New Evidence on Why Children's Food Security Varies Across Households with Similar Incomes

Diane Whitmore Schanzenbach
Northwestern University

Patricia M. Anderson
Dartmouth College

Kristin F. Butcher
Wellesley College

Hilary W. Hoynes
University of California-Berkeley

Author correspondence
Diane Schanzenbach, School of Education and Social Policy, Northwestern University, Annenberg Hall, Room 205, 2120 Campus Drive, Evanston, IL 60208; Email: dws@northwestern.edu; Phone: (847) 491-3884

Final Report:

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Diane Whitmore Schanzenbach, Northwestern University
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Abstract

This project examines why very low food security status among children is different across households with very similar measured resources. Controlling for measures of income-to-needs, we examine whether elements in the environment, household characteristics, or behaviors are systematically correlated with VLFS among children. We use different measures of income-to-needs, including those averaged across years to capture "permanent" income (or to average out measurement error) and measures that include income after taxes and transfers. Our analysis uses the Current Population Survey (across many years, matched December to March), the American Time Use Survey (matched to the December CPS), the National Health and Nutrition Examination Surveys (1999-2010), and the Panel Study of Income Dynamics. We find that, no matter how we control for income-to-needs, certain characteristics appear to be systematically correlated with VLFS among children. In particular, mental and physical disabilities of the household head are strongly correlated with VLFS among children. The presence of teenage children, holding other aspects of household size and composition constant, predict VLFS among children, suggesting that larger children require more food. Finally, participating in transfer programs is correlated with VLFS among children, suggesting that these households are in the "system." These patterns suggest pathways for future research and future policy actions to address VLFS among children.

Executive Summary

This project investigates why very low food security status (VLFS) among children varies even among families with very similar measured income levels. If income relative to needs were the only thing that systematically explained VLFS among children, then after controlling for measures of income relative to needs in a regression of VLFS among children no other observable characteristics about the household would be statistically significant. If this were the case, in statistical terms this would be as if VLFS among children were driven by idiosyncratic shocks unobservable to the econometrician.

Our analysis examines what else, besides measured income relative to needs, is systematically correlated with VLFS among children. To get the most complete picture possible, we analyze a variety of datasets, including the Current Population Survey (CPS) both linked across survey months and linked across years, the American Time Use Survey (ATUS), the National Health and Nutrition Examination Survey (NHANES) and the Panel Study of Income Dynamics (PSID). We frame the potential correlates to VLFS among children into three groups: environment, resources, and behavior. We examine whether various approaches to capturing access to resources makes a difference for what else is systematically correlated with VLFS among children.

We examine whether using long-term measures of income to needs (averaged across many years in the PSID or two years in the CPS) changes what is systematically related to VLFS among children. We also examine whether measures of resources that explicitly take into account the tax and transfer system – as discussed in the literature around the Supplemental Poverty Measure – changes these correlates. To get further insight into VLFS among children, we examine transitions of households into and out of this state.

Although precisely parallel analyses are not possible across all the data sets, the results that emerge from this provide some informative patterns. First, we find little evidence that the geographic environment – and thus characteristics that are correlated with geography such as persistent differences in prices across states – are correlated with VLFS among children. Second, no matter what measure of income-to-needs we use, there continue to be particularly characteristics of the household or household "behaviors" that are systematically correlated with VLFS among children, across multiple datasets and specifications. These include household composition: households with more teenage children are more likely to suffer from VLFS among children, suggesting unmet needs as children grow and require more food. Further, a work limiting disability of the household head, depression, lack of emotional support, drug use, and time spent sleeping (which may all pick up related problems) are correlated with VLFS among children, even when controlling for income-to-needs. Next, households with VLFS among children are more likely to participate in transfer programs meant to address such needs than are other similar households. When we control for income-to-needs, participation in programs directed at poverty alleviation indicates selection into these programs by needy households. Our analysis post-tax and post-transfer income to needs, inspired by the supplemental poverty measure, suggests that after taking program

participation into account, households with very low food security among children have higher measured income-relative-to-measured needs than do households where the children are not food insecure. Thus, it seems that these households are applying for an receiving programmatic help, but other factors make it such that their access to resources are inadequate to insulate their children from VLFS status. Our analysis of transitions into and out of VLFS status among children suggests that for many households, this is a new and unexpected state.

The patterns of findings suggest several pathways for policy to address VLFS among children. In particular, the role of parents' mental and physical disabilities is important and needs further study. While disability and mental illness clearly predict VLFS among children after controlling for income-to-needs ratios, the appropriate policy remedy is not clear. Do households with significant health challenges need more income – perhaps because there are other uncompensated expenses – to keep their children food secure? Or, potentially, does disability mean that these households cannot turn other resources – like time – into food security because activities like food shopping or cooking are so much more burdensome in the face of these challenges? If so, then direct help, or resources to hire such help, may be required. The fact that having more teenage children is correlated with VLFS among children suggests that programs should adjust not only for the number of children, but for their ages.

Finally, the fact that for many households VLFS among children is a transitory state, is good news. However, if programs are going to shield children from the effects of VLFS among children, even if it is a short-term state, the policies need to be able respond quickly without long administrative delay.

I. Introduction

Access to healthful food during critical periods of fetal and child development is an important determinant of long-term health and economic well-being.[1] Research has shown that for children even a modest compromise in nutritional access may impair intellectual, physical and social development and may cause permanent damage.[2] Other work has shown a clear link between the food insecurity measures and worse nutrient intakes (see Kaiser & Townsend 2005 for a review, also Cristofar & Basiotis 1992, Bhattacharya et al. 2004, Rose & Oliveira 1997, Casey et al. 2001). As a result, food insecurity is an important marker of disadvantage.

