

Intergenerational Pathways of Disadvantage:  
Linking Maternal Depression to Children's Problem Behaviors

Kristin Turney  
Robert Wood Johnson Foundation Health & Society Scholar  
University of Michigan

June 28, 2011

\* Direct all correspondence to Kristin Turney, University of Michigan, 1415 Washington Heights, 3642 SPH Tower, Ann Arbor, MI 48109. Turney's work on this project was supported by the Robert Wood Johnson Foundation Health & Society Scholars Program. Funding for the Fragile Families and Child Well-being Study was provided by NICHD through grants R01HD36916, R01HD39135, and R01HD40421, as well as a consortium of private foundations (see <http://www.fragilefamilies.princeton.edu/funders.asp> for the complete list). The author thanks Hedy Lee and Jessica Hardie for their helpful feedback on drafts of this manuscript.

## **ABSTRACT**

A rich, venerable body of literature documents the intergenerational transmission of disadvantage from parents to children, though less attention has been given to the independent role of maternal depression in the transmission of disadvantage across generations. In this paper, I use data from the Fragile Families and Child Wellbeing Study to estimate and explain the consequences of maternal depression for five-year-old children's internalizing and externalizing problem behaviors. Ordinary least squared (OLS) regression models that adjust for a lagged indicator of children's behaviors, as well as propensity score models, show that children exposed to chronic and intermittent maternal depression have more problem behaviors than their counterparts with never depressed mothers. Results also show that economic resources and maternal parenting behaviors mediate much of the association between maternal depression and children's problem behaviors, but that relationships with romantic partners and perceived social support do little to attenuate this association, especially when mothers are chronically depressed. This research extends past literature by illuminating mechanisms through which depression matters for children; by utilizing longitudinal measures of maternal depression and children's problem behaviors; by employing statistical techniques to limit unobserved heterogeneity; and by using a large, diverse, and non-clinical sample of children most susceptible to maternal depression. Given that early childhood behavioral problems lay a crucial foundation for short- and long-term life trajectories, this study elucidates the important role maternal depression plays in the intergenerational transmission of inequality.

A substantial, diverse body of literature in sociology, psychology, and related disciplines addresses inequalities in the social and emotional wellbeing of young children, as well as explanations for these inequalities and the consequential, long-term effects of divergent outcomes. Internalizing problem behaviors (such as feeling lonely or nervous) and externalizing problem behaviors (such as destroying things or fighting) are perhaps the most commonly studied indicators of social and emotional wellbeing in early childhood. Impaired behaviors during early childhood may place children on trajectories to experience additional disadvantages throughout childhood, adolescence, and adulthood (Caspi, Bem, and Elder 1989; Crosnoe and Elder 2004; Duncan and Magnuson 2010; Entwisle, Alexander, and Olson 2005; Hinshaw 1992; McLeod and Fettes 2007; McLeod and Kaiser 2004; NICHD Early Child Care Research Network 2004; though see Duncan et al. 2007). In the short-term, children with problem behaviors may be viewed by their teachers as disengaged, disobedient, or rebellious; may experience difficulty integrating into peer networks; or may be hampered in their ability to succeed academically (Ladd, Birch, and Buhs 1999; Pianta and Stuhlman 2004). In the long-term, problem behaviors in childhood may lead to lowered educational attainment, impaired psychological wellbeing, and few social support networks (Knoester 2003; Mason et al. 2004; McLeod and Kaiser 2004; Miech et al. 1999).

Children's internalizing and externalizing problem behaviors are not randomly distributed across the population but are instead influenced by a host of individual- and family-level characteristics such as race (Lee and Burkam 2002), socioeconomic status (Duncan and Brooks-Gunn 1997; Duncan et al. 2011; Gerard and Buehler 1999), and family instability (Fomby and Cherlin 2007). One predictor of children's problem behaviors that has received relatively less attention in the sociological literature is maternal mental health. One of the most

common, chronic, and debilitating mental health disorders is major depressive disorder, which affects more than 13 million individuals, many of them parents, in the United States annually (Kessler et al. 2003).

There are compelling conceptual reasons that may explain why maternal depression is associated with young children's problem behaviors. Depression – which is characterized by symptoms including fatigue, difficulty concentrating, and losing interest in daily activities – is a leading cause of role impairments that may compromise a mother's ability to provide her child necessary developmental resources. The social consequences of depression are far-reaching, with sufferers reporting they are unable to carry out usual activities for nearly 30 days each year (Kessler et al. 2003; Merikangas et al. 2007). Depression may increase economic insecurity (Frank and Koss 2005; Marcotte and Wilcox-Gok 2001), impair a mother's ability to parent effectively or consistently (Lovejoy et al. 2000; Marmorstein, Malone, and Iacono 2004), and facilitate withdrawn or negative interactions in romantic partnership and other social relationships (Coyne 1976; Kim and McKenry 2002). Given these social consequences of depression, all of which have independent and robust effects on child wellbeing, it may not be surprising that the social consequences of depression extend to children of depressed mothers. Maternal depression may be especially detrimental to young children, as young children are dependent on their parents, have little exposure to social settings outside the home, and may be less equipped to understand and cope with stressors to the family environment.

Indeed, existing research finds that maternal depression is associated with impaired cognitive, behavioral, and health outcomes from infancy through adulthood (Augustine and Crosnoe 2010; blinded; Brennan et al. 2000; Carlson and Corcoran 2001; Downey and Coyne 1990; Goodman and Gotlib 2002; Hay et al. 2001; Kiernan and Huerta 2008). Though a

burgeoning body of research suggests maternal depression has important, negative, and long-lasting consequences for young children, there are several opportunities to advance our understanding of this relationship, not the least of which is understanding the pathways linking maternal depression to children's outcomes. Theoretical perspectives suggest several potential mechanisms through which maternal depression renders children vulnerable and researchers agree about the importance of understanding these mechanisms, but relatively little research has explored these mechanisms in a comprehensive fashion (blinded; Downey and Coyne 1990; Goodman and Gotlib 2002).

Thus, in this paper, I broaden our understanding of the collateral consequences of depression by investigating the relationship between maternal depression and five-year-old children's internalizing and externalizing problem behaviors, behaviors that have important implications for social inequality across the life course.<sup>1</sup> I use data from the Fragile Families and Child Wellbeing Study, a survey of nearly 5,000 mostly unmarried couples who had children between 1998 and 2000, which provides an exceptional empirical lens to understand this relationship. These data allow for an exploration of the intergenerational consequences of maternal depression using a large, diverse sample of children arguably most at risk of exposure to maternal depression and to problem behaviors; feature a longitudinal design that includes established measures of depression and children's problems behaviors; and include unusually rich information about family functioning. These design features make possible an evaluation of the consequences of maternal depression that is sensitive to social selection processes and to

---

<sup>1</sup> Though paternal depression may be independently linked to children's outcomes and is an important direction for future research (Phares and Compas 1992), I focus solely on maternal depression. Maternal depression is particularly important because nearly all children live with their mothers and fewer than half (44% of children in my sample when they are five years old) are co-resident with their fathers, and because mothers are nearly twice as likely as fathers to report depression (DeKlyen et al. 2006). Additionally, prior research suggests maternal depression is a stronger independent predictor of children's outcomes than paternal depression (Meadows et al., 2007), and attrition among fathers would substantially reduce the sample size.

mechanisms, which helps advance theoretical perspectives and inform intervention efforts for depressed mothers and their children. Given that substantial numbers of children are exposed to maternal depression, the unequal distribution of maternal depression across the population, and the importance of early childhood behaviors for life course trajectories, disentangling the consequences of maternal depression for children adds a new dimension to our understanding of how social inequalities are produced and maintained across the life course.

## **BACKGROUND**

### **Intergenerational Transmission of Disadvantage**

A rich, venerable body of literature documents the intergenerational transmission of advantage and disadvantage. Much of this research, rooted in the Wisconsin model of status attainment, focuses on how indicators of parental socioeconomic status such as income or education leads to advantages or disadvantages in the second generation (Campbell 1983; Sewell and Shah 1968). This seminal research spawned a host of investigations in the United States and abroad, including a large body of literature that highlights the importance of parental education and income for determining children's behaviors (Carlson and Corcoran 2001; Duncan and Brooks-Gunn 2000), educational performance (Magnuson 2007), and health (Bloom, Cohen, and Freeman 2009).

But much less attention has been given to the role of parental psychological wellbeing in the status attainment process and the transmission of advantage or disadvantage across generations (Miech et al. 1999; for a recent exception, see Augustine and Crosnoe 2010). There is, however, reason to believe that psychological wellbeing – such as the presence or absence of depression – may facilitate the reproduction of inequality *independently* of socioeconomic status. Depression is not randomly distributed across the population but instead affects the most

vulnerable populations. Certain groups of the population – such as the economically disadvantaged, the unmarried, and those living in impoverished communities – are more vulnerable to depression than their counterparts, which may create an accumulation of disadvantage for already burdened children, families, and communities (Kessler and Zhao 1999; Ross 2000; Wood, Goesling, and Avellar 2007). For example, maternal depression may play an important role in the intergenerational transmission of disadvantage because of the well-known effects of maternal depression on children’s outcomes such as problem behaviors. In addition to the obvious short-term consequences of problem behaviors (i.e., children with externalizing behavioral problems may be viewed by their teachers as disruptive), a large body of literature suggests that wellbeing in early childhood places children on trajectories of successes or failures (Duncan and Magnuson 2010; Entwisle et al. 2005; McLeod and Fettes 2007; McLeod and Kaiser 2004; Palloni 2008). Behavioral problems in early childhood are linked to low grades in elementary school (Alexander, Entwisle, and Dauber 1993), a greater likelihood of course failure in high school (Needham, Crosnoe, and Muller 2004), and a reduced probability of graduating from high school and enrolling in college (Currie and Stabile 2008; McLeod and Fettes 2007; McLeod and Kaiser 2004).

### **The Social Consequences of Depression**

Depression is fundamentally psychological. But it has durable social consequences for sufferers and their family members, not the least of which include consequences for children’s problem behaviors. Conceptually, the role impairment perspective suggests there are many potential reasons why maternal depression may be linked to children’s behaviors. Indeed, depression is a leading cause of disability and its influence on role impairment often exceeds that of common physical illnesses (Merikangas et al. 2007). Virtually all depressed individuals

experience some resulting impairment that affects their ability to carry out normal activities (Baune et al. 2010; Kessler et al. 2003). Even when not completely incapacitated, depressed individuals may still experience impairments in their ability to economically support themselves and their families, their capacity to parent effectively and consistently, and their capacity to maintain supportive and positive relationships with romantic partners, family members, and friends.<sup>2</sup> Given that theoretical perspectives and empirical findings document the independent importance of economic resources (Conger et al. 1992; Duncan and Brooks-Gunn 1997), parenting (Amato and Fowler 2002; Bodovski and Youn 2010), and social relationships (Amato, Loomis, and Booth 1995; Dadds and Powell 1991; Fomby and Osborne 2010; Ryan, Kalil, and Leininger 2009) for children's behaviors, it is likely that each of these factors attenuate the negative consequences of maternal depression for children's problem behaviors.

To begin with, consistent with the role impairment perspective, depression may compromise a mother's ability to economically support herself and her family. Although economic insecurity and hardship may precipitate the onset or recurrence of a depressive episode (Heflin and Iceland 2009), the role impairments associated with depression also increases economic insecurity and hardship. Indeed, empirical evidence suggests that economic insecurity is one of the many social consequences of depression (Currie and Madrian 1999; Frank and Koss 2005). Depressed mothers may be less likely than their counterparts to be employed, as symptoms of depression may impede motivation to search for work and, once employed, make it difficult to sustain employment (Jackson et al. 1998). Furthermore, among the employed, individuals with mental illness earn between \$3,500 and \$6,000 less annually, are more likely to

---

<sup>2</sup> Of course, it is also possible that maternal depression has a direct effect on children's problem behaviors, as children may inherit genes that increase their susceptibility to depression, anxiety, or other mental health conditions (Downey and Coyne 1990). Additionally, children may mirror symptoms of depression exhibited by their mothers, which may impair their behavioral functioning.



be in poverty, and more likely to have an early exit from the labor market (Frank and Koss 2005; Kessler et al. 2003; Marcotte and Wilcox-Gok 2001).

Another social consequence of depression is that it may impair a mother's role as a parent. In fact, Belsky's (1984) process model of parenting suggests that mental health is one of the most important predictors of parenting. Symptoms of depression may compromise a mother's ability to parent effectively or consistently, perhaps by facilitating negative, withdrawn, or aggravated interactions with children (Cummings and Davies, 1994; Lovejoy et al., 2000; Lyons-Ruth et al. 2002). Depressed mothers may be less empathetic, more aggressive, and less emotionally responsive to their children than their non-depressed counterparts, all of which may facilitate neglectful parenting behaviors (Feng et al. 2007; Lovejoy et al. 2000; Silberg and Rutter 2002). The empirical literature suggests that depression is associated with fewer interactions with children, and that depressed mothers are more likely to neglect and harshly discipline their children (Bodovski and Youn 2010; Frech and Kimbro 2011; Kiernan and Huerta 2008; Lovejoy et al. 2000).

Finally, conceptual frameworks suggest that depression impairs the sufferer's interpersonal relationships and functioning (Coyne 1976). Thus, it is likely that depressed mothers also experience impairments in their roles as romantic partners, family members, and friends. Depressed mothers may be more likely than their nondepressed counterparts to criticize their partners, be physically or verbally aggressive, or have inconsistent routines that place stress on the couple relationship (Proulx, Helms, and Buehler 2007; Whisman 2001). These mothers may also be unable to sustain romantic relationships or fend off destructive partnerships, which may lead to frequent changes in the household roster and create an unstable household environment for children. Relationships with friends and family are also likely hampered by

depression (Coyne 1976). In the same way that depression may facilitate poor relationships with intimate partners, depression may cause friends and family members to limit the amount of instrumental and emotional support they provide (Lin, Ye, and Ensel 1999; Thoits 1984). Symptoms of depression (such as feeling worthless) may also make it difficult for depressed mothers to activate their social support networks when necessary or may lead to an incongruence between perceptions and availability of support (Meadows 2009).

