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## Chronic and Proximate Depression Among Mothers: Implications for Child Well-Being

*This article uses data from the Fragile Families and Child Well-Being Survey (N = 2,427) to examine the association between the chronicity and timing of maternal depression and child well-being. Maternal depression, particularly chronic depression, is linked to internalizing and externalizing problem behaviors in children, and children have worse behaviors when mothers report proximate depression. Children of depressed and nondepressed mothers have similar cognitive outcomes. Results also suggest that boys are more vulnerable to maternal depression than girls and that socioeconomic advantage does not buffer children from the consequences of maternal depression. Given that impairments in early childhood may place children on disadvantaged life-course trajectories, early intervention and treatment of depressed mothers may help ameliorate social disparities.*

Nationally, as many as 10% of individuals suffer from major depressive disorder (MDD) each year, and lifetime prevalence rates are about 17% (Kessler & Zhao, 1999). Depression can be a particularly debilitating, chronic condition and is often linked to impairments throughout the life course (Miech & Shanahan, 2000; Teitler & Reichman, 2008; Yu & Williams,

1999). The family is one institution through which depression manifests itself, as depressed individuals may have difficulty maintaining healthy interpersonal relationships and have more withdrawn or negative interactions with others (Coyne, 1976).

Children may be particularly vulnerable to maternal depression, especially if depression persists across multiple years. In accordance with the life-course perspective, which highlights the interdependency of parents and their offspring, as well as the intergenerational transmission of mental health, empirical research has consistently demonstrated that depressed mothers transmit disadvantages to their children (Elder, 1998). Children of depressed mothers, compared to their counterparts with nondepressed mothers, are more likely to have impaired social, behavioral, and cognitive outcomes from infancy through adulthood (G. Downey & Coyne, 1990; Goodman & Gotlib, 2002). Given that the family is an important context of human development, understanding the association between maternal depression and well-being among young children is crucial (Bronfenbrenner, 1986). Young children may be particularly dependent on their mothers, have little exposure to social settings outside the home, and be ill-equipped to understand and cope with maternal depression (Radke-Yarrow & Klimes-Dougan, 2002).

Although a growing, robust literature has examined the link between maternal depression and child well-being, there are several gaps in our knowledge about the consequences of maternal depression for children. Relatively few

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studies consider maternal depression at more than one point in time, the mechanisms underlying this association, or how the relationship may vary by socioeconomic status (SES) or child gender. Understanding patterns of behavioral and cognitive outcomes in childhood—particularly when children are transitioning to elementary school—is important, as life-course scholars have consistently demonstrated that impairments in early childhood may place children on trajectories of disadvantage throughout adolescence and adulthood (Entwisle & Alexander, 1989).

Thus, in this article, I examine how patterns of maternal depression are associated with the behavioral and cognitive outcomes of 5-year-old children. I use data from the Fragile Families and Child Well-Being survey, a longitudinal study of nearly 5,000 mostly unmarried parents in 20 U.S. cities who had children between 1998 and 2000. Understanding the outcomes of children born to unmarried parents is crucial; this is an increasing demographic group (Hamilton, Martin, & Ventura, 2009), these children may be particularly vulnerable (Sigle-Rushton & McLanahan, 2004), and we know little about the consequences of maternal depression for them (Goodman & Gotlib, 2002). This article extends prior research on the link between maternal depression and child well-being in additional ways: by examining the chronicity and timing of maternal depression, by highlighting several mechanisms through which maternal depression transmits disadvantages to children, and by considering the moderating role of SES and child gender.

#### *Life-Course Perspective and the Consequences of Maternal Depression for Children*

The life-course perspective has emerged as the dominant framework for understanding human development. This perspective highlights the intergenerational transmission of advantage and disadvantage as well as the interdependence of social relationships; thus, the mental health of mothers may be linked to the well-being of their children (Elder, 1998). Indeed, empirical research has consistently demonstrated that parental depression, particularly maternal depression, is linked to less favorable outcomes in children (Goodman & Gotlib, 2002). Maternal depression has been associated with both internalizing and externalizing behavior problems (Cummings & Davies, 1994; G. Downey

& Coyne, 1990; Kiernan & Huerta, 2008; Meadows, McLanahan, & Brooks-Gunn, 2007). Depression among mothers may create a stressful living environment, disrupt family routines, or limit the mother's ability to parent effectively (Marmorstein, Malone, & Iacono, 2004). Depressed mothers often exhibit hostile, negative, or withdrawn behaviors when interacting with their children, which may also lead to behavior problems (G. Downey & Coyne, 1990; Lovejoy, Graczyk, O'Hare, & Neuman, 2000).

Although the association between maternal depression and children's behavior is robust, the evidence linking maternal depression to children's cognitive ability has been inconsistent. Some research has linked maternal depression to worse language, vocabulary, and IQ (Brennan et al., 2000; Hay et al., 2001; Kiernan & Huerta, 2008), though others found no independent association (Petterson & Albers, 2001).

