Applied Economic Perspectives and Policy (2016) volume 38, number 1, pp. 73–92.
doi:10.1093/aepp/ppv007
Advance Access publication on 31 March 2015.

Submitted Article

Food Security and Teenage Labor Supply

Sarah Hamersma* and Matthew Kim

Sarah Hamersma is an assistant professor of public administration and international affairs at Syracuse University. Matthew Kim is an associate professor of economics at the University of St. Thomas.

*Correspondence may be sent to: sehamers@maxwell.syr.edu.

Submitted 28 August 2014; accepted 13 February 2015.

Abstract *This study assesses whether teenage labor force participation may influence the food security of children in their families. We utilize the Current Population Survey annual Food Security Supplement and linked monthly core data from 2001 through 2012 to assess the year-to-year dynamics of food security status in families with teenagers. We estimate the effect of teenage employment on food security while controlling for all time-invariant individual and household characteristics using a fixed-effects model. We find that an employed teen reduces the predicted probability of a family's children having very low food security by an economically and statistically significant 50%.*

Key words: Food security, labor supply, teenage employment.

JEL codes: I1, I3, J2.

Introduction

An abundance of evidence has established that reliable access to food is fundamental to children's human capital development, health, and well-being (see Nord 2009, for a review of the literature). As noted by Cook and Frank (2008), food insecurity has been established as a "risk to the growth, health, cognitive, and behavioral potential of America's poor and near-poor children." By the most recent estimates, about 10% of American households with children experienced food insecurity in 2012 (Coleman-Jensen et al. 2013).

Households and their children experience and respond to scarce food resources in a variety of ways. Detailed child interview work carried out by Fram et al. (2011) indicates that children's experiences of food security range from mere cognitive knowledge of the family situation, to deep emotional anxiety, to physical hunger. Children engage in a variety of actions to help take responsibility for the family's food situation, with young children more likely to engage in basic cooperation with parental strategies and older children more likely to take action. While teenagers were not the focus of the interview work (indeed, only 2 of the 26 children interviewed were high-school students), the findings suggest that older children have cognitive awareness of food insecurity and know of some options they have for

resource generation.[1] Combined with their ability to enter the formal labor force at age 15, this suggests the possibility that older teenagers in potentially food-insecure households may use early labor force participation to help contribute to family food resources.

In this paper, we explore the relationship between children's food-security dynamics and teenagers' labor market decisions. In particular, we are interested in understanding whether changes in food security are ever a result of a teenager's entry into (or exit from) the labor force. The empirical approach used here will allow us to estimate the effect of teenage labor force participation on the food security status of the children in the family. We implement our analysis using the Current Population Survey (CPS) annual Food Security Supplement (FSS) and linked CPS monthly core data from 2001 through 2012 (U.S. Bureau of Census and U.S. Bureau of Labor Statistics, 2001–2012).

Unlike many food security studies using the CPS data, we leverage the short-panel structure of the survey by matching individuals in adjacent survey years to provide additional insight into teenage employment and family food security.[2] First, we are able to assess the year-to-year dynamics of child food security status in families with teenagers. A preliminary examination of the data shows a great deal of movement from one year to the next, with only rare occurrences of consistent very low food security.

These dynamics motivate our larger research question: Is there evidence that teenage labor force entry and exit has consequences for the food security of the children in the teenager's family? To answer this question, we call upon the other advantage of the matched data: we can estimate the effect of employment on food security while controlling for all time-invariant individual, household, and local assistance program characteristics using a fixed-effects model. This approach addresses the problem of omitted variables that would otherwise bring about potential endogeneity concerns. We conduct a similar analysis examining hours of work rather than simply including an employment indicator.

Our findings are consistent with the hypothesis that teenage employment has a protective effect on children's food security in general, though the estimated effect on *very low* food security is more robust across specifications. We find consistently negative point estimates across our ordinary least squares and fixed-effects models, but the estimated effects of employment on the probability of food insecurity measured broadly (i.e., combining both low and very low food security) are seldom statistically distinguishable from zero. However, we find that an employed teen reduces the predicted probability of a family's children having *very low* food security by an economically and statistically significant 50%.

In an effort to better understand the effects of teenage employment on food security, we also extend our analysis to consider the more detailed

[1] *Fram et al. (2011) provide an example from their interviews: "In one particularly poignant example, a high-school boy hesitantly described how he and other youth in his community helped their families when food was running out: '. . . we'll like get together and we'll find a way to get money up, not, we ain't got to sell no drugs though, not like that, but we'll find a way to get money up. We might all get together and cut the grass or something. We'll find some way . . . people will be putting money up on fights and stuff, too. And they might do dog fights every now and [then] to get money like that.'"*

[2] *Two notable exceptions are Nord and Golla (2009), who estimated the effects of the Supplemental Nutritional Assistance Program on food insecurity, and Kennedy et al. (2013), who use the 2001–2010 CPS-FSS to document transitions into and out of food insecurity among households with children (who may or may not be teenagers).*

data upon which food security indicators are based: child food security index scores (which range in value from 0 to 8). While the basic results using linear models are consistent with our main findings, the analysis, which uses non-linear models that explicitly account for the ordinal nature of the dependent variable (namely, negative binomial regression, quantile regression, and ordered probit regression), reaches the limitations of the data. Our non-linear results are sensitive to empirical specification; this may be because the non-linear models cannot include individual fixed effects and thus rely more heavily on the covariates, or may be related to the very thin distribution at high scores. In any case, we are unable to draw strong conclusions about the particular nature of the employment effect when we push the data beyond an analysis of broad food security categories. However, our original finding stands, that is, teen employment matters—and in particular, it reduces food insecurity for those at the more severe end of the food-insecurity scale.

Identifying the positive role that teenage employment can play in family well-being through buffering children from food insecurity provides an important basis for evaluating the competing forms of policy investment in this area. While teenage employment may have some positive effects, there is ongoing concern that working students may be unable to invest significantly in education. In addition, downturns in the business cycle tend to generate disproportionately high teen unemployment rates at times when families may need teenagers' contributions the most. There is continuing debate over the ideal combination of services to improve food security, from direct safety net programs to work and educational assistance. Our findings indicate that the role of teenage workers should not be overlooked in this policy discussion.

Teenagers in the Household and Labor Force

Teenagers who are old enough to do market work (i.e., children aged 15 or older in the United States) are often in a stage of transition in which they can begin to learn about handling finances without yet taking significant financial responsibility for their own needs. However, in low-income families—which are increasingly likely to be headed by a single earner—teenagers may not have the luxury of relying on family resources to meet all of their needs or those of their younger siblings. In addition, there are many reasons to think that teenagers may bear a disproportionate share of the burden of food insecurity, and thus may be more cognizant of the potential need for their contribution to family resources. Unfortunately, data on the food security of individual children are not available in the standard source of nationally-representative data on food security; the CPS-FSS only captures a measure of children's food security at the household level. However, Noonan et al. (2014) cite evidence that households with very young children are more food secure than those with older children.

