined in order to identify skewed distributions and univariate outliers. Self-reported laxness, self-reported overreactivity, observed warmth, and mothers' depression were normally distributed. However, observed negative affect and lax parenting were skewed, defined by a skewness score over 3. Further inspection of these two variables indicated little variability, with most mothers presenting very low levels of negative affect and laxness during the 10-minute observation. Since there did not appear to be sufficient variability for these measures, they were excluded from further analyses. Univariate outliers, with z-scores larger than ± 3.29 and were transformed by replacing their raw score value with the next highest value as recommended by Tabachnick and Fidell (2001). There were 11 outliers for mothers' depression; 3 for overreactivity, 4 for laxness, and no outliers for warmth across the four time-points.

Hierarchical Linear Modeling (HLM; Raudenbush & Bryk, 1992) was used to analyze the relationship of mothers' depression and parenting across the four time points. This technique extends multiple regression analyses for repeated measures that are nested within individuals, making it suitable for longitudinal analyses. Details regarding the models are presented in the results section.

CHAPTER III

RESULTS

Descriptive Statistics

Table 1 presents descriptive statistics for mothers' depression scores, self-reported overreactivity, self-reported laxness, and observed warmth, for each time point. Based on MCMI-III BR scores at the beginning of the study, 14% of the mothers fell in the clinical range on the Major Depression (BR > 75), Depressive Personality (BR > 85), or Dysthymia (BR > 75) subscales, with an additional 8% falling in the subclinical range on one of these scales. Intercorrelations were calculated separately for each of these variables across the four time points[2] to examine their stability over time. There were mostly strong positive correlations across time for mothers' depression scores (ranging from $r = .68$ to .82, all significant at $p < .001$), self-reported overreactivity ($r = .43$ to .66, all significant at $p < .001$), and self-reported laxness ($r = .62$ to .73, all significant at $p < .001$). Mothers' observed warmth was also positively correlated across time points (ranging from $r = .21$ to .45, all significant at $p < .05$,). For each of these variables, averages were calculated across the four time points to yield measures of average depression and parenting for each mother and intercorrelations among these variables and Time 1 demographics were examined (Table 2). Mothers' average depression was positively correlated with average self-reported overreactivity and laxness, and negatively correlated with average observed warmth, years of education, and family income. Observed warmth was not significantly correlated with overreactivity but was negatively correlated with laxness. Overreactivity and laxness were positively correlated. Mothers'

[2] Averages were calculated using all available data; if only one time-point was available, that data point was used for the average for that mother.

years of education and family income were negatively correlated with average self-reported depression and average self-reported laxness, and were positively correlated with observed warmth, but were not significantly correlated with self-reported overreactivity.

Hierarchical Linear Models

To address whether mothers' self-report of depression predicts self-reported overreactivity, self-reported laxness, and observed warmth across the preschool years, hierarchical linear models were constructed separately for each parenting variable. For the level 1 model, the parenting variable was regressed on child's age (centered at age 6 so the intercept would define parenting at age 6), child's age squared (to estimate curvature in parenting trajectories), and depression as a time-varying covariate. Thus, to characterize mothers' parenting trajectories, the level 1 models defined the following parameters: 1) parenting outcomes when children were 6 years old (time 4; the intercept, $\beta 0$); 2) the rate of change in parenting from age 3 to age 6, $\beta 1$; 3) the rate of acceleration or deceleration in parenting outcomes across time (quadratic effect, $\beta 2$); and 4) the relation between changes in mothers' depression and changes in parenting ($\beta 3$). Mothers' enduring depression (time invariant) was calculated by averaging depression across the 4 time points and was included as a level 2 predictor for parenting outcome ($\beta 0$ from the level 1 model), and as a predictor of the rate of change in parenting ($\beta 1$ from the level 1 model). Separating the time-varying and the time-invariant effects of depression on parenting provides information about (a) how enduring depression, averaged across the four time-points, relates to parenting change and outcomes, and (b) how changes in

depression are related to changes in parenting. The strategy we use for separating these two components was first described in Horney, Osgood, & Marshall (1995).

For each parenting outcome, the following steps were completed to construct the final model: 1) the linear effect of time was assessed in the unconditional model with child's age, centered on age 6, as the only level 1 predictor to assess if parenting changed as a function of time; 2) the quadratic effect of time was tested adding child's age squared as a level 1 predictor, and was excluded from the model if insignificant; 3) mothers' depression was included group mean centered as a level 1 time varying covariate (transient depression); 4) mothers' average depression was included grand mean centered as a level 2 predictor (enduring depression); 5) mothers' years of education and family income were included as control variables at level 2. If these demographic variables proved to be insignificant predictors, they were excluded from the model. Table 3 presents the final model for each parenting outcome.