#### *Chronicity and Timing of Maternal Depression*

Two additional aspects of the life-course perspective are relevant to understanding the consequences of maternal depression for child well-being. First, the life-course perspective posits that the accumulation of disadvantage may be particularly detrimental (Elder, 1998). Thus, children who reside with persistently depressed mothers may be more vulnerable than children of mothers who experience short-term, fleeting depression (Fergusson & Lynskey, 1998; Petterson & Albers, 2001). When mothers are chronically depressed, children likely experience a greater number of negative or withdrawn interactions with their mothers, and the accumulation of these interactions may lead to behavior problems. Similarly, when depression is chronic and recurrent, mothers may experience a more persistently stressful and less supportive social context than when depression is intermittent (Turner & Lloyd, 1999), which may lead to strained interactions with children. Furthermore, the mechanisms linking chronic depression to child well-being may be different from those when mothers experience only intermittent depression. Chronic depression may lead to long-term economic instability; persistent impairments in parenting; or a conflictual, hostile relationship with intimate partners (G. Downey & Coyne, 1990; Heflin & Iceland, 2009)—all of which have been independently linked to childhood vulnerabilities (Cummings & Davies,

2002; Strohschein, 2005). It is also possible, though, that any exposure to maternal depression is detrimental for children. Children may not adjust when short-lived depression disappears or when mothers move in and out of depressive episodes (G. Downey & Coyne, 1990).

Second, the life-course perspective posits that the timing of events matters for child well-being. There is evidence that proximal (one's current life situation) and distal (biographical characteristics) factors differentially influence adult development (Martin & Martin, 2002), and it is likely that these factors also have different implications for children. Because children may adapt and adjust over time, a current or very recent depressive episode may be more detrimental than a more distal one (Elder, 1998). Proximally occurring maternal depression may mean that current interactions between mothers and children are strained, whereas children may recover from negative interactions that occurred in the past. Indeed, some research has suggested that proximate maternal depression is more consequential for children than distally occurring depression (Hay et al., 2001). Some evidence, though, suggested that any maternal depression—even if it remits—has long-lasting consequences on children (Goodman & Gotlib, 1999).

#### *Consequences of Maternal Depression by SES*

The life-course perspective highlights the importance of the family as a context in shaping developmental outcomes, and the social contexts in which families are embedded may help elucidate the divergent trajectories of children of depressed mothers (Bronfenbrenner, 1986). Socioeconomic status may be a protective factor for these children, though little research has examined this possibility (for an exception, see Petterson & Albers, 2001). Economic resources have been shown to buffer stressful life circumstances (Lin & Ensel, 1989), and maternal depression may be a stressor to the family environment. For example, economic resources may enable depressed mothers to send their children to high-quality child-care programs that facilitate the development of good behaviors (Burchinal, 1999). Resources may also enable mothers to outsource household chores that may lead to reductions in stress or give mothers the opportunity to purchase materials (e.g., books) or services (e.g., art

classes, music lessons) that may benefit child well-being, even in the face of maternal depression (Amato & Fowler, 2002). Others have found that financial strain was associated with an increased likelihood of depression, and children from economically advantaged families had more favorable behavioral and cognitive outcomes than their disadvantaged counterparts (Kessler & Zhao, 1999; Strohschein, 2005).

#### *Consequences of Maternal Depression by Child Gender*

Child gender may also moderate the association between maternal depression and child well-being. It is well known that boys exhibited worse behaviors, particularly externalizing behaviors such as aggression or antisocial behavior, than girls (Zill, 1999). In addition, although the evidence on how child gender moderates the effects of parental divorce has been mixed (Amato, 2000; Demo & Fine, 2010), some research has pointed to an interaction between gender and other traditional risk factors, such as family instability and parental incarceration, on children's behaviors. In early childhood, boys were more likely than girls to respond to such risk factors with increased externalizing behaviors (Cooper, Osborne, Beck, & McLanahan, 2010; Wildeman, in press).

Maternal depression may be another childhood risk factor especially detrimental to young boys. If depressed mothers are less empathetic, more withdrawn, and less emotionally available and responsive to their children, as the literature has suggested (Cummings & Davies, 1994; Lovejoy et al., 2000), the aggressive behaviors more commonly exhibited by boys may be exacerbated if boys act out to capture the attention of their mothers. This is also consistent with research that found that parents treat boys and girls differently (Raley & Bianchi, 2006).

#### *Additional Correlates of Maternal Depression and Child Well-Being*

The multivariate analyses control for a host of individual-level characteristics that may be correlated with depression and child well-being. Findings regarding racial disparities in depression were inconsistent (Simpson, Krishnan, Kunik, & Ruiz, 2007), but minorities and children of immigrants had less favorable behaviors than their White or native-born

counterparts (Lee & Burkam, 2002; Turney & Kao, 2009). The association between age and depression was nonlinear (Kessler & Zhao, 1999), and children with older mothers had fewer behavioral problems than did their counterparts with younger mothers (Turley, 2003). Parents' religiosity was associated with more favorable behaviors in children (Bartkowski, Xu, & Levin, 2008). Characteristics of the family environment such as family instability and number of siblings were linked to less favorable behaviors (D. B. Downey & Condron, 2004; Fomby & Osborne, 2008; Osborne & McLanahan, 2007).