In this study, we examine households in the United States that are most likely to have children at risk of inadequate nutrition – those that report very low food security among their children. Although food insecurity in the United States is quite common (about 20 percent of households with children in 2012), very low food security (VLFS) among children is relatively uncommon (about 1.2 percent of households in 2012).[3] Even though households with very low food security among children make up a small percentage of households, the percent of households with this status has roughly doubled over the last decade. Further, these households account for a disproportionate share of children, as poor households tend to have more children, and the children in these households are those for whom the risks of inadequate nutrition during critical periods of development are a real possibility. In

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[1] See Currie (2009) for a review of the literature on the importance of early life incomes, and Hoynes, Schanzenbach and Almond (2012) for a specific example of the benefits of childhood food stamp receipt on reducing the likelihood of poor adult outcomes.

[2] See for example Gluckman and Hanson 2005, Kaiser and Townsend 2005, Alaimo et al. 2001, Kirkpatrick et al. 2010, Cook et al. 2006, and Winicki and Jemison 2003.

[3] These statistics come from http://www.ers.usda.gov/topics/food-nutrition-assistance/food-security-in-the-us/key-statistics-graphics.aspx#children

this study, we examine the characteristics and correlates of households with very

low food security among children. Among most low-income households, even those

that report that they are food insecure, children appear to be insulated from food

insecurity themselves. Here, we explore what publicly available data can tell us

about households in the U.S. where the children live at the extremes of poverty.[4]

The likelihood of experiencing VLFS among children declines with income.

Panel A of Figure 1 shows the VLFS rate by income-to-poverty group in the Current

Population Survey (CPS) data. Here we merge detailed information on income that is

collected in the March CPS to food security status collected in the preceding

December, and data are pooled across all years 2001 through 2011. Approximately

3 percent of families with incomes between 20 and 40 percent of the poverty

threshold report VLFS among children. This rate steadily declines as income

increases, until it falls below 1 percent of families at 200 percent of the poverty line.

Panel B of Figure 1 constructs graph showing a similar pattern using data from the

National Health and Nutrition Examination Survey (NHANES) pooled across 1999

through 2010. While these figures show that VLFS declines with income, even

among families with similarly low incomes some families are able to protect their

children from VLFS. In this project, we explore whether there are systematic

reasons for VLFS among children, after conditioning on income. We are not

attempting to provide a causal analysis of, for example, the impact of program

participation or health status on the incidence of very low food security among

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[4] We are using the term "extremes of poverty" loosely, not the formal definition of "extreme poverty" defined by the World Bank as households living on $2 or less per person per day. Edin and Schaefer (2013) use this formal definition and find that 4.3 percent of non-elderly households with children in the U.S. were in this category in 2011.

children. However, we will present the correlations between a household reporting very low food security among children, and a large list of household descriptors. Insights that come out of these detailed descriptions can be used to guide further research and policy.

We explore a variety of potential reasons for variation in VLFS among children in households with similar incomes. First, we describe households with VLFS among children in great detail using 11 years of the Current Population Survey, plus data from the National Health and Nutrition Examination Survey and American Time Use Survey. Focusing on data for households with children where the income to poverty ratio is less than 300% of the poverty threshold,[5] we present summary statistics on participation in various public programs and household characteristics by different food security levels.

After establishing the correlates of food insecurity, we turn to regression analysis. Again, it is important to emphasize that this is not a causal analysis, but rather a "horse-race" style analysis to see which correlates of very low food security among children are statistically significant when income-to-poverty ratios and other covariates are held constant. The thought experiment here is that if income determines children's food security, then even if income does a poor job of explaining the variation in children's very low food security status, nothing else should be systematically correlated with the outcome. Those factors that remain robustly statistically significant suggest correlates of unmet need and may provide guidance for public policy aimed at addressing the extremes of poverty.

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[5] When we use the Panel Study of Income Dynamics we examine all households and then households with incomes less than 200 percent of the poverty threshold.

One explanation for why other factors may predict VLFS status among children is that income may be systematically mis-measured, or measured with error, and these other factors are correlated with true or permanent income. To address this concern, we next explore additional income measures aimed at better measuring permanent income or current disposable income. First, we use the Panel Study of Income dynamics to explore how VLFS among children correlates with "permanent" and "transitory" measures of income, calculated as mean income across many years, and current income's deviation from that long-run mean. Note that averaging over years of income will also smooth out measurement error in current income. In order to investigate this in the Current Populations Survey, we use merged samples and average income measures across two adjacent years. In order to examine whether measures of disposable income or resources are what drive VLFS among children, we use insights from the Supplemental Poverty Measure, using the CPS data to create measures of income-to-needs where income is post-tax and post-transfer. We test whether using improved measures of income reduces the power of other covariates in predicting VLFS among children.

By linking longitudinally across two years of Current Population Surveys, we also show transition rates into different programs and food security levels. A striking fact from this exercise is that there are a lot of transitions into and out of VLFS status among children. We explore the role of income shocks as well as average income in determining transitions into VLFS, using data from the CPS.

Our findings suggest that some household characteristics and patterns of program participation, even controlling flexibly for income-to-poverty,

systematically predict very low food security among children. For example, controlling for household size, having a larger share of the household in the 13-to-18 age range is positively associated with very low food security among children, suggesting that rapidly growing teenage children may put greater stress on a household's ability to provide food security for them. Participation in programs like free and reduced priced lunch and SNAP are positively correlated with VLFS among children, suggesting a relationship driven by negative selection where struggling households that have already identified themselves as requiring assistance continue to have unmet needs. Furthermore, our examination of the NHANES and ATUS data corroborates our findings in the CPS and PSID and suggests an important role for both mental and physical health in determining the food security status of children.

II. Data Sources

A. The Current Population Survey (CPS)

Food insecurity is officially measured in the U.S. based on a supplement to the Current Population Survey (CPS). Since 2001, this supplement has been part of the December survey. Because the questions refer to the past twelve months, we consider the food security measure to refer to the calendar year of the survey. Food security is defined based on a battery of 18 questions (10 if there are no children in the household), which are shown in Appendix Tables 1a and 1b. Based on the answers to these questions, households are categorized as food secure or food insecure. Food insecure households are further broken down into those suffering from very low food security. In addition to the overall food security status of the

household, there are specific designations for the children in the household, based on the questions about the children. The children themselves may be food secure or food insecure, and food insecure children may be suffering from very low food security. Appendix Table 2 shows how each of these six categories is defined. Very low food security among children (the topic of this paper) is clearly quite severe, with five or more of the eight questions specifically about children having to be answered in the affirmative to be so classified.

