



Food insecurity and child behavior problems in fragile families



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ABSTRACT

Food insecurity remains a persistent problem in the United States. Several studies have shown that food insecurity is associated with child externalizing and internalizing behavior problems. However, some potential methodological limitations remain. For example, most studies use a household measure of food insecurity while there is evidence that children, especially younger ones, tend to be shielded by their parents from experiencing food insecurity. In addition, the mechanisms through which food insecurity affects children are not well understood. This study uses longitudinal data from the Fragile Families and Child Wellbeing Study to address these limitations. Fixed-effects models show that the association is even larger using a measure of child food insecurity instead of a household one. Correlated-random effects models show a large difference in child behavior problems between food secure and food insecure children due to unobserved heterogeneity. In addition, the association between child food insecurity and child externalizing behaviors remains largely unexplained while food insecurity among adults explains almost all the variation in the association with child internalizing behaviors. Food insecure children and parents are at risk of micronutrient deficiencies, which may lead to behavior problems in young children. These findings underscore the need for greater focus on reducing the risk of food insecurity, especially for children in fragile families, in order to reduce behavior problems and improve their educational attainment.

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1. Introduction

Food insecurity, the inability to access enough food to maintain a healthy and active life, is a persistent problem in the United States. Since the 2008, the rate of household food insecurity has hovered around 14%, which represents about one out of seven households (Coleman-Jensen et al., 2015). A large body of literature has documented the negative consequences of food insecurity on the well-being of children across the life-course (Alaimo et al., 2001; Belsky et al., 2010; Gundersen and Ziliak, 2015; Jyoti et al., 2005; Rose-Jacobs et al., 2008; Slopen et al., 2010). Food insecure children have poorer health outcomes and lag behind their peers in academic outcomes (Jyoti et al., 2005), leading to lower educational attainment. Furthermore, because food insecurity is concentrated among vulnerable households and children (Coleman-Jensen et al., 2015), another consequence of food insecurity is the growing inequality among children (Roustit et al., 2010).

While there is ample evidence showing that food insecurity has negative impacts on child behavior problems (e.g. Huang et al., 2010; Kimbro and Denney, 2015), these studies have several

methodological limitations. First, most studies on the relationship between food insecurity and child behavior problems do not account for unobserved heterogeneity except for a handful of them (Howard, 2011; Jyoti et al., 2005). Second, children, especially younger ones, tend to be shielded by their parents from experiencing food insecurity (Coleman-Jensen et al., 2013). Most studies on child food insecurity use a household-level measure of food insecurity, which likely overstates the actual prevalence of child food insecurity. Since no studies have compared estimates between child and household food insecurity, it remains unknown as to how shielding affects the estimates of food insecurity from previous studies. Lastly, the mechanisms through which food insecurity may lead to child behavior problems are not well understood and few studies have tested them.

This study attempts to address some of these limitations in several ways. First, I use longitudinal data from the Fragile Families and Child Wellbeing Study (FFCWS) with fixed-effects models to estimate the association between food insecurity and child behavior problems. Second, I compare the estimates using a child-level measure of food insecurity to a household-level one to account for shielding. Third, I estimate correlated-random effects models to compare the within and between estimates of food insecurity. Lastly, I test three mechanisms through which child

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food insecurity may lead to behavior problems: maternal depression, parenting stress, and parental food insecurity.

2. Background

2.1. Conceptual framework

Food insecurity could directly negatively affect child development through undernutrition and micronutrient deficiencies. Children living in food insecure households have numerous micronutrient deficiencies, including deficiencies in iron and zinc (Kirkpatrick and Tarasuk, 2008; Skalicky et al., 2006). These nutritional deficiencies, especially in young children, can lead to adverse – or under – development of the brain and its functioning (Benton, 2008; Georgieff, 2007; Knickmeyer et al., 2008), which can result in poor cognitive functioning, behavioral, and emotional problems in children (Grantham-McGregor and Ani, 2001; Lozoff et al., 2000).