### *Research Questions*

Grounded in the above theoretical perspectives, this article addresses three research questions that will advance the understanding of the consequences of maternal depression for young children. First, what is the relationship between the chronicity and timing of maternal depression and child well-being? I expect that children of chronically depressed mothers, compared to their counterparts with mothers with transitory depression or no depression, have worse behavioral and cognitive outcomes in early childhood. I also expect that proximate maternal depression is associated with worse behavioral and cognitive outcomes. Second, how does the association between maternal depression and child well-being vary by SES? I expect that greater socioeconomic resources buffer children from the negative consequences of maternal depression. Finally, how does the association between maternal depression and child well-being vary by child gender? I expect boys to be more vulnerable than girls to depression.

## METHOD

### *Data Source*

I used data from the Fragile Families and Child Well-being survey, a longitudinal study of nearly 5,000 new and mostly unmarried parents in 20 U.S. cities (Reichman, Teitler, Garfinkel, & McLanahan, 2001). Mothers completed a 30- to 40-minute in-person interview at the hospital after the birth of their child, between February 1998 and September 2000. Mothers were interviewed by telephone when their children were approximately 1, 3, and 5 years old. Response rates varied by marital status and

gender but were still relatively high (Bendheim-Thoman Center for Research on Child Well-Being, 2008).

I also used data from the 5-year In-Home Longitudinal Study of Pre-School Aged Children, a subsample of 2,978 families who participated in the Fragile Families survey. The in-home survey includes two components: a parent interview and an activity booklet. In the interview, the child's caregiver (the mother in 99% of observations in this article's analytic sample) answered questions about family functioning and child well-being. The activity booklet includes anthropometric measures of the mother and child, Peabody Picture Vocabulary Test (PPVT) scores, and observations about the child's home environment. These data were collected in 2005 and 2006 when children were, on average, 5 years old (Bendheim-Thoman Center for Research on Child Well-Being, 2009).

These data are well suited to examine the consequences of maternal depression for young children. To begin with, unmarried mothers were oversampled, which means the sample overrepresents minorities, socioeconomically disadvantaged mothers, and nonresidential fathers. Children born to unmarried parents now account for nearly 40% of all children born in the United States, and researchers are only beginning to examine how this diverse and generally disadvantaged group of children fares (Hamilton et al., 2009). Unmarried mothers, compared to their married counterparts, have fewer economic resources and less social support, which may lead to impairments in psychological well-being among mothers and worse behaviors among children (Waite & Gallagher, 2000; Williams, Sessler, & Nicholson, 2008). These data are advantageous in other ways. Mothers were asked a host of questions that make it possible to control for characteristics that might explain the relationship between maternal depression and child well-being. The longitudinal data allow for an examination of variation in the chronicity and timing of depression, as well as an exploration of the mechanisms through which children are vulnerable to maternal depression.

### *Measures*

*Child well-being.* Child well-being is measured by the following three indicators when children are 5 years old: internalizing behaviors, externalizing behaviors, and PPVT scores.

The internalizing and externalizing behaviors scales come from the Child Behavior Checklist (CBCL), an established measure of problem behaviors in children (Achenbach, 1992). Mothers were asked to rate aspects of their children's behaviors, and their responses constitute the internalizing and externalizing scales (0 = *not true*, 1 = *somewhat or sometimes true*, and 2 = *very true or often true*). I sum responses for each scale and standardize each to have a mean of 0 and a standard deviation of 1. Higher scores indicate more problem behaviors ( $\alpha = .75$  for internalizing behaviors;  $\alpha = .86$  for externalizing behaviors).

Although they are commonly used measures of child development, maternal reports of children's behavior may be problematic when mothers are depressed. Some research has indicated that depressed mothers may have distorted, negative beliefs about their children's behavior (Chi & Hinshaw, 2002; Chilcoat & Breslau, 1997; for exceptions, see Achenbach, McConaughy, & Howell, 1987; Richters, 1992). In supplemental analyses described below, I examine the robustness of my findings by predicting paternal reports of children's temperament, an alternative indicator of child well-being.

Children's cognitive development is measured with the third edition of the PPVT (PPVT-III), which measures children's verbal ability and was administered to children during the in-home survey. The PPVT was administered in English and is highly correlated with standardized measures of intelligence such as the third edition of the Wechsler Intelligence Scale (Dunn & Dunn, 1997).

*Maternal depression.* The measure of maternal depression comes from mothers' responses to the Composite International Diagnostic Interview Short Form (CIDI-SF), Version 1.0, November 1998 (Kessler, Andrews, Mroczek, Ustun, & Wittchen, 1998). Mothers were asked whether, at some time during the previous year, they had feelings of depression or were unable to enjoy things that they normally found pleasurable. Those who experienced at least one of these two conditions most of the day, every day, for a 2-week period were asked additional questions (about losing interest in things, feeling tired, experiencing a change in weight of at least 10 pounds, having trouble sleeping, having trouble concentrating, feeling

worthless, and thinking about death), and those who answered affirmatively to three or more of those questions are considered depressed. These are not lifetime measures but refer to individuals as likely having major depressive disorder (MDD) in the previous year. Although limitations to the CIDI-SF exist (Link, 2002), it is commonly used in large-scale community surveys to estimate the prevalence of depression in the population (Aalto-Setälä et al., 2002). On the basis of mothers' responses at the 1-, 3-, and 5-year surveys, I create a series of mutually exclusive, exhaustive variables that capture the persistence of depression over time: never depressed, depressed at one wave, depressed at two waves, and depressed at all three waves (reference category). Proximate depression is represented by a dummy variable indicating the mother is depressed at the 5-year survey.