In order to analyze the determinants of very low food security among children, it is important to not only have data on the answers to the 18 food security questions, but also to have good information on the household's income and program participation. The March supplement to the CPS collects this information, in reference to the previous calendar year. The CPS sampling frame allows us to match this March supplement to the December supplement for a subset of the sample. A CPS household is in the sample for four consecutive months, out of the sample for eight months, and then back in for four consecutive months. Thus, for households where December is the first of one of their set of consecutive months, they will also be surveyed in March and the two surveys can be matched at the household level. Additionally, starting in 2002, the March supplement sample was expanded by asking the questions of the February and April sample households that were not also in the March sample, as well as some of the prior November sample. Matching on the household identifier across these months results in a sample of about 14,000 matched households per year. We limit our sample to households with

children and with income of 300 percent or less of the poverty line. Thus, our main analysis sample has about 3,000 observations per year.

While our main analysis uses this matched December-March CPS data set, a subset of households can be matched from one year to the next. A household that first joins the CPS survey in December will rotate out the following March, but rejoin the sample for December through March of the next year. For these households, we can observe the one-year transitions across program participation and food security status. The result of this matching process gives us about 4,500 households per year that can be matched to the previous year. Note, however, that because of a change in the household identifier between 2003 and 2004, we are unable to match across those years. Again limiting our sample to households with children and income of 300 percent or less of the poverty line leaves us with only about 750 observations per year.

B.   The National Health and Nutrition Examination Survey (NHANES)

While the official measures of food insecurity come from the CPS supplements, the same battery of questions is asked in the much smaller National Health and Nutrition Examination Survey (NHANES), which since 1999 has been fielded over consecutive two-year periods (i.e. 1999-2000, followed by 2001-2002, etc.). The NHANES includes a range of different questionnaire modules, physical examinations, and a food diary, all used to evaluate the health and nutrition status of the country. While typically not everyone in the household is a part of the NHANES (and many children are sampled without any adult household members), the food security questionnaire is completed at the household level for all sample members.

In particular, the status of children is ascertained whether or not the child is a sample member. Over half of the actual sample members are the children themselves, but for our purposes we are most interested in information that is unavailable in the CPS, such as the dietary data, and questionnaires on drug use and mental and physical health that are characteristics associated with the adults in the household. Thus, we restrict our sample further to only those observations where the sample member is over 18. The result is a sample of almost 9,000 observations. However, many of the questions and their samples change over time in the NHANES, meaning that for many variables we have much smaller samples.[6]

C.   *American Time Use Survey (ATUS)*

The American Time Use Survey (ATUS) asks respondents to report on how, where, and with whom they spend their time. Respondents are a randomly chosen subset drawn from households that have completed their final CPS monthly survey response. To be useful for our analysis, a household must have participated in the December Food Security Supplement. Since the ATUS is asked between 2 and 5 months after a household completes its final CPS survey, the households that participated in a December CPS were surveyed for the ATUS between the months of February and August. The respondent is surveyed about his or her activities sequentially, walking through the 24-hour period that began at 4 a.m. on the designated day and continued through 3:59 a.m. on the following day. Respondents describe in their own words the primary activity in which they were engaged at each point in the day, and these activities are coded into categories. While we

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[6] For example, the depression screener was only given to all adults in the last three waves of the survey. Prior to that, only a half sample of 20 to 39 year olds was screened for depression.

primarily show results across the major groupings (e.g. eating and drinking; working; household services), we also break out some activities such as food preparation and food shopping in more detail. We limit the sample to households with children. When the data are pooled across 2002-2010 December CPS data that can be linked to the ATUS, we have a sample of 17,341 respondents, 2413 of which are food insecure and 100 of which have very low food security among children.

D.   Panel Study of Income Dynamics

The great benefit of the Panel Study of Income Dynamics (PSID) is that we can observe households over a long period of time. We exploit this feature in order to create measures of mean income for the household over time, and deviations from that overall mean during each year. This allows us insight into the whether food insecurity is associated with low "permanent income" as opposed to a bad income draw in a given year.

Food security questions were answered by PSID respondents in 1999, 2001, and 2003. We have a household level data set for these years. We limit the data set to those households with children in order to examine Very Low Food Security (VLFS) among Children, and we have 12,766 observations in the three years combined, with approximately 4,000 observations per year. The rate of VLFS among children is similar to that in the Current Population Survey in these years, with 0.7%, 0.7%, and 0.65% of households in this category in 1999, 2001, and 2003, respectively. There are a total of 92 observations on households with VLFS status among children. The small sample size poses a challenge in how much we can say and with what degree of precision about VLFS among children. Nonetheless, as

described below, there are a number of interesting things that corroborate and extend our findings using the CPS and other data sets.

To each observation in the 1999-2003 years, we have attached information on mean household income, calculated from all of the years in which we have valid observations for income for the household. We have decomposed these income measures into income from earnings, government transfers, and other sources. In addition to a mean income level, we have calculated "transitory" income, which is this period's income minus the average across the years for this income type. Income is measured in real dollars. Current total income is in thousands of dollars. We have also created scaled measures relative to a measure of a household specific needs threshold, so that some measures are income to needs ratios.

III. Research Question: Who Experiences VLFS Among Children?

We start by describing characteristics of the households with VLFS among children, before conditioning on income. We investigate how they differ in terms of their environment, their access to resources, and other measures of behavior.

