Maternal Depressive Symptoms, Father’s Involvement, and the Trajectories of Child Problem Behaviors in a US National Sample

Jen Jen Chang, PhD; Carolyn T. Halpern, PhD; Jay S. Kaufman, PhD

Objective: To examine the effect of maternal depressive symptoms on child problem behavior trajectories and how the father’s positive involvement may modify this association.

Design: Secondary data analysis using data from the National Longitudinal Survey of Youth.

Setting: A nationally representative household sample of men and women from the National Longitudinal Survey of Youth.

Participants: The study sample includes 6552 mother-child dyads interviewed biennially between January 1, 1992, and December 31, 2002; children were 0 to 10 years old at baseline.


Main Outcome Measures: Maternal self-reports of child internalizing and externalizing behaviors were assessed repeatedly using a modified Child Behavior Checklist.

Results: Linear growth curve models indicate that the adverse effects of maternal depressive symptoms on child problem behavior trajectories become negligible after controlling for the father’s involvement and other covariates, including the child’s age, sex, and race/ethnicity; the mother’s educational level; maternal age at child birth; number of children; poverty status; urban residence; and father’s residential status. Positive involvement by the father was inversely associated with child problem behavior trajectories. The effects of maternal depressive symptoms on child problem behaviors varied by the level of the father’s positive involvement.

Conclusion: When the father actively compensates for limitations in the depressed mother’s functioning, the child’s risk of problem behaviors may be reduced.

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ent during childhood, but the sample size was small, and child problem behavior assessments included only 2 time points. Longer-term longitudinal analyses spanning different developmental stages are needed to gain a better understanding of the effects of maternal depression on change in child problem behaviors over time.

Despite the adversity of having a depressed mother, many children exhibit competent adaptation to their adverse environment. Little is known about protective factors associated with better outcomes for children of depressed parents, but one factor is the availability of a support system for a child, such as a good relationship with at least 1 parent. The father's role has traditionally been neglected in the child development literature. Some studies have found that fathers have a positive effect on children's well-being, whereas others have reported that fathers are peripheral to certain child and adolescent outcomes. These mixed findings may be attributed to the differences in the measurement of the father's involvement, with some studies reporting the frequency of paternal contacts and others assessing the quality of the father's involvement.

The present study examines the effects of maternal depressive symptoms on the trajectories of offspring problem behaviors in childhood and early adolescence over 10 years. The study also evaluates the extent to which the effect of maternal depressive symptoms on child problem behaviors varies by the level of the father's positive involvement. This study was approved by the institutional review board at the University of North Carolina at Chapel Hill.

**METHODS**

**STUDY DESIGN AND SAMPLE**

This study uses data from the National Longitudinal Survey of Youth (NLSY79). Since 1979, the NLSY79 has conducted in-home interviews with a nationally representative household sample of men and women to trace their labor market experiences. Since 1986, detailed information about their biological children, including each child's behavioral and social functioning, has been collected biennially. Each mother can be matched with more than 1 biological child.

The present investigation spans from January 1, 1992 (when depressive symptoms were first included), to December 31, 2002. Children eligible for the analysis sample were 0 to 10 years old in 1992, were living with their biological mother, and must have been interviewed at least once during the study period. Mothers must have complete maternal depression data to be eligible. This results in an analytic sample of 6552 children of 3197 NLSY79 mothers. The NLSY79 children are representative of children born to women in the United States who were 21 through 29 years of age in 1986.

**MEASURES**

**Maternal Depressive Symptoms**

Maternal self-reported depressive symptoms were measured in 1992 using the Center for Epidemiologic Studies–Depression (CES-D) scale. The CES-D scale is a 20-item self-report instrument designed to assess the frequency of depressive symptoms experienced in the previous week. A higher score indicates more depressive symptoms. The CES-D scale was dichotomized using the previously reported standard cutoff score of 15 or higher to identify cases of depressive symptoms. The CES-D scale has been widely used as a measure of depressive symptoms in epidemiologic research and as an initial screening tool for clinical depression in community-based samples.

**Behavior Problems**

The behavior problems of children aged 4 to 14 years were assessed biennially using the Behavioral Problems Index (BPI), modeled after the Child Behavior Checklist. This instrument is a listing of 28 specific childhood problem behaviors or symptoms designed to be administered relatively efficiently in the context of a survey. The BPI has been used in many studies of children's behavior problems. Mothers indicate whether the symptom in question was typically exhibited by their child in the past 3 months. Responses were summed into scales. Higher scores indicate a higher level of behavior problems. Reliability estimates of the total problem score range from 0.86 to 0.89. Past research has shown that the BPI factors consist of 2 broad constructs: internalizing problems, such as anxiety and depression, and externalizing problems, such as antisocial behavior, peer problems, and hyperactivity. The Center for Human Resource Research has standardized BPI scores by age and sex based on cross-sectional data of general population samples (mean [SD], 100 [15]).

