



# The impact of maternal depression on child academic and socioemotional outcomes



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## ABSTRACT

This paper examines how maternal depression affects children's test scores and socioemotional outcomes. An empirical challenge surrounding this research is to address the omission of unobserved factors affecting both maternal depression and child outcomes. By implementing bounding, an underutilized estimation technique not previously applied to maternal depression studies, I am able to generate ranges of the causal impact of maternal depression on child test scores and socioemotional outcomes. Primary findings include moderately-sized reductions in children's socioemotional measures and slight reductions in children's test scores when a mother reported any level of depression in single-period analyses, an increase in magnitude of the findings for kindergarten students as severity of depression increased, and larger impacts on reading scores of third graders when their mother was depressed in multiple time periods.

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## 1. Introduction

Nearly one in 10 American adults currently suffers from depression (Centers for Disease Control and Prevention). Depression is costly to society, with direct costs estimated to exceed 80 billion dollars annually in the U.S. (Greenberg, Fournier, Sisitsky, Pike, & Kessler, 2015), measured in terms of lost wages and health care needs. There is less clarity surrounding the indirect costs of depression, including the spillover effects on family, friends, and coworkers. This study adds to the literature of the costs of depression by identifying the range of causal effects of maternal depression on elementary school-aged academic and socioemotional outcomes.

Previous research has found a person's mental health status impacts adults around them, manifesting as

reductions in mental health status of colleagues (D'Souza et al., 2007) and spouses (Fletcher, 2009; Siegel, Bradley, Gallo, & Kasl, 2004). There are also labor market spillovers for spouses of those with mental health problems, such as foregone employment opportunities and lost wages (Access Economics & SANE Australia, 2003; Rice & Miller, 1996; Tarricone et al., 2000). Maternal depression adversely affects children's health (Casey, Goolsby, & Berkowitz, 2004; Perry, 2008; Clayton et al., 2013; Raposa, Hammen, Brennan, & Najman, 2014) and behavior (Frank & Meara, 2009). However, less studied are the causal effects of maternal depression on test scores and other non-cognitive socioemotional classroom outcomes of school-aged children.

Generating a causal estimate of the impact of maternal depression on a child's academic skills and social functioning is difficult to measure due to endogeneity, stemming from the omission of unobserved factors that affect both maternal depression and child outcomes. For example, omitted variables that are not easily available in most data sources such as family history of depression and

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neighborhood characteristics (e.g. feeling safe in the home) might negatively impact both a mother's mental state as well as a child's emotional and academic outcomes. Therefore, this paper applies a rigorous robustness check to an important topic in health economics. In doing so, I address the role of endogeneity by identifying bounds of the maximum effect of maternal depression on various child outcomes.

There are three key findings from this work: First, the presence of maternal depression leads to slight reductions in test scores and moderately-sized reductions in socioemotional outcomes for both kindergartners and third graders. Second, severity of maternal depression appears to be more detrimental for younger students than older students. Third, when a mother is depressed in multiple points in time, the negative effects on her child are stronger than if she were depressed in only one period.

## 2. Background

There is a sizable literature in child development and pediatrics documenting a relationship between maternal depression and negative child outcomes. Much of the prior work focuses on infant health and postpartum depression in women occurring in the year following childbirth. A review of these studies is provided by [Lovejoy, Graczyk, O'Hare, and Neuman \(2000\)](#), whose meta-analysis of the early interactions between depressed women and infants found that those women who were depressed during their infants' first 3 months of life were more irritable and hostile, less engaged, displayed less warmth and emotion, and were less likely to play with their infants. Postpartum depression leads to negative reactions in infants such as crying, looking away, directed hand movements, and self-soothing behaviors, ([Cohn & Tronick, 1983](#)) and reduced mental and motor development skills at the end of infants first year of life ([Field, 1995](#); [Lyons-Ruth, Connell, & Grunebaum, 1986](#)). Early mother–infant interactions also predict poorer infant cognitive outcomes at 18 months of age ([Murray, Fiori-Cowley, Hooper, & Cooper, 1996](#)).

The negative impacts of maternal depression are not limited to infants of mothers battling postpartum depression. Using the National Longitudinal Survey of Youth (NLSY), [Frank and Meara \(2009\)](#) find depression leads to moderately large effects in child behavioral problems (such as bullying, fearfulness, anxiety, and sudden changes in mood) but not cognitive outcomes once children enter school. Similar to my study, Frank and Meara recognize the potential role of unobserved measures generating their results. Instead of creating bounds of the range of the causal effect of maternal depression on child outcomes, Frank and Meara focus on the richness of available observable covariates in their data and then apply astute robustness testing. By estimating models restricted to subpopulations of mothers with more than one child, they are able to examine within-mother differences in child outcomes that might be related to maternal depression. Although my paper and Frank and Meara's use different techniques to assess the role of endogeneity in maternal depression studies, by arriving at similar conclusions bolsters support that

maternal depression does negatively affect non-cognitive behavior in school-aged children.

Others have also found increased behavioral problems ([Klein, Lewinsohn, Seeley, & Olin, 2005](#); [Shaw, Hyde, & Brennan, 2012](#); [Weissman et al., 1987](#); [Welsh-Allis & Ye, 1988](#)), poorer infant and child health ([Casey et al., 2004](#)), elevated risks of psychopathology ([Beardslee, Bemporad, Keller, & Klerman, 1983](#); [Downey & Coyne, 1990](#); [Orvaschel, 1983](#)), and higher rates of depression ([Fendrich, Warner, & Weissman, 1990](#)). Additionally, children with chronic health problems like asthma and diabetes whose mothers are depressed have higher emergency room and hospital utilization rates ([Clayton et al., 2013](#); [Perry, 2008](#)).

Three additional themes from the literature guided this study. The first is that severity of depression is important. [Brennan et al. \(2000\)](#) demonstrated a positive relationship between severity of maternal depression and behavioral problems and a negative relationship between maternal depression and vocabulary scores for 5-year-old children. Second, the longer the mother is depressed, the larger the negative impacts on her child. This result is present both for infants ([Campbell, Cohen, & Meters, 1995](#)) and young children ([Brennan et al., 2000](#)). Lastly, the literature suggests maternal depression may predict long-term negative outcomes for children. [Raposa et al. \(2014\)](#) find negative effects (increased health-related stress and poor social functioning) of maternal depression on children up to 20 years after depression was first reported. Research by [Gilliam et al. \(2015\)](#) finds maternal depression is linked to aggression in youth, even when it was experienced several years prior.

Previous work demonstrates that the impacts of maternal depression on children may begin during infancy and remain through adolescence (and beyond). Examining the role of maternal depression on school-aged child outcomes is important, as it may stymie the formation of human capital in children and economic success of children is influenced by human capital formation ([Cunha & Heckman, 2007](#); [Heckman, 2006](#); [Heckman 2007](#)). This paper augments the literature by examining the effect of maternal depression on school-age child outcomes using nationally representative longitudinal data, allowing for severity, episodic occurrences (chronicity), and longer-term time trends to be studied. Additionally, it builds on the findings of similar studies ([Frank & Meara, 2009](#)) by also recognizing the role of endogeneity and applying alternative statistical techniques to evaluate robustness of findings.

## 3. Data

### 3.1. Sample

The Early Childhood Longitudinal Study-Kindergarten Class of 1998–1999 (ECLS-K) is a large, nationally representative, longitudinal study sponsored by the National Center for Educational Statistics (NCES) to follow kindergartners upon entry and through completion of eighth grade. Data collection began in the fall of kindergarten (1998) and follow-up surveys were administered in the spring of kindergarten (1999), the fall of first grade (1999),

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