We suggest four important factors that suggest teenagers are particularly vulnerable to food insecurity. First, for a given household, household-level food security is consistently worse than child food security, which implies that parents try to buffer children from some of the food-related concerns of the adults in the household. To the extent that the older children in the household play more adult roles, they may also be trying to make their own adjustments to protect younger siblings. Second, there is consistent

evidence that teenagers have low participation rates in the National School Lunch Program, likely due to social stigma (Ralston et al. 2008); this, too, would indicate that they may be among the less-food-secure among children in a household. Third, assistance programs such as the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) and Head Start (which includes meals) are specifically targeted at infants and preschoolers, with no direct benefits to teenagers in the house. Finally, teenagers are at a point in their physical development in which their caloric needs are high, and thus a shortage of food may disproportionately affect the adequacy of their diet (Schanzenbach et al. 2014).

It is important to note that while teenagers may be particularly vulnerable to food insecurity conditions, they are also better suited to help their families manage food security through their ability to generate resources (and to do so in meaningful ways). For instance, consider the literature that examines the labor supply response of secondary earners to primary earners' unemployment spells—teenagers may act as "secondary" earners in the household. Lundberg (1985) finds a small but significant increase in the labor supply of married women in response to their husbands becoming unemployed. Similarly, Cullen and Gruber (2000) find a large and significant reduction in the labor supply of married women in response to their husbands receiving unemployment insurance benefits. More recently, Juhn and Potter (2007) indicate that husbands' unemployment still appears to generate increases in their wives' labor force participation.

Furthermore, there is also a substantial body of literature examining the resource contributions of children to their households. Debates over child labor standards in developing countries inevitably bring up the fact that some families depend upon children's income to help support the family, potentially contributing positively to family food security. Research on teenagers in the United States by Johnson and Lino (2000) indicates that in low-income families, the earnings of teenagers can account for a meaningful share of family income (in their 1997–1998 data, the average was about 9%), though they are not able to precisely estimate the magnitude of the possible link between employment and food expenditures. Aaronson et al. (2006) document long-run declines in teen labor market participation and find little reason to expect that the reduction is due to diminished demand for their services, thus leaving open the possibility that teens could realistically enter the labor force if needed for their family's well-being. Meanwhile, the debate continues over whether market work is beneficial or detrimental for teenagers in the long run.

While this is the first study (of which we are aware) that considers the role of teenage employment in alleviating food insecurity, this project finds some motivation in recent work being done on household employment issues and food security. Groover et al. (2012) examine the role of employment shocks in food security dynamics. Similarly, Li et al. (2012) use panel data to track the relationship between unemployment patterns, food stamp participation, and food security.

Data

We construct a matched data set that allows us to follow both the food security and employment experiences of a sample of working-age teenagers

over time. This sample is assembled from December CPS data from 2001 through 2012.[3] In these years, the December CPS includes the annual FSS, which contains a comprehensive battery of questions used to establish both adult and child food security status in each household. Importantly, the standard monthly CPS also contains detailed information about labor force status of all individuals in the surveyed household who are at least 15 years of age. Each CPS household is interviewed for the same four consecutive calendar months in two adjacent years; in any given December survey, about half of the CPS households are in their first wave of participation and the other half in their second and final wave. We use household and person identifiers, as well as race, gender, and age, to link teenagers 15 to 19 years old across adjacent survey years.[4]

Our final matched sample consists of a series of overlapping two-year panels containing 30,938 observations for 15,469 working-age teenagers. The first section of table 1 describes the (weighted) distribution of child food security in their families (over the last 12 months). Coleman-Jensen et al. (2011) note that very low food security among children occurred in about 1% of households with children in 2010. We find the same frequency in our sample of families with working-age teenagers from 2001 to 2012. Table 1 also contains other relevant descriptive statistics for our matched sample. One can observe that teen employment is an important phenomenon; approximately one-fourth of the teens in our sample are employed, and these employed teens work an average of over 19 hours per week.

Methods

We examine two features of the sample to establish the basic landscape of food security and employment patterns in these families with teenagers. First we provide a simple qualitative examination of the dynamics of child food security status from year to year in our sample of teenagers, which is possible because of the panel structure of the matched data. If food security status moves between "food secure," "low food security," and "very low food security" across two years, this motivates us to understand whether there are causal mechanisms for improvements in food security for these families from one year to the next, including the entry of teenage family members into the labor force. Table 2 displays the children's food security transition matrix for the families of the teenagers in our sample. This table provides evidence that there is a substantial amount of movement between children's food security categories, and in particular, movement in and out of very low food security (VLFS). Among teenagers who begin in a family with VLFS among children, the most common situation during the following year is for them to move to the less-severe low food security (LFS)

[3] *Prior to 2001, the FSS was conducted in varying months of the year, making our panel approach infeasible prior to 2001. For the year 2007, there is a sample loss of about 25% due to unsuccessful experimentation with alternative language on some questions (Nord et al. 2008).*

[4] *Our matching procedure is based on Madrian and Lefgren (2000); details are available upon request. We were able to successfully match about two-thirds of the theoretically-matchable sample (Kennedy et al. (2013) report a similar match rate among CPS households with children). Of those not matched, about 35% involved a family leaving the dwelling (no follow-up observation), 28% involved the family moving into the dwelling (no initial observation), 12% involved the teen moving out, 2.5% involved the teen moving in, and the remainder (about 22%) were in households that were not present in an adjacent CPS sample.*

