



Participation in the National School Lunch Program and food security: An analysis of transitions into kindergarten [☆]



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ABSTRACT

We use variation in state kindergarten eligibility dates to explore the protective effects of NSLP participation on household food security by focusing on the research question: What is the impact of the NSLP on household food insecurity among households with a kindergarten-aged child in the Early Childhood Longitudinal Study – Birth cohort (ECLS-B)? Our modeling approach provides consistent support for the contention that the NSLP reduces food insecurity. Additionally, we find that paying full price for school lunch is associated with increases in food insecurity among our low-income sample. Sensitivity analysis demonstrates that controlling for the reduction in child care hours among low-income households does not diminish the size of the NSLP effect. Additionally, school entry is not associated with reductions in food insecurity among families whose incomes are above 185% of the federal poverty line. Finally, our findings are robust to excluding twins. This finding is consistent with a growing literature documenting the benefits of school lunch programs but is unique for the focus on the period of school entry, at time when behavioral and cognitive patterns of school outcomes are being established for the future.

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1. Introduction

The impact of food insecurity on children's development is well documented. From a developmental perspective, it is believed that food insecurity has cumulative effects at different stages of development beginning in the prenatal period (Bhattacharya, Currie, & Haider, 2004; Cook & Frank, 2008; Duncan, Brooks-Gunn, & Klebanov, 1994; Morgane, Austin-LaFrance, Bronzino, et al., 1993; Pollit, 1994; Scholl & Johnson, 2000). During infancy, hunger has negative effects during the period of neurodevelopment. Controlled experiments with animals suggest that hunger results in irreversible damage to brain development such as that associated with the insulation of neural fibers (Yaquub, 2002). The damage associated with a lack of nutritional intake accumulated during the first 2 years of life include susceptibility to infections, slowed cognitive development, slow growth, susceptibility to chronic diseases, girls are at higher risk of having low-birth weight babies, and other non-health related problems such as reduced school performance, increased school dropouts and reduced productivity during adulthood (Hoddinott, Behrman, Maluccio, Flores, & Martorell, 2008).

During schooling years, food insecurity is associated with poor school performance and academic achievement (Roustit, Hamelin, Grillo, Martin, & Chauvin, 2010; Maluccio et al., 2006; Cook & Frank, 2008). Neurologists and psychologists suggest that the impact of food insecurity on learning can be attributed to two mechanisms. First, there is a direct effect on cerebral functioning, which defines child's cognitive abilities. Second, there is an indirect effect on physical and psychological health that contributes to distraction, absenteeism and low motivational abilities for learning. Thus, the evidence indicates that the effects of nutritional inadequacy persist across childhood but that the causal mechanisms may vary at different periods of biological, cognitive and social development.

We examine the change in household food security as children enter kindergarten and are able to access the National School Lunch Program (NSLP). While others have examined the effect of NSLP on children's nutritional outcomes, (Bartfeld & Dunifon, 2006; Frisvold, 2013; Gundersen, Kreider, & Pepper, 2012), our paper is unique for its focus on the transition to kindergarten, a time period that is especially important for future school success. Specifically, we exploit variation in NSLP participation directly related to the age of children and state of residence. In order to access the NSLP program, children must be enrolled in formal kindergarten programs (i.e. not Headstart or other forms of child care), usually as part of an elementary school system. Kindergarten enrollment in largely based on turning age 5 by a cut-off point, which varies by state from August 1 in Missouri to January 1 in Connecticut (National Center for Education Statistics, US Department of Education, 2013).

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In this paper, we use this variation in state eligibility rules to explore the protective effects of NSLP participation on household food security by focusing on the research question: What is the impact of the NSLP on household food insecurity among households with a kindergarten-aged child? We use data from the Early Childhood Longitudinal Study – Birth cohort (ECLS-B) with state kindergarten enrollment policies as an instrument for participation in the NSLP. We begin by summarizing prior research on food and nutrition programs available to children around the time of kindergarten entry. Then we explain our modeling strategy and our use of the variation in kindergarten enrollment policies to address known selection problems with participation in school lunch programs. Results with sensitivity analyses follow. Our findings suggest that participation in the NSLP among kindergartners is associated with a significant reduction in the probability of being food insecure. This finding is consistent with a growing literature documenting the benefits of school lunch programs but is unique for the focus on the period of school entry, at a time when behavioral and cognitive patterns of school outcomes are being established for the future.

1.1. Literature review

The federal food and nutritional safety net designed to address the serious issue of childhood food insecurity is currently a patchwork. Program services may be delivered in the form of vouchers, (near) cash supplements, or directly as food. Services may be available to specific members of the household only or to the entire household. In addition to household income eligibility, children's eligibility for a specific program may depend upon their age and the income level of others in their day-care or school. The result of this hodge-podge of food and nutritional programs is that different households with similar income levels and number of children, may be receiving substantially different bundles of food assistance. The Supplemental Nutrition Assistance Program (SNAP) is the sole program that provides consistent nutritional assistance across the life course.