**Father's Positive Involvement**

This measure applied to resident and nonresident fathers. The father's involvement was based on 7 questions in the self-administered supplement for children 10 years or older. Participants were asked about how often their father talks to important decisions with the child, listens to the child's side of an argument, knows who the child is with when not at home, misses events or activities that are important to the child, whether the child thinks the father spends enough time with him or her, how well the father and child share ideas or talk about things that really matter, and how close the child feels to the father. Each question has 4 or 5 Likert-type response categories. Factor analysis indicated a 1-factor dimension for the 7 father involvement items ($\alpha = .95$). Therefore, responses were summed into a scale. Higher scores reflect higher levels of positive paternal involvement. The mean of the individual items was used for the indicator of the father's involvement to include children who did not have answers to all 7 corresponding questions in the analysis. To reflect the father's involvement over time, this measure was coded as time varying from multiple assessments.

**Covariates**

Child's sex was a 0/1 dummy variable, with a value of 1 being male. Race/ethnicity was captured by two 0/1 dummy variables, one for black and the other for Hispanic, with 1 representing minority status. Maternal age at child birth was a continuous variable and was mean centered for easier variable estimate interpretation. Mother's educational level was also a mean-centered continuous variable reflecting the number of years of schooling mothers reported as of January 1, 1992. Number of children was used to indicate how many minors were living in the household. Most NLSY79 women were of childbearing age during the study. Family size may change over time. Multiple assessments of number of children were used to create a time-varying measure.
Familial poverty status compared the respondent’s income with the corresponding poverty threshold for the respondent’s family size and the year in which the interview was conducted. Respondents whose income was below this threshold were classified as being in poverty. Because family income may fluctuate over time, poverty status was treated as a time-varying measure with multiple assessments. Urban residency was a 0/1 dummy variable. This measure was also coded as time varying with multiple assessments. A time-varying binary resident father status indicator was constructed based on self-reported data from children aged 10 to 14 years. The presence of a resident father was indicated if a child reported living with either a biological father or a stepfather.

**STATISTICAL ANALYSIS**

To accommodate the nested structure of the data and to obtain unbiased estimates, growth curve analysis of hierarchical linear modeling was performed. The growth curve models simultaneously estimate intra-individual time-based trajectories and test whether interindividual differences in the parameters of these trajectories are a function of time-invariant and time-variant predictors. A general form of the full linear growth curve model is as follows:

\[
Y_{ij} = \mu_i + \alpha_1 \text{Time} + \alpha_2 X_{ij} + \alpha_3 X_{ij} + \alpha_4 \mu_i + \alpha_5 \mu_i + \epsilon_{ij}
\]

The variable \( \mu_i \) represents the maternal depressive symptoms measure. The vectors \( X_i \) and \( X_j \) include observed child- and mother-specific factors, respectively, which may affect the trajectories of child problem behaviors. The vectors \( \mu_i \) and \( \mu_j \) represent the time-invariant, unobserved child \( (i) \) and maternal \( (j) \) factors that affect child behavior outcomes.

At each wave of NLSY79 data, the distributions of internalizing and externalizing scores were positively skewed. This violates the assumption of normality of the dependent variable for linear growth curve modeling. Several transformations of outcome measures were attempted. Among all, a log-transformation of the outcome subtracted by a constant yielded an approximately normal distribution of outcomes. Hence, this article reports results based on the log-transformed outcome data.

### RESULTS

The mean age of the children in 1992 was 5.6 years (Table 1). The proportions of boys and girls were approximately the same (50.1% were boys). There were more white (50.0%) than black (27.8%) or Hispanic (22.2%) children. The mean (SD) child internalizing and externalizing scores in 1992 were both 104 (15). The mean maternal age was 30.7 years. Most mothers had at least a high school education (87.0%), reported living in an urban area (81.5%), and had a mean of 2 children. The mean maternal age at child birth was 27.6 years. Approximately 24% of the mothers lived in poverty, and 23.4% of women in the study sample reported having depressive symptoms. Most children (67.4%) reported living with either their biological father or stepfather. The degree of the father’s involvement ranged from 0 to 3.5, with a mean of 2.2. A mean of 2.2 reflects moderate levels of positive involvement by the father (eg, sometimes talking over important decisions with the child, listening to the child’s side of an argument, and the child reporting feeling fairly close to the father).