*Covariates.* I control for a host of maternal characteristics measured at baseline: race, immigrant status, age, religiosity, and education. A series of dummy variables represent the mother's race: White (reference category), Black, Hispanic, and other race. The mother's immigrant status is a dummy variable indicating whether the respondent was born outside of the United States. I include a continuous indicator of mother's age, and the following dummy variables represent the mother's attendance at religious services: at least once a week (reference category), several times a month, several times a year or hardly ever, and never. The following represent the mother's education: less than high school diploma (reference category), high school diploma (includes mothers with a GED), and postsecondary education. I also control for the number of children in the household at the 5-year survey. In addition, to account for the intergenerational transmission of psychological well-being (Cummings & Davies, 1994), I include dummy variables indicating whether at least one of the mother's or father's biological parents experienced a 2-week period of feeling depressed, down in the dumps, or blue (measured at the 3- and 5-year surveys). I also include two characteristics of the child: a dummy variable indicating the child is a boy and a continuous indicator of age at behavioral break assessment.

To uncover some of the mechanisms underlying the relationship between maternal depression and child well-being, I include additional maternal characteristics from the 5-year survey in

some models. I include a logged measure of household income and a dummy variable indicating whether the mother was employed in the previous week. I also include a dummy variable indicating fair or poor self-rated health. I capture the total number of family structure transitions between the child's biological mother and father: no transitions (reference category), one transition, and two or more transitions. In addition, I include dummy variables indicating whether the mother has a new romantic partner and that the child lives with a grandmother.

### *Procedures*

In Table 3, I use ordinary least squares (OLS) regression to predict child well-being. In all models, I include dummy variables indicating the chronicity of maternal depression and a dummy variable for proximate depression. Model 2 includes the following variables: race, immigrant status, age, age squared, frequency of attendance at religious services, education, number of children in the household, depression of one of mother's biological parents, depression of one of father's biological parents, child age, and child gender. Model 3 includes additional characteristics that may be endogenous to maternal depression: household income, employment, fair or poor self-rated health, number of family structure transitions, presence of a social father, and grandmother in the household. This final model provides some evidence of the mechanisms underlying the transmission of disadvantage from mothers to their children.

In Table 4, I extend the analyses from Table 3 to include interaction terms between maternal depression and child gender. Previewing the results slightly, the interaction terms between maternal depression and household income, as well as between maternal depression and household income, fail to reach statistical significance, so I do not include these interactions in Table 4. In all multivariate analyses, mothers' characteristics are used as control variables, as nearly all children live with their mothers. Supplemental analyses that control for both mothers' and fathers' characteristics produce similar estimates. With the exception of paternal reports of depression in his parents, which has incomplete information for 19% of observations, each covariate is missing fewer than 2% of observations. Only 24 observations are missing more

than one covariate. I use the *ice* command in Stata to impute missing data (Royston, 2004).

### *Sample Characteristics*

Of the 4,898 observations in the Fragile Families sample, 1,920 (39%) did not participate in the 5-year in-home survey. An additional 262 (5%) were excluded because of missing data on maternal depression at any wave, and 289 (6%) were excluded because of missing data on children's internalizing or externalizing behaviors. The final analytic sample included 2,427 observations. An additional 482 children (10%) were not administered the PPVT test, so the models predicting this outcome included fewer observations ( $n = 1,945$ ). Mothers in both the analytic and the full samples were equally likely to report depression and report similar behaviors in their children. However, mothers in the analytic sample were more likely to be Black and less likely to be Hispanic, other race, or foreign born. Mothers had higher educational attainment than those in the full sample, and children were slightly younger.

Table 1 shows descriptive statistics of all variables in the analysis. More than one third (34%) of children had a mother who reported depression at least once throughout their first 5 years, and 5% of children had mothers who reported depression at all three points in time. More than half of mothers (52%) were Black, and more than one fifth (22%) were Hispanic. About 10% of mothers, including 31% of Hispanic mothers, were not born in the United States. Mothers were, on average, 25 years old when their children were born. At baseline, most mothers had not received education beyond high school. About 31% of mothers did not have a high school diploma, and 32% had a high school diploma but no additional schooling. Mothers, on average, had 2.5 children at the 5-year survey. Just under half (49%) of children experienced at least one family structure transition during their first 5 years.