A. *Differences in Environment*

As noted above, a child is classified as suffering from very low food security (VLFS) if five or more of the questions about the child are answered in the affirmative. Essentially, then, it is impossible to be so classified unless there are extreme circumstances in the household such as the size of the child's meals being cut or the child being hungry, but with no more money for food. It is perhaps not surprising, then, that even among poorer households with income at or below 300%

of the poverty line, the rate of very low food security among children remains relatively low, averaging about 0.013 over our CPS sample. That average masks some important time variation, with rates reaching as high as 0.021 at the start of the Great Recession. The average also masks geographic variation, as shown in Figure 2. In several states, such as Colorado and New Hampshire, the rate of very low food security among children over this time period averages under 0.003, while in states such as Missouri and Maryland it is over 7 times higher, at 0.020. As will be described in more detail below, state fixed effects are insignificant in a regression explaining whether a household contains a child with very low food security, while year fixed effects are significant. However, controlling for year has no real impact on the role of other explanatory variables. Note that the regression results reported below control flexibly for a household's income to poverty ratio, so it may be that the geographic variation we observe in Figure 2 is at least partially driven by differences in financial well-being across states.[7]

Table 1 shows state-level characteristics for each of four samples from the CPS. First, is the full sample of households with children and income below 300% of the poverty line. Second is a subset of this sample made up of only households that are coded as being food insecure, followed by the subset with very low food security. Finally, we look at those households containing very low food secure children. Columns (1), (3), (5) and (7) present the means for these four samples, with the following columns giving the standard deviations. Looking across columns

[7] State fixed effects are jointly statistically insignificant in explaining variation in VLFS among children, whether or not we control for income. However, some individual state dummies are statistically significant indicating the levels of VLFS among children for some states are statistically different from some other states.

the columns of means gives us insight into the characteristics associated with progressively more dire food security situations. Note that Table 1 presents state averages to characterize the economic and safety net conditions in the environments where the food insecure live, while below Table 2 will present individual level participation among the food insecure. The state unemployment rate increases across columns, indicating that households with VLFS among children live in areas with higher levels of unemployment. Participation rates in major means-tested safety net programs including SNAP, free or reduced-price lunch, WIC or TANF are flat across columns. SNAP benefit amounts per recipient increase across columns. Since SNAP benefits are determined by a federal formula, this suggests that households with the lowest levels of food security live in areas with less disposable income. On the other hand, TANF payments per participating household decline across severity of food insecurity.

B.   *Differences in Access to Resources*

Table 2 describes rates of program participation and various demographics at the individual household level for the same four samples shown in Table 1. For example, participation in the free/reduced price lunch program and in SNAP (Supplemental Nutrition Assistance Program, formerly known as food stamps) both increase sharply across the columns, as does receipt of energy assistance, SSI benefits and welfare. In all cases, participation comes close to doubling when moving from the full sample of low-income households to the subsample of households containing a child with very low food security.

It is important to make clear that it would be unwise to interpret these patterns as implying that receipt of these important safety net programs causes lower food security.[8] Rather, in these unconditional means, it may simply be the case that these programs are most highly correlated with the lowest resource levels that would be expected in the most food insecure households. Below, we will control for the ratio of household's income to poverty, but for now, it is interesting to note that not all programs have participation rates that increase as sharply across the columns. In the case of non-means-tested programs, such as unemployment compensation, workers compensation, social security, veterans' benefits, survivors' benefits or retirement benefits, this lack of a sharp increase across columns is consistent with the idea of some program participation simply capturing relative resources. At the same time, there are also differences in participation increases across the means-tested programs. Medicaid participation increases a bit between all low-income households (column 1) and all low-income food insecure households (column 3), but then stays fairly constant across the more severe levels of food insecurity. Somewhat similarly, eligibility for the Earned Income Tax Credit (EITC) is relatively flat across the first three samples, before increasing a bit for the households with a very low food secure child.[9] These results may also be consistent, however, given that both of these programs are often available to both low- and moderate-income households.

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[8] In fact, Schmidt et al. (2013) show that safety net programs played an important role in keeping many families food secure during the Great Recession.

[9] Note that here and elsewhere in our analysis of the CPS, EITC receipt is imputed based on earnings and observed family characteristics. The CPS does not ask households about EITC receipt.

The rows in the lower half of Table 2 investigate the means of assorted demographic variables.[10] First, we see that while overall household size is not very different across samples, the number of teenagers is much higher in families with low food security children at 0.944 compared to just 0.655 for food insecure households. Given the higher caloric needs of older children, this result may reflect the increased difficulty of avoiding hunger as children age while incomes remain the same. Looking at aspects of the household head, we see several characteristics that become more common across the samples. Households with very low food secure children, are more likely to be headed by a female, by an African American, by a recent immigrant, by someone who is disabled, and by a high school dropout, but less likely to be headed by a homeowner or an individual who is neither black nor white.[11] Finally, potential workers in households with a low food secure child spend a larger fraction of the year looking for work and a lower fraction working. As was the case with program participation, these household characteristics may simply be correlated with resource availability, making it important to investigate their role in a regression framework, as we will do below.

At the bottom of Table 2, we can see that among this sample of poor households, 28 percent are food insecure, 7.7 percent have very low food security, and just 1.3 percent have a very low food secure child. The fact that many households are able to protect their children from very low food security is made

[10] Coleman-Jensen, McFall and Nord (2013) presents a range of descriptive statistics on food insecurity in households with children in 2010-2011 that is complementary to our longer time period.
[11] These results are similar to past findings on correlates of household food insecurity (versus very low food security among children) reviewed in Gundersen, Krieder and Pepper (2011).

most clear by columns (3) and (5), where we see that less than 5 percent of food insecure households have children with very low food security, and even among very low food security households, only 17 percent have very low food security among their children.