Table 1 Descriptive Statistics

	Mean	Std. Dev.	Min.	Max.
Children's food security status				
Food secure	0.9080	0.2890	0	1
Low food security	0.0820	0.2744	0	1
Very low food security	0.0100	0.0994	0	1
Teenager characteristics				
Employed last month	0.249	0.432	0	1
Usual hours worked per week	4.47	9.49	0	104
Usual hours (if hours > 0)	19.25	11.28	1	104
Age = 15	0.167	0.373	0	1
Age = 16	0.356	0.479	0	1
Age = 17	0.267	0.443	0	1
Age = 18	0.147	0.354	0	1
Age = 19	0.063	0.243	0	1
In school, on track	0.910	0.286	0	1
In school, behind	0.033	0.178	0	1
Out of school, dropped out	0.026	0.159	0	1
Out of school, graduated	0.031	0.173	0	1
Female	0.483	0.500	0	1
White, non-Hispanic	0.676	0.468	0	1
Black, non-Hispanic	0.110	0.313	0	1
Hispanic (any race)	0.154	0.361	0	1
Other race, non-Hispanic	0.060	0.237	0	1
Foreign born	0.052	0.222	0	1
Family characteristics				
Highest grade < HS	0.088	0.283	0	1
Highest grade = HS	0.236	0.425	0	1
Highest grade = some college	0.167	0.373	0	1
Highest grade = associate's degree	0.127	0.333	0	1
Highest grade = bachelor's degree	0.232	0.422	0	1
Highest grade > bachelor's degree	0.150	0.357	0	1
Family size	4.297	1.319	2	15
Any kids under age 6	0.080	0.271	0	1
Lives in urban area	0.831	0.375	0	1
Parents are married	0.770	0.421	0	1
Family income less than $15,000*	0.067	0.250	0	1
Family income $15,000 − $29,999	0.104	0.306	0	1
Family income $30,000 − $49,999	0.153	0.360	0	1
Family income $50,000 − $74,999	0.176	0.381	0	1
Family income at least $75,000	0.324	0.468	0	1
Family income missing	0.176	0.380	0	1
State-level characteristics				
State unemployment rate	6.55	2.20	2.5	13.8
State per-pupil expenditures	9605	2606	4838	20910

Notes: This sample contains the 30,938 observations (for 15,469 people) we have matched across December CPS data for 2001–2012. All observations are 15 to 19 years old in both years (i.e., those who transition from 14 to 15, or 19 to 20, are not included). This sample does not include those with missing or "not in universe" values for children's food security; if there is no child in the home under 18, that household is "not in universe" for the child food security questions. The child food security variable is based on 12-month recollection; we constructed it from the raw score (HRFS12M6) using the same method that (in some years of the data) was used to construct a composite variable (HRFS12MC). Descriptive statistics are weighted using CPS family weights.

**There are actually 15 family income categories (plus "missing") to be used in the regressions; categories are combined here to conserve space.*

Table 2 One-year Transitions across States of Children's Food Security

	Status, one year later			
Initial status	**Food secure**	**Low FS**	**Very low FS**	**Total**
Food secure	13,392 [95.28]	607 [4.32]	57 [0.41]	14,056 [100.00]
Low FS	773 [61.59]	427 [34.02]	55 [4.38]	1,255 [100.00]
Very low FS	58 [36.71]	67 [42.41]	33 [20.89]	158 [100.00]
Total	14,223 [91.95]	1,101 [7.12]	145 [0.94]	15,469 [100.00]

Notes: See sample description below table 1. Numbers in cells are (unweighted) frequencies, with row percentages in brackets.

category. Even more strikingly, teenagers are more likely to become fully food secure than to remain with VLFS. Thus, it appears that VLFS is often a temporary situation.[5]

To provide some initial evidence on the magnitude of the possible relationship between food insecurity and teen employment, table 3 provides the distribution across food security categories separately for employed and non-employed teenagers (where employment is an indicator for "employed last month").[6] Dividing the sample into employed and non-employed teenagers reveals a striking difference in the children's food security distribution. The incidence of VLFS among children is less than half as high when teens are employed, and the incidence of LFS (rather than VLFS) is also much lower for children in families with an employed teen. Among teens who are not employed, we see 9.47% of their families have LFS or VLFS among children; among the employed this total is only 6.2%.

While estimating the correlation between food insecurity and teen employment is fairly straightforward, using the panel features of our data from the CPS is essential for a convincing *causal* analysis of teen employment on food security status. There are clear threats to the exogeneity of teen employment in a model of food security, including omitted variables likely to be correlated with both (e.g., parental characteristics, children's health status, or local assistance program availability and characteristics) and reverse causality. We utilize the panel structure of our data to estimate the effects of teen employment on food security status with a fixed-effects model that effectively controls for time-invariant characteristics of the child, family, and geographic area.[7] This basic model takes the following form:

$$ChildFoodSecurity_{it} = X'_{it}\beta + \gamma TeenEmployment_{it} + \sum \alpha_i + \sum \delta_t + \varepsilon_{it}, \quad (1)$$

[5] *Kennedy et al. (2013) conduct a similar analysis among households with children of any age and report similar findings.*

[6] *Note that the CPS also includes a variable for "worked last week." Given the timing of the survey (December) and the noisiness of a weekly measure, we report all estimates using the "employed in previous month" measure. Results are, however, similar using the "worked last week" measure and are available upon request.*

[7] *Note that the key programs targeting child nutrition (WIC and the National School Lunch Program) set eligibility at the national level, while the School Breakfast Program varies more substantially across states. However, the included fixed-effects control for any cross-state differences (whether in eligibility or implementation) that are constant over a two-year period (the effective length of each of the overlapping panels in our sample).*

Table 3 Distribution of Food Security Conditional on Teen Employment

	Employed		
Children's food security status	**No**	**Yes**	**Total**
Food secure	20,496 [90.53]	7,783 [93.79]	28,279 [91.41]
Low FS	1,881 [8.31]	475 [5.72]	2,356 [7.62]
Very low FS	263 [1.16]	40 [0.48]	303 [0.98]
Total	22,640 [100.00]	8,298 [100.00]	30,938 [100.00]

Notes: See sample description below table 1. Numbers in cells are (unweighted) frequencies, with column percentages in brackets.

where i marks individuals and t indicates the year. We measure food insecurity in a dichotomous fashion using two alternative cutoffs as defined by the USDA: a broader measure (LFS or VLFS) and a narrower one (VLFS only).

The vector X_{it} includes time-varying characteristics of the teenager and his or her family and environment.[8] For the teen, we include indicators for age, race, ethnicity, nativity, gender, and educational status.[9] For the family, we include a set of indicators for the highest education level completed in the family, whether the teen has married parents, an indicator for urban location, an indicator for the presence of any young children (less than six years old), and a measure of family size. We also interact gender with the age indicators, as caloric needs between females and males begin to diverge during the later teen years. Finally, we include family income in the model.[10] Our income measure enters the model in the form of 15 dummy variables (including one for "missing"), as this is the finest level of detail reported in the monthly CPS.[11] We include indicators for state of residence in non-fixed-effects models and include year indicators δ_t to account for secular (potentially non-linear) trends in food security nationwide.