Overreactivity in parenting. There was no significant linear or quadratic effect of time, which means that on average overreactivity did not increase or decrease during the preschool years. However, baseline analyses revealed significant variability in the rate of change of self-reported overreactivity, $\chi^2(179) = 258.92$, $p < .001$, supporting further examination of predictors of this variability. Controlling for mothers' education, family income, and maternal overreactivity when children were 6 years old was predicted by higher mean levels of maternal depression during the preschool years, and mothers' enduring depression was also a significant predictor of change in overreactivity over time. In addition, change in depression was a significant predictor of change in overreactivity.

Laxness in parenting. There was a small, but significant, positive curvature in the trajectory of laxness, suggesting that during the preschool years, laxness in parenting tended to decrease and then increase. Baseline analyses revealed significant variability in the rate of change of self-reported laxness, $\chi^2(179) = 249.29$, $p < .001$. Controlling for mothers' education and family income, maternal laxness when children were 6 years old was predicted by higher mean levels of maternal depression during the preschool years, but mothers' enduring depression was not a significant predictor of change in laxness. Change in depression was a significant predictor of change in laxness.

Warmth in parenting. There was no significant linear or quadratic effect of time, meaning that on average warmth did not increase or decrease during the preschool years. Baseline analyses revealed significant variability in the rate of change of self-reported warmth, $\chi^2(169) = 231.05$, $p < .001$. Controlling for mothers' education and family income, maternal warmth when children were 6 years old was predicted by higher mean levels of maternal depression during the preschool years, but mothers' enduring depression was not a significant predictor of change in warmth. In addition, change in depression was not a significant predictor of change in warmth.

CHAPTER IV

DISCUSSION

Depression in mothers is an important risk factor for behavioral and emotional problems in their children (Elgar et al., 2004) and parenting is thought to be an important mediator of this relationship. However, the bulk of research on the relation between depression and parenting is cross-sectional. The present study examined the relation between maternal depression and parenting longitudinally across the preschool years. Furthermore, this study attempted to tease apart the correlates of enduring, chronic maternal depressive symptoms from those of transient depressive symptoms on parenting during the preschool years. In particular, this study sought to predict changes in parenting across the preschool years as well as to predict parenting practices as parents and children emerge from the preschool years.

Mothers with higher average depressive symptoms across the preschool years reported more overreactivity and laxness, and showed less warmth as their children entered school-age (age 6). These mothers were also more likely to increase their self-reported overreactivity over time, but enduring depression did not predict changes in laxness and warmth. Changes in maternal depression also predicted changes over time in overreactivity and laxness, but not in observed warmth; increases in depression were associated with increases in overreactivity and laxness.

The fact that enduring depression and transient depression were both linked with increases in self-reported overreactivity over time suggests that maternal depression during the preschool years may play an important role in shaping mothers' use of harsh parenting. This negative trajectory may be a function of a vicious cycle in which

depression leads to more overreactive parenting, resulting in more child behavior problems, which in turn elicits even more overreactivity as parents attempt to regain control over the child's behavior. If this cycle exists, then the fact that enduring depression was linked with increases in overreactivity rather than laxness is consistent with evidence that overreactivity may be more strongly influenced by child effects than is laxness (Arnold, McWilliams, & Arnold, 1998).

Our results point to the importance of both chronic, enduring maternal depression, as well as more temporary maternal depressive symptomatology during the preschool years in shaping parenting practices during this critical time period. This is consistent both with previous cross-sectional/retrospective studies that concluded that current depression had a stronger effect on parenting than past depression (Lovejoy et al., 2000), but are also in keeping with research suggesting that chronic depression was more strongly associated with parenting difficulties than was depression of a shorter duration (Campbell et al., 1995). While the findings of the present study suggest that even transient depression may impair parenting, the fact that changes in depression corresponded with changes in parenting also suggests that as mothers become less depressed, parenting improves. This finding bodes well for the potential benefit for families of treating maternal depression.

The fact that maternal depression during the preschool years predicted warmth at age 6, but that changes in depression did not predict changes in warmth over the preschool years suggests that the association between warmth and maternal depression may be accounted for by more stable third variables that are linked with maternal depression, such as underlying personality attributes. It may also be that the observational

measure of warmth was less reliable than self-reported measures and was not sufficiently sensitive to detect a relation between changes in warmth and depression. Alternatively, the link between changes in maternal depression and changes in self-reported measures of parenting could be accounted for by shared method variance or by depressive symptoms coloring mothers' perceptions of their own parenting, and could account for differences in correlates of overreactivity/laxness versus warmth in this study.