### **Empirical Evidence Linking Maternal Depression to Children's Problem Behaviors**

Given the compelling theoretical reasons for why maternal depression may be associated with children's outcomes, it is not surprising that a large body of empirical literature finds depressed mothers do indeed transmit disadvantages to their children. Children exposed to maternal depression experience disadvantages in their academic, health, and behavioral outcomes, and this relationship begins in infancy and lasts through adulthood (Augustine and Crosnoe 2010; blinded; Brennan et al. 2000; Carlson and Corcoran 2001; Downey and Coyne 1990; Goodman and Gotlib 2002; Hay et al. 2001; Kiernan and Huerta 2008; Meadows et al. 2007).

Much of this empirical research focuses on children's behaviors (Brown 2004; Cummings and Davies 1994; Downey and Coyne 1990; Kahn, Brandt, and Whitaker 2004; Kiernan and Huerta 2008; Meadows et al. 2007). For example, three-year-old children are more likely to have anxious/depressed, attention deficit, and oppositional defiant disorders when their mothers report depression or anxiety (Meadows et al. 2007; also see blinded). Maternal depression has also been linked to greater reports of childhood depressive symptoms (Whitaker, Orzol, and Kahn 2006), antisocial behavior (Kim-Cohen et al. 2005), overanxious symptoms (Foley et al. 2001), and conduct disorder (Marmorstein et al. 2004).

Many children spend some part of their childhood with a depressed mother. But there is substantial variation in the chronicity and timing of maternal depression, both of which may be important determinants of how children cope with and respond to maternal depression. Major depression is often chronic, with its symptoms cycling over time and occasionally disappearing (Kendler, Thornton, and Gardner 2000). Children residing with chronically depressed mothers are likely exposed to persistently stressful, unsupportive social contexts and may be more vulnerable than children of mothers with fleeting depression (blinded; Giles et al. 2011; though see Alpern and Lyons-Ruth 1993). Additionally, a current or very recent depressive episode may be more detrimental than a prior episode, as children may adapt (blinded; Elder 1998).

Although existing theoretical perspectives and empirical research suggest maternal depression may be detrimental to the social roles occupied by sufferers, the mechanisms linking maternal depression to children's behavioral outcomes are not well understood. Some empirical research considers the mechanisms linking maternal depression to children's outcomes. Analyses on this topic commonly focus on only one set of proposed mechanisms (i.e., parenting behaviors). One noteworthy analysis, for example, found that three types of parenting behaviors – reading activities, mother-child relations, and discipline practices – mediated the relationship between maternal depression and young children's behaviors (Kiernan and Huerta 2008). Other investigations, often based on small and homogeneous samples, provide inconsistent support for the idea that maternal parenting behaviors (Conger et al. 1992; Conger et al. 2002; Cummings, Keller, and Davies 2005; Du Rocher Schudlich and Cummings 2007; Gartstein and Sheeber 2004; Mustillo et al. 2011) and relationship quality (Conger et al. 1992; Du Rocher Schudlich and Cummings 2007; Leinonen, Solantaus, and Punamaki 2003; Papp, Cummings, and Schermerhon 2004) indirectly link the association between maternal depression and children's

outcomes. To my knowledge, however, there exists no empirical research that has considered the independent contributions of economic resources, parenting behaviors, and social relationships in a comprehensive fashion.

### **Additional Correlates of Maternal Depression and Children's Problem Behaviors**

Theoretical perspectives and empirical research highlights the necessity of controlling for a host of demographic and socioeconomic characteristics associated with both depression and children's behaviors. To begin with, though racial differences in depression are inconsistent (Simpson et al. 2007), minorities and children of immigrants have more problem behaviors than their counterparts. Maternal age is associated with both depression (Kessler and Zhao 1999) and children's behaviors (Turley 2003), as is maternal religiosity (Bartkowski, Xu, and Levin 2008; Ellison et al. 2001). Socioeconomic status (e.g., income, education) consistently predicts children's behaviors (Duncan and Brooks-Gunn 1997; Gerard and Buehler 1999) and is also correlated with depression (Heflin and Iceland 2009). Characteristics of the family environment such as family instability and household composition are associated with depression (Meadows, McLanahan, and Brooks-Gunn 2008) and children's behaviors (Fomby and Osborne 2010). Maternal self-rated health is associated with depression (Schnittker 2005) and child wellbeing (Currie 2005). Finally, child characteristics such as gender and low birth weight are known correlates of children's behaviors (Klebanov, Brooks-Gunn, and McCormick 1994; Zill 1999).

### **Research Questions**

This paper addresses two research questions to advance our understanding of the relationship between maternal depression and child wellbeing. First, how robust is the association between maternal depression and children's internalizing and externalizing problem behaviors? I expect that children of depressed mothers, especially chronically depressed mothers,

will have more problem behaviors than their counterparts with never depressed mothers. I expect this association will persist after adjusting for a host of baseline demographic and socioeconomic characteristics, after adjusting for a lagged indicator of problem behaviors, and when using propensity score matching estimators. I also expect that proximate depression, net of depression chronicity, will be associated with more problem behaviors. Second, to what extent do economic resources, maternal parenting behaviors, relationship supportiveness and co-parenting, and perceived instrumental and emotional social support mediate the association between maternal depression and children's problems behaviors? Though these proposed mechanisms are not exhaustive of all pathways through which maternal depression may influence children, and may be related to one another (e.g., Cui and Conger 2008), they provide a useful starting point for understanding the processes that underlie the intergenerational transmission of disadvantage via maternal depression. I expect that all four sets of mechanisms will substantially attenuate the consequences of maternal depression for children and that, considered together, they will render the consequences of both chronic and transitory depression for children's problem behaviors statistically insignificant.

## **METHODS**

### **Data Source**

I use data from the Fragile Families and Child Wellbeing Study, a longitudinal survey of nearly 5,000 new and mostly unmarried parents in 20 U.S. cities that were stratified by labor market conditions, welfare generosity, and child support policies. Because unmarried mothers were oversampled, the sample over-represents minority children, economically disadvantaged children, and children with non-residential fathers. 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, and fathers were interviewed as soon as possible after the child's birth. Both parents were interviewed by telephone when their children were approximately one, three, and five years old. Response rates were relatively high.<sup>3</sup> See Reichman et al. (2001) for further information about the study design (also see Bendheim-Thoman Center for Research on Child Wellbeing 2008a).

Additionally, I use data from the In-Home Longitudinal Study of Pre-School Aged Children, a subsample of families who participated in the Fragile Families survey. When children were approximately three and five years old, researchers administered a survey in the child's home. In this survey, the child's caregiver (in 96% of observations, the child's mother) answered questions about family functioning and child wellbeing. About 78% of families in the baseline Fragile Families sample participated in the three-year In-Home survey and 61% participated in the five-year In-Home survey (Bendheim-Thoman Center for Research on Child Wellbeing 2008b, 2009).

The Fragile Families data provide a unique opportunity to understand the association between maternal depression and children's problem behaviors among a group of children arguably most at risk of maternal depression and problem behaviors.<sup>4</sup> These data include measures of maternal depression at three points in time, allowing for an examination of the differential consequences of chronic and intermittent depression. In addition, these data include established indicators of children's problem behaviors at two points in time, making it possible

---

<sup>3</sup> Of those sampled to participate in the baseline interview, 82% of married and 87% of unmarried mothers participated. Of mothers who responded to the baseline interview, 89% participated in the one-year survey, 86% participated in the three-year survey, and 85% participated in the five-year survey.

<sup>4</sup> The Early Childhood Longitudinal Study-Birth Cohort (ECLS-B), a nationally representative longitudinal survey that follows a cohort of nearly 11,000 children born in 2001, is another data source that would allow me to examine the relationship between maternal depression and problem behaviors in early childhood. However, in the ECLS-B, information about maternal depression was collected inconsistently across waves, making it difficult to examine depression chronicity. Additionally, the Fragile Families data contain more established and frequently used measures of children's problem behaviors as well as a host of covariates unavailable in the ECLS-B.

to adjust for early problem behaviors in the multivariate models. In addition, these data include a rich set of measures about family functioning and other previously unobserved information (e.g., depression in the child's maternal and paternal grandparents, coparenting among the child's mother and father).

The final analytic sample includes 2,427 observations. Of the 4,898 observations in the Fragile Families baseline sample, I dropped the 1,920 (39%) observations that did not participate in the five-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 behaviors at the five-year survey.<sup>5</sup> Few observations were missing data on control variables, and I preserve these observations with multiple imputation. I produce 20 data sets using the ICE procedure in Stata (Royston 2004). In the imputation model, I include variables related to the research questions or to the likelihood of being missing (Allison 2002).<sup>6</sup> Importantly, mothers in both the analytic and full samples were equally likely to report depression, report similar behaviors in their children, and have similar values on each of the proposed mechanisms. However, there are some differences between the full and analytic samples. Mothers in the analytic sample are more likely to be Black and less likely to be Hispanic, other race, or foreign-born. These mothers have higher educational attainment, and children are slightly younger ( $p < 0.05$ ).

## Measures

***Children's Problem Behaviors.*** Children's internalizing and externalizing problem behaviors are measured by the Child Behavior Checklist (CBCL), an established measure of

---

<sup>5</sup> Maternal depression is not predictive of attrition. In supplemental analyses, I use a broader sample inclusion criterion by allowing mothers to be in the sample if they have nonmissing data on depression at any wave and impute missing values on depression. Findings are robust to this specification.

<sup>6</sup> Findings are robust to listwise deletion.

problem behaviors in children (Achenbach 1992). During the five-year telephone and In-Home surveys, mothers were asked to rate aspects of their children's behaviors, and these responses comprise the internalizing and externalizing scales (see Appendix A for individual items that comprise each scale). For consistency across outcomes, I sum responses for each scale and standardize each to have a mean of 0 and a standard deviation of 1 ( $\alpha=0.754$  for internalizing behaviors,  $\alpha=0.862$  for externalizing behaviors). Some models include lagged indicators of children's problem behaviors (measured with the CBCL during the three-year In-Home survey).<sup>7</sup>

Though commonly used indicators for studying problem behaviors in children, these outcomes are limited because they are reported by children's mothers. This may be problematic when mothers are depressed, as depressed mothers may have distorted beliefs about their children's behavior (Chi and Hinshaw 2002; Chilcoat and Breslau 1997; for contrary findings, see Achenbach, McConaughy, and Howell 1987; Richters 1992). This is an important limitation to keep in mind, and one that I address with supplemental analyses described below (also see blinded; Meadows et al. 2007).

***Maternal Depression.*** Maternal depression is measured by mothers' responses to the Composite International Diagnostic Interview Short Form (CIDI-SF) (Kessler et al. 1998). Mothers were asked if, at some time during the past year, they had feelings of depression or were unable to enjoy normally pleasurable things. Those who experienced at least one of these two conditions for a two-week period most of the day, every day 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, or thinking

---

<sup>7</sup> Because the CBCL asks developmentally appropriate questions, not all questions asked at the three-year survey were asked at the five-year survey (and vice versa). In supplemental analyses, I create a measure of children's problem behaviors using measures that overlap in the two waves (seven questions comprising both the internalizing and externalizing scales). Results are robust to this measurement strategy.



about death), and those who reported affirmative answers to at least three of these symptoms are considered depressed. Although limitations to the CIDI-SF exist (Link 2002; also see Horwitz and Wakefield 2007), it is commonly used in large-scale community surveys to estimate the prevalence of depression in the population (Aalto-Setälä et al. 2002). Based on mothers' responses at the one-, three-, and five-year surveys, I create a series of mutually exclusive variables that capture depression chronicity: never depressed, depressed at one wave, depressed at two waves, and depressed at three waves. I measure proximate depression with a dummy variable indicating the mother is depressed at the five-year survey.<sup>8</sup>

**Control variables.** I control for a host of maternal and child characteristics measured at baseline, ensuring they are as exogenous as possible from the dependent variable. Mother's race is represented by a series of dummy variables: White, Black, Hispanic, and other race. A dummy variable indicates the mother was born outside of the United States. I control for a continuous measure of mother's age.<sup>9</sup> Mother's attendance at religious services is represented by a series of dummy variables: at least once a week, several times a month, several times a year or hardly ever, and never. The following measures mother's education: less than high school diploma, high school diploma or GED, and postsecondary education. A dummy variable indicates the child's birth was paid for by Medicaid. I include a logged measure of household income, as well as a series of dummy variables indicating the mother's relationship status with the child's biological father at baseline: married, cohabiting, dating but not co-residential, and separated. A dummy

---

<sup>8</sup> Maternal depression measured at the one-year survey may include mothers who experience short-term post-partum depression (Kearns et al. 1997). Given that the percentages of mothers affected by depression are highest at the three-year survey (20%, compared to 16% at the one-year and 17% at the five-year), there is no reason to believe that an unusually large number of mothers report post-partum depression. Additionally, there is no reason to believe post-partum depression is less influential for children's problem behaviors than major depressive disorder. If post-partum depression is less consequential than major depression disorder, the analyses may underestimate the consequences of maternal depression.

<sup>9</sup> Because some research emphasizes the nonlinear association between depression and age (Mirowsky and Ross 1992), supplemental analyses included a squared term for mother's age. Results were robust to this alternative specification.

variable indicates the child's grandmother lived in the household, and a continuous variable indicates the number of children in the household at baseline. Mother's health is represented by a dummy variable (1=*fair or poor*, 0=*excellent, very good, or good*). Additionally, I include dummy variables indicating one of the mother's and father's biological parents experienced a two-week period of feeling depressed, down in the dumps, or blue. A dummy variable indicates the child is male and a continuous variable indicates age (in months) at the five-year survey.