The set of individual indicator variables α_i allows us to identify the effect of teenage employment on children's food security in their family without conflating it with other teen-specific time-invariant factors like family socioeconomic status and unmeasured parent and child characteristics; in other

[8] *We use CPS families instead of households since the latter could include unrelated individuals who share living quarters.*

[9] *Unlike a sample of adults, most teenagers' education attainment is still in progress; hence, a "typical" measure of education will be highly collinear with the teenager's age. Therefore, we classify a teenager's educational status into one of four categories: in school and on track, in school but behind, out of school due to dropping out, or out of school due to graduation. We classify a teenager as "behind" if they are two or more years older than we would expect for their most recently completed grade level; for example, those who are 16 years old are coded "behind" if their education level is 8th grade or less.*

[10] *While income is known to be correlated with food insecurity, it is worth noting that the relationship is far from deterministic. Sullivan, Turner, and Danziger (2008) and Gundersen, Kreider, and Pepper (2011) suggest that income's predictive power is somewhat limited; the majority of people with incomes at the poverty line are food secure, and some people with quite high incomes are food insecure.*

[11] *The results are nearly identical if we combine the income into the wider brackets reported in table 1. Using wider brackets may help with measurement-error issues (i.e., misclassification into narrow brackets), inflation (which may have caused spurious movements from one bracket to the next over time), and conserving degrees of freedom. While we could have conserved degrees of freedom further by imputing a continuous-value approximation of income using bin midpoints, the number of observations in the top (unbounded) income bracket (12.5%) and the number with missing data (18%) was too large to consider this approach.*

words, we are able to net out time-invariant individual heterogeneity and isolate the relationship between the two variables of interest. This is important because while we have suggested a potentially negative correlation between teenage employment and food insecurity, it is possible that there is also a positive relationship between the two that is either spurious (i.e., related to unobserved factors) or reflects reverse causality (teens begin to work *because* there is food insecurity in the family). Our fixed-effects model should handle the first issue. The second issue, if anything, will bias our estimates downward (i.e., towards zero), causing us to underestimate the improvements (if any) generated by teenage employment.[12]

The clearest usable measure for the dependent variable in these data reflects children's food security over the previous 12 months (i.e., calendar year, since this is a December survey).[13] This measure is available as long as a household has at least one child under 18; in practice, this means we lose some of the 18- and 19 year-olds that would otherwise have been in our sample if they are the youngest person in the household.[14] Ideally, we would use the teen's employment over the same one-year period as an explanatory variable in the regressions; unfortunately, only the March CPS provides a detailed annual retrospective (and our sample would be too small if we restricted it to those with both a December and a March survey). We instead use an indicator for whether the teenager was employed last month, that is, as of the date of the interview. We also estimate employment effects utilizing hours of work by using a measure of usual hours worked per week including the zeroes.

Results

Baseline Models

As a baseline for assessing the effect that teen employment may have on the food security of children in a family, we estimate an ordinary least squares (OLS) regression model with an indicator for food insecurity as the dependent variable. We use two different versions of this indicator: a broader measure (LFS or VLFS) and a narrower one (VLFS only). We report the results from this regression in the first and third columns of table 4. While we find no evidence of an effect on the broader measure, there is a statistically significant and substantial negative relationship between teenage employment and the probability that the teenager's family experiences very low food security, with employment predicting an improvement of 31% relative to the baseline mean. Of course, this finding could reflect a spurious correlation if there are unobserved family-specific factors related to both employment and food security.

[12] *An alternative approach to handling endogeneity would be to find an instrumental variable that is correlated with teen employment but not with food insecurity. We carefully explored two potential instruments: teen labor laws and high school graduation requirements. Unfortunately, we found that there was not sufficient variation across states and over time to produce a strong first stage conditional on the many control variables in the models. Further details are available upon request.*

[13] *There are some issues with consistency in the questions/reporting of individual items over the many years we examine. However, we are able to compose aggregate measures that are comparable across years.*

[14] *Since this causes us to have a non-random set of 18- and 19-year-olds (i.e., only those with younger children in the household) while the younger teens may or may not have a younger child present, we perform a robustness check in which we restrict the sample to* only *teens with at least one younger child present in the household.*

Table 4 Estimated Relationship between Teenage Employment and Food Security

	(1)	(2)	(3)	(4)
	Low or very low food security [mean = 0.0820]		**Very low food security [mean = 0.0100]**	
Covariates	**OLS**	**FE**	**OLS**	**FE**
Employed last month	−0.0058	−0.0034	−0.0036***	−0.0051**
	(0.0044)	(0.0061)	(0.0012)	(0.0026)
Female	−0.0126		0.0017	
	(0.0090)		(0.0036)	
Black	0.0548***		0.0060*	
	(0.0099)		(0.0035)	
Hispanic	0.0423***		0.0053**	
	(0.0112)		(0.0021)	
Other race	0.0017		−0.0007	
	(0.0093)		(0.0033)	
Foreign born	0.0199		0.0034	
	(0.0119)		(0.0040)	
Lives in urban area	0.0227***		0.0042**	
	(0.0063)		(0.0017)	
Married-parent family	−0.0976***	−0.1869***	−0.0068	−0.0254
	(0.0308)	(0.0652)	(0.0165)	(0.0241)
Family size	0.0137***	0.0162*	0.0011	0.0001
	(0.0028)	(0.0085)	(0.0007)	(0.0030)
Any kids under age 6	0.0030	−0.0144	−0.0045	0.0012
	(0.0088)	(0.0162)	(0.0030)	(0.0051)

Notes: N = 30,938. Columns one and three report OLS regression results. Columns two and four include individual-specific fixed effects. Robust standard errors (in parentheses) account for correlation in the error term within state of residence. Along with the listed covariates, all regressions include indicator variables for age (4 indicators), educational status of the teen (3 indicators as described in text), highest grade completed in family (5 indicators), family income dummy variables (15 indicators including "missing"), sex-by-age interaction terms, education (family)-by-married parents interaction terms, year fixed effects, and state fixed effects. (State fixed effects are omitted in columns two and four since they are collinear with the individual fixed effects). All regressions use CPS family weights.
****$p < 0.01$, **$p < 0.05$, *$p < 0.1$.*

Therefore, we provide estimates that control for individual fixed effects in the second and fourth columns of table 4 to assess whether a relationship between teenage employment and food insecurity remains even when we control for omitted (time-invariant) unobservable variables. In the case of the broader measure of food insecurity (including both LFS and VLFS), the estimated effect is slightly smaller than the OLS estimate and has an even larger standard error, and thus remains statistically insignificant. In contrast, the estimated effect of employment is larger than the OLS estimate for our stricter measure (VLFS only). The point estimate of −0.0051 indicates an approximate 50% reduction in the probability of very low food security (relative to baseline) in the presence of a working rather than a non-working teen. This suggests a protective effect of teen employment when it comes to VLFS among children.