To our knowledge, all previous studies have compared parenting of depressed mothers to non-depressed mothers at one time point. Linking changes in depression with changes in parenting using longitudinal data allowed us to rule out many other third variables that could account for the well-established link between depression and parenting. Using within-mother comparison provides stronger causal support for the relationship between maternal depression and parenting. There are, however, other possible causal explanations for these findings. It is possible that a third variable that varies together with depressive symptoms and parenting could account for this link. For example, changes in children's behavior problems during the preschool years due to maturation may result in changes in maternal depression and changes in parenting. In fact, previous studies have documented the effects of child behavior on both maternal mood and on parenting (Arnold & O'Leary, 1995; Marchand et al., 2002).

Children with behavioral problems are particularly challenging to parents, and mothers' depression has been identified as a risk factor for behavioral and emotional problems in children (Elgar et al., 2004). The results of the present study support the possibility that parenting may mediate the relation between maternal depression and children's early behavior development. Future studies are needed to more directly test

such a mediational model. Since parenting may affect which children outgrow their behavioral problems, maternal depression among at-risk children may be particularly problematic if it results in deteriorating parenting over time. Interventions for mothers of preschoolers with behavior problems that foster mothers' well-being, and prevent or decrease depressive symptomatology could help improve mothers parenting, and indirectly, have a positive impact on children's development.

These findings should be considered in the context of several limitations of this study. First, depression and two of the three parenting measures were self-report, which may have inflated some relations due to shared method variance. Additional research is also needed to examine whether our findings can be generalized to mothers of children with no behavioral problems. The present study examined only maternal depression; future research is needed to also examine paternal depression, given evidence that fathers' psychopathology also plays an important role in child development (Phares & Compas, 1993). Finally, while attrition was relatively low and the statistical approach used is ideal for handling missing data, estimates of change would have been less reliable for families who did not complete all time points.

Despite these limitations, our study is the first to examine how depressive symptomatology in mothers relates to parenting outcome and trajectory using longitudinal data, and provides stronger, though still not definitive, evidence than previous cross-sectional studies for a causal relation between depression and parenting. Our study also demonstrates that both transient and enduring depressions in mothers are significant predictors of parenting difficulties, and points to prevention and treatment of maternal depression as a way of promoting children's well-being.

TABLES

1. Means and Standard Deviations for Parenting and Depression at Each Time Point

	Time 1	Time 2	Time 3	Time 4
	M (SD)	M (SD)	M (SD)	M (SD)
Mothers' Depression	6.12 (6.62)	6.07 (7.12)	5.67 (7.19)	5.40 (6.7)
	n = 186	n = 181	n = 156	n = 163
Mothers'	2.81 (.76)	2.76 (.78)	2.66 (.74)	2.74 (.79)
Overreactivity	n = 184	n = 177	n = 156	n = 161
Mothers'Laxness	2.97 (.97)	2.73 (.91)	2.64 (.93)	2.68 (.90)
	n = 183	n = 177	n = 156	n = 161
Mothers' Warmth	4.33 (1.15)	4.19 (.99)	4.44 (.62)	4.30 (.49)
	n = 172	n = 165	n = 123	n = 125

2. Intercorrelations among Demographic Variables and Averages Across Time for Parenting and Depression

	1	2	3	4	5
1. Mothers' Education					
2. Family Income	.53***				
	n = 199				
3. Mothers' Average Depression	-.35***	-.26***			
	n = 199	n = 199			
4. Mothers' Average Overreactivity	.00	-.04	.32***		
	n = 196	n = 196	N = 196		
5. Mothers' Average Laxness	-.27***	-.22**	.33***	.25***	
	n = 196	n = 196	N = 196	n = 196	
6. Mothers' Average Warmth	.35***	.26***	-.34***	-.04	-.24***
	n = 197	n = 197	N = 197	n = 195	n = 195

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

3. Final Models of Time-Invariant and Time-Variant Predictors for Mothers' Parenting

(N = 199)

	Self-reported Overreactivity		Self-reported Laxness		Observed Warmth	
Predictors	Coeff.	SD	Coeff.	SD	Coeff.	SD
For Level of Parenting Outcome:						
Intercept	2.744***	0.047	2.692***	0.060	4.312***	0.038
Mothers' Average Depression	0.045***	0.008	0.036***	0.010	-0.022**	0.007
Mothers' Years of Education (T1)	0.034	0.018	-0.031	0.024	0.045**	0.016
Family Income (T1)	-0.000	0.000	-0.000	0.000	0.000	0.000
Mothers' Depression Time-Varying	0.024***	0.007	0.016*	0.007	0.005	0.010
For Rate of Change in Parenting:						
Intercept	-0.001	0.002	-0.002	0.003	0.000	0.002
Average Depression	0.001**	0.000	0.000	0.000	0.001	0.000
For Curvature in Parenting:						
Intercept			0.000*	0.000		
Variance Component for Slope	0.000***	0.012	0.000***	0.012	0.000**	0.020
Deviance of Model & Number of Estimated Parameters	1244.412 (11)		1376.331 (12)		1285.329 (11)	

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

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