***Mechanisms.*** I consider four sets of mechanisms that may attenuate the association between maternal depression and children's problem behaviors, all measured at the five-year survey: economic resources, maternal parenting behaviors, relationship supportiveness and co-parenting, and perceived instrumental support. To begin with, the three indicators of economic resources include employment status, income-to-poverty ratio, and material hardship. A dummy variable indicates the mother is employed. Income-to-poverty ratio is the ratio of total household income to official poverty thresholds established by the U.S. Census Bureau. Poverty thresholds correspond to the year before the interview, and are based on reports of household size and composition. Finally, material hardship is measured with mother's responses to 12 questions about experiencing events because there was not enough money (e.g., received free food or meals). I summed answers to these questions to create an index of material hardship. See Appendix B for a complete description of the individual items that comprise this measure as well as other measures.

Four indicators of maternal parenting behaviors, measured at the five-year survey, include the following: neglect, psychological aggression, physical assault, and engagement. Mothers were asked questions from the Parent-Child Conflict Tactics Scales (CTSPC) about neglect and two types of discipline: psychological aggression and physical assault (Straus 1990).

Examples of neglect include leaving the child home alone or not getting the child food ( $\alpha=0.436$ ).<sup>10</sup> Psychological aggression includes questions about discipline such as shouting at the child or threatening to kick the child out of the house ( $\alpha=0.504$ ). Physical assault includes spanking or shaking the child ( $\alpha=0.532$ ). I use yearly prevalence measures for each of the separate indicators of neglect, psychological aggression, and physical assault (1=*happened in the past year*, 0=*did not happen in the past year*), and take an average of these variables that ranges from 0 to 1.<sup>11</sup> Additionally, maternal engagement is measured by the average number of days per week mothers participated in various activities with their child (e.g., playing games, reading, or telling stories) ( $\alpha=0.690$ ).

I examine three indicators of relationship supportiveness and co-parenting measured at the five-year survey: supportive behaviors, shared responsibility in parenting, and cooperation in parenting.<sup>12</sup> Supportive behaviors comprises three mutually exclusive dummy variables (no relationship, low supportiveness, and high supportiveness) based on maternal reports about things such as her partner's willingness to compromise ( $\alpha=0.942$ ). Shared responsibility in parenting is captured by mothers' responses to four questions about how often the father assists with things such as running errands ( $\alpha=0.933$ ), and cooperation in parenting is measured by

---

<sup>10</sup> This variable has relatively low internal validity, likely due to under-reporting, the rare occurrence of the individual items comprising the scale, and the weak correlation between some items (Straus et al. 1998). Supplemental analyses not presented consider the five scale components separately and reveal virtually identical findings. Because this indicator of neglect is an established scale and prior research suggests it is highly correlated with child wellbeing (e.g., Taylor et al. 2010), the analyses presented use the summary measure.

<sup>11</sup> Indicators of chronicity – as opposed to prevalence – are available for neglect, psychological aggression, and physical assault. In supplemental analyses, I measure the chronicity of these behaviors by assigning weights to values in accordance with the frequencies indicated by the response categories (0=*this has never happened in the past year*; 1=*once*; 2=*twice*; 4=*three to five times*; 8=*six to 10 times*; 15=*11 to 20 times*; 25=*more than 20 times*). Findings are robust to this alternative measurement strategy. Because prevalence measures are preferred to chronicity measures (Straus 1990), I report those in the tables.

<sup>12</sup> Preliminary analyses included family instability as a potential mechanism. Including a measure of family instability did not improve the model fit, so the models presented do not include this. For supportive behaviors, I use mothers' responses about her current partner, which is either the child's father or another partner. Shared responsibility and cooperation in parenting refer to mothers' experiences with children's fathers; though many parents separated by the five-year survey, nearly all fathers are involved in co-parenting (Carlson, McLanahan, and Brooks-Gunn 2008).

mothers' responses to six statements about the father's role in parenting (i.e., how often the mother talks to the father about problems that come up with raising the child) ( $\alpha=0.957$ ). The final measures of shared responsibility in parenting and cooperation in parenting average the responses to their respective questions.

Social support at the five-year survey is measured by perceived instrumental support, number of close friends, and presence of a confidante. First, mothers were asked if they could count on someone during the next year for the following: to loan them \$200, to loan them \$1,000, to help with babysitting or child care, to provide them with a place to live, to cosign a bank loan for \$1,000, and to cosign a bank loan for \$5,000. Each of these questions comprises a dichotomous variable, and the final measure of perceived instrumental support averages responses to these six items ( $\alpha=0.785$ ). Number of close friends is a continuous variable ranging from 0 to 30, and a dummy variable indicates the presence of a confidante.

### **Analytic Strategy**

The multivariate analyses proceed in three parts. In the first stage, presented in Table 3, I use ordinary least squared (OLS) regression models to estimate children's internalizing and externalizing problem behaviors as a function of maternal depression. In all models, I include dummy variables that indicate the chronicity and timing of maternal depression. Model 1 presents the unadjusted association between maternal depression and children's problem behaviors. Model 2 includes the maternal and child baseline control variables described above and Model 3 adds a lagged indicator of children's problem behaviors (measured when children are about three years old). Including the lagged dependent variable is useful because it provides a stringent, conservative test of the relationship between maternal depression and children's problem behaviors. This also addresses concerns about endogeneity between maternal depression

and children's problem behaviors (though supplemental analyses provide no evidence that problem behaviors in children lead to maternal depression). After the lagged measures are included, any remaining association between maternal depression and children's problem behaviors at the five-year survey are *net* of children's behaviors at the three-year survey.<sup>13</sup>

In the second stage, I use propensity score matching to estimate the effect of maternal depression on children's problem behaviors. Propensity score matching is a way to diminish concerns about pre-existing differences between groups by matching individuals on the distribution of their observed covariates (Morgan and Harding 2006; Rosenbaum and Rubin 1983). Given that depression is not a randomly occurring event and the infeasibility of randomly assigning mothers to depression, propensity score matching is especially useful for studying the link between maternal depression and child wellbeing. Propensity score matching approximates an experimental design by using observed variables to comprise a treatment group (in this case, depressed mothers) and a control group (never depressed mothers). Propensity score matching makes the treatment and control groups as similar as possible, which is especially beneficial given the stark differences between never-depressed and ever-depressed mothers (see Table 2). It is important to note that propensity score matching only eliminates bias due to observed variables and not unobserved variables. Thus, though it reduces bias traditionally associated with

---

<sup>13</sup> A change score approach is another appropriate method of estimating a dependent variable that is measured at two points in time. A key requirement of a change score model, however, is that the model includes a time-varying independent variable (Johnson 2005). Given that a time-invariant variable (maternal depression chronicity) is the key predictor of interest, the lagged dependent variable approach more closely fits the research questions and hypotheses of this paper. Additionally, the lagged dependent variable approach is an appropriate modeling strategy when it is possible to adjust for important exogenous predictors of the outcome variable (Johnson 2005). Given that the Fragile Families data was designed to, among other things, investigate child wellbeing, I am able to control for a host of family- and child-level characteristics that predict internalizing and externalizing problem behaviors. Another methodological strategy would be to employ a fixed-effects approach, which would estimate children's problem behaviors net of time-varying observed characteristics and all time-invariant characteristics. However, fixed-effects models would drop all observations in which maternal depression does not change over time (including the chronically depressed and the never depressed), making it impossible to examine the differential effect of chronic and transitory depression.

OLS regression models, the findings presented should not be taken as definitive causal conclusions.

I estimate three sets of propensity score models: comparing children of mothers depressed at one survey wave to those with never depressed mothers, children of mothers depressed at two survey waves to those with never depressed mothers, and children of mothers depressed at three survey waves to those with never depressed mothers. I first generate a propensity score for each observation that estimates the probability of maternal depression at one wave, at two waves, or at three waves.<sup>14</sup> I include the following variables in the logistic regression model that generates the propensity score (most measured at baseline): mother's race, mother's immigrant status, mother's age, mother's age squared, mother's age cubed, mother's frequency of attendance at religious services, mother's education, mother's household income, mother's relationship status, presence of a grandmother in the household, number of children in the household, mother's self-reported health, mother's employment status, mother's income-to-poverty ratio, father's depressive symptoms, depression in a child's maternal grandparent, child's temperament, race \* depression in a child's maternal grandparent, and income-to-poverty ratio \* depression in a child's maternal grandparent.

After generating propensity scores for each observation, I then match observations on the probability of experiencing depression. I restrict the analysis to regions of common support and use three types of matching procedures: nearest neighbor matching, radius matching, and kernel

---

<sup>14</sup> Propensity score methods are only able to estimate the effect of a dichotomous treatment (i.e., children of mothers depressed at one survey wave, compared to those with never depressed mothers) and not a categorical treatment (as used in the OLS regression models). Thus, when matching on maternal depression at one survey wave, I drop observations in which mothers report depression at two or three survey waves. I employ similar sample restrictions when matching on depression at two and three survey waves. This allows me to garner estimates that are comparable to the OLS regression models.

matching (Morgan and Harding 2006).<sup>15</sup> Nearest neighbor matching estimates children's behaviors by comparing each treatment observation to a control observation with the closest propensity score. I use matching with replacement, which means that each control observation can be matched to more than one treatment observation. Radius matching compares each treatment observation with control observations within a specific radius (caliper=0.005). Kernel matching compares each treatment observation with all control observations, but weights these observations according to their distance from treatment cases (bandwidth=0.006; kernel=Gaussian). All propensity score analyses were conducted using Stata (Becker and Ichino 2002).<sup>16</sup>

Previewing the results slightly, the propensity score models substantiate findings from the OLS models that suggest that maternal depression has negative consequences for children's internalizing and externalizing problem behaviors. Thus, in the final stage of analysis, I again turn to OLS regression models to examine how much of the association between maternal depression and children's problem behaviors is explained by the proposed mechanisms. In Tables 5 (internalizing behaviors) and 6 (externalizing behaviors), I extend the final model from Table 3, the model that includes all control variables and the lagged indicator of children's problem behaviors. Model 1 includes indicators of economic wellbeing, Model 2 includes parenting behaviors, Model 3 includes relationship supportiveness and co-parenting, and Model 4 includes perceived instrumental and emotional social support. The final model includes all

---

<sup>15</sup> Note that the goal of propensity score matching is to match individuals in the treatment group (i.e., children of mothers depressed at three survey waves) to individuals in the control group (i.e., children of never depressed mothers) who have a similar distribution of covariates. Because each of the three matching procedures employed here uses a different algorithm to match treatment and control observations, and it is not always possible to match each treatment observation with another observation, the Ns differ across matching estimators. However, fewer than 10 treatment observations do not match with a control observation.

<sup>16</sup> Because the Stata commands for estimating propensity score models cannot be used appropriately with multiple imputed data sets, I estimate these models for the first imputed data set. The results presented are robust to using different single data sets.

potential mechanisms. Although all models do not yield definitive causal estimates, a point I return to, they do provide strong evidence for the collateral consequences of maternal depression.

### **Sample Description**

Table 1 presents descriptive statistics of all variables in the analysis. More than one-third (34%) of children have mothers who report depression at least once throughout their first five years, and 5% of children have mothers who report depression at all three points in time. About 17% of mothers report depression at the five-year survey. In terms of demographic characteristics, more than half of mothers (52%) are Black and nearly one-fourth (23%) are Hispanic. Mothers are, on average, 25 years old when their children were born. At baseline, nearly two-thirds of mothers do not have education beyond high school. About 59% of mothers are in marital or cohabiting relationships with their child's father.

[Table 1.]

## **RESULTS**

### **Estimating Children's Problem Behaviors as a Function of Maternal Depression**

Descriptive statistics presented in Table 2 demonstrate substantial differences in children's problem behaviors by maternal depression. I use chi-square tests or two-tailed T-tests, depending on the distribution of the outcome variable, to compare children of never depressed mothers to all other groups of children. Children of mothers depressed at one, two, or three survey waves have more internalizing and externalizing problem behaviors than their counterparts with never depressed mothers. Never depressed mothers differ in a host of additional characteristics than depressed mothers. For example, never depressed mothers are more likely to be employed, report higher income-to poverty ratios, and have less material



hardship. They also report more favorable parenting behaviors, more supportive intimate partnerships, better co-parental relationships, and greater support networks.

[Table 2.]

***OLS Regression Models.*** I first consider the relationship between maternal depression and children's problem behaviors. Model 1 in Table 3 estimates children's internalizing and externalizing problem behaviors as a function of maternal depression. Net of proximate depression, children of mothers who report depression at one, two, or three survey waves have more internalizing and externalizing problem behaviors than their counterparts with never depressed mothers. The magnitudes of these associations are considerable. Children of chronically depressed mothers (i.e., mothers depressed at all three waves) have internalizing and externalizing problem behaviors that are about half of a standard deviation worse than children of never depressed mothers (0.492,  $p < 0.001$  for internalizing behaviors; 0.541,  $p < 0.001$  for externalizing behaviors). Children of mothers with proximate depression also have more problem behaviors than other children.

The size and statistical significance of the maternal depression coefficients are reduced in Model 2, though maternal depression still remains a statistically significant predictor of children's problem behaviors. Children of chronically depressed mothers have behaviors that are approximately two-fifths of a standard deviation worse than those with never depressed mothers (0.383,  $p < 0.01$  for internalizing behaviors; 0.395,  $p < 0.01$  for externalizing behaviors). Children also experience vulnerabilities when mothers are depressed at one or two survey waves, and proximate depression is independently associated with internalizing and externalizing problem behaviors.

The final set of models includes a lagged dependent variable, which also attenuates the magnitude of the maternal depression coefficients. However, taking into account children's prior behaviors does not render the association between maternal depression and children's problem behaviors statistically insignificant. These most conservative models show that children of chronically depressed mothers, compared to their counterparts with never depressed mothers, have internalizing problem behaviors that are about one-third of a standard deviation worse and externalizing problem behaviors that are about one-fourth of a standard deviation worse. Adjusting for prior behaviors renders the association between proximate depression and five-year-old children's problem behaviors marginally significant ( $p < 0.10$  for both internalizing and externalizing problem behaviors). As expected, prior behaviors are powerful predictors of behaviors at the five-year survey. There is no evidence that the association between maternal depression and children's problem behaviors varies by demographic characteristics such as race, income, or family structure and instability (results available upon request).

[Table 3.]