Table 5 provides the analogous table for the effect of usual hours of work on food insecurity. We find patterns of statistical significance similar to the employment results, and the magnitudes are consistent with the earlier

Table 5 Estimated Relationship between Teenage Hours of Work and Food Security

	(1)	(2)	(3)	(4)
	Low or very low food security [mean = 0.0820]		**Very low food security [mean = 0.0100]**	
Covariates	**OLS**	**FE**	**OLS**	**FE**
Usual hours worked per week	−0.00046*	−0.00050	−0.00015**	−0.00027**
	(0.00025)	(0.00038)	(0.00006)	(0.00011)
Female	−0.0127		0.0016	
	(0.0089)		(0.0036)	
Black	0.0547***		0.0062*	
	(0.0099)		(0.0035)	
Hispanic	0.0423***		0.0054**	
	(0.0112)		(0.0021)	
Other race	0.0016		−0.0006	
	(0.0094)		(0.0033)	
Foreign born	0.0200		0.0034	
	(0.0120)		(0.0040)	
Lives in urban area	0.0227***		0.0042**	
	(0.0063)		(0.0017)	
Married-parent family	−0.0974***	−0.1871***	−0.0067	−0.0255
	(0.0309)	(0.0651)	(0.0165)	(0.0241)
Family size	0.0137***	0.0161*	0.0011	0.0001
	(0.0028)	(0.0085)	(0.0007)	(0.0030)
Any kids under age 6	0.0030	−0.0145	−0.0045	0.0013
	(0.0088)	(0.0162)	(0.0030)	(0.0051)

*Notes: See notes below table 4. ***p < 0.01, **p < 0.05, *p < 0.1.*

findings: while the estimated coefficients are smaller, this is because each estimate reflects the marginal effect of a one-hour change in usual hours worked. Using both tables 4 and 5, one can conclude that the estimated effect of "working" on VLFS (last column of table 4) is equivalent to approximately 18.85 hours of work; this is very close to the average hours worked by working teens in the sample (19.25, from table 1).

Since our models involve a dichotomous outcome, we also estimated them using two alternative models: probit and complementary log-log regression.[15] Since these non-linear models are biased when fixed effects are used, we estimate them without fixed effects simply to confirm that they do not result in substantially different estimates from those produced by OLS (which might suggest a serious problem with the linear probability model). In both cases, we estimate marginal effects similar to those estimated via OLS (detailed results available upon request).

There are various ways in which we might improve our estimates of the effect of teenage employment on children's food security; we explore one key alternative prior to exploring a series of additional specifications and robustness checks in the next section.

[15] *A complementary log-log model is particularly useful in cases with an abundance of zeroes, as is the case here. Results from both sets of regressions are available upon request.*

A major concern in our context is whether we may be estimating a "diluted" effect of employment on food security because of the presence of families in our sample whose food security is fully established (regardless of whether they have a working teenager). The CPS includes a measure of family income reported in brackets with widths ranging from $2,500 (for annual incomes below $15,000) to $50,000 (for annual incomes above $100,000). This means that a simple "income cut" of the sample is not straightforward. Moreover, since families in our sample are of varying sizes and participate in different years of the survey (during which the brackets do not change definition despite inflation), we determined that a more sensible approach would be to develop our own approximate income cut related to the Federal Poverty Guidelines (FPG) that are established by year and family size by the Department of Health and Human Services. Since food insecurity is not strictly an income inadequacy problem, we did not want to limit the sample too narrowly by income. Therefore, we restricted the sample to families at approximately 300% FPG or lower, which eliminated about half of the sample among whom very few have any level of food insecurity. We operationalized this cut by identifying—by family size and year—whether a given family's reported income bracket would unambiguously place them above 300% FPG, and if so, we eliminated the family from the sample.[16]

Panel B of table 6 shows the results of our fixed-effects analysis using the lower-income sample (the baseline estimates from tables 4 and 5 are reported in panel A for comparison). Due at least in part to the smaller sample size, the estimated standard errors are nearly twice as large as those in the baseline model. Thus, in the results using the broader measure of food security, the estimates for both the employment effect and hours effect in the individual fixed-effects models (column 1 and 2) continue to be statistically indistinguishable from zero. For the narrower measure (columns 3 and 4), we find that the fixed-effects coefficients increased substantially from the full-sample estimates, but maintained the same approximately 50% estimated effect of employment on VLFS relative to baseline mean (which, in this subsample, is nearly 2% rather than 1%). Thus, it appears that the results are robust within the lower-income subsample.[17]

Narrowing Down the Mechanism: Who Drives and Who Experiences Effects of Employment?

Our data set provides us with the opportunity to further investigate the effect of teen employment on food security by utilizing subsamples and alternative specifications that utilize our fixed-effects framework. We conduct four key additional analyses to follow up the baseline results. First, we consider whether the younger or older teens are more effective in reducing

[16]*This means that some families may remain in the sample even if they are slightly above 300% FPG since we cannot measure their income precisely enough. Observations with missing values for the income variable are also kept in the sample.*

[17]*As an alternative to the low-income restriction, we also conducted the analysis with a sample that contained only those families who passed the "screen" for the battery of food security questions, that is, those families the CPS considered "at risk" (as it is, families who are not asked the questions are, by default, coded as food secure). The resulting sample size (N = 2,406) is much smaller than the low-income sample (N = 14,560); the estimated coefficient in the VLFS model implies a 40% marginal effect, similar to the implied marginal effect using the low-income sample (50%), but this result is statistically significant only at the 83% level.*

Table 6 Teenage Employment and Food Security, Alternative Fixed-effects Estimates

	(1)	(2)	(3)	(4)
	Dependent variable			
	Low or very low FS		**Very low FS**	
	Employed last month	**Usual hours per week**	**Employed last month**	**Usual hours per week**
A: Baseline sample	−0.0034	−0.00050	−0.0051**	−0.00027**
(N = 30,938)	(0.0061)	(0.00038)	(0.0025)	(0.00011)
		[0.0820]		[0.0100]
B: Excludes those > 300% FPG	0.0006	−0.00063	−0.0096*	−0.00040**
(N = 14,560)	(0.0130)	(0.00067)	(0.0052)	(0.00017)
		[0.1688]		[0.0191]
C: Younger teens	−0.0044	−0.00059	−0.0027	−0.00010
(N = 22,090)	(0.0088)	(0.00065)	(0.0024)	(0.00011)
		[0.0909]		[0.0100]
D: Older teens	−0.0017	−0.00040	−0.0092*	−0.00041**
(N = 8,848)	(0.0077)	(0.00044)	(0.0047)	(0.00018)
		[0.0945]		[0.0100]
E: Dep var = adult FS	−0.0018	−0.00015	0.0014	−0.00009
(N = 30,674)	(0.0063)	(0.00034)	(0.0058)	(0.00030)
		[0.1216]		[0.0402]
F: Teens with younger child in HH	−0.0037	−0.00049	−0.0079**	−0.00035***
(N = 21,662)	(0.0065)	(0.00039)	(0.0033)	(0.00012)
		[0.1011]		[0.0105]