## RESULTS

### *Means of Child Well-Being Indicators by Maternal Depression*

Table 2 shows that children of mothers who reported any depressive episode had more internalizing and externalizing problem behaviors

Table 1. Descriptive Statistics of Variables Included in Analyses (N = 2,427)

Variables	M or %	SD	Range
Child well-being			
Internalizing behaviors (y5, ih5)	0.00	1.00	-1.25-4.81
Externalizing behaviors (y5, ih5)	0.00	1.00	-1.68-4.30
PPVT score (ih5)	93.80	15.61	40-139
Mother characteristics			
Never depressed (y1, y3, y5)	65.84%		
Depressed at 1 wave (y1, y3, y5)	20.11%		
Depressed at 2 waves (y1, y3, y5)	9.44%		
Depressed at 3 waves (y1, y3, y5)	4.61%		
Proximate depression (y5)	16.65%		
White (b)	22.49%		
Black (b)	52.29%		
Hispanic (b)	22.49%		
Other race (b)	2.72%		
Immigrant (b)	10.44%		
Age (b)	25.09	6.02	15-43
Religious services at least once a week (b)	22.01%		
Religious services several times a month (b)	16.24%		
Religious services several times a year/hardly ever (b)	47.90%		
Religious services never (b)	13.85%		
Less than high school (b)	30.54%		
High school diploma or GED (b)	31.99%		
Postsecondary education (b)	37.47%		
Number of children in household (y5)	2.53	1.36	0-11
Depression of maternal grandparents (y3, y5)	31.75%		
Depression of paternal grandparents (y3, y5)	28.92%		
Log of household income (y5)	9.96	1.40	0-13.44
Employed (y5)	60.82%		
Fair or poor health (y5)	14.22%		
No family-structure transitions (b, y1, y3, y5)	50.58%		
1 family-structure transition (b, y1, y3, y5)	32.69%		
2 family-structure transitions (b, y1, y3, y5)	14.13%		
3 or more family-structure transitions (b, y1, y3, y5)	2.60%		
Presence of social father (y5)	27.98%		
Grandmother in household (y5)	12.39%		
Child characteristics			
Boy (b)	51.92%		
Age, in months (ih5)	64.16	3.19	47.40-75.58

Note: Data from Fragile Families and Child Well-being Study. b = baseline survey; y1 = 1-year survey; y3 = 3-year survey; y5 = 5-year survey; ih5 = 5-year in-home survey.

than their counterparts with never-depressed mothers. Children of never-depressed mothers, for example, had an average internalizing behaviors score of -0.14, and children of mothers who reported one episode of depression had an average score of 0.16. This increased to 0.39 and 0.55 for children of mothers depressed at two waves and children of mothers depressed at three waves, respectively. There are

no statistically significant differences between children of mothers depressed at two waves and children of mothers depressed at three waves. Contrary to expectations, there were no statistically significant differences in children's PPVT scores by maternal depression.

These bivariate analyses do not account for the possibility that differences in children's behaviors are artifacts of other heterogeneity

Table 2. Means of Indicators of Child Well-being, by Maternal Major Depressive Disorder (MDD) Over Time (N = 2,427)

Variable	Never Depressed	Depressed at 1 Wave	Depressed at 2 Waves	Depressed at 3 Waves
	n = 1,598	n = 488	n = 229	n = 112
Internalizing behaviors	-0.14 <sup>b,c,d</sup>	0.16 <sup>a,c,d</sup>	0.39 <sup>a,b</sup>	0.55 <sup>a,b</sup>
Externalizing behaviors	-0.14 <sup>b,c,d</sup>	0.18 <sup>a,c,d</sup>	0.36 <sup>a,b</sup>	0.56 <sup>a,b</sup>
PPVT score	94.26	92.58	93.42	93.70

Note: Data from Fragile Families and Child Well-being Study. Not all children were administered the PPVT test, so the analyses of this outcome include fewer observations ( $n = 1,945$ ).

<sup>a</sup>Statistically different from never depressed ( $p < .05$ ). <sup>b</sup>Statistically different from depressed at 1 wave ( $p < .05$ ).

<sup>c</sup>Statistically different from depressed at 2 waves ( $p < .05$ ). <sup>d</sup>Statistically different from depressed at 3 waves ( $p < .05$ ). Statistical significance determined by pairwise  $t$  tests with Bonferroni corrections for multiple comparisons.

between families. Thus, in the subsequent tables, the analyses estimated child well-being as a function of maternal depression and controlled for factors that may influence both depression and behavior. Because Table 2 showed no differences in PPVT scores by maternal depression, the subsequent analyses examined children's behaviors.

#### Children's Behaviors as a Function of Maternal Depression

The first set of multivariate models, presented in Table 3, shows results consistent

with those in Table 2. Children of chronically depressed mothers, compared to children of never-depressed mothers, had more internalizing and externalizing problem behaviors. Children of chronically depressed mothers also had worse behaviors than children of mothers who reported depression only once but had similar behaviors to those with mothers depressed at two points in time. Independent of chronicity of maternal depression, proximate maternal depression—depression reported at the same time as children's behaviors—was independently associated with more behavior problems in children.

Table 3. OLS Regression Models Predicting Children's Behaviors, by Maternal Major Depressive Disorder (MDD) Over Time (N = 2,427)

Variable	Internalizing Behaviors			Externalizing Behaviors		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Maternal depression						
Never depressed	-0.49*** (0.12)	-0.43** (0.12)	-0.37** (0.12)	-0.54*** (0.12)	-0.43*** (0.12)	-0.38** (0.12)
Depressed at 1 wave	-0.25* (0.12)	-0.24* (0.11)	-0.20 (0.11)	-0.27* (0.12)	-0.24* (0.11)	-0.22 (0.11)
Depressed at 2 waves	-0.08 (0.12)	-0.08 (0.11)	-0.06 (0.11)	-0.14 (0.12)	-0.14 (0.11)	-0.12 (0.11)
Depressed at 3 waves	—	—	—	—	—	—
Proximate depression	0.19* (0.08)	0.21** (0.08)	0.19* (0.08)	0.15* (0.08)	0.19* (0.08)	0.18* (0.08)
Intercept	0.35	0.88	1.14	0.40	1.75	1.98