An additional descriptive look at the CPS data is shown in Table 3. Here, we present the food security status of low-income households with children by selected characteristics. Not surprisingly, this table provides many of the same take-away messages as Table 2. Food security status is much lower among households that receive free/reduced price lunch, that receive SNAP or welfare, and that are eligible for the EITC. Households with teenagers, those headed by a female, by a high school dropout, by an African American, or by a disabled person also have worse food security outcomes, as do those not owning their own homes. Focusing specifically on very low food security among children, we often see a doubling (or more) of the rate across categories. For example, poor households that do not participate in the school lunch program have a rate of 0.7 percent, while those that do have a rate of 2.4 percent. The pattern across those that do and do not receive SNAP is comparable (1 percent for SNAP non-recipients versus 2.6 percent for SNAP recipients). Similarly, poor households not on welfare have a rate of 1.2 percent, while for welfare recipients it is 3 percent. This exact same change is observed when comparing households that are not and are headed by a disabled person.
It is important to emphasize that the results shown in these tables are simple correlations, with no implication that receipt of certain safety net programs causes food insecurity. Rather, as before, we should look at these results as evidence that

certain programs best capture the low resources and other issues that lead to problems maintaining food security, as do certain characteristics of the household head (such as disability, or female). Clearly, it will be important to turn to a multivariate framework to better investigate these associations after accounting for income, which we do below.

Table 4 further extends the description resource availability by using the PSID to show the means of various measures of income by whether the households' food security status is Very Low Food Security among Children. Using the long panel series in the PSID, we can measure "permanent" income as the average income across a longer number of years. We can also measure "transitory" income as the difference between this year's income and permanent income. As expected, households where children are food secure are much better off, with an average income to needs ratio of 4.09, than are households where the children are food insecure, with an average income to needs ratio of 1.2. Note that the average of the transitory income measures are near zero, as must be the case given how these are defined. The overall average of mean or "permanent" earned income for the VLFS among children households is 1.0, indicating that on average, these households have earnings that are typically right at the poverty line. Households with VLFS among children have higher average government transfer income and lower "other" income, again indicating that these households are persistently worse off than other households. Below we turn to regression analysis to examine the explanatory power of these different income measures in VLFS among children.

C. Differences in Behavior

Table 5 is similar in spirit to Table 2, in that it presents characteristics of households with children that are below 300 percent of the poverty line, with the first set of columns for the overall sample, the second set of columns for food insecure households, the third set of columns for very low food security households, and the final set of columns for households with VLFS among children. The sample used for Table 5, though, is derived from NHANES sampled households that interviewed an adult member, leaving us with a subset of all households and a much smaller analysis sample than that derived from CPS households. While a few basic characteristics are included to ensure that this sample is not very different from the larger CPS sample, the main focus here is on outcomes only measured in the NHANES. Recall that NHANES questionnaires vary over time in both the questions asked and the universe for those questions, resulting in wide variation in sample sizes across rows. Sample sizes are reported in the final column of each set of columns.

The first few rows of Table 5 focus on mental and physical health. Here, it is clear that depression is highly correlated with food security outcomes.[12] While 9 percent of the adults in households in column (1) report being depressed, this rate increases to 24.3 percent in column (10).[13] This increase in depression is monotonic, with a rate of 14.8 percent in food insecure households, 20.2 percent in

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[12] It is known, especially in the pediatrics literature, that children with a depressed mother (and father) are at greater risk for poor health, education, and behavioral outcomes (c.f. Kahn et al. (2004) and cites therein).

[13] In the first three waves, only a half sample of 20 to 39 year-olds are asked about depression, while in the final three waves all adults are administered a 9-item depression screener.

households with very low food security, and 24.3 percent in households with VLFS among children. Also increasing monotonically is the number of days over the past month in which the household adult was kept from their usual activities by their mental or physical health, reaching almost a week for the households with VLFS among children, up from under 2 days for the full sample. Similarly, the fraction reporting only fair or poor health (versus good, very good or excellent) more than doubles across the columns, increasing from 21.8 percent to 48.4 percent.[14] Recall that in the CPS, a disabled household head was strongly associated with very low food security among children. Here, we see reinforcing information on the role of not only physical health, but also mental health. These results provide good evidence for the types of issues facing households in the extremes of poverty that are often unmeasured in standard data sets.

The questions in the next two rows of Table 5, reporting whether the respondents have someone on whom they can rely for emotional and financial support, are based on the smallest samples. In the first three waves of the NHANES the questions were only asked of respondents age 60 and over (many of whom may no longer have children in the household). While the sample was expanded to those age 40 and over for the next two waves, the questions on social support were dropped entirely for the wave completed in 2010. Nonetheless, the pattern across the columns is intriguing. Not only does the likelihood of having someone for financial support drop monotonically across the columns, so does that for emotional

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[14] Siefert et al. (2004) find a relationship between food insufficiency and physical and mental health in a sample of welfare recipients, while Stuff et al. (2004) find this relationship for a sample of adults in the Lower Mississippi Delta region. Note that the latter's interpretation is that adult food insecurity leads to poor adult health outcomes.

support. The former, while interesting, may not be overly surprising given that lack

of financial resources is expected to be correlated with food insecurity. The latter

result, however, is an additional indication of the type of nonfinancial issue that may

impact a household's food security status. A lack of emotional support may be

tightly linked with worse mental health.[15]

In addition to providing information on physical/mental health and potential

deleterious behaviors, the NHANES also includes a food diary, which lets us examine

the nutrition status of the sample household member. While there is very little

difference in BMI across the columns, the small changes do reflect increasing BMI

with more dire food security status.[16] Similarly, the small changes in total daily

calories generally imply fewer calories eaten by the adults in households with very

low food secure children, perhaps reflecting the adult's attempt to better shield the

children from deprivation.[17] This same idea of the adults perhaps trying to protect

the children, and "doing without" for themselves can also be seen as they eat a

higher percentage of meals at home, a lower percentage at fast food restaurants, and

reach a lower percentage of the recommended daily nutrients.[18] The fact that the

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[15] Ziliak, Gundersen and Haist (2008) find that lack of access to emotional support is a significant predictor of hunger among the elderly.

[16] Obesity is often found in tandem with food insecurity in the United States, although there is some disagreement over the strength of the relationship. Kuku, Garasky and Gundersen (2012) argue that while parametric analyses find no relationship, a nonparametric approach can find a relationship for some groups.

