Children and Youth Services Review 53 (2015) 24–33

Contents lists available at ScienceDirect

Children and Youth Services Review

journal homepage: www.elsevier.com/locate/childyouth

Food insecurity across the first five years: Triggers of onset and exit

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ARTICLE INFO

Article history:
Received 27 January 2015
Received in revised form 9 March 2015
Accepted 9 March 2015
Available online 14 March 2015

Keywords:
Food insecurity
Children
Transitions

ABSTRACT

Very low food security among young children is associated with developmental deficiencies. However, little is known about the factors that predict entry into or exit from very low food security during early childhood. This study seeks to: (1) understand the triggers that explain movements into or out of very low food security among children from birth to age five; (2) examine the first aim using different definitions of food insecurity. The analysis relies on the Early Childhood Longitudinal Study — Birth Cohort (ECLS-B), a longitudinal, nationally representative dataset of approximately 10,700 children, to estimate linear probability models. Results suggest that residential moves and declines in maternal or child health are associated with transitioning into food insecurity, whereas increases in the number of adults in the household are associated with exits from food insecurity. Changes in income and maternal depression are associated with both entrances and exits.

1. Introduction

In 2011, 14.9% of households in the United States were classified as food insecure (Coleman-Jensen, Nord, Andrews, & Carlson, 2012), defined as "having limited or uncertain availability of food, or limited or uncertain ability to acquire acceptable foods in socially acceptable ways"[1] (Bickel et al., 2000). Of these food-insecure households, more than one-third (5.7% of all households in the U.S.) experienced very low food security (Coleman-Jensen et al., 2012). Very low food security is more severe than low food security, and can entail reduced food intake and disrupted eating patterns. While children are typically protected from food need, 9.0% of households with children were classified as experiencing low food security among children and 1.0% of all households with children experienced very low food security among children, meaning that children themselves did not have adequate food (Coleman-Jensen et al., 2012).

Although the prevalence of food insecurity among children can be viewed as low, the consequences cannot be overlooked, especially with regard to food insecurity experienced during the early childhood period. Even when children themselves do not experience hunger, their parents' experiences of food insecurity pose serious threats to children's physical, behavioral, and cognitive development, mediated through parental stress or depression (see Nord (2009) for a comprehensive review of this literature). Young children who live in food-insecure households are more likely to experience fair or poor health (Bronte-Tinkew, Zaslow, Capps, Horowitz, & McNamara, 2007; Cook et al., 2004, 2006), are more likely to have been hospitalized since birth (Cook et al., 2004, 2006), and exhibit more behavioral problems, including aggressiveness, hyperactivity, depression, and anxiety (Whitaker, Phillips, & Orzol, 2006) than their counterparts in food-secure households.

Presumably, the health consequences of directly experiencing food insecurity in terms of lack of food are more severe than the indirect effects via parent stress or other household processes. Furthermore, the health consequences of food insecurity are likely to be more severe when experienced during early childhood, as opposed to older ages, as developmental science emphasizes the importance of early experiences for children's physical, cognitive, and social–emotional development (e.g., Bronfenbrenner & Morris, 1998; Shonkoff & Phillips, 2000). For example, Shonkoff and Phillips (2000) suggest that nutritional deficiency during infancy can lead to impaired brain development. Because of these consequences, this study focuses on food insecurity directly experienced by children from birth to five years of age.

Despite the severe and long-lasting consequences of food insecurity, little is known about the factors related to child-level food insecurity, especially among young children. This study uses a nationally representative, longitudinal dataset, the Early Childhood Longitudinal Study — Birth Cohort (ECLS-B), to examine the triggers or shocks that contribute to the onset of and exit from food insecurity among young children. Triggers examined include changes in employment, income, household composition, child health, maternal mental and physical health, and

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[1] Food insecurity measures both the quality and quantity of food based on an 18-item scale developed by the USDA. The scale captures experiences at the household level (in the last 12 months), such as running out of food, perceptions that food in a household is of inadequate quality or quantity, and reduced food intake by adults or children, all because of financial constraints (Bickel, Nord, Price, Hamilton, & Cook, 2000). The scale assesses food insecurity as "low food security" and "very low food security". For more information see Coleman-Jensen et al. (2012).

http://dx.doi.org/10.1016/j.childyouth.2015.03.012
0190-7409/

residential moves. Specifically, the two primary research aims of this study are:

Aim 1. Understand the triggers or shocks that explain movements into or out of very low food security among children from birth to age five.

Aim 2. Examine the first aim using different definitions of food insecurity, including low and very low food security among children, very low food security among adults and children, and low and very low food security among adults and children.

By understanding the triggers of very low food security, food assistance and other programs can better target resources to serve the families most at risk or most in need; likewise, policies can be improved to build upon identified predictors that help lift children out of food insecurity.