Notes: Each pair of cells reports the estimated coefficients and standard errors (in parentheses) for the employment variable of interest from a separate individual fixed-effects regression (see notes below table 4 for details). Panel E has a smaller sample size than the baseline sample since a small number of observations that reported valid child food security scores did not report valid adult food security scores. Baseline mean values of the dependent variable for a given subsample are reported in brackets.
****$p < 0.01$, **$p < 0.05$, *$p < 0.1$.*

child food insecurity. Second, we assess whether teens also influence the food security of adults in the family. Third, we restrict the main sample to families with teens that also have a younger child in the household to more carefully examine the hypothesis that teens protect younger children. Fourth, we examine whether work-hour intensity generates differential effects on reductions in food insecurity. Finally, we also present a host of additional robustness checks to further affirm the main results.

First, in panels C and D of table 6, we report evidence on whether younger and older teens have differential impacts on children's food insecurity by splitting the sample into the younger and older teens in our sample. Based on the higher labor force participation rates of older teens, we thought there may be meaningful variation in the impact of this employment on their families. Panel C reports our results when we use the subsample of younger teens (defined as teens who are 15 or 16 in the first observation year), whereas panel D reports the analogous results on the subsample of older teens (those ages 17 or 18 in the first observation year).

While statistical inference here is difficult because of the relatively large standard errors, the point estimates related to very low food security are precise enough to suggest that the employment and hours effects are larger among older teens (and in fact may not exist for younger teens). Thus, it seems likely that the improvements we find are primarily driven by the work decisions of older teens in the household.

Second, in panel E of table 6, we address the question of the potentially broader impact of teen work on food security by utilizing the adult (instead of the child) measure of food security collected in the CPS. Examining the effect on adult food security in the household provides a sense of the spillover benefits to the entire household from a working teenager. In general, the point estimates of the effects on adult food insecurity are much smaller (in absolute value terms) than for child food insecurity, and never statistically different from zero. Moreover, since the baseline rate of food insecurity is higher for adults than children, the implied marginal effects are even smaller when expressed in percentage terms; for instance, the point estimates on employment suggest only a 1–4% decrease in either measure of food insecurity. It appears that teen employment operates primarily as relief for child food security in the household—either of younger siblings or the teenager him or herself.

Third, we estimate the models by restricting the sample to members who had at least one younger person in the household (panel F in table 6).[18] This allows us to see whether the employment effect tends to be strongest when there are smaller children who may be in need. As expected, we find that the estimated effects are larger than the baseline for VLFS, and statistically different from zero, though the two sets of estimates are not statistically distinguishable from one another.

Fourth, in table 7 we extend the examination of the employment effect by relaxing the assumption that the marginal effect of being employed is constant across all workers. We categorize workers into one of three bins by their usual hours worked per week: 0 hours ("no work"), greater than 0 hours but fewer than 30 hours ("part-time work"), and greater than or equal to 30 hours ("full-time work"). The analysis shows that, on average, as the intensity of work hours increases so does the impact of employment on reductions in food insecurity: the point estimates for the effect of full-time work are approximately three times larger than those for part-time work, and, similar to before, the effect of full-time work is statistically different from zero when considering the narrower measure of food insecurity. Since work (and especially full-time work) is more common among the older teenagers in our sample, and by its very nature nearly incompatible with active high school attendance, this may be an indication that we should be especially concerned about the potential for dropping out during the final year of high school.

Finally, along with these alternative approaches, we performed several robustness checks to see if the results would change substantially under different assumptions; we report these results in table 8. We generated alternative main estimates with *a*) no sampling weights, *b*) clustering standard

[18]*This final restriction is already applied to the 18- and 19-year-old members of the sample because their households are not asked the child food security questions by the CPS unless someone under 18 is present. This subsample in which all observations have someone younger in the household is meant to make a more systematic sample cut than that made by the survey cutoff age.*

Table 7 Effects of Part-time vs. Full-time Work on Food Security

	(1) Low or very low FS	(2) Very low FS
Omitted: no work (indicator: = 0 hours)		
Part-time worker (indicator: <30 hours)	−0.0033 (0.0063)	−0.0040 (0.0027)
Full-time worker (indicator: ≥30 hours)	−0.0112 (0.0144)	−0.0134*** (0.0042)

Notes: N = 30,938. Each column reports the parameters of interest from a separate individual-fixed-effects regression (see notes below table 4 for details). Part-time and full-time work are classified using "usual hours worked per week."
****p < 0.01, **p < 0.05, *p < 0.1.*

Table 8 Teenage Employment and Food Security, Additional Robustness Checks

	(1)	(2)	(3)	(4)
	Dependent variable			
	Low or very low FS		**Very low FS**	
	Employed last month	**Usual hours per week**	**Employed last month**	**Usual hours per week**
A: Baseline sample	−0.0034	−0.00050	−0.0051**	−0.00027**
(N = 30,938)	(0.0061)	(0.00038)	(0.0026)	(0.00011)
		[0.0820]		[0.0100]
B: No weighting	0.0023	−0.00039	−0.0044**	−0.00023**
(N = 30,938)	(0.0050)	(0.00030)	(0.0019)	(0.00009)
		[0.0820]		[0.0100]
C: Cluster by individual	−0.0034	−0.00050	−0.0051**	−0.00027**
(N = 30,938)	(0.0060)	(0.00033)	(0.0022)	(0.00012)
		[0.0820]		[0.0100]
D: Include per-pupil expenditure	0.0004	−0.00017	−0.0045	−0.00021**
(N = 25,954)	(0.0067)	(0.00037)	(0.0031)	(0.00011)
		[0.0899]		[0.0094]
E: hours capped at 50	–	−0.00050	–	−0.00027**
(N = 30,938)	–	(0.00038)	–	(0.00011)
		[0.0820]		[0.0100]

Notes: Each pair of cells reports the estimated coefficients and standard errors (in parentheses) for the employment variable of interest from a separate individual fixed-effects regression (see notes below table 4 for details). Panel D has a smaller sample size than the baseline sample because the per-pupil expenditure data are available for a subset of years, 2001–2010. Baseline mean values of the dependent variable for a given subsample are reported in brackets.
****p < 0.01, **p < 0.05, *p < 0.1.*

errors by individual instead of state of residence, *c*) including state-year school expenditures per student (years 2001–2010), and *d*) recoding the top 1% of hours worked at the level of the 99th percentile (50 hours/week). None of the results differed substantially from the main results reported in

tables 4 and 5. In particular, the estimated employment effect (baseline = −0.0051) ranges from −0.0044 to −0.0051, while the estimated hours effect (baseline = −0.00027) ranges from −0.00021 to −0.00027; the main results appear to be quite robust.