[17] In fact, if Table 4 is repeated for a sample where the children are the NHANES sample members, calories increase across the columns from 1831 to 2011. However, the children are also older in the final column averaging over 10 years old versus just 8.5 in the first column. This increase in average age is likely related to the CPS finding of households with older children being more likely to have food insecure children.

[18] When looking instead at the sample children, the percent of the recommended nutrients achieved is actually highest in the final column, at almost 65 percent, compared to about 63 percent in the other columns. However, the differences are small and the sample sizes very small in the final column.

adults in these households suffering from the extremes of child food insecurity are themselves the worst off nutritionally is consistent with the impression arrived at earlier that many of these households are likely to have unmeasured and unmet needs.

The next several rows focus on drug and alcohol use and abuse. Broadly speaking, drugs and alcohol do not seem to have a major correlation with food security. For example, the rate of cocaine use over the past year is about 2 percent for each of the samples, while reported use of meth in the past 30 days is very low for all groups, and actually zero for the households with very low food security children. That said, while use of heroin in the past 30 days is also very low for all groups, it increases ten-fold across the columns, starting at 0.1 percent for the overall sample, rising to 0.3 percent for food insecure households and 0.8 percent for very low food security households, before almost doubling to 1.5 percent for households with very low food security children. While reporting smoking pot in the last 30 days is much more common – 12.4 percent for the sample overall, and peaking at 23.7 percent for very low food security households, it does not seem to be a good explanation for the most extreme outcome of very low food security among children. Both these households and those who are simply food insecure have similar rates of reported pot smoking – about 17.8 and 17.9 percent respectively. The idea that extremes of drug use may be most harmful (i.e. heroin versus pot) for the household's children is reinforced by the fact that the household adult is much more likely to have been to rehab for households with very low food security children. The 5.8 percent for the full sample column (1) increases to

8.8 percent for food insecure households, 11 percent for very low food security and

reaches 16.2 percent for households with very low food security among children.

While it is important to keep in mind that the sample sizes here are small, serious

issues with substance abuse for a household adult do appear to be highly correlated

with very low food security among the children in the household.[19] Since depression

and other mental health issues are commonly correlated with substance abuse, this

finding likely echoes the importance of adult mental health for children's food

security.

The final rows look at many of the same variables as in Table 2, showing very

similar results. Most importantly, the fraction of the overall sample that has very

low food security children is identical at 1.3 percent in both data sets. While levels

are not identical, similar patterns are seen for SNAP across tables, with receipt

greatly increasing as food security status worsens. Overall, then, while the NHANES

sample is generally smaller than the CPS, it does not seem to differ greatly in the

basic demographics, reinforcing the validity of using the NHANES to draw

conclusions about what unmeasured characteristics might be driving some of the

CPS results.

Table 6 is parallel to Table 3 in that it presents rates of food insecurity by

different characteristics, again using the NHANES sample adults. This table mainly

reinforces the lessons of the previous table. For example, the adult being in fair or

poor health more than triples the probability of the household having a very low

food security child, as does the adult being depressed. While households where the

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[19] Interestingly, Kursmark and Weitzman (2009) report on recent studies finding that having a
smoker in a house is associated with childhood food insecurity.

adult has someone who provides emotional support have a 1.1 percent rate of VLFS among children, the rate increases to 5 percent in households with no emotional support. The results are fairly similar for financial support, where the rate increases from 0.8 percent to 3 percent. Viewing the data from this perspective makes smoking pot seem a bit more predictive of food insecurity, especially for the basic outcome of the household being food insecure. Here, 25.7 percent of households are food insecure when the adult has not smoked in the past month, while 39.6 percent are when the adult has smoked. Given the relatively high fraction of adults in this sample who have smoked pot in the last month, the rate of very low food security among children is just a bit higher than the overall rate of 1.3 percent for those smoking, at 1.4 compared to 0.9 percent for those not smoking pot. As before, the relationship between heroin use and poor food security outcomes is strong, but it is now clear just how rare it is for the household adult to have used heroin in the past month – there are only five observations. Nonetheless among these small number of households, food security outcomes are very poor – 71.7 percent are food insecure, 52.9 have very low food security, and 13.5 percent have very low food security among their children – over ten times the average rate. There are no systematic differences across households that report drinking fewer than or more than 5 alcoholic drinks per week on average, nor across differences in meth use. Finally, we again see that the adult having been to rehab is associated with much higher rates of very low food security among the children, at 2.7 percent compared to 0.9 percent.

Table 7 describes the nutritional intake and other characteristics among children in the NHANES, by household food security status. These descriptive results should be interpreted with some caution because not only are there small sample sizes, but also dietary recall data are measured with substantial error.[20] Overall, children in households with VLFS among children report a slightly higher average caloric intake, though this pattern in means is complicated by the facts that the standard deviation in caloric intake is also substantially higher, the average child age is older, and children are more likely to be male among this group. Children in VLFS households report consuming a slightly lower percentage of meals at home (72.5 percent vs. 76.4 percent for children in all households with income less than 300 percent of the poverty line), and a slightly higher percentage of meals from fast food (6.2 percent vs. 5.5 percent). Average intake of recommended nutrients is slightly higher, as is the likelihood that the household received SNAP benefits. Household size is larger and income relative to the poverty line is lower in households with VLFS among children. Children in these households are also more likely to be male, black or Hispanic, and less likely to be a U.S. citizen.

Table 8 presents descriptive information about time use by food security status. To maximize sample size, this table merges December CPS to ATUS data, and therefore does not have detailed information on a household's income-to-poverty ratio that is collected in the March CPS survey. Instead, we only have an indicator for whether a household's income is less than 185 percent of the poverty line. We

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[20] Note that dietary intake data are collected from proxy (adult) respondents for children 5 years old or younger, proxy-assisted interviews are conducted with children aged 6-11, and children 12 years old or older report on their own intake.

present means and standard deviations for all households in columns (1)-(2), all low-income households in columns (3)-(4), then in the subsequent columns regardless of whether a household is low-income we present all food insecure households, all households with VLFS, and all households with VLFS among children.