First, 2 unconditional growth curve models were estimated for internalizing and externalizing behaviors. The unconditional growth model estimated that the mean trajectories for child internalizing and externalizing behaviors have a nonzero intercept and a nonzero slope (internalizing: \( P_{\text{intercept}} \leq .001, P_{\text{slope}} \leq .001 \); externalizing: \( P_{\text{intercept}} < .001, P_{\text{slope}} < .001 \) (data not shown). The variances around the mean intercept and slope were also significant (\( P < .001 \)), indicating that there is notable diversity in children’s individual trajectories of problem behaviors. The slope is the rate of change in problem behaviors over time represented by child age at each wave centered at 4.

Next, separate conditional growth models were constructed to examine whether individual changes in child problem behaviors over time differ by maternal depressive symptoms. A multiplicative interaction term of maternal depressive symptoms and rate of change was tested. Covariates such as child’s sex, race/ethnicity, maternal education, maternal age at child birth, number of children, poverty status, urban residency, and resident father status were included to control for potential confounding. The conditional growth curve models estimated a statistically significant effect of maternal depressive

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Value</th>
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<tbody>
<tr>
<td>Child age, y</td>
<td></td>
</tr>
<tr>
<td>≤4</td>
<td>3271 (55.0)</td>
</tr>
<tr>
<td>5-8</td>
<td>1646 (27.7)</td>
</tr>
<tr>
<td>≥9</td>
<td>1030 (17.3)</td>
</tr>
<tr>
<td>Mean (SD)</td>
<td>5.6 (3.1)</td>
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<td>Child sex, male</td>
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<tr>
<td>Child race/ethnicity</td>
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<tr>
<td>Hispanic</td>
<td>1452 (22.2)</td>
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<tr>
<td>Black</td>
<td>1824 (27.8)</td>
</tr>
<tr>
<td>Non-Hispanic white</td>
<td>3276 (50.0)</td>
</tr>
<tr>
<td>Child standardized BPI score, mean (SD)</td>
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</tr>
<tr>
<td>Internalizing</td>
<td>104 (15.8)</td>
</tr>
<tr>
<td>Externalizing</td>
<td>104 (15.4)</td>
</tr>
<tr>
<td>Age of mother, mean (SD), y</td>
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</tr>
<tr>
<td>&lt;12</td>
<td>417 (13.1)</td>
</tr>
<tr>
<td>12</td>
<td>1395 (43.7)</td>
</tr>
<tr>
<td>&gt;12</td>
<td>1382 (43.3)</td>
</tr>
<tr>
<td>Mean (SD)</td>
<td>12.9 (2.3)</td>
</tr>
<tr>
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<td>5273 (81.5)</td>
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<tr>
<td>No. of children of mother in the household, mean (SD)</td>
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<tr>
<td>Age of mother at childbirth, mean (SD), y</td>
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<tr>
<td>Poverty</td>
<td>1349 (23.9)</td>
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<tr>
<td>Maternal depression (n = 3197), y</td>
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<td>Father’s involvement</td>
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<tr>
<td>Range</td>
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<tr>
<td>Mean (SD)</td>
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<td>Resident father</td>
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<tr>
<td>Yes</td>
<td>759 (67.4)</td>
</tr>
<tr>
<td>No</td>
<td>368 (32.7)</td>
</tr>
</tbody>
</table>

Abbreviation: BPI, Behavioral Problems Index.

*Data are given as number (unweighted percentage) except where otherwise indicated.

Father’s resident status was first assessed in 1994 for children aged 10 to 14 years in the self-administered questionnaire.
The present study shows that the adverse effects of maternal depressive symptoms on the trajectories of child problem behaviors across childhood and early adolescence are negligible after the role of positive paternal involvement is considered. We observed that higher levels of positive involvement by the father were negatively associated with trajectories of child problem behaviors. Higher levels of positive involvement by the father also attenuated the adverse effect of maternal depressive symptoms on trajectories of child problem behaviors. Radke-Yarrow and associates9 reported increases in disruptive and depressive problems in young children of affectively ill mothers compared with children of control mothers, but their analysis did not include the father’s involvement and did not extend beyond 2 time points, in contrast to the multiple assessments of the present study. When one parent is depressed, the other parent may attempt to compensate for the impaired functioning of the depressed parent,15,20 possibly resulting in better parenting practices.
in the home environment. Therefore, the father’s positive involvement should not be overlooked when evaluating the effect of maternal depression on child development. Previous research on 2-parent families generally have found that feelings of closeness between fathers and children were associated with positive child outcomes, such as low levels of psychological distress and delinquency. Consistent with previous research, we observed that higher levels of positive involvement by the father were associated with lower levels of child problem behaviors. We also observed that the protective effect of the father’s positive involvement was larger for the nondepressed group than for the depressed group (Figure 1). Having a depressed parent is a marker of risk of living in a family context characterized by considerable disadvantage. Children with a depressed parent are at higher risk for chronic stress, family crises, parental marital conflict, family violence, and possibly a disturbed second parent. This adversity in families with a depressed parent may explain the difference in the protective effect of the father’s involvement experienced by the depressed and nondepressed groups in the present study. Results of the present study have important implications for intervention. Promoting increased levels of positive involvement from a father may be another avenue for reducing negative effects on child development when a mother displays depressive symptoms.