Can We Measure Effects on the Food Security Score Distribution?

Following much of the literature (for example, Nord 2009 and Kennedy et al. 2013), we have focused on dichotomous measures of food security. Recall that these dichotomous measures of food security (i.e., "food secure," "low food security," and "very low food security") are defined by meeting or exceeding specific thresholds in the number of food insecurity questions answered affirmatively. This categorization process may partially mask the impact of teenage labor supply on food security since it may generate inframarginal changes in the underlying index that do not generate changes in the categories.

The CPS provides each household's answers to the full 8-question battery of child food security questions, from which a simple index (0 to 8) can be constructed (where 8 means that the household's children are severely food insecure by every measure in the survey). While using any one question is certainly ill-advised, and even the total index must be treated with caution (Nord and Hopwood 2007), we use the index to determine if we can learn a bit more about the nature of the impact of teenage labor supply on food security by directly predicting the underlying child food security index score. Table 9 presents the distribution of the child food security index score. The distribution is extremely skewed: over 90% of the observations have a score of zero or one. The distribution also has a very thin right tail: more than half of the "very low food security" observations have the minimum score possible for that designation (5 questions answered affirmatively), which suggests that modeling these distinct gradations in the outcome may be difficult with these data.

Table 10 reports the results of analysis using the child security index score as the dependent variable. We repeat the pattern of analysis used earlier and thus begin with OLS estimation in panel A. Both the employment and hours variables are negative and statistically significant, but as before we are concerned about omitted variables. Panel B displays the results including individual fixed effects, and while the estimates grow slightly in absolute value,

Table 9 Distribution of Child Food Security Index Score

Score	Relative frequency	Cumulative %
0	0.8396	83.96
1	0.0684	90.80
2	0.0451	95.32
3	0.0291	98.23
4	0.0078	99.00
5	0.0054	99.54
6	0.0015	99.69
7	0.0026	99.95
8	0.0005	100.00

Notes: N = 30,938. Distribution is weighted with CPS family weights.

Table 10 Estimated Relationship between Teenage Employment and Food Security, Full Distribution of Responses

	(1) Employed last month	(2) Usual hours per week
A: OLS	−0.0219*	−0.00144**
	(0.0128)	(0.00066)
B: FE	−0.0275	−0.00229*
	(0.0236)	(0.00122)

Notes: N = 30,938. Mean value of dependent variable = 0.3350. See additional notes below table 4.
****p < 0.01, **p < 0.05, *p < 0.1.*

the much larger standard errors cause the employment effect to become insignificant while the hours effect remains significant at the 10% level. Thus, while the extended analysis is consistent with the earlier finding that teen employment is negatively correlated with child food insecurity, it is unable to provide deeper insight into this relationship.

Obviously, a linear regression of an ordinal index score is far from ideal; an appropriate econometric model should explicitly account for the potential non-linearity of the effect of employment on the index score (which is ordinal, not cardinal). We considered three such models: negative binomial regression (to accommodate count data), quantile regression (to address possible heterogeneous effects across the distribution of the index), and ordered probit regression (to allow a very flexible functional form for the treatment effect). Unfortunately, estimating these kinds of models places high demands on the data; moreover, the estimation particularly suffers from the sparseness in the right tail of the food security index distribution. In addition, incorporating individual fixed effects into any of these models will introduce bias. Perhaps because of these issues, we found that results using these flexible methods were very unstable; for example, results varied (even moving from statistically significant to insignificant) when income variables were handled differently or were left out. Because of the fragility of these estimates and their failure to account for unobserved heterogeneity, we do not believe they lend further insight into the question of interest (though results are available upon request). It would appear that a non-linear analysis at the index-score level is beyond the reasonable capabilities of the current data, thus requiring a larger data set and perhaps a different identification strategy that does not rely on fixed effects, which we leave to future work.

Conclusion

Teenagers can play an important role in providing for a family's needs, and the need for food in hard times may be particularly transparent to the older children in a family. We find evidence that working teenagers reduce the probability that children in their family (which may include the teens themselves) will experience very low food security. Our fixed-effects analysis suggests that a working teenager reduces his or her family's probability of experiencing very low child food security by approximately 50%, and this result is robust to a variety of specifications. Our overall conclusion is

that the evidence supports a real value to teenage employment in families at risk for very low food security, with weaker evidence that teen employment may matter for the broader measure of food insecurity.

Our findings suggest that reduced levels of very low food security among families whose teenagers work may orient policy discussion in a new direction, away from food-related public assistance programs and towards questions of whether public programs can (or should) seek to encourage or discourage teen employment when it is contributing to family well-being. If there is concern that teens are leaving school—or giving school substantially less attention—when they take jobs, intervention (by government or nonprofits) may be important for helping families to consumption-smooth over time while teens concentrate on their educational investments. Our finding that full-time workers are most effective in helping their families underscores the potential importance of programs to prevent students from dropping out of school. While this particular policy issue is outside the scope of the current paper (and is therefore a topic for future study), previous research for developing countries indicates that educational incentives can help reduce the probability that a child in a poor family abandons school for work (Behrman et al. 2005).

On the other hand, there is evidence that limited work among low-income teens may actually complement school engagement (Lerman 2000) and can provide valuable labor market experience (Carr et al. 1996) and improvements in self-confidence (Cunnien et al. 2009). To the extent that this employment also contributes to family well-being and food security, this can be a win-win situation (although we find the largest effects for greater hours of work, which are less likely to be a positive investment for the teenager). In this case, the greater policy concern could be to facilitate the availability of jobs. In the recent recession, unemployment rates among teen workers (ages 16–19) have exceeded 25% (Edwards and Hertel-Fernandez 2010); precisely in a family's time of need, a teen may be unable to find the job that could help buffer the family's children against food insecurity. Higher rates of unemployment among black and Hispanic teenagers make this concern even more serious, given the increased likelihood of families in these groups being food-insecure (Coleman-Jensen et al. 2011). Policies that encourage the hiring of teens may merit greater attention if employment opportunities for teens have desirable impacts on both their own welfare and their families' food security. However, again, future investigation of the interrelationships among teenage labor supply, educational attainment, and food security will be necessary and warranted to create well-informed and sound public policies.