Food insecure households spend more time on personal care, and this is entirely driven by more time sleeping. Furthermore, the mean time spent sleeping increases monotonically in the severity of food insecurity, and the difference between adults in households with VLFS among children and all households is statistically significant. Increased time reported sleeping can be a marker for depression (Tsuno et al. 2005), which is consistent with our findings from the NHANES data that households with VLFS among children are more likely to have an adult suffering from depression.

Adults in households with VLFS among children spend more time in household activities (such as laundry, cleaning, and food preparation). When we break out time spent in food preparation separately, the pattern in means suggests that the most food insecure households are spending more time in food preparation, although the surveyed adult in households with VLFS among children are slightly less likely to report doing food preparation. Surprisingly, households with VLFS among children also spend statistically significantly less time caring for household members.

Low-income households and food insecure households report more time spent in leisure and less time spent on work than households overall, but there is no

consistent pattern across severity of food insecurity. While average minutes spent working are relatively stable across low-income households and those that are food insecurity, the fraction reporting any time spent working declines across levels of food insecurity. Neither is there a consistent pattern in time spent eating and drinking across groups. Time spent shopping, and in particular time spent shopping for food, decreases as food insecurity increases in severity. The difference in time spent shopping between households with VLFS among children and households overall is statistically significant.

There are no clear patterns across the remaining categories, including time spent in education, using services, sports, religious or volunteer activities, or travel. Adults in VLFS among children households report more time on the telephone, but this difference seems to be driven by a few respondents with very high telephone use, and the difference is not statistically significant.

Table 8 further builds evidence into the types of household characteristics that are likely to lead to food insecurity. In particular, respondents in households with VLFS among children spend more time sleeping, and less time working, caring for household members, and are less likely to do food preparation. Consistent with the NHANES results, these patterns also suggest that unobserved mental or physical health status may differ in important ways in households with VLFS among children.

IV. Research Methods & Results: Predictors of VLFS Among Children,

Conditional on Income

Many of the characteristics that predict VLFS among children in Tables 2

through 8 are also correlated with income. Next we investigate whether, after

holding constant income relative to the poverty line, these characteristics retain

their predictive power. The results provide insight into the following thought

experiment: if there are just random shocks that throw households into VLFS among

children, then once we control for the households' income-relative-to-needs,

nothing else should statistically significantly predict VLFS status.

     A.   Results from the Current Population Survey

Table 9 presents multivariate regression analyses of the correlates of very

low food security among children in the CPS data. These are linear probability

models where the dependent variable is equal to 1 if the household reports very low

food security among its children, and 0 otherwise (the standard errors are robust to

heteroskedasticity). Recall from above that the data are 11 years of the December

Current Population Survey matched to the subsequent March Current Population

Survey data in order to combine food security status, income-to-poverty ratios, and

program participation information, and the data are restricted to households with

children with income-to-poverty ratios below 300% of the poverty line.

In each regression, income-to-poverty measures are held constant with

dummy variables for fifteen income-to-poverty ratio bins (grouped by 20

percentage points, with zero to 20% of the poverty line as the omitted category). In

regressions not shown, we find that when the income-to-poverty dummies are

entered into the regression alone, they are jointly statistically significant, but explain only about 0.5% of the variation in VLFS among children. Although Figure 2 shows that there are states with higher rates of VLFS among children, a complete set of state fixed effects are not jointly statistically significant when included.[21] This suggests that differences across states such as variation in prices do not explain VLFS among children. Controlling for year dummies, on the other hand, does significantly increase the explanatory power of the regressions. This is, perhaps, unsurprising since the data span the years of the Great Recession when all degrees of food insecurity increased. Thus, all of the regressions in the table include year dummies (with 2001 as the omitted group) but we do not include state fixed effects.

The first column of regression results includes the dummy variables for the (20 percentage point) income-to-poverty bins, year dummies, and controls for household size and composition. Controlling for household size, having more children in the 13-to-18 year old age range significantly increases the probability that a household reports very low food security among its children.[22] The point estimate suggests that one additional child in this age range, holding constant household size, increases the probability of VLFS among children by 0.64 percentage points. As 1.3 percent of households in this sample report VLFS among children, this is roughly a 50% increase in the probability of being in this category.

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[21] State fixed effects are jointly statistically significant correlates of food insecurity and even very low food security for households in this sample. However, the do not explain variation in very low food security among children.

[22] Other specifications examined whether age categories among adults were correlated with VLFS among children; 13-to-18 is the only age category that is significantly related to VLFS among children.

The second column includes a set of dummy variables that control for characteristics of the head of household and for whether the household lives in a rural area. The head of household being African American, female, or a recent immigrant are all statistically significantly and positively correlated with VLFS among children. If the household head is disabled, there is a statistically significant 1.3 percentage point increase in the probability that children in the household have very low food security – roughly a 100% increase in this probability. Finally, if the household head is a homeowner, the household is significantly less likely to report very VLFS among children.

Recall that all of these regressions control flexibly for income relative to poverty thresholds for the household characteristics. Thus, it should not be the fact that households with a disabled head are simply more likely to be poor that is driving the statistically significant correlation between this group and VLFS. Rather, it suggests that income-to-poverty is not capturing the relationship between resources and food security status equally well across households of different types.

The third column examines the correlations between VLFS among children and program participation and labor force patterns among potential workers in the household. Conditional on income-to-poverty ratios, if the adults on average work a larger fraction of the year, the children are less likely to have very low food security. Interestingly, most of the indicators for participation in public assistance programs are not statistically significantly correlated with VLFS among children after holding constant income and other program participation. Households where the children receive free or reduced priced lunch are particularly likely to report VLFS among

children, and households eligible for the EITC are statistically more likely to report VLFS among children.