1.1. Background

The limited research on the factors related to children's food insecurity, which includes children of all ages and uses varying definitions of food insecurity, indicates that household income, employment, and education level, which are indicators of families' social and economic resources, are important predictors. Approximately one-quarter (24.1%) of U.S. households below the poverty line had food-insecure children (Coleman-Jensen et al., 2012). Households classified as food insecure are less likely to have health insurance (Gundersen & Gruber, 2001), and food-insecure households with children are more likely to be mother-headed, have more children, and average lower education among adults than their food-secure counterparts (Bartfeld & Dunifon, 2006). In 2007, about half (55%) of households with food-insecure children had no adult with any education beyond the high school level; among households with children experiencing very low food security, 59% had no adult members with more than a high school degree (Nord, 2009). However, employment and higher income do not guarantee food security. More than two-thirds (69%) of households with children classified as having low food security had one or more persons employed full-time; 62% of children with very low food security lived in households with one or more persons employed full-time (Nord, 2009).

While several studies document the correlates of food insecurity, less is known about why children themselves enter or exit food insecurity — that is, what factors or events trigger the onset of or exit from food insecurity among young children. Understanding these factors is important because food insecurity tends to be episodic rather than chronic (Coleman-Jensen et al., 2012); thus, changes in food insecurity status are likely frequent among young children living in low-resourced families. Further, these predictors of very low food security among young children may be different from those associated with the food insecurity of older children and adults. For example, the effect of maternal depression on school-age children's food insecurity may be mitigated by the receipt of school breakfast or lunch; however, young children, who receive more of their nutritional intake from their families, may be negatively affected by maternal depression as it may impede a mother's ability to purchase and prepare food.

Relevant to understanding triggers of changes in food insecurity status, poverty research indicates that changes in employment, family composition, parent or child health, and receipt of public programs predict entry or exit from poverty (e.g., Blank, 1997; Chen & Corak, 2008; Lichter, Qian, & Melliot, 2006). Indeed, previous research suggests that unexpected losses in income, particularly among low-income families, create budget constraints that render households susceptible to food insecurity (Gundersen & Gruber, 2001). Similarly, parental job loss, divorce, the birth of a child, or unexpected health expenses are hypothesized to place greater strain on families' economic resources. Conversely, a parent's entry into the labor force, income increases, marriage or union formation, or improvements in health may help lift children and their families out of food insecurity.

2. Methodology

2.1. ECLS-B

The ECLS-B is a longitudinal dataset collected by the National Center for Education Statistics (NCES). The baseline sample of approximately 10,700 children was designed to be nationally representative of children born in the U.S. in 2001 with an over-sample of Asian and American Indian children, twins, and low and very low birth-weight children.[2] The ECLS-B followed children from birth through kindergarten with data collection occurring when the child was 9 months of age (2001–02), 2 years of age (2003–04), approximately 4 years of age (2005–06, also known as the preschool wave), and at two waves at kindergarten entry (2006–08).[3] The 9-month data collection also includes variables from infants' birth certificates. This research relies on data from the first four waves of the ECLS-B, thus excluding information from the smaller, second kindergarten wave of data.

Given the broad motivations of the ECLS-B, these data are rich and appropriate for this study.[4] The ECLS-B is the only longitudinal dataset of young children that contains the full 18-item U.S. Department of Agriculture (USDA) Core Food Security Module (CFSM) in every wave of data collection. The use of a dataset that includes the CFSM allows for comparisons of results with other studies and an exploration of the research aims at multiple levels of food insecurity. The very low food security rate among children generated using the first wave of data from the ECLS-B is remarkably similar to that generated using the Current Population Survey (CPS) (0.5% from the ECLS-B and 0.6% from the CPS) (Coleman-Jensen et al., 2012).[5] For these reasons, the ECLS-B data are preferred for this analysis over data from the Survey of Income and Program Participation (SIPP) and the Fragile Families and Child Wellbeing Study. The ECLS-B also contains a rich set of variables on child, maternal, and household characteristics. Finally, the ECLS-B includes zip codes, which facilitates the merger and analysis of county-level contextual variables such as the rates of poverty, unemployment, and participation in food assistance programs.

2.2. Empirical strategy

This paper tests the hypothesis that events or changes in child, maternal, and household circumstances affect the likelihood of entry into and exit from very low food security among children (Aim 1) by estimating two linear probability models that are represented by Eq. (1).

$$Y_{it} = B_0 + B_1 X_{it} + B_2 Z_i + \varepsilon_{it}. \quad (1)$$

In Eq. (1), Y_{it} captures two dependent variables for child i in transition t. Given that the dependent variables are binary, linear probability models are appropriate.[6] Separate regression models predicting entry into and exit from very low food security are estimated instead of one regression model with child fixed-effects to determine if factors that influence entry into and exit from very low food security are different as suggested by the finding in Heflin and Butler (2013) that different factors predict entry into and exit from material hardship. Hazard models

[2] The reported sample sizes have been rounded to the nearest 50, per NCES regulations regarding disclosure of restricted-use data.

[3] In the fall of 2006, information was collected from all participating children, approximately 75% of whom were in kindergarten or higher. In the fall of 2007, data were collected from the remaining 25% of participating children who were first entering or were repeating kindergarten in the 2007–08 school year.

[4] For additional information see the ECLS-B survey instruments at http://nces.ed.gov/ecls/Birth.asp.

[5] While the ECLS-B and CPS very low food security rates among children may not be directly comparable because of the age of children studied, the closeness of the two rates is suggestive of the validity of the ECLS-B.

[6] Results (available upon request) from logit models are qualitatively similar to those presented in the paper.