An important limitation, as discussed earlier, is that children's problem behaviors are reported by their mothers, and an ideal research design would include complete information on children's behaviors from multiple reporters including trained interviewers. Although children's fathers were not administered the full CBCL questionnaire, they were asked a subset of questions (six of the 22 internalizing problem behaviors and five of the 30 externalizing problem behaviors) at the five-year survey. I capitalize on this information by estimating father-reported problem behaviors as a function of maternal depression.

Before proceeding to these supplemental results, several caveats are in order. First, fathers were not asked any CBCL questions at the three-year survey, so it is impossible to adjust

for prior behaviors. Additionally, I restrict this analysis to children living with their fathers at the five-year survey (n=1,029), as non-residential fathers may have less complete information about children's behaviors than residential fathers or mothers. The sample size is reduced dramatically (by 58%), so I combine children with mothers depressed at two and three survey waves (n=102). These paternal reports of children's behaviors are not a perfect substitute for maternal reports, but they are moderately correlated ( $r=0.267$  for both internalizing and externalizing behaviors) and it is possible to compare fathers' responses to mothers' responses of the exact same survey questions.

Results suggest that maternal depression, especially chronic depression, is associated with children's problem behaviors regardless of whether these behaviors are reported by their mothers or fathers. Taking into account the baseline demographic and socioeconomic characteristics (the equivalent of Model 2 in Table 2), fathers report that children have worse internalizing (0.146,  $p<0.05$ ) and externalizing (0.223,  $p<0.05$ ) problem behaviors when mothers are depressed at two or three survey waves. This is similar, though slightly smaller in magnitude, to mothers' reports of the same six internalizing (0.291,  $p<0.05$ ) and five externalizing (0.304,  $p<0.05$ ) problem behaviors. Depression at one survey wave is not associated with either paternal or maternal reports of these outcomes. This is consistent with other research using these data that finds a correlation between interviewers' reports of children's temperament and depressed mothers' reports of children's behavior (Meadows et al. 2007).

***Propensity Score Matching.*** In Table 4, I present estimates of the effect of maternal depression on children's problem behaviors using nearest neighbor, radius, and kernel matching strategies. Each of these matching strategies suggests that children with depressed mothers have more problem behaviors than their counterparts with never depressed mothers. The average

treatment effect for the treated (ATT) estimates for maternal depression at one survey wave range from 0.176 to 0.215 for internalizing problem behaviors and from 0.168 to 0.209 for externalizing problem behaviors. Interpreting the most conservative estimates, those garnered from a radius matching approach, children of mothers depressed at one survey wave have behaviors that are about one-sixth of a standard deviation worse than those with never depressed mothers. When I instead match on distally occurring depression at only one survey wave (i.e., children of mothers depressed at only the one- or three-year survey), the results reduce to statistical insignificance. All three types of matching procedures find that these children have internalizing problem behaviors similar to their counterparts with never depressed mothers and that they exhibit only slightly worse externalizing problem behaviors, suggesting results presented in the first panel of Table 4 are driven by proximally occurring short-lived depression.

The next two panels of Table 4 estimate the effect of maternal depression at two and three waves, respectively. These results are consistent with findings from the OLS regression models; maternal depression at two or three survey waves is associated with internalizing and externalizing problem behaviors in children. Children also suffer when mothers report proximate depression. Taken together, these propensity score models suggest that when children of depressed mothers are matched to other children, so that the only observed difference between the two groups is the presence or absence of maternal depression, there remains an association between maternal depression and children's problem behaviors.

[Table 4.]

### **Explaining Children's Problem Behaviors and Maternal Depression**

Both the OLS models and the propensity score models establish that maternal depression is a consistently significant predictor of children's problem behaviors. These analyses, however,

have not considered the mechanisms underlying this association. Given that proximate maternal depression was only marginally significantly associated with children's problem behaviors in the final model of Table 3, I focus this discussion on depression chronicity. I turn first to the estimates of children's internalizing problem behaviors in Table 5.

Adjusting for economic resources reduces the magnitude and statistical significance of maternal depression. I include all three indicators of economic resources simultaneously in the model, as a chi-square test revealed joint significance ( $F=8.03, p<0.001$ ). Taking into account economic resources reduces the magnitude (by 22%) and statistical significance of chronic depression. For mothers depressed at one and two waves, respectively, the coefficient is reduced by 13% and 23%. Adjusting for economic resources does not entirely explain the association between maternal depression and children's internalizing behaviors, suggesting other factors may explain this relationship. Thus, in Model 2, I adjust for maternal parenting behaviors, which also substantially reduces the maternal depression coefficients. As in the prior model, I test the joint significance of these variables ( $F=20.80, p<0.001$ ). In this case, the coefficient for chronic maternal depression is reduced by 25%. The coefficients for maternal depression at one and two waves, respectively, are also reduced by 22% and 12%. Relationship supportiveness and co-parenting (Model 3) does little to attenuate the association between maternal depression and children's internalizing behaviors, reducing the magnitude of these coefficients by 4% to 5% ( $F=6.23, p<0.001$ ). Similarly, perceived social support does little to attenuate the association ( $F=5.23, p<0.001$ ). In Model 5, which includes all potential mechanisms, the relationship between chronic maternal depression and children's internalizing behaviors is reduced by 41%. Additionally, the relationship between proximate maternal depression and children's

internalizing behaviors is reduced by 40% from Model 3 of Table 3. In this final model, all maternal depression coefficients are statistically insignificant.

[Table 5.]

Table 6, which displays estimates of externalizing problem behaviors, tells a generally consistent story as the estimates of internalizing problem behaviors. Generally, though, the proposed mechanisms – considered independently and together – explain a greater proportion of the association between maternal depression and children’s externalizing behaviors than the association between maternal depression and children’s internalizing behaviors. For example, in the first model that adjusts for economic resources, the association between maternal depression and children’s externalizing behaviors falls from statistical significance ( $F=9.93, p<0.001$ ). Taking into account economic resources reduces the coefficient for maternal depression at one wave by 16%, at two waves by 51%, and at three waves by 27%. Adjusting for maternal parenting behaviors in Model 2 also alters the relationship between maternal depression and children’s externalizing behaviors to statistical insignificance ( $F=46.91, p<0.001$ ). Relationship supportiveness and co-parenting (Model 3) and perceived social support (Model 4) attenuate the link between intermittent but not chronic maternal depression ( $F=7.16, p<0.001$ ;  $F=7.26, p<0.001$ ). All maternal depression coefficients, compared to Model 3 of Table 3, are reduced by at least 47% (47% for mothers depressed at one wave, 59% for mothers depressed at two waves, and 47% for mothers depressed at three waves) and to statistical insignificance. Additionally, the relationship between proximate maternal depression and children’s externalizing behaviors is reduced by 53% from Model 3 of Table 3. Supplemental analyses (not presented but available upon request) provide little evidence that the effect of maternal depression on children’s problem behaviors varies by the mechanisms.

[Table 6.]

## DISCUSSION

In this paper, I use data from the Fragile Families and Child Wellbeing study, a rich data source uniquely suited to understand the wellbeing of young children, to examine how maternal depression chronicity and timing has consequences for children's internalizing and externalizing problem behaviors. Depression is a severe, often chronic mental disorder that has durable social consequences for sufferers, and I find that the social consequences for sufferers may have spillover effects onto their children. Given the importance of early childhood problem behaviors for children's life course trajectories, these results suggest that maternal depression may play an important, independent role in the transmission of advantage or disadvantage across generations.

I find that children of depressed mothers, especially chronically depressed mothers, have more internalizing and externalizing problem behaviors than their counterparts with never depressed mothers. The relationship between maternal depression and children's problem behaviors exists independent of a wide array of mother and child characteristics, including several indicators of socioeconomic status measured at baseline for this relatively disadvantaged sample of children. The magnitudes of these associations are substantial. In the fully specified model (Model 3 of Table 3), I find that chronic depression is associated with one-third of a standard deviation increase in internalizing problem behaviors and one-fourth of a standard deviation increase in externalizing problem behaviors. Further, few variables are as important predictors of children's problem behaviors as maternal depression chronicity. For both internalizing and externalizing behaviors, only the (standardized) coefficient for the lagged dependent variable is larger in magnitude than the coefficient for chronic maternal depression. The results also show that, once taking into account prior behaviors, proximate depression is

only marginally associated with children's wellbeing, highlighting the importance of depression chronicity.

These results are consistent with a large body of evidence documenting the deleterious consequences of maternal depression for child wellbeing (Augustine and Crosnoe 2010; blinded; Giles et al. 2011; Goodman and Gotlib 2002; Meadows et al. 2007). But these results also extend this literature in several ways. First, I employ two modeling strategies to minimize bias: (1) OLS regression models with lagged dependent variables and (2) propensity score models. In the OLS models, the lagged dependent variables account for selection into depression resulting from children's problem behaviors and provide a stringent, conservative test of the influence of maternal depression by estimating change in children's behaviors. The propensity score models, though still subject to unobserved heterogeneity, allow me to match "treatment" observations (i.e., chronically depressed mothers) to other observations that are similar in many ways except for the presence of depression. Taken together, these modeling strategies provide a rigorous test of the relationship between maternal depression and children's problem behaviors.

Conceptually, there are many reasons to expect why maternal depression – with its debilitating symptoms that often include fatigue, irritability, or loss of interest in daily activities – may lead to problem behaviors in children, and an examination of these potential explanations is a second contribution of this paper. The role impairments associated with depression may lead to reduced economic wellbeing, impaired parenting behaviors, or hampered social relationship with intimate partners, family members, or friends, all of which have consequences for child wellbeing. Indeed, I find that the wide-reaching social consequences of depression – those that impair mothers' abilities as earners, parents, and partners – explain the deleterious consequences of depression for children. Together, economic resources, parenting behaviors, relationship



supportiveness and co-parenting, and perceived social support explain a large proportion of the association between maternal depression and children's problem behaviors. These mechanisms explain 41% of the relationship between chronic depression and internalizing behaviors and 47% of the relationship between chronic depression and externalizing behaviors. These findings suggest the importance of paying greater attention to understanding and ameliorating the wide-ranging social consequences of depression. Interventions that decrease economic hardship and improve parenting skills may aid in leveling the playing field for children of depressed mothers.

Economic resources and parenting behaviors are especially strong mechanisms. This is consistent with expectations, as the socioeconomic and parenting consequences of depression are well documented in the literature (Kessler et al. 2003; Lovejoy et al. 2000; Marcotte and Wilcox-Gok 2001). In addition, economic resources are a consistent, robust predictor of children's behavioral problems, with children from impoverished families having more problems than their economically advantaged counterparts (Duncan et al. 2011). Economically disadvantaged children may attend poor quality child care programs that do not facilitate the development of positive behaviors (Burchinal 1999). Few economic resources may also mean that mothers cannot purchase materials (i.e., books) or services (i.e., art classes or music lessons) that may benefit children. Similarly, parenting behaviors such as neglect and harsh discipline have been consistently linked to children's outcomes (Amato and Fowler 2002; Bodovski and Youn 2010).

Conceptual perspectives on depression suggest that the disorder impairs the sufferer's interpersonal relationships and functioning (Coyne 1976), and a large body of empirical research confirms that, indeed, depression disrupts social relationships (Proulx et al. 2007; Whisman 2001). Contrary to expectations, social relationships (defined as relationship supportiveness and co-parenting and perceived social support) play only a weak role in attenuating the relationship

between maternal depression and children's problem behaviors despite the independent correlations with both depression and problem behaviors. It is possible that the origins of depression and impaired social relationships are similar and, thus, accounting for social relationships only marginally diminishes the already deleterious consequences of maternal depression for children. Future research would benefit from an examination of the upstream factors associated with depression, as understanding these origins may further shed light on its social consequences. Indeed, other research has found that relationship quality does not mediate the association between depression and children's outcomes (Du Rocher Schudlich and Cummings 2003; Papp et al. 2004; though see Leinonen et al. 2003). Comparing across studies is difficult, though, as relationship quality is rarely measured consistently and employed measures are often conceptually distinct (i.e., ranging from positive to negative aspects of the relationship, and from self-reports to interviewer observations). Thus, future research would also benefit from understanding the multi-dimensional, longitudinal nature of the association between relationship quality and depression. With respect to social support, depressed mothers may have a distorted view of their available support, and this measurement error may lead to an imprecise estimate of the role of social support in attenuating the relationship between maternal depression and children's behaviors (Meadows 2009; Wethington and Kessler 1986).

### ***Limitations***

Several limitations exist. To begin with, I cannot make causal conclusions about the effect of maternal depression on children, as unobserved characteristics may render the association between maternal depression and children's behaviors spurious. However, adjusting for a lagged dependent variable and employing propensity score models substantially improves upon many other research designs. Also, the rich nature of the Fragile Families data makes it

possible to control for many potential confounders and thus reduce unobserved heterogeneity. Another limitation, discussed at length in the results section, is that children's problem behaviors are reported by their mothers and depressed mothers may have negative perceptions of their children (Chi and Hinshaw 2002; Chilcoat and Breslau 1997). However, supplemental analyses with a subset of father-reported behavior problems suggest a real association between maternal depression and children's behaviors, not an association biased by systematic measurement error. There are other reasons to believe reporting bias does not affect the results. For example, proximate depression – depression that is measured at the same time as children's behaviors – is not significantly linked to worse behaviors in children once prior behaviors are taken into account (Model 3 of Table 3). If depressed mothers were indeed negative reporters of their children's behaviors, this statistically significant association would undoubtedly persist. Other research using these data has come to similar conclusions (blinded; Meadows et al. 2007). An ideal research design would have independent assessments of children's behaviors, and the not-yet-released fifth wave of Fragile Families data will provide an opportunity to simultaneously examine mother, teacher, and child reports of behaviors.

Additional limitations exist regarding variable measurement. It is possible that some mechanisms considered influence one another or are endogenous to maternal depression. For example, economic hardship may lead to depression (Heflin and Iceland 2009). The analytic design, with its particular attention to the time ordering of variables, addresses most threats to endogeneity, with depression being measured prior to the mechanisms and with extensive baseline controls that are exogenous to the measurement of depression.<sup>17</sup> Furthermore, the

---

<sup>17</sup> Endogeneity could be a concern if a mother reports depression at the five-year survey, when the mechanisms are measured. Because supplemental analyses showed substantively similar findings when I only used indicators of depression at the one- and three-year surveys, I present these findings to take advantage of having measurement of depression at three survey waves.