Acknowledgment

This project benefited greatly from research assistance by Lincoln Groves, and comments from Craig Gundersen, James Ziliak, and seminar and conference participants at Indiana University–Purdue University Indianapolis, University of Illinois, the Minnesota Population Center, and the Research Program on Childhood Hunger progress report conferences. This research was supported with a grant from the University of Kentucky Center for Poverty Research through funding by the U.S. Department of Agriculture, Food and Nutrition Service, contract number AG-3198-S-12-0044. The opinions and conclusions expressed herein are solely those

of the authors and should not be construed as representing the opinions or policies of the UKCPR or any agency of the federal government.

References

Aaronson, D., K. Park, and D. Sullivan. 2006. The Decline in Teen Labor Force Participation. *Economic Perspectives*.

Behrman, J., P. Sengupta, and P. Todd. 2005. Progressing through PROGRESA: An Impact Assessment of a School Subsidy Experiment in Rural Mexico. *Economic Development and Cultural Change* 54 (1): 237–75.

Carr, R.V., J.D. Wright, and C.T. Brody. 1996. Effects of High School Work Experience a Decade Later: Evidence from the National Longitudinal Survey. *Sociology of Education* 69 (1): 66–81.

Coleman-Jensen, A., M. Nord, M. Andrews, and S. Carlson. 2011. *Household Food Security in the United States in 2010*. Washington DC: U.S. Department of Agriculture, Economic Research Service, Economic Research Report No. 125.

Coleman-Jensen, A., M. Nord, and A. Singh. 2013. *Household Food Security in the United States in 2012*. Washington DC: U.S. Department of Agriculture, Economic Research Service, Economic Research Report No. 155.

Cook, J.T., and D.A. Frank. 2008. Food Security, Poverty, and Human Development in the United States. *Annals of the New York Academy of Sciences* 1136 (1): 193–209.

Cullen, J.B., and J. Gruber. 2000. Does Unemployment Insurance Crowd out Spousal Labor Supply? *Journal of Labor Economics* 18 (3): 546–72.

Cunnien, K.A., N. MartinRogers, and J.T. Mortimer. 2009. Adolescent Work Experience and Self-efficacy. *International Journal of Sociology and Social Policy* 29 (3/4): 164–75.

Edwards, K.A., and A. Hertel-Fernandez. 2010. The Kids Aren't Alright: A Labor Market Analysis of Young Workers. Economic Policy Institute Briefing Paper #258.

Fram, M.S., E.A. Frongillo, M.P. Burke, S.J. Jones, R.C. Williams, and M.P. Burke. 2011. Children Are Aware of Food Insecurity and Take Responsibility for Managing Food Resources. *Journal of Nutrition*, 1114–9.

Groover, K., B. Mills, and G. Davis. 2012. Does Economic Decline Contribute to a Decline in Children's Food Security? University of Kentucky Center for Poverty Research, Discussion Paper DP2012-17.

Gundersen, C., B. Kreider, and J. Pepper. 2011. The Economics of Food Insecurity in the United States. *Applied Economic Perspectives and Policy* 33 (3): 281–303.

Johnson, D.S., and M. Lino. 2000. Teenagers: Employment and Contributions to Family Spending. *Monthly Labor Review* 123 (9): 15–25.

Juhn, C., and S. Potter. 2007. Is There Still an Added-worker Effect? Federal Reserve Bank of New York Staff Reports, no. 310.

Kennedy, S., C.A. Fitch, J.R. Warren, and A.J. Rivera Drew. 2013. Food Insecurity During Childhood: Understanding Persistence and Change Using Linked Current Population Survey Data. University of Kentucky Center for Poverty Research, Discussion Paper DP2013-03.

Lerman, R.I. 2000. Are Teens in Low-income and Welfare Families Working Too Much? Assessing the New Federalism Series B, No.B-25.

Li, Y., B. Mills, G. Davis, and E. Mykerezi. 2012. Child Food Security and the Food Stamp Program: What a Difference a Month Makes. University of Kentucky Center for Poverty Research, Discussion Paper DP2012-18.

Lundberg, S. 1985. The Added Worker Effect. *Journal of Labor Economics* 3 (1): 11–37.

Madrian, B.C., and L.J. Lefgren. 2000. An Approach to Longitudinally Matching Current Population Survey (CPS) Respondents. *Journal of Economic and Social Measurement* 26: 31–62.

Noonan, K., H. Corman, and N. Reichman. 2014. Effects of Maternal Depression on Family Food Insecurity. University of Kentucky Center for Poverty Research, Discussion Paper DP 2014-07.
Nord, M. 2009. Food Insecurity in Households with Children. Washington DC: U.S. Department of Agriculture, Economic Research Service, Economic Information Bulletin No. 56.
Nord, M., M. Andrews, and S. Carlson. 2008. Household Food Security in the United States, 2007. Washington DC: U.S. Department of Agriculture, Economic Research Service, Economic Research Report No. 66.
Nord, M., and A.M. Golla. 2009. Does SNAP Decrease Food Insecurity? Washington DC: U.S. Department of Agriculture, Economic Research Service Report No. 85.
Nord, M., and H. Hopwood. 2007. Recent Advances Provide Improved Tools for Measuring Children's Food Security *Journal of Nutrition* 137 (3): 533–6.
Ralston, K., C. Newman, A. Clauson, J. Guthrie, and J. Buzby. 2008. The National School Lunch Program: Background, Trends, and Issues. Washington DC: U.S. Department of Agriculture, Economic Research Service.
Ribar, D.C., and K.S Hamrick. 2003. Dynamics of Poverty and Food Sufficiency. Washington DC: U.S. Department of Agriculture, Economic Research Service.
Schanzenbach, D., P. Anderson, K. Butcher, and H. Hoynes. 2014. New Evidence on Why Children's Food Security Varies Across Households with Similar Incomes. University of Kentucky Center for Poverty Research, Discussion Paper DP2014-08.
Sullivan, J., L. Turner, and S. Danziger. 2008. The Relationship Between Income and Material Hardship. *Journal of Policy Analysis and Management* 27 (1): 63–81.
U.S. Bureau of Census and U.S. Bureau of Labor Statistics. 2001–2012. Current Population Survey–Food Security Supplement 2001–2012. Washington DC. http://www.bls.gov/cps/ (accessed March 21, 2015).
Wilde, P., and M. Nord. 2005. The Effect of Food Stamps on Food Security: A Panel Data Approach. *Review of Agricultural Economics* 27 (3): 425–32.