Note: Data from Fragile Families and Child Well-being Study. Coefficients are unstandardized. Standard errors are in parentheses. Models 2 and 3 include the following variables: mother's race, mother's immigrant status, mother's age, mother's age squared, frequency of mother's attendance at religious services, mother's education, number of children in mother's household, depression of one of mother's biological parents, depression of one of father's biological parents, child's age, and child's gender. Model 3 also includes the following variables: mother's household income (log), mother's employment status, number of family-structure transitions, presence of a social father, and whether mother is coresident with a grandmother.

\*  $p < 0.05$ . \*\*  $p < 0.01$ . \*\*\*  $p < 0.001$ .

The covariates entered into the second set of models attenuated the association between maternal depression and children's behaviors but did not completely ameliorate the negative consequences of maternal depression. Children of chronically depressed mothers, compared to children of mothers who never reported depression and those who reported depression at only one survey wave, had more internalizing and externalizing problem behaviors. Proximate maternal depression was still associated with negative behavior in children once the covariates were taken into account.

The final set of models, those that included maternal characteristics that may be endogenous to depression (e.g., income), suggest that children of chronically depressed mothers, compared to their counterparts with never-depressed mothers, had less favorable internalizing ( $-0.37$ ,  $p < .01$ ) and externalizing ( $-0.38$ ,  $p < .01$ ) behaviors. Interpreted another way, children of chronically depressed mothers had behaviors nearly two fifths of a standard deviation worse than children of never-depressed mothers. Children of chronically depressed mothers no longer had worse behaviors than when mothers reported one episode of depression. Thus, economic resources, family structure, and maternal health may be mechanisms through which intermittent maternal depression confers risks on children. These mechanisms, however, did not explain the negative consequences of chronic depression. The final models also provided evidence that proximate maternal depression was detrimental to children, above and beyond the chronicity of maternal depression. Children of mothers depressed at the 5-year survey, compared to their counterparts with nondepressed mothers at the 5-year survey, had internalizing ( $0.19$ ,  $p < .05$ ) and externalizing ( $0.18$ ,  $p < .05$ ) behaviors nearly one fifth of a standard deviation worse.

Rotating the reference category (tables available on request) shows that children experienced vulnerabilities if ever exposed to depression. According to the models that included all covariates, children of mothers who reported depression at one survey wave, compared to those with never-depressed mothers, had more internalizing ( $-0.17$ ,  $p < .01$ ) and externalizing ( $-0.17$ ,  $p < .01$ ) behaviors. There were no statistically significant differences between children of mothers depressed at one wave and children of mothers depressed at two or three waves. In addition, rotating the reference category showed

that children of never-depressed mothers had better internalizing and externalizing behaviors than all other groups of children.

These findings were robust to three additional model specifications (tables available on request). First, I included controls for maternal substance dependence at the 5-year survey and generalized anxiety disorder (GAD) at the 3-year survey (this measure is not available in the 5-year survey), two conditions often comorbid with depression (Kessler et al., 1994) and associated with children's outcomes (Osborne & Berger, 2009). The additional variables did not substantively alter the link between maternal depression and children's behaviors.

Because depressed mothers may have negative or inaccurate views of their children's behaviors (Chi & Hinshaw, 2002), I substituted mothers' reports of behaviors with paternal reports of an alternative indicator of child well-being, temperament at the 5-year survey. Child temperament is a subscale taken from the emotionality and shyness dimensions of the Emotionality, Activity, and Sociability Temperament Survey for Children (Buss & Plomin, 1984). Fathers were asked to respond to the following about their child (1 = *not like my child at all*, 2 = *a little like my child*, 3 = *somewhat like my child*, 4 = *a lot like my child*, and 5 = *very much like my child*): child tends to be shy (reverse coded), child often fusses and cries (reverse coded), child is very sociable, child gets upset easily (reverse coded), child reacts strongly when upset (reverse coded), and child is very friendly with strangers ( $\alpha = .52$ ).

Given that nonresidential fathers likely had different perspectives on children's behaviors than did residential fathers or mothers, I restricted this analysis to children with coresidential parents ( $n = 1,029$ ). Mothers' and fathers' reports of children's temperament were moderately correlated ( $r = .36$ ), and the correlation was similar for depressed mothers and non-depressed mothers. The multivariate results were robust to this model specification; for example, chronic depression in mothers, compared to when mothers never reported depression, was associated with paternal reports of worse child temperament.

In final supplemental analyses, I substituted the continuous measures of internalizing and externalizing behaviors with a dichotomous indicator of whether children display behavioral problems at or above the 90th percentile in the

population of children (with the cutoff point being t-scores of greater than or equal to 63). The models predicting internalizing behaviors were robust to this model specification; in the full model, children with chronically depressed mothers had more internalizing behaviors than their counterparts with never-depressed mothers. With respect to externalizing behaviors, chronic depression was associated with worse behavior than two reports of depression, one report of depression, or no reports of depression. Children of depressed mothers were more susceptible to meeting this stringent definition of externalizing problem behaviors than were children of never-depressed mothers.