Fragile Families sampling design, with its focus on unmarried mothers, reduces socioeconomic heterogeneity. Given that depression does indeed affect the most vulnerable mothers, though, children of depressed mothers likely experience an accumulation of disadvantages and future research would benefit from an explicit exploration of this. Finally, the dichotomous indicator of depression does not allow for the possibility of looking at mothers who do not meet the criteria for major depressive disorder but still exhibit some symptoms of depression (Mirowsky and Ross 2002).

### *Conclusions*

Overall, results suggest that maternal depression plays an important role in the transmission of disadvantage across generations. Children exposed to maternal depression early in the life course, especially those exposed to depression across multiple years, are more likely than their counterparts to have internalizing and externalizing problem behaviors when they are five years old. Much of the independent consequences of depression for children, though, stem not directly from depression but instead from other social consequences of depression. These findings extend prior research on the consequences of maternal depression for children by using a large, non-clinical, and representative sample; by utilizing longitudinal measures of maternal depression and children's behaviors; by employing statistical techniques to address concerns about unobserved heterogeneity; and, most importantly, by elucidating mechanisms through which depression matters for children. Given the importance of early childhood behavioral problems predicting short- and life-term trajectories, this study elucidates the important role maternal depression plays in the intergenerational transmission of inequality.

## REFERENCES

- Aalto-Setälä, T., L. Haarasilta, M. Marttunen, A. Tuulio-Henriksson, K. Poikolanen, H. Aro, and L. Lonnqvist. 2002. "Major Depressive Episode among Young Adults: CIDI-SF versus SCAN Consensus Diagnosis." *Psychological Medicine* 32:1309-1314.
- Achenbach, Thomas M. 1992. *Manual for the Child Behavior Checklist / 2-3 and 1992 Profile*. Burlington, VT: University of Vermont Department of Psychiatry.
- Achenbach, Thomas M., Stephanie H. McConaughy, and Catherine T. Howell. 1987. "Child/Adolescent Behavioral and Emotional Problems: Implications of Cross-Informant Correlations for Situational Specificity." *Psychological Bulletin* 101:213-232.
- Alexander, Karl L., Doris R. Entwisle, and Susan L. Dauber. 1993. "First-Grade Classroom Behavior: Its Short- and Long-Term Consequences for School Performance." *Child Development* 64:801-814.
- Allison, Paul D. 2002. *Missing Data*. New York: Sage Publications.
- Alpern, Lisbeth, and Karen Lyons-Ruth. 1993. "Preschool Children at Social Risk: Chronicity and Timing of Maternal Depressive Symptoms and Child Behavior Problems at School and at Home." *Development and Psychopathology* 5:371-387.
- Augustine, Jennifer March, and Robert Crosnoe. 2010. "Mother's Depression and Educational Attainment and their Children's Academic Trajectories." *Journal of Health and Social Behavior* 51(3):274-290.
- Amato, Paul R., and Frieda Fowler. 2002. "Parenting Practices, Child Adjustment, and Family Diversity." *Journal of Marriage and the Family* 64(3):703-716.
- Amato, Paul R., Laura Spencer Loomis, and Alan Booth. 1995. "Parental Divorce, Marital Conflict, and Offspring Well-being during Early Adulthood." *Social Forces* 73(3):895-915.
- Bartkowski, John P., Xiaohu Xu, and Martin L. Levin. 2008. "Religion and Child Development: Evidence from the Early Childhood Longitudinal Study." *Social Science Research* 37:18-36.
- Baune, Bernhard T., Robyn Miller, Jordan McAfoose, Melissa Johnson, Francis Quirk, and David Mitchell. 2010. "The Role of Cognitive Impairment in General Functioning in Major Depression." *Psychiatry Research* 176:183-189.
- Becker, Sascha O., and Andrea Ichino. 2002. "Estimation of Average Treatment Effects Based on Propensity Scores." *The Stata Journal* 2(4):358-377.
- Belsky, Jay. 1984. "The Determinants of Parenting: A Stress Model." *Child Development* 55(1):83-96.
- Bendheim-Thoman Center for Research on Child Wellbeing. 2008a. "Introduction to the Fragile Families Public-Use Data: Baseline, One-Year, Three-Year, and Five-Year Telephone Data." Princeton, NJ: Office of Population Research, Princeton University.
- Bendheim-Thoman Center for Research on Child Wellbeing. 2008b. "Three-Year In-Home Longitudinal Study of Pre-school Aged Children." Princeton, NJ: Office of Population Research, Princeton University.
- Bendheim-Thoman Center for Research on Child Wellbeing. 2009. "Five-Year In-Home Longitudinal Study of Pre-school Aged Children." Princeton, NJ: Office of Population Research, Princeton University.
- Bloom, Barbara, Robin A. Cohen, and Gulnar Freeman. 2009. "Summary Health Statistics for U.S. Children: National Health Interview Survey, 2008." *Vital Health Statistics* 10(244).

- Washington, DC: National Center for Health Statistics.
- Bodovski, Katerina, and Min-Jong Youn. 2010. "Love, Discipline, and Elementary School Achievement: The Role of Family Emotional Climate." *Social Science Research* 39:585-595.
- Brennan, Patricia A., Constance Hammen, Margaret J. Anderson, William Bor, Jake M. Najman, and Gail M. Williams. 2000. "Chronicity, Severity, and Timing of Maternal Depressive Symptoms: Relationships with Child Outcomes at Age Five." *Developmental Psychology* 36(6):759-766.
- Brown, Susan. 2004. "Family Structure and Child Well-Being: The Significance of Parental Cohabitation." *Journal of Marriage and Family* 66(3):351-367.
- Burchinal, Margaret R. 1999. "Child Care Experiences and Developmental Outcomes." *Annals of the American Academy of Political and Social Science* 563:73-97
- Campbell, Richard T. 1983. "Status Attainment Research: End of the Beginning or Beginning of the End?" *Sociology of Education* 56:47-62.
- Carlson, Marcia J., and Mary E. Corcoran. 2001. "Family Structure and Children's Behavioral and Cognitive Outcomes." *Journal of Marriage and Family* 63:779-792.
- Carlson, Marcia J., Sara S. McLanahan, and Jeanne Brooks-Gunn. 2008. "Coparenting and Nonresident Fathers' Involvement With Young Children After a Nonmarital Birth." *Demography* 45:461-488.
- Caspi, Avshalom, Daryl J. Bem, and Glen H. Elder, Jr. 1989. "Continuities and Consequences of Interactional Styles Across the Life Course." *Journal of Personality* 57(2):375-406.
- Chi, Terry C., and Stephen P. Hinshaw. 2002. "Mother-Child Relationships of Children with ADHD: The Role of Maternal Depressive Symptoms and Depression-Related Distortions." *Journal of Abnormal Child Psychology* 30(4):387-400.
- Chilcoat, Howard D., and Naomi Breslau. 1997. "Does Psychiatric History Bias Mothers' Reports? An Application of a New Analytic Approach." *Journal of the American Academy of Child and Adolescent Psychiatry* 36(7):971-979.
- Conger, Rand D., Katherine J. Conger, Glen H. Elder, Jr., Frederick O. Lorenz, Ronald L. Simons, and Les B. Whitbeck. 1992. "A Family Process Model of Economic Hardship and Adjustment of Early Adolescent Boys." *Child Development* 63:526-541.
- Conger, Rand D., Lora Ebert Wallace, Yumei Sun, Ronald L. Simons, Vonnie C. McLoyd, and Gene H. Brody. 2002. "Economic Pressure in African American Families: A Replication and Extension of the Family Stress Model." *Developmental Psychology* 38(2):179-93.
- Cooper, Carey E., Sara S. McLanahan, Sarah O. Meadows, and Jeanne Brooks-Gunn. 2007. "Family Structure Transitions and Maternal Parenting Stress." Fragile Families working paper.
- Coyne, James C. 1976. "Depression and the Response of Others." *Journal of Abnormal Psychology* 85(2):186-193.
- Crosnoe Robert, and Glen Elder. 2004. "From Childhood to the Later Years: Pathways of Human Development." *Research on Aging* 26:623-654.
- Cui, Ming, and Rand D. Conger. 2008. "Parenting Behavior as Mediator and Moderator of the Association Between Marital Problems and Adolescent Maladjustment." *Journal of Research on Adolescence* 18(2):261-284.
- Cummings, E. Mark, and Patrick T. Davies. 1994. "Maternal Depression and Child Development." *Journal of Child Psychology and Psychiatry* 35(1):73-112.
- Cummings, E. Mark, Peggy S. Keller, and Patrick T. Davies. 2005. "Towards a Family Process

- Model of Maternal and Paternal Depressive Symptoms: Exploring Multiple Relations with Child and Family Functioning.” *Journal of Child Psychology and Psychiatry* 46(5):479-89.
- Currie, Janet. 2005. “Health Disparities and Gaps in School Readiness.” *Future of Children* 15(1):117-138.
- Currie, Janet, and Brigitte C. Madrian. 1999. “Health, Health Insurance and the Labor Market.” In O. Ashenfelter and D. Card (Eds), *Handbook of Labor Economics* (pp.3309-3407). New York: Elsevier.
- Currie, Janet, and Mark Stabile. 2008. “Mental Health in Childhood and Human Capital.” In J. Gruber (Ed.), *An Economic Perspective on the Problems of Disadvantaged Youth* (pp. 115-148). Chicago: University of Chicago Press.
- Dadds, Mark R., and Martine B. Powell. 1991. “The Relationship of Interpersonal Conflict and Global Marital Adjustment to Aggression, Anxiety, and Immaturity in Aggressive and Nonclinic Children.” *Journal of Abnormal Child Psychology* 19(5): 553-567.
- Dawson, Geraldine, Sharon B. Ashman, Heracles Panagiotides, David Hessel, Joanna Self, Emily Yamada, and Lara Embry. 2003. “Preschool Outcomes of Children of Depressed Mothers: Role Of Maternal Behavior, Contextual Risk, and Children’s Brain Activity.” *Child Development* 74(4):1158-1175.
- DeKlyen, Michelle, Jeanne Brooks-Gunn, Sara McLanahan, and Jean Knab. 2006. “The Mental Health of Married, Cohabiting, and Non-Coresident Parents with Infants.” *American Journal of Public Health* 96(10):1838-1841.
- Downey, Douglas B. and Dennis J. Condron. 2004. “Playing Well with Others in Kindergarten: The Benefit of Siblings at Home.” *Journal of Marriage and Family* 66:333-350.
- Downey, Geraldine, and James C. Coyne. 1990. “Children of Depressed Parents: An Integrative Review.” *Psychological Bulletin* 108(1):50-76.
- Du Rocher Schudlich, Tina, and E. Mark Cummings. 2003. “Parental Dysphoria and Children’s Internalizing Symptoms: Marital Conflict Styles as Mediators of Risk.” *Child Development* 74(6):1663-1681.
- Du Rocher Schudlich, Tina, and E. Mark Cummings. 2007. “Parental Dysphoria and Children’s Adjustment: Marital Conflict Styles, Children’s Emotional Security, and Parenting as Mediators of Risk.” *Journal of Abnormal Child Psychology* 35:627-639.
- Duncan, Greg J., and Jeanne Brooks-Gunn. 1997. *Consequences of Growing Up Poor*. New York: Russell Sage Foundation.
- Duncan, Greg J. and Jeanne Brooks-Gunn. 2000. “Family Poverty, Welfare Reform and Child Development.” *Child Development* 71:188-196.
- Duncan, Greg J., Chantelle J. Dowsett, Amy Claessens, Katherine Magnuson, Aletha C. Huston, Pamela Klebanov, Linda S. Pagani, Leon Feinstein, Mimi Engel, Jeanne Brooks-Gunn, Holly Sexton, and Kathryn Duckworth. 2007. “School Readiness and Later Achievement.” *Developmental Psychology* 43(6):1428-1446.
- Duncan, Greg, and Katherine Magnuson. Forthcoming. “The Nature and Impact of Early Achievement Skills, Attention Skills, and Behavior Problems.” In *Whither Opportunity: Rising Inequality, Schools, and Children’s Life Chances*, edited by G.J. Duncan and R.J. Murnane. New York: Russell Sage.
- Duncan, Greg, Katherine Magnuson, Ariel Kalil, and Kathleen Ziol-Guest. Forthcoming. “The Importance of Early Childhood Poverty.” *Social Indicators Research*.
- Elder, Glen H. Jr. 1998. “The Life Course and Human Development.” Pp. 939-991 in *Handbook*