Food insecurity could also indirectly affect child development through family members, most notably, parents. The Family Stress Model proposes that economic hardships such as low income and negative economic events directly affect economic pressures within the family (Conger and Conger, 2002). Examples of economic pressures are the inability to pay for basic needs or having to reduce expenses on necessities. The model suggests that during high economic pressure, such as the inability to access enough food, parents are at higher risk of emotional distress (e.g. anxiety and depression). Food insecurity could also lead to parental emotional distress, not only through stress, but also through nutritional deficiencies (Dixon et al., 2001; Tarasuk and Beaton, 1999a). Some of these nutritional deficiencies, such as a lack of folate, are known to increase the risk of depression in mothers (Alpert et al., 2000; Reynolds, 2002). This could explain why several studies find a link between food insecurity and maternal depression (Hromi-Fiedler et al., 2011; Laraia et al., 2006; Noonan et al., 2016; Whitaker et al., 2006). The parental emotional distress and accumulation of stress could disrupt the relationship between the parent and the child, and decrease parenting quality (Crnic et al., 2005; Goodman et al., 2011; Wachs et al., 2009). Parents who are too preoccupied to provide food to their children may be less likely to be able to attend to their children's needs and engage them in activities that stimulate their cognitive and social development, which may lead to behavior problems (Alpert et al., 2000; Dixon et al., 2001; Reynolds, 2002).

2.2. Existing evidence

Empirical evidence has shown an association between food insecurity and poor child developmental outcomes such as behavior problems (e.g. Howard 2011; Huang et al., 2010; Kimbro and Denney, 2015; Rose-Jacobs et al., 2008; Slack and Yoo, 2005). While there is an abundant evidence of this association, a large number of these studies have methodological limitations. For example, several of these studies are cross-sectional (e.g. Alaimo et al., 2001; Rose-Jacobs et al., 2008), and studies that use longitudinal data did not substantially improve on the cross-sectional studies as they did not account for unobserved time-invariant measures that may confound this association (Hernandez and Jacknowitz, 2009; Kimbro and Denney, 2015; Slack and Yoo, 2005; Slopen et al., 2010; Whitaker et al., 2006). An example of unobserved (time-invariant) characteristic that could affect this association is food insecurity during pregnancy, which leads to low birthweight and birth defects (Borders et al., 2007; Carmichael et al., 2007), thus increasing the risk of later behavior problems in children. Only a handful of studies have attempted to deal with these potential methodological concerns using methods such as

fixed-effects models or structural equation modeling (Howard, 2011; Jyoti et al., 2005; Zaslow et al., 2009).

In food insecure households, parents usually try to shield their children – especially younger ones – from experiencing food insecurity (Coleman-Jensen et al., 2013, 2015). Descriptive statistics from the 2010–2011 Current Population Survey shows that in food insecure households, children younger than 4 years old are 50% less likely to experience food insecurity than teenage children (Coleman-Jensen et al., 2013). As a result, studies on children (especially younger ones) using a household measure of food insecurity may likely overestimate the prevalence of child food insecurity and misclassify them as food insecure while they are actually food secure. Given that no studies have compared the estimates between household and child food insecurity, it is unclear how estimates from previous studies that use household food insecurity are affected.

The potential mechanisms through which food insecurity affects child behavior problems are not well understood. The conceptual framework provided suggests three potential mechanisms through which food insecurity could lead to child behavior problems: maternal depression, parenting stress, and parental food insecurity. Only two previous studies have used longitudinal data to test potential mechanisms. Zaslow et al. (2009) use structural equation modeling to find that maternal depression mediates the relationship between household food insecurity and mental proficiency. Huang et al. (2010) use data from the Panel Study of Income Dynamics (PSID) and fixed-effects models to find that parenting distress and psychological distress mediate the association between food insecurity and child behavior problems. However, their analytical sample using listwise deletion used only 14% of the sample of children (416 children out of 2907) in the dataset, which lowers the power of the study and making it susceptible to attrition bias.

In addition to the lack of understanding about potential mechanisms that may explain these relationships, these relationships are not well understood in the context of vulnerable households such as fragile families. These families are known to be at higher risk of experiencing food insecurity and poverty. This is important because these households are typically the target recipients of public assistance programs such as the Supplemental Nutrition Assistance Program (SNAP), the School Breakfast Program (SBP), and the National School Lunch Program (NSLP). Given the high prevalence of food insecurity in the U.S. and its importance for the development of children, disentangling the consequences of food insecurity for child behavior problems adds a better understanding of health disparities and social inequalities among children.

3. Data and methods

3.1. Analytical sample

The Fragile Families and Child Wellbeing Study (FFCWS) is a longitudinal study that sampled children born between 1998 and 2000 in 20 large U.S. cities with populations of at least 200,000. Both mothers and fathers were interviewed at baseline (when the child was born) and regular intervals over time (e.g. year 1, 3, 5, and 9). When weighted, the sample is representative of unmarried mothers and “fragile families” as they are at higher risk of living in poverty and separation (Reichman et al., 2001). The core surveys were conducted by telephone and provide extensive information pertaining to family background, relationships, health, and parenting behaviors among others. The in-home survey is most of the time conducted at the home of the respondents and collects information on children's cognitive and emotional development,

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