Previous research suggests that childhood problem behaviors frequently endure over time. The present study shows stability in externalizing behaviors from childhood to earlier adolescence but a decline in internalizing behaviors. The decline in internalizing behaviors may reflect true change over time, or it may be a result of possible measurement error in maternal self-reported child problem behavior data. This study observed significant within-subject effects from the growth curve models, implying that levels of problem behavior varied over time and that the individual trajectory differed from one child to another. This confirms the need to study individual change over time when the child is exposed to maternal depressive symptoms. The conventional population-average approach assumes the same population mean and slope in predicting child problem behaviors for all children. Present within-individual effects suggest that intervention programs tailored to individuals’ specific needs and backgrounds may be warranted for children with problem behaviors who are living with a depressed mother.

Some methodological limitations of this study need to be considered in interpreting the study findings. The CES-D scale used in the NLSY79 is not a diagnostic criteria-based assessment tool for clinical depression. Moreover, maternal depressive symptoms were considered only at baseline. Depressive symptoms often wax and wane during an individual’s lifetime. Multiple assessments of this exposure are needed to better understand the effect of maternal depression on child behaviors over time. The BPI scores used in this study are not comparable with a Diagnostic and Statistical Manual of Mental Disorders (Fourth Edition) diagnoses of externalizing disorders in later childhood, and to use mental health services later in childhood. The present study was also limited by no independent (beyond the mothers’) report of children’s behavior problems. Nonetheless, previous studies have found that mothers’ reports on emotional and behavior problems in children were consistent with the reports of others, including teachers and mental health professionals.

Past research has suggested that depressed mothers’ impaired cognition and perceptions may bias their report and result in higher rates of child problem behaviors. Hence, measurement error in child problem behavior is possible. In general, the older the child at exposure, the more likely the child will be resilient to the adversity of maternal depression because the child will have developed competencies that prepare him or her for successful coping. The inclusion of children at varying ages of exposure at baseline may have resulted in an underestimation of the effect of maternal depression on child problem behaviors. This investigation was also limited by a lack of information on potential confounders,
such as domestic violence, genetic data, paternal depression, and maternal treatment status for depression.

This study also has considerable methodological strengths, including a large and ethnically diverse sample and the availability of measures of long-term child and adolescent outcomes in a continuous context. To our knowledge, this is the first longitudinal study that incorporates multiple assessments of family environment in studying child problem behaviors. Most previous studies of child development measured family characteristics at only 1 point in time, assuming that the life circumstances a child experiences remain constant over time. In addition, the literature about depressed mothers rarely considers the fathers’ involvement.

In conclusion, the results of this study show that higher levels of positive involvement by the father were inversely associated with child problem behaviors over time and that the effects of maternal depressive symptoms on child behaviors vary by the level of the father’s positive involvement. Poor maternal mental health has serious implications for the health of women and for their children. Increased recognition and treatment of maternal depression is needed. The protective effect of a father’s positive involvement documented in this study suggests that health care professionals should encourage the father’s increased positive involvement with his children. When the father readily compensates for the limitations on the depressed mother’s functioning, the child’s risk of problem behaviors may be reduced.19

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Correspondence: Jen Jen Chang, PhD, Department of Community Health in Epidemiology, Saint Louis University School of Public Health, 3545 Lafayette Ave, Suite 300, St Louis, MO 63104 (jjchang@slu.edu).

Author Contributions: Dr Chang had full access to all the data in the study and takes responsibility for the integrity of the data and the accuracy of the data analysis. Study concept and design: Chang. Acquisition of data: Chang. Analysis and interpretation of data: Chang, Halpern, and Kaufman. Drafting of the manuscript: Chang and Kaufman. Critical revision of the manuscript for important intellectual content: Chang, Halpern, and Kaufman. Statistical analysis: Chang and Kaufman. Administrative, technical, and material support: Chang. Study supervision: Halpern and Kaufman.

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REFERENCES


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The average news broadcast contains as much violence, sex, and action as many of the most popular entertainment shows on TV.
—From http://www.talkingwithkids.org