- of Child Psychology: Volume 1: Theoretical Models of Human Development*, edited by W. Damon and R.M. Lerner. New York: Wiley.
- Ellison, Christopher G., Jason D. Boardman, David R. Williams, and James S. Jackson. 2001. "Religious Involvement, Stress, and Mental Health: Findings from the 1995 Detroit Area Study." *Social Forces* 80(1):215-249.
- Entwisle, Doris R., Karl L. Alexander, and Laurie S. Olson. 2005. "First Grade and Educational Attainment by Age 22: A New Story." *American Journal of Sociology* 110(5):1458-1502.
- Feng, Xin, Daniel S. Shaw, Emily M. Skuban, and Tonya Lane. 2007. "Emotional Exchange in Mother-Child Dyads: Stability, Mutual Influence, and Associations with Maternal Depression and Child Problem Behavior." *Journal of Family Psychology* 21(4): 714-25.
- Foley, Debra L., Andrew Pickles, Emily Simonoff, Hermine H. Maes, Judy L. Silberg, John K. Hewitt, and Lindon J. Eaves. 2001. "Parental Concordance and Comorbidity for Psychiatric Disorder and Associate Risks for Current Psychiatric Symptoms and Disorders in a Community Sample of Juvenile Twins." *Journal of Clinical Psychology and Psychiatry* 42:381-394.
- Fomby, Paula, and Andrew Cherlin. 2007. "Family Instability and Child Well-being." *American Sociological Review* 72:181-204.
- Fomby, Paula, and Cynthia Osborne. 2010. "The Influence of Union Instability and Union Quality on Children's Aggressive Behavior." *Social Science Research* 39:912-924.
- Frank, Richard G., and Catherine Koss. 2005. *Mental Health and Labor Markets Productivity Loss and Restoration*. Geneva, Switzerland: World Health Organization.
- Frech, Adrienne, and Rachel Tolbert Kimbro. 2011. "Maternal Mental Health, Neighborhood Characteristics, and Time Investments in Children." *Journal of Marriage and Family* 73:605-620.
- Gartstein, Maria A., and Lisa Sheeber. 2004. "Child Behavior Problems and Maternal Symptoms of Depression: A Mediational Model." *Journal of Child and Adolescent Psychiatric Nursing* 17(4):141-150.
- Gerard, Jean M., and Cheryl Buehler. 1999. "Multiple Risk Factors in the Family Environment and Youth Problem Behaviors." *Journal of Marriage and the Family* 61(2):343-361.
- Giles, Lynne C., Michael J. Davies, Melissa J. Whitrow, Megan J. Warin, and Vivienne Moore. 2011. "Maternal Depressive Symptoms and Child Care During Toddlerhood Relate to Child Behavior at Age 5 Years." *Pediatrics* 128(1):e1-e7.
- Goodman, Sherryl H., and Ian H. Gotlib. 1999. "Risk for Psychopathology in Children of Depressed Mothers: A Developmental Model for Understanding Mechanisms of Transmission." *Psychological Review* 106(3):458-490.
- Goodman, Sherryl H., and Ian H. Gotlib. 2002. *Children of Depressed Parents: Mechanisms of Risk and Implications for Treatment*. Washington, DC: American Psychological Association.
- Hay, Dale F., Susan Pawlby, Deborah Sharp, Paul Asten, Alice Mills, and R. Kumar. 2001. "Intellectual Problems Shown by 11-Year-Old Children Whose Mothers Had Postnatal Depression." *Journal of Child Psychology and Psychiatry* 42(7):871-889.
- Heflin, Colleen M., and John Iceland. 2009. "Poverty, Hardship, and Depression." *Social Science Quarterly* 90(5):1051-1071.
- Hinshaw, Stephen P. 1992. "Externalizing Behavior Problems and Academic Underachievement in Childhood and Adolescence: Causal Relationships and Underlying Mechanisms." *Psychological Bulletin* 111: 127-155.



- Jackson, Aurora P., Phyllis Gyamfi, Jeanne Brooks-Gunn, and Mandy Blake. 1998. "Employment Status, Psychological Well-Being, Social Support, and Physical Discipline." *Journal of Marriage and the Family* 60:894-903.
- Johnson, David. 2005. "Two-Wave Panel Analysis: Comparing Statistical Methods for Studying the Effects of Transitions." *Journal of Marriage and Family* 67:1061-1075.
- Horwitz, Allan V., and Jerome C. Wakefield. 2007. *The Loss of Sadness: How Psychiatry Transformed Normal Sorrow Into Depressive Disorder*. Oxford: Oxford University Press.
- Kahn, Robert S., Dominique Brandt, and Robert C. Whitaker. 2004. "Combined Effect of Mothers' and Fathers' Mental Health Symptoms on Children's Behavioral and Emotional Well-Being." *Archives of Pediatric and Adolescent Medicine* 158:721-729.
- Kearns, Robin A., Patricia M. Neuwelt, Belinda Hitchman, and Michele Lennan. 1997. "Social Support and Psychological Distress Before and After Childbirth." *Health and Social Care in the Community* 5(5):296-308.
- Keller, Peggy S., E. Mark Cummings, and Patrick T. Davies. 2005. "The Role of Marital Discord and Parenting in Relations between Parental Problem Drinking and Child Adjustment." *Journal of Child Psychology and Psychiatry* 46(9):943-951.
- Kendler, Kenneth S., Laura M. Thornton, and Charles O. Gardner. 2000. "Stressful Life Events and Previous Episodes in the Etiology of Major Depression in Women: An Evaluation of the 'Kindling' Hypothesis." *American Journal of Psychiatry* 157:1243-1251.
- Kessler, Ronald C., Patricia Berglund, Olga Demler, Robert Jin, Doreen Koretz, Kathleen R. Merikangas, A. John Rush, Ellen E. Walters, and Philip S. Wang. 2003. "The Epidemiology of Major Depressive Disorder: Results from the National Comorbidity Survey Replication (NCS-R)." *Journal of the American Medical Association* 289(3):3095-3105.
- Kessler, Ronald C., Ellen E. Walters, and Melinda S. Forthofer. 1998. "The Social Consequences of Psychiatric Disorders, III: Probability of Marital Stability." *American Journal of Psychiatry* 155(8):1092-1096.
- Kessler, Ronald C., Gavin Andrews, Daniel Mroczek, Bedirhan Ustun, and Hans-Ulrich Wittchen. 1998. "The World Health Organization Composite International Diagnostic Interview Short-Form (CIDI-SF)." *International Journal of Methods in Psychiatric Research* 7:171-185.
- Kessler, Ronald C., and Shanyang Zhao. 1999. "Overview of Descriptive Epidemiology of Mental Disorders." Pp. 127-50 in *Handbook of the Sociology of Mental Health*, edited by C. S. Aneshensel and J. C. Phelan. New York: Springer.
- Kiernan, Kathleen, and M. Carmen Huerta. 2008. "Economic Deprivation, Maternal Depression, Parenting, and Children's Cognitive and Emotional Development in Early Childhood." *The British Journal of Sociology* 59(4):783-806.
- Kim, Hyoun K., and Patrick C. McKenry. 2002. "The Relationship Between Marriage and Psychological Well-Being - A Longitudinal Analysis." *Journal of Family Issues* 23:885-911.
- Kim-Cohen, Julia, Terrie E. Moffitt, Alan Taylor, Susan J. Pawlby, and Avshalom Caspi. 2005. "Maternal Depression and Children's Antisocial Behavior: Nature and Nurture Effects." *Archives of General Psychiatry* 62:173-181.
- Klebanov, Pamela K., Jeanne Brooks-Gunn, and Marie C. McCormick. 1994. "Classroom Behavior of Very Low Birth Weight Elementary School Children." *Pediatrics* 94:700-708.

- Knoester, Chris. 2003. "Implications of Childhood Externalizing Problems for Young Adults." *Journal of Marriage and Family* 65:1073-1080.
- Ladd, Gary W., Sondra H. Birch, and Eric S. Buhs. 1999. "Children's Social and Scholastic Lives in Kindergarten: Related Spheres of Influence?" *Child Development* 70:1373-1400.
- Langenkamp, Amy G., and Michelle L. Frisco. 2008. "Family Transitions and Adolescent Severe Emotional Distress: The Salience of Family Context." *Social Problems* 55(2):238-253.
- Lee, Valerie E. and David T. Burkam. 2002. *Inequality at the Starting Gate: Social Background Differences in Achievement as Children Begin School*. Washington, DC: Economic Policy Institute.
- Leinonen, Jenni A., Tytti S. Solantaus, and Raija-Leena Punamaki. 2003. "Parental Mental Health and Children's Adjustment: The Quality of Marital Interaction and Parenting as Mediating Factors." *Journal of Child Psychology and Psychiatry* 44(2):227-241.
- Lin, Nan, Xiaolan Ye, and Walter M. Ensel. 1999. "Social Support and Depressed Mood: A Structural Analysis." *Journal of Health and Social Behavior* 40(4):344-359.
- Link, Bruce. 2002. "The Challenge of the Dependent Variable." *Journal of Health and Social Behavior* 43(2):247-253.
- Lovejoy, M. Christine, Patricia A. Graczyk, Elizabeth O'Hare, and George Neuman. 2000. "Maternal Depression and Parenting Behavior: A Meta-Analytic Review." *Clinical Psychology Review* 20(5):561-592.
- Lyons-Ruth, Karlen, Amy Lyubchik, Rebecca Wolfe, and Elisa Bronfman. 2002. "Parental Depression and Child Attachment: Hostile and Helpless Profiles of Parent and Child Behavior Among Families at Risk." Pp. 89-120 in *Children of Depressed Parents: Mechanisms of Risk and Implications for Treatment*, edited by S.H. Goodman and I.H. Gotlib. Washington, DC: American Psychological Association.
- Magnuson, Katherine. 2007. "Maternal Education and Children's Academic Achievement During Middle Childhood." *Developmental Psychology* 43:1497-1512.
- Marcotte, Dave E., and Virginia Wilcox-Gok. 2001. "Estimating the Employment and Earnings Costs of Mental Illness: Recent Developments in the United States." *Social Science and Medicine* 53(1):21-27.
- Marmorstein, Naomi, Stephen M. Malone, and William G. Iacono. 2004. "Psychiatric Disorders among Offspring of Depressed Mothers: Associations with Paternal Psychopathology." *American Journal of Psychiatry* 161:1588-1594.
- Mason, W. Alex, Rick Kosterman, David J. Hawkins, Todd I. Herrenkohl, Lilliana J. Lengua, and Elizabeth McCauly. 2004. "Predicting Depression, Social Phobia, and Violence in Early Adulthood from Childhood Behavior Problems." *Journal of the American Academy of Child and Adolescent Psychiatry* 43(3):307-315.
- McLeod, Jane D., and Karen Kaiser. 2004. "Childhood Emotional and Behavioral Problems and Educational Attainment." *American Sociological Review* 69:636-658.
- McLeod, Jane D., and Danielle L. Fettes. 2007. "Trajectories of Failure: The Educational Careers of Children with Mental Health Problems." *American Journal of Sociology* 113(3):653-701.
- Meadows, Sarah O., Sara S. McLanahan, and Jeanne Brooks-Gunn. 2007. "Parental Depression and Anxiety and Early Childhood Behavioral Problems Across Family Types." *Journal of Marriage and Family* 69(6):1162-1177.
- Meadows, Sarah O., Sara S. McLanahan, and Jeanne Brooks-Gunn. 2008. "Stability and Change in Family Structure and Maternal Health Transitions." *American Sociological*

- Review* 73(2):314-34.
- Meadows, Sarah O. 2009. "Is It There When You Need It?: Mismatch in Perception of Future Availability and Subsequent Receipt of Instrumental Support." *Journal of Family Issues* 30:1070-1097.
- Merikangas, Kathleen R., Minnie Ames, Lihong Cui, Paul E. Stang, T. Bedirhan Ustun, Michael Von Korff, and Ronald C. Kessler. 2007. "The Impact of Comorbidity of Mental and Physical Conditions on Role Disability in the U.S. Adult Population." *Archives of General Psychiatry* 64(1):1180-1188.
- Miech, Richard A., Avshalom Caspi, Terrie E. Moffitt, Bradley R. Entner Wright, and Phil A. Silva. 1999. "Low Socioeconomic Status and Mental Disorders: A Longitudinal Study of Selection and Causation during Young Adulthood." *American Journal of Sociology* 104(4):1096-1131.
- Mirowsky, John, and Catherine E. Ross. 1992. "Age and Depression." *Journal of Health and Social Behavior* 33:187-205.
- Mirowsky, John, and Catherine E. Ross. 2002. "Measurement for a Human Science." *Journal of Health and Social Behavior* 43(2):152-170.
- Morgan, Stephen L., and David J. Harding. 2006. "Matching Estimators of Causal Effects: Prospects and Pitfalls in Theory and Practice." *Sociological Methods and Research* 35(1):3-60.
- Mustillo, Sarah A., Shannon Dorsey, Kate Conover, and Barbara J. Burns. 2011. "Parental Depression and Child Outcomes: The Mediating Effects of Abuse and Neglect." *Journal of Marriage and Family* 73:164-180.
- Needham, Belinda L., Robert Crosnoe, and Chandra Muller. 2004. "Academic Failure in Secondary School: The Inter-Related Role of Health Problems and Educational Context." *Social Problems* 51(4):569-586.
- NICHD Early Child Care Research Network. 2004. "Trajectories of Physical Aggression from Toddlerhood to Middle Childhood: Predictors, Correlates, and Outcomes. *SRCD Monographs* 69(4):1-146.
- Osborne, Cynthia, and Sara S. McLanahan. 2007. "Partnership Instability and Child Wellbeing." *Journal of Marriage and Family* 69:1065-1083.
- Palloni, Alberto. 2006. "Reproducing Inequalities: Luck, Wallets, and the Enduring Effects of Childhood Health." *Demography* 43:587-615.
- Papp, Lauren M., E. Mark Cummings, and Alice C. Schermerhorn. 2004. "Pathways among Marital Distress, Parental Symptomatology, and Child Adjustment." *Journal of Marriage and Family* 66:368-384.
- Phares, Vicky, and Bruce E. Compas. 1992. "The Role of Fathers in Child and Adolescent Psychopathology: Make Room for Daddy." *Psychological Bulletin* 111(3):387-412.
- Pianta, Robert C., and Megan W. Stuhlman. 2004. "Teacher-Child Relationships and Children's Success in the First Years of School." *School Psychology Review* 33:444-458.
- Proulx, Christine M., Heather M. Helms, and Cheryl Buehler. 2007. "Marital Quality and Personal Well-Being: A Meta-Analysis." *Journal of Marriage and Family* 69(3):576-593.
- Reichman, Nancy E., Julien Tietler, Irv Garfinkel, and Sara S. McLanahan. 2001. "Fragile Families: Sample and Design." *Children and Youth Services Review* 23(4/5):303-26.
- Richters, John E. 1992. "Depressed Mothers as Informants About Their Children: A Critical Review of the Evidence for Distortion." *Psychological Bulletin* 112(3):485-499.