The direction and magnitude of the covariates were consistent with prior literature. Maternal education and household income, for example, were independently protective against children's problem behaviors. Children who experienced more family-structure transitions had worse behaviors, as did children whose maternal grandparents experienced depression.

#### *Subgroup Variation in Association Between Maternal Depression and Children's Behaviors*

Although maternal depression, especially when it persists, had important consequences for child well-being, it may not be an equal opportunity risk factor for children. Child gender and SES may both alter the association between maternal depression and children's behaviors, and I examined this possibility. Turning first to SES, there was no interaction between maternal depression and education or between maternal depression and household income, and I do not present these nonsignificant interactions in Table 4. This suggests that maternal depression was associated with worse behaviors in children regardless of SES.

The second set of models in Table 4 includes interaction terms between maternal depression and child gender. There is some evidence that maternal depression was more strongly linked to internalizing and externalizing behaviors among boys than girls. For internalizing behaviors, there was a statistically significant interaction

Table 4. OLS Regression Models Predicting Children's Behaviors, by Maternal Major Depressive Disorder (MDD) Over Time, With Interactions by Socioeconomic Status and Child Gender (N = 2,427)

Variable	Internalizing Behaviors		Externalizing Behaviors	
	Model 1	Model 2	Model 1	Model 2
Maternal depression				
Never depressed	-0.37** (0.12)	-0.19 (0.16)	-0.38** (0.12)	-0.11 (0.16)
Depressed at 1 wave	-0.20 (0.11)	-0.04 (0.15)	-0.22 (0.11)	-0.07 (0.15)
Depressed at 2 waves	-0.06 (0.11)	0.23* (0.16)	-0.12 (0.11)	0.19 (0.16)
Depressed at 3 waves	—	—	—	—
Proximate depression	0.19* (0.08)	0.19* (0.08)	0.18* (0.08)	0.19* (0.08)
Child is a boy	0.03 (0.04)	0.36* (0.18)	0.15*** (0.04)	0.57** (0.18)
Maternal depression × Child gender				
Never depressed × Boy		-0.34* (0.19)		-0.49** (0.19)
Depressed at 1 wave × Boy		-0.30 (0.20)		-0.24 (0.20)
Depressed at 2 waves × Boy		-0.53* (0.22)		-0.56* (0.22)
Intercept	1.14	0.95	1.98	1.75

Note: Data from Fragile Families and Child Well-being Study. Coefficients are unstandardized. Standard errors are in parentheses. All models include covariates from Model 3 in Table 3.

\* $p < 0.05$ . \*\* $p < 0.01$ . \*\*\* $p < 0.001$ .

between having a mother depressed at two waves and being a boy. With respect to externalizing behaviors, having a never-depressed mother and being a boy, as well as having a mother depressed at two waves and being a boy, was statistically significant. The interaction terms for having a mother depressed at 1 wave and being a boy did not reach statistical significance but went in the expected direction. Interpreting the interaction terms, boys with never-depressed mothers have internalizing behavior scores that are 0.53 standard deviations lower than their counterparts with chronically depressed mothers. Their internalizing behavior scores are 0.34 standard deviations lower when their mothers are depressed at one point in time and 0.30 standard deviations less when their mothers are depressed at two points in time. The coefficients for boys' externalizing behavior problems are  $-0.60$ ,  $-0.31$ , and  $-0.37$ , respectively. The coefficients for girls can be interpreted from the main effects of maternal depression presented in Table 4. Taken together, there is some evidence that maternal depression leads to greater behavioral problems for boys than for girls.

#### DISCUSSION

In this article, I used data from the Fragile Families survey, a birth cohort of children born in urban areas between 1998 and 2000. I focused on the link between maternal depression and child well-being in early childhood, a period in the life course that has implications for future educational and labor market outcomes (McLeod & Kaiser, 2004; Smith, 2009). To begin with, more than 34% of children in the sample had a mother who reported at least one episode of depression during the first 5 years of their children's lives. About 5% of mothers reported depression when their children were about 1, 3, and 5 years old. The prevalence of depression among mothers in this sample (16% at the 1-year survey, 20% at the 3-year survey, and 17% at the 5-year survey; descriptives not shown) was greater than that of the general population; these discrepancies may be because the sample overrepresents nonmarital births and, therefore, economically disadvantaged parents who may be more susceptible to episodes of depression (Kessler & Zhao, 1999).

Consistent with a life-course perspective that highlights the interdependency of parents and children, as well as how an accumulation of

disadvantages may render children vulnerable, I found that maternal depression was associated with worse behavioral but not cognitive outcomes among 5-year-old children. When mothers were chronically depressed, children were poised to enter elementary school with more internalizing and externalizing problem behaviors than their counterparts with never-depressed mothers. Although exposure to chronic depression made children particularly vulnerable, children ever exposed to maternal depression (i.e., mothers report depression at one survey wave) also had worse behaviors than those never exposed. Furthermore, proximate depression in mothers, independent of depression chronicity, was linked to worse behaviors in children, which is consistent with tenets of the life-course perspective that stress the importance of event timing. Given that both chronicity and timing of maternal depression are important predictors of child well-being, the findings underscore the importance of using longitudinal data to understand this relationship and suggest that prior cross-sectional examinations may underestimate the consequences of maternal depression for children.