While variation may occur across the entire childhood period, there is a significant transition in the types of food and nutrition programs for which children qualify as children reach age five and become age eligible to enter kindergarten. Before age five, children are age eligible for WIC and may receive nutritional assistance through child care programs such as the Child and Adult Care Food Program (CACFP). After age five, children are no longer eligible for WIC and are much less likely to have contact with a child care center that participates in CACFP. Preliminary analyses by the Heflin, Arteaga, and Gable (2012) using the Early Childhood Longitudinal Study–Birth Cohort and similar methods to those used here suggest that household food insecurity increases by 7–13% when children reach month 61 and age out of eligibility for the WIC program. We seek to explore whether transitions into kindergarten and access to the National School Lunch, the main sources of nutritional supplementation for school-aged children, reduce food insecurity.

The NSLP is administered at the school level, with upwards of 97% of public schools participating in the NSLP. Participation in the NSLP has traditionally been limited to those who qualify based on categorical eligibility or income eligibility. Children can be categorical eligible for the NSLP based on their household participation in other federal means-tested programs, such as SNAP or TANF. Income eligibility is established by demonstrating that gross household income is below 130% of the federal poverty line for free meals, or between 130 and 185% of the poverty line for reduced meals. Beginning in 2012, schools with at least 40% of their students qualifying for free meals based on categorical eligibility can qualify for community eligibility in which meals are provided free to all children. Community eligibility is currently being phased in and was not an option during the time period of this study (Food and Nutrition Service, 2011). The NSLP also provides snacks to children during after-school programs. However, additional variation in the value of the nutritional benefit occurs through the school schedule (number of instruction days; traditional calendar with summers off versus year-round

with a month off every 3 months) and the availability of the Summer Food Service Program, which serves meals during “vacation” months. In fiscal year 2011, over 31 million students received a free or reduced-price lunch daily. According to Dahl and Scholz (2011), participation rates among eligible children are 75% for the NSLP.

While the NSLP provides a stable source of food for children enrolled in school, the extent to which the NSLP is directly supportive of household food security is unclear. NSLP participation is high among the population at risk of food security: Two-thirds of households with food insecurity among children report participation in the free or reduced-price school lunch program in the last 30 days (Nord, 2009). It is unclear, however, what the nature of the relationship is between the NSLP and food insecurity. As has been found with other food assistance programs, it is likely that those who are food insecure are more likely to participate in the NSLP and that analysis of the relationship is hampered by the non-random process of NSLP program participation. The most common approach has been to use a two-stage estimator that relies upon instruments (Gao, Ishdorj, & Higgins, 2012; Gundersen & Oliveira, 2001; Jensen, 2002; Kabbani & Kmeid, 2005; Mykerezzi & Mills, 2010) although new evidence is emerging using regression discontinuity (Frisvold, 2013; Heflin et al., 2012).

While most studies of program participation focus on the food stamp program (now known as SNAP), there are three studies that have tried to estimate causal effects of NSLP participation on food insecurity. Kabbani and Kmeid (2005) use CPS data from April 1995, 1997, 1999 and 2001 and find that participation in the NSLP was associated with lower odds of food insecurity for households with school-age children. In contrast, Gao et al. (2012) examine the relationship between NSLP participation and food insecurity using the third School Nutrition Dietary Assessment study (SNDA-III) sponsored by the Food and Nutrition Service (FNS) of USDA. Mathematica Policy Research, Inc. collected data from 287 schools in 94 districts from 2314 students over the 2004–2005 school year to assess the dietary quality of school meal programs. Gao et al. (2012) employ an instrumental variable approach, using if the child has enough time to eat their school lunch as an identifying instrument, to predict participation in the NSLP. Their models suggest that there is no relationship between NSLP participation and children's food insecurity. On the other hand, Gundersen et al. (2012) use data from NHANES for the period 2001 to 2004 to study the impact of NSLP on child outcomes. Under a set of assumptions, they found that NSLP reduces food insecurity by at least 6% using a non-parametric approach, bounding methods, and a large age range of children—those who are between 6 and 17 years of age.

The lack of clear evidence regarding the efficacy of the NSLP on food insecurity is somewhat surprising given the recent evidence that school food programs are effective at improving child outcomes. Although Dunifon and Kowaleski-Jones reported in 2003 that participation in the NSLP do not indicate positive results for child outcomes, Bartfeld and Dunifon (2006), Gundersen et al. (2012), and Frisvold (2013) all find positive effects of school food programs on child outcomes, such as obesity, child's health, math scores, and reading scores.

1.2. Data

In order to estimate the effect of participation in the National School Lunch Program (NSLP) on food insecurity, we use the Early Childhood Longitudinal Survey, Birth Cohort (ECLS-B). We focus our analysis on households with children who are eligible to receive free or reduced lunch, those who live in households with income levels at or below 185% of the federal poverty line.

1.3. Early childhood longitudinal study, birth-cohort

The Early Childhood Longitudinal Study, Birth Cohort (ECLS-B) is conducted by the National Center for Education Statistics (NCES) to examine the development, health and learning environment of a single cohort of US children who were born in 2001. It utilizes a multi-reporter,

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