- Rosenbaum, Paul R. and Donald B. Rubin. 1983. "The Central Role of the Propensity Score in Observational Studies for Causal Effects." *Biometrika* 70:41-55.
- Rosenfield, Sarah, Julie Phillips, and Helene White. 2006. "Gender, Race, and the Self in Mental Health and Crime." *Social Problems* 53(3):161-185.
- Ross, Catherine E. 2000. "Neighborhood Disadvantage and Adult Depression." *Journal of Health and Social Behavior* 41:177-187.
- Royston, Patrick. 2004. "Multiple Imputation of Missing Values." *Stata Journal* 4(3):227-41.
- Ryan, Rebecca, Ariel Kalil, and Lindsey Leinenger. 2009. "Low-Income Mothers' Private Safety Nets and Children's Socioemotional Well-being." *Journal of Marriage and Family* 71(2):279-298.
- Scaramella, Laura V., Sara L. Sohr-Preston, Kristin L. Callahan, and Scott P. Mirabile. 2008. "A Test of the Family Stress Model on Toddler-Aged Children's Adjustment Among Hurricane Katrina Impacted and Nonimpacted Low-Income Families." *Journal of Clinical Child and Adolescent Psychology* 37(3):530-541.
- Schnittker, Jason. 2005. "When Mental Health Becomes Health: Age and the Shifting Meaning of Self-Rated Health." *The Milbank Quarterly* 83:397-423.
- Sewell, William H. and Vimal P. Shah. 1968. "Social Class, Parental Encouragement, and Educational Aspirations." *American Journal of Sociology* 73:559-572.
- Silberg, Judy, and Michael Rutter. 2002. "Nature-Nurture Interplay in the Risks Associated with Parental Depression." Pp. 13-36 in *Children of Depressed Parents: Mechanisms of Risk and Implications for Treatment*, edited by S.H. Goodman and I.H. Gotlib. Washington, DC: American Psychological Association.
- Simpson, Sherri M., Laura L. Krishnan, Mark E. Kunik and Pedro Ruiz. 2007. "Racial Disparities in Diagnosis and Treatment of Depression: A Literature Review." *Journal of Psychiatric Quarterly* 78:3-14.
- Straus, Murray A. 1990. "Measuring Intrafamily Conflict and Violence: The Conflict Tactics (CT) Scales." Pp. 29-47 in *Physical Violence in American Families*, edited by M.A. Straus and R.J. Gelles. New Brunswick, NJ: Transaction.
- Straus, Murray A., Sherry L. Hamby, David Finkelhor, David W. Moore, and Desmond Runyan. 1998. "Identification of Child Maltreatment with the Parent-Child Conflict Tactic Scales: Development and Psychometric Data for a National Sample of American Parents." *Child Abuse and Neglect* 22:249-270.
- Sullivan, Patrick F., Michael C. Neale, and Kenneth S. Kendler. 2000. "Genetic Epidemiology of Major Depression: Review and Meta-Analysis." *American Journal of Psychiatry* 157:1552-1562.
- Taylor, Catherine A., Jennifer Manganello, Shawna J. Lee, and Janet C. Rice. 2010. "Mothers' Spanking of 3-Year-Old Children and Subsequent Risk of Children's Aggressive Behavior." *Pediatrics* 125:e1057-e1065.
- Thoits, Peggy A. 1984. "Explaining Distributions of Psychological Vulnerability: Lack of Social Support in the Face of Life Stress." *Social Forces* 63(2):453-481.
- Turley, Ruth N. Lopez 2003. "Are Children of Young Mothers Disadvantaged Because of Their Mother's Age or Family Background?" *Child Development* 74:465-474.
- Wethington, Elaine, and Ronald C. Kessler. 1986. "Perceived Support, Received Support, and Adjustment to Stressful Life Events." *Journal of Health and Social Behavior* 27:78-89.
- Whisman, Mark A. 2001. "The Association Between Depression and Marital Distress." Pp. 3-24

- in *Marital and Family Processes in Depression: A Scientific Foundation for Clinical Practice*, edited by Beach. Washington, DC: American Psychological Association.
- Whitaker, Robert C., Sean M. Orzol, and Robert S. Kahn. 2006. "Maternal Mental Health, Substance Use, and Domestic Violence in the Year After Delivery and Subsequent Behavior Problems in Children at Age 3 Years." *Archives of General Psychiatry* 63(3):551-560.
- Wood, Robert G., Brian Goesling, and Sarah Avellar. 2007. "The Effects of Marriage on Health: A Synthesis of Recent Research Evidence." Princeton, New Jersey: Mathematica Policy Research, Inc.
- Zill, Nicholas. 1999. "Promoting Educational Equity and Excellence in Kindergarten." In R. C. Pianta and M. J. Cox (Eds.), *The Transition to Kindergarten* (pp. 67-105). Baltimore, MD: Paul H. Brookes Publishing Co., Inc.

**Table 1. Descriptive Statistics of Variables Included in Analyses.**

Variable	Mean	S.D.	Min.	Max.
<i>Children's problem behaviors</i>				
Internalizing behaviors (ih3)	0.000	(1.000)	-1.599	4.624
Internalizing behaviors (y5, ih5)	0.000	(1.000)	-1.252	4.811
Externalizing behaviors (ih3)	0.000	(1.000)	-1.731	3.739
Externalizing behaviors (y5, ih5)	0.000	(1.000)	-1.680	4.303
<i>Maternal depression</i>				
Maternal depression over time (y1, y3, y5)				
Never depressed	0.658			
Depressed at one wave	0.201			
Depressed at two waves	0.094			
Depressed at three waves	0.046			
Proximate depression (y5)	0.166			
<i>Control variables</i>				
Race (b)				
White	0.225			
Black	0.523			
Hispanic	0.225			
Other race	0.027			
Immigrant (b)	0.104			
Age (b)	25.094	(6.016)	15.000	43.000
Frequency of attendance at religious services (b)				
At least once a week	0.220			
Several times a month	0.162			
Occasionally	0.479			
Never	0.138			
Education (b)				
Less than high school	0.305			
High school diploma or GED	0.320			
Post-secondary education	0.375			
Household income, log (b)	9.891	(1.288)	0.000	11.804
Medicaid birth (b)	0.598			
Relationship status (b)				
Married	0.237			
Cohabiting	0.349			
Visiting	0.288			
Separated	0.126			
Grandmother in household (b)	0.256			
Number of children in household (b)	2.267	(1.305)	1.000	9.000
Fair or poor health (b)	0.073			
Depression in child's maternal grandparent (y3)	0.318			
Depression in child's paternal grandparent (y3)	0.289			
Child age, in months (y5)	64.159	(3.189)	47.400	75.580
Child is male (b)	0.519			
<i>Potential mechanisms</i>				
Employed (y5)	0.608			
Income-to-poverty ratio (y5)	1.925	(2.128)	0.100	34.800

Material hardship (y5)	1.886	(2.022)	0.000	12.000
Neglect (y5)	0.028	(0.090)	0.000	1.000
Psychological aggression (y5)	0.413	(0.198)	0.000	1.000
Physical assault (y5)	0.335	(0.239)	0.000	1.000
Engagement (y5)	4.646	(1.162)	0.375	7.000
No relationship (y5)	0.260			
Low supportive behaviors (y5)	0.346			
High supportive behaviors (y5)	0.394			
Shared responsibility in parenting (y5)	2.438	(1.205)	1.000	4.000
Cooperation in parenting (y5)	3.045	(1.100)	1.000	4.000
Perceived instrumental support (y5)	0.949	(0.220)	0.000	1.000
Number of friends (y5)	4.739	(4.966)	0.000	30.000
Presence of a close confidante (y5)	0.917			

---

N 2,427

Source: Author's calculations using the Fragile Families and Child Wellbeing Study.

Note: b: baseline survey; y1: 1-year survey; y3: 3-year survey; y5: 5-year survey; ih3: 3-year In-Home survey; ih5:5-year In-Home survey.

**Table 2. Descriptive Statistics of Variables Included in Analyses, by Maternal Depression Chronicity.**

Variable	Never depressed	Depressed at one wave	Depressed at two waves	Depressed at three waves
<i>Children's problem behaviors</i>				
Internalizing behaviors (ih3)	-0.122	0.109 ***	0.314 ***	0.393 ***
Internalizing behaviors (y5, ih5)	-0.112	0.163 ***	0.433 ***	0.506 ***
Externalizing behaviors (ih3)	-0.137	0.161 ***	0.391 ***	0.545 ***
Externalizing behaviors (y5, ih5)	-0.138	0.175 ***	0.364 ***	0.555 ***
<i>Control variables</i>				
Race (b)				
White	0.228	0.197	0.266	0.223
Black	0.508	0.559 *	0.524	0.571
Hispanic	0.237	0.211	0.197	0.170
Other race	0.026	0.033	0.013	0.036
Immigrant (b)	0.122	0.086 *	0.035 ***	0.071
Age (b)	25.362	24.377 **	24.808	24.973
Frequency of attendance at religious services (b)				
At least once a week	0.238	0.189 *	0.149 **	0.250
Several times a month	0.171	0.150	0.154	0.107
Occasionally	0.458	0.520 *	0.526	0.500
Never	0.133	0.141	0.171	0.143
Education (b)				
Less than high school	0.293	0.342 *	0.311	0.313
High school diploma or GED	0.320	0.328	0.316	0.295
Post-secondary education	0.387	0.330 *	0.373	0.393 **
Household income, log (b)	9.966	9.790 **	9.712 **	9.624
Medicaid birth (b)	0.581	0.632 *	0.642 *	0.598
Relationship status (b)				
Married	0.266	0.186 ***	0.166 **	0.118 *
Cohabiting	0.346	0.342	0.376	0.375
Visiting	0.279	0.318	0.297	0.268
Separated	0.109	0.154 **	0.162 *	0.179 *
Grandmother in household (b)	0.238	0.313 **	0.241	0.295
Number of children in household (b)	2.233	2.342	2.390	2.170
Fair or poor health (b)	0.051	0.113 ***	0.118 ***	0.117 **
Depression in child's maternal grandparent (y3)	0.224	0.428 ***	0.581 ***	0.625 ***
Depression in child's paternal grandparent (y3)	0.273	0.301	0.372 **	0.310
Child age, in months (y5)	64.153	64.140	64.105	64.432
Child is male (b)	0.523	0.482	0.563	0.536
<i>Potential mechanisms</i>				
Employed (y5)	0.644	0.555 ***	0.524 ***	0.500 **
Income-to-poverty ratio (y5)	2.138	1.549 ***	1.516 ***	1.325 ***
Material hardship (y5)	1.445	2.199 ***	3.326 ***	3.875 ***
Neglect (y5)	0.020	0.034 ***	0.038 **	0.080 ***
Psychological aggression (y5)	0.392	0.444 ***	0.452 ***	0.504 ***
Physical assault (y5)	0.318	0.365 ***	0.374 ***	0.364 *
Engagement (y5)	4.688	4.646	4.455 **	4.443 *
No relationship (y5)	0.245	0.274	0.308 *	0.321
Low supportive behaviors (y5)	0.337	0.355	0.366	0.402
High supportive behaviors (y5)	0.419	0.371	0.326 **	0.277 **
Shared responsibility in parenting (y5)	2.553	2.299 ***	2.131 ***	2.106 ***
Cooperation in parenting (y5)	3.318	2.941 ***	2.838 ***	2.587 ***
Perceived instrumental support (y5)	0.969	0.922 ***	0.891 ***	0.902 ***
Number of friends (y5)	5.097	4.197 ***	3.852 ***	3.821 *
Presence of a close confidante (y5)	0.924	0.908	0.913	0.866 *
N	1,598	488	229	112

Source: Author's calculations using the Fragile Families and Child Wellbeing Study.

Note: b: baseline survey; y1: 1-year survey; y3: 3-year survey; y5: 5-year survey; ih3: 3-year In-Home survey; ih5: 5-year In-Home survey. Asterisks for two-tailed significance tests comparing never depressed mothers to all other groups of mothers. \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ .



**Table 3. OLS Regression Models Predicting Children's Internalizing and Externalizing Problem Behaviors, by Maternal Depression.**

Variable	Internalizing behaviors						Externalizing behaviors					
	Model 1		Model 2		Model 3		Model 1		Model 2		Model 3	
<i>Maternal depression</i>												
Never depressed (reference)	---	---	---	---	---	---	---	---	---	---	---	---
Depressed at one wave	0.243	(0.056) ***	0.163	(0.056) **	0.131	(0.052) *	0.267	(0.055) ***	0.166	(0.055) **	0.103	(0.050) *
Depressed at two waves	0.408	(0.085) ***	0.304	(0.085) ***	0.242	(0.080) **	0.406	(0.084) ***	0.250	(0.084) **	0.114	(0.056) *
Depressed at three waves	0.492	(0.123) ***	0.383	(0.122) **	0.314	(0.115) **	0.541	(0.122) ***	0.395	(0.121) **	0.259	(0.110) *
Proximate depression	0.190	(0.078) *	0.207	(0.076) **	0.128	(0.072)	0.153	(0.078) *	0.191	(0.076) *	0.113	(0.068)
<i>Control variables</i>												
Race												
White			---	---	---	---			---	---	---	---
Black			-0.079	(0.055)	-0.091	(0.053)			-0.071	(0.055)	-0.085	(0.050)
Hispanic			0.194	(0.066) **	0.163	(0.062) **			-0.046	(0.065)	-0.073	(0.059)
Other race			0.123	(0.130)	0.049	(0.122)			0.124	(0.128)	0.021	(0.116)
Immigrant			0.206	(0.073) **	0.190	(0.070) **			-0.034	(0.073)	0.040	(0.067)
Age			-0.002	(0.004)	-0.001	(0.004)			-0.008	(0.004) *	-0.004	(0.004)
Frequency of attendance at religious services												
At least once a week			---	---	---	---			---	---	---	---
Several times a month			-0.074	(0.063)	-0.078	(0.060)			-0.078	(0.063)	-0.058	(0.057)
Occasionally			-0.029	(0.051)	-0.047	(0.048)			-0.035	(0.051)	-0.044	(0.046)
Never			0.008	(0.069)	-0.061	(0.066)			0.038	(0.069)	0.014	(0.063)
Education												
Less than high school			---	---	---	---			---	---	---	---
High school diploma or GED			-0.020	(0.050)	0.018	(0.048)			-0.047	(0.050)	-0.046	(0.045)
Post-secondary education			-0.204	(0.056) ***	-0.076	(0.054)			-0.179	(0.056) **	-0.119	(0.051) *
Household income (log)			-0.028	(0.018)	-0.019	(0.017)			-0.011	(0.018)	-0.003	(0.016)
Medicaid birth			0.070	(0.046)	0.017	(0.044)			0.102	(0.046) *	0.074	(0.042)
Relationship status												
Married			---	---	---	---			---	---	---	---
Cohabiting			0.139	(0.061) *	0.114	(0.057) *			0.103	(0.060)	0.067	(0.054)
Visiting			0.177	(0.070) *	0.109	(0.066)			0.237	(0.069) **	0.177	(0.064) **
Separated			0.086	(0.079)	0.020	(0.075)			0.162	(0.078) *	0.065	(0.072)
Grandmother in household			0.007	(0.051)	0.009	(0.049)			-0.007	(0.051)	-0.010	(0.046)
Number of children in household			0.017	(0.016)	-0.003	(0.015)			0.043	(0.016) **	0.033	(0.014) *
Fair or poor health			0.279	(0.076) ***	0.191	(0.072) **			0.195	(0.076) *	0.100	(0.069)
Depression in child's maternal grandparent			0.191	(0.044) ***	0.158	(0.041) ***			0.174	(0.044) ***	0.129	(0.039) **
Depression in child's paternal grandparent			0.044	(0.046)	0.032	(0.043)			0.098	(0.046) *	0.073	(0.040)
Child age, in months			-0.001	(0.006)	0.005	(0.006)			-0.016	(0.006) *	-0.009	(0.006)
Child is male			0.030	(0.039)	0.003	(0.036)			0.143	(0.038) ***	0.079	(0.035) *
Lagged indicator of behavior					0.362	(0.020) ***					0.461	(0.019) ***
Intercept	-0.137		0.065		-0.274		-0.138		0.914		0.501	
R-squared	0.048		0.113		0.229		0.048		0.111		0.309	
N	2,427		2,427		2,427		2,427		2,427		2,427	

Source: Author's calculations using the Fragile Families and Child Wellbeing Study.