The findings are consistent with prior empirical research that has pointed to the detrimental consequences of maternal depression for children's behavior (Cummings & Davies, 1994; Goodman & Gotlib, 2002; Kiernan & Huerta, 2008; Meadows et al., 2007). Symptoms of depression—such as having trouble concentrating or losing interest in things—may make it difficult for mothers to engage with their children, or when depressed mothers do engage with their children, they may have more withdrawn or negative interactions or may perceive more stress associated with the parental role (Abidin, 1990; Lovejoy et al., 2000). The results also suggest that economic resources, family structure, and maternal health may be mechanisms through which maternal depression, when it is not persistent, influences children's behaviors. Future research will benefit from a more thorough examination of how these and additional mechanisms (e.g., parenting behaviors) differentially mediate the association between chronic and intermittent depression.

Contrary to expectations, maternal depression was not associated with children's cognitive performance. This is inconsistent with some prior research that found a positive association between maternal psychological well-being and

children's cognitive outcomes (Kiernan & Huerta, 2008), though consistent with other work (Petterson & Albers, 2001). Unlike many prior studies, these data included an oversample of children born to unmarried parents and a sample of young children instead of adolescents. It may be that maternal depression matters less for young children's cognitive outcomes than their behavioral outcomes, in the same way that other researchers have found domain-specific effects of family instability (Carlson & Corcoran, 2001; Fomby & Cherlin, 2007; Sun & Li, 2002). Other factors such as maternal aptitude may be a more important predictor of cognitive outcomes (Carlson & Corcoran, 2001).

These analyses also examined whether maternal depression is an equal opportunity risk factor for some groups of children. Contrary to expectations, maternal education and income did not buffer children from the negative behavioral consequences of maternal depression. Maternal depression was similarly linked to behavioral outcomes among children of mothers without high school diplomas and for those of mothers with postsecondary education. It is possible that the lack of subgroup differences may reflect the relative lack of socioeconomic variation in the Fragile Families sample, and future research should examine the interplay among maternal depression, SES, and children's behavior with a more socioeconomically diverse sample.

However, the association between maternal depression and child behavior did vary by child gender. By and large, maternal depression was more detrimental for young boys than for young girls. This is consistent with prior research that has found that boys are more vulnerable to other traditional risk factors such as family instability and incarceration (Cooper et al., 2010; Wildeman, in press). The fact that young boys were more vulnerable than girls to maternal depression may have wide-ranging implications, perhaps even contributing to the growing gender gap in educational attainment (Buchmann & DiPrete, 2006). The interaction between maternal depression at one point in time and child gender did not reach statistical significance, which may suggest that boys and girls respond similarly to maternal depression when it is short lived and that gender differences emerge when depression persists.

Of course, these analyses do not provide causal evidence linking maternal depression to early childhood vulnerabilities. Although these

data include a rich array of variables associated with both maternal depression and children's outcomes, unobserved heterogeneity may exist. There are additional limitations of the data and the measurement of some variables. These data include a birth cohort of children born in 1998–1999 in 20 U.S. cities with populations of at least 200,000. Thus, the findings may differ for children in rural areas or older children. The analytic sample includes about 50% of the original Fragile Families sample, and this reduction mostly results from mothers not participating in the 5-year in-home survey, when children's behaviors were measured. Supplemental analyses show no statistically significant differences in maternal depression between the full and analytic samples, but the samples differ on a host of other characteristics. Readers should keep in mind that the analytic sample is more advantaged than the full Fragile Families sample, and these results cannot be generalized to the entire Fragile Families sample or to a broader population. In addition, the dichotomous measure of depression does not allow for the possibility of taking into account mothers who do not meet the criteria for depression but still exhibit some symptoms (Mirowsky & Ross, 2002). Similarly, mothers who report depression at each wave are a heterogeneous group, and there is no way to distinguish between mothers depressed for only 2 weeks during the year and mothers depressed for the entire year. Ideally, information about maternal mental health would be available more frequently than once every 2 years, and future data collection efforts should consider collecting this information. Finally, as discussed earlier, mothers report their children's behavioral outcomes. Supplemental analyses of fathers' reports of children's temperament, however, provide some evidence that depressed mothers are accurate reporters of children's behaviors, although this comparison is limited to children who live with both parents.

Despite these limitations, this research extends much prior research about the consequences of maternal depression for child well-being. Findings suggest that maternal depression, particularly chronic depression, is associated with worse behavioral but not cognitive outcomes among 5-year-old children and underscore the importance of understanding this relationship through a life-course perspective.

These analyses extend prior research in the following ways: by examining a recent birth cohort of children born to mostly unmarried mothers, by using a dynamic measure of maternal depression, by elucidating mechanisms through which depressed mothers transmit disadvantages to their children, and by examining how SES and child gender moderate children's vulnerabilities. Given that children's transitions into elementary school predict outcomes throughout the life course, impairments in early childhood may translate into much greater disadvantages over time (Entwisle & Alexander, 1989; McLeod & Kaiser, 2004). Thus, early intervention and treatment of maternal depression may help level the playing field for young children as they begin elementary school.

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