Note: Standard errors are in parentheses. \* p < 0.05, \*\* p < 0.01, \*\*\* p < 0.001.

**Table 4. Propensity Score Matching Models Estimating the Consequences of Maternal Depression for Children's Internalizing and Externalizing Problem Behaviors.**

	Treatment N	Control N	Internalizing behaviors		Externalizing behaviors	
Depressed at one wave						
Nearest neighbor matching	480	1,577	0.215	(0.059) ***	0.189	(0.060) **
Radius matching	475	1,577	0.176	(0.055) **	0.168	(0.056) **
Kernel matching	482	1,577	0.211	(0.055) ***	0.209	(0.055) ***
Depressed at two waves						
Nearest neighbor matching	216	1,577	0.373	(0.092) ***	0.277	(0.084) ***
Radius matching	216	1,577	0.340	(0.087) ***	0.304	(0.079) ***
Kernel matching	222	1,577	0.395	(0.084) ***	0.333	(0.076) ***
Depressed at three waves						
Nearest neighbor matching	105	1,577	0.549	(0.121) ***	0.488	(0.121) ***
Radius matching	105	1,577	0.564	(0.116) ***	0.491	(0.114) ***
Kernel matching	110	1,577	0.593	(0.111) ***	0.577	(0.109) ***
Proximate depression						
Nearest neighbor matching	395	1,997	0.376	(0.065) ***	0.335	(0.062) ***
Radius matching	395	1,997	0.505	(0.054) ***	0.362	(0.058) ***
Kernel matching	395	1,997	0.433	(0.060) ***	0.387	(0.057) ***

Source: Author's calculations using the Fragile Families and Child Wellbeing Study.

Note: Standard errors are in parentheses. In estimating the effect of maternal depression at one survey wave, I drop observations in which mothers report depression at two or three survey waves. Similarly, I drop observations in which mothers report depression at one or three survey waves when predicting maternal depression at two waves, and observations in which mothers report depression at one or two survey waves when predicting maternal depression at three waves. \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ .

**Table 5. OLS Regression Models Predicting Internalizing Problem Behaviors, by Maternal Depression with Mechanisms.**

	Model 1		Model 2		Model 3		Model 4		Model 5	
<i>Maternal depression</i>										
Never depressed (reference)	---	---	---	---	---	---	---	---	---	---
Depressed at one wave	0.114	(0.052) *	0.102	(0.051) *	0.126	(0.052) *	0.128	(0.053) *	0.089	(0.052)
Depressed at two waves	0.186	(0.081) *	0.213	(0.079) **	0.231	(0.080) **	0.237	(0.080) **	0.159	(0.081)
Depressed at three waves	0.246	(0.116) *	0.234	(0.114) *	0.302	(0.115) **	0.311	(0.115) **	0.185	(0.114)
Proximate depression	0.090	(0.072)	0.115	(0.071)	0.114	(0.072)	0.127	(0.072)	0.077	(0.071)
Lagged indicator of behavior	0.361	(0.020) ***	0.332	(0.020) ***	0.357	(0.020) ***	0.361	(0.020) ***	0.328	(0.020) ***
<i>Potential mechanisms</i>										
Employed	-0.006	(0.039)							-0.013	(0.038)
Income-to-poverty ratio	0.001	(0.011)							0.003	(0.011)
Material hardship	0.049	(0.010) ***							0.037	(0.010) ***
Neglect			0.942	(0.210) ***					0.868	(0.210) ***
Psychological aggression			0.413	(0.108) ***					0.381	(0.107) ***
Physical assault			0.298	(0.089) **					0.271	(0.090) **
Engagement			-0.019	(0.016)					-0.012	(0.016)
No relationship					---	---			---	---
Low supportive behaviors					0.171	(0.051) **			0.153	(0.051) **
High supportive behaviors					-0.003	(0.049)			0.021	(0.049)
Shared responsibility in parenting					-0.073	(0.025) **			-0.049	(0.026)
Cooperation in parenting					0.027	(0.027)			0.024	(0.027)
Perceived instrumental support							-0.080	(0.087)	-0.050	(0.086)
Number of friends							-0.001	(0.004)	0.001	(0.004)
Presence of a close confidante							0.032	(0.068)	-0.006	(0.067)
Constant	-0.348		-0.388		-0.231		-0.221		-0.438	
R-squared	0.238		0.254		0.237		0.229		0.265	
N	2,427		2,427		2,427		2,427		2,427	

Source: Author's calculations using the Fragile Families and Child Wellbeing Study.

Note: All models include covariates from Model 3 of Table 3. \* p < 0.05, \*\* p < 0.01, \*\*\* p < 0.001.

**Table 6. OLS Regression Models Predicting Externalizing Problem Behaviors, by Maternal Depression with Mechanisms.**

	Model 1		Model 2		Model 3		Model 4		Model 5	
<i>Maternal depression</i>										
Never depressed (reference)	---	---	---	---	---	---	---	---	---	---
Depressed at one wave	0.087	(0.050)	0.068	(0.048)	0.087	(0.050)	0.097	(0.050)	0.055	(0.048)
Depressed at two waves	0.056	(0.077)	0.092	(0.073)	0.102	(0.076)	0.108	(0.076)	0.047	(0.074)
Depressed at three waves	0.190	(0.110)	0.189	(0.106)	0.241	(0.109) *	0.258	(0.110) *	0.136	(0.106)
Proximate depression	0.073	(0.068)	0.093	(0.065)	0.098	(0.068)	0.112	(0.068)	0.053	(0.065)
Lagged indicator of behavior	0.455	(0.019) ***	0.397	(0.019) ***	0.452	(0.019) ***	0.460	(0.019) ***	0.391	(0.019) ***
<i>Potential mechanisms</i>										
Employed	-0.003	(0.037)							-0.014	(0.036)
Income-to-poverty ratio	0.004	(0.010)							0.008	(0.010)
Material hardship	0.052	(0.009) ***							0.038	(0.009) ***
Neglect			0.447	(0.193) *					0.377	(0.193)
Psychological aggression			0.880	(0.100) ***					0.849	(0.099) ***
Physical assault			0.400	(0.084) ***					0.374	(0.084) ***
Engagement			0.000	(0.015)					0.008	(0.014)
No relationship					---	---				
Low supportive behaviors					0.127	(0.048) **			0.099	(0.047) *
High supportive behaviors					-0.056	(0.047)			-0.038	(0.045)
Shared responsibility in parenting					-0.050	(0.024) *			-0.026	(0.024)
Cooperation in parenting					-0.007	(0.026)			-0.012	(0.025)
Perceived instrumental support							-0.045	(0.082)	-0.016	(0.079)
Number of friends							-0.004	(0.004)	-0.001	(0.003)
Presence of a close confidante							0.072	(0.065)	0.027	(0.062)
Constant	0.432		0.069		0.631		0.495		0.069	
R-squared	0.319		0.361		0.318		0.310		0.310	
N	2,427		2,427		2,427		2,427		2,427	

Source: Author's calculations using the Fragile Families and Child Wellbeing Study.

Note: All models include covariates from Model 3 of Table 3. \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ .

## **A1. Description of 5-Year-Old Children's Problem Behaviors.**

Internalizing behaviors (0 = *not true*, 1 = *somewhat or sometimes true*, 2 = *very true or often true*)

Complains of loneliness  
Complains that no one loves him/her  
Cries a lot  
Feels he/she has to be perfect  
Fears he/she might think or do something bad  
Feels that others are out to get him/her  
Feels too guilty  
Feels worthless or inferior  
Nervous, high strung, or tense  
Rather be alone than with others  
Refuses to talk  
Secretive, keeps things to self  
Self-conscious or easily embarrassed  
Shy or timid  
Stares blankly  
Sulks a lot  
Suspicious  
Too fearful or anxious  
Underactive, slow moving, lacks energy  
Unhappy, sad, or depressed  
Withdrawn, doesn't get involved with others  
Worries

Externalizing behaviors (0 = *not true*, 1 = *somewhat or sometimes true*, 2 = *very true or often true*)

Argues a lot  
Braggs or boasts  
Cruel, bullies, shows meanness  
Destroys others' things  
Destroys own things  
Disobedient at home  
Disobedient at school/childcare  
Doesn't seem to feel guilty after misbehaving  
Easily jealous  
Gets in many fights  
Hangs around with others who get in trouble  
Has sudden changes in mood or feeling  
Has temper tantrums or hot temper  
Lies or cheats  
Physically attacks people  
Prefers being with older kids  
Runs away from home  
Screams a lot  
Sets fires  
Shows off or clowns around  
Steals at home  
Steals outside the home  
Stubborn, sullen or irritable  
Swears or uses obscene language  
Talks too much  
Teases a lot

Threatens people  
Unusually loud  
Vandalizes  
Wants a lot of attention

## A2. Description of Potential Mechanisms.

Material hardship (1 = *occurred in past year*, 0 = *did not occur in past year*)

- Received free food or meals
- Child was hungry but couldn't afford more food
- Were hungry but didn't eat because couldn't afford enough food
- Did not pay the full amount of rent or mortgage payments
- Were evicted from your home or apartment for not paying the rent or mortgage
- Did not pay the full amount of a gas, oil, or electricity bill
- Gas or electric was turned off, or the heating company did not deliver oil, because there wasn't enough money
- Borrowed money from friends or family to help pay bills
- Moved in with other people even for a little while because of financial problems
- Stayed at a shelter, in an abandoned building, an automobile, or any other place not meant for regular housing
- Anyone in your household who needed to see a doctor or go to the hospital but couldn't go because of the cost
- Cut back on buying clothes for self
- Worked overtime or taken a second job

Neglect (0 = *did not do in past year*, 1 = *did in past year*)

- Had to leave child home alone
- Were so caught up in own problems, not able to show child love
- Were not able to make sure child got food he or she needed
- Were not able to make sure child goes to a doctor or hospital
- Were so drunk or high that you had a problem taking care of child

Psychological aggression (0 = *did not do in past year*, 1 = *did in past year*)

- Shouted, yelled, or screamed at child
- Threatened to spank or hit child but didn't actually do it
- Swore or cursed at child
- Called child dumb or lazy or some other name like that
- Said you would send child away or would kick child out of the house

Physical assault (0 = *did not do in past year*, 1 = *did in past year*)

- Spanked child on the bottom with your bare hand
- Hit child on the bottom with a hard object
- Slapped child on the hand, arm, or leg
- Pinched child
- Shook child

Engagement (0 = *0 days per week*, 7 = *7 days per week*)

- Sang songs or nursery rhymes with child
- Read stories to child
- Told stories to child
- Played inside with toys such as blocks or legos with child
- Told child that you appreciated something he/she did
- Played outside in the yard, park, or playground with child
- Take child on an outing, such as shopping, or to a restaurant, church, or museum
- Watch TV or a video together

Supportive behaviors (0 = *no partner*, 1 = *never*, 2 = *sometimes*, 3 = *often*)

- Fair and willing to compromise
- Expresses love or affection
- Encourages or helps you do things
- Listens when you need someone to talk to

Understands your hurts and joys

Hostile behaviors (0 = *no partner*, 1 = *never*, 2 = *sometimes*, 3 = *often*)

- Insults or criticizes your ideas
- Tries to keep you from seeing friends or family
- Tries to prevent you from going to work or school
- Withholds money or tries to take your money

Shared responsibility in parenting (1 = *never*, 2 = *rarely*, 3 = *sometimes*, 4 = *often*)

- Looks after child when you need to do things
- Runs errands for you like picking things up at the store
- Fixes things around your home, paints, or makes it look nicer
- Takes child places he needs to go, such as the doctor

Cooperation in parenting (1 = *never*, 2 = *rarely*, 3 = *sometimes*, 4 = *always*)

- When father is with child, acts like the father you want
- Can trust father to take good care of child
- Father respects the schedules and rules you make for child
- Father supports you in the way you want to raise child
- You and father talk about problems that come up when raising child
- Can count on father to help when you need someone to look after child

Perceived social support (1 = *available*, 0 = *not available*)

- Loan for \$200
- Loan for \$1,000
- Place to live
- Child care
- Cosigner for \$1,000
- Cosigner for \$5,000