The final column presents a "horse-race" regression among all of these different variables. Recall that year dummies and income-to-poverty 20 percentage point bin dummies are included. Column (4) allows us to examine, for example, whether the correlation between household composition and VLFS among children was simply that African American households, for example, are more likely to have children in this age range. Covariates that were statistically significant in the first three columns may simply have been highly correlated with other household descriptors that are highly correlated with VLFS among children. The saturated model allows us to see which covariates have the strongest conditional correlation with VLFS among children.

Household composition – in particular having more children age 13 to 18 in the house – continues to be statistically and strongly correlated with VLFS among children. The coefficient is virtually unchanged from column 1, suggesting that having a child in this age range is not particularly correlated with any of the other included household descriptors. It is possible to imagine that a family might find that its current income and benefit levels are sufficient to insulate children from food insecurity when they are small, but when they hit the growth spurts of adolescence, the family's resources cannot keep up with food requirements.

The household head being African American and the household head being a high school dropout are no longer statistically significantly correlated with VLFS among children in column (4). The coefficient on "African American" was cut in half,

but the standard error did not change, suggesting that having an African American

head of household is significantly correlated with the other correlates of VLFS

among children that are now included in the regression.[23] On the other hand, other

household characteristics remain statistically meaningfully correlated to VLFS

among children. A household with a recent immigrant as the head is still

significantly more likely to report VLFS among children. The fact that this coefficient

is virtually the same as in column (2) suggests that having a recent immigrant head

is not highly correlated with other included variables.[24] Further, having a disabled

household head remains positively correlated with VLFS among children, although

the coefficient is about a third smaller; this is likely collinear with the receipt of SSI

benefits. If the household owns its own home, it continues to be less likely to suffer

from VLFS among children. Finally, female-headed households are statistically more

likely to have VLFS among children, even when we control for this broad set of

variables.

Turning to the coefficients on the program participation variables, we see

that households that participate in free and reduced priced lunch are more likely to

report VLFS among children, although the coefficient is about a third lower than in

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[23] In a subset of years we can consistently define a "central city" geographic designation. In that subset of years, the indicator variable for African American is positively correlated with VLFS among children, until central city status is held constant. This suggests that the fact that African Americans are more likely to live in central cities, and households in central cities are more likely to have VLFS among children, is driving the unconditional correlation between African American and VLFS among children.

[24] Research by Borjas (2004) shows that food insecurity among immigrants was affected by program eligibility changes for immigrants that came with welfare reform. Kaushal et al. (2013) focus on food insecurity among children (though not VLFS among children) and find that children in households with Mexican-born parents are about 3 to 4 percentage points more likely to be food insecure than other households, controlling for income-to-poverty ratios.

the previous column. Eligibility for the EITC remains positively correlated with VLFS among children in column (4).

This exercise points to unmeasured and unmet needs in some households. If, for example, poverty thresholds correctly adjust for family composition, then we would expect that once income-to-poverty ratios are held constant, there would be little role for a household with more 13-to-18 year old children to be more likely to have very low food security among those children. Similarly, the fact that head's disability status is positively correlated with VLFS among children suggests that there is unmeasured and unmet need in these households.[25] Such households appear to have applied for and received many forms of public assistance, but perhaps the benefit levels do not adequately compensate for characteristics like disability, or there are changes in the household to which these programs do not adjust quickly. For example, as children in a household age into the teen years, perhaps benefit levels of programs do not adjust to meet this new greater demand for food.

B.   Results from NHANES

Table 9 is best thought of as indicating which groups of people are likely to have unmeasured and unmet needs. In Table 10, we turn to the National Health and Nutrition Examination Survey to glean insight into what some of these unmet and unmeasured (in the CPS) needs might be. The NHANES is smaller which is particularly limiting here in our analysis of a fairly rare status, but it goes into more depth about mental and physical health, and related behaviors, that will give insight

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[25] Coleman-Jensen and Nord (2013) describe the strong positive relationship between adult food insecurity and disability.

into these households at the extremes of poverty in the United States. The correlation between some of these variables and income makes clear that it is important to control for the income to poverty ratio. Unfortunately, we cannot follow the exact procedures from Table 9 that we used with the CPS data, and run a "horse race" to see which variables are most correlated with very low food security among children, conditional on income. Because the NHANES changes questions and samples over time, a model with all of our variables included together has only about 750 observations. Instead, we carry out a modified exercise presented in Table 10. Each column reports a regression with the dependent variable being an indicator for VLFS among children. The regressions in columns (1) through (9) each control for the set of 15 income-to-poverty bin indicators (representing 20 percentage point ranges of the household's income to poverty ratio), year indicators, household size, and indicators whether the sampled adult in the household is African-American, a high school dropout, a US citizen, a homeowner, and employed, plus the NHANES variable shown on the left. Across each of these columns, we add to the basic controls one variable at a time in order to capture the health and behavioral variables discussed above.

Starting with the first five columns, we see that controlling for the baseline income and demographic variables, poor health, depression and lack of social support for the household adult are significantly related to the probability that there is very low food security among the children in the household. In columns (6) to (9) we see that none of the drug use variables, including having been to rehab, significantly predict VLFS. The point estimate on heroin use, though, continues to be

extremely large but imprecise – an increase in very low food security among children of 12.1 percentage points is predicted for households with an adult reporting heroin use. Finally, column (9) shows that receiving SNAP is significantly related to very low food security among children; as discussed above we interpret this as likely to be capturing unobserved aspects of the family's resources. In fact, controlling for either health, or social support, or drug use, as is done in columns (10) to (12) wipes out the predictive power of SNAP receipt.

Column (10) provides a horse race among the available health variables for the subset of observations for whom we observe these variables. When the poor health indicator, days of inactivity and the depression indicator are included together, the point estimates for the former two drop almost in half, losing significance. There is very little change for depression, however, which maintains its significant correlation with very low food security among children.[26] Moving to the social support variables in the next column, both point estimates are slightly reduced when included together, and individually their significance drops to the 10 percent level. However, the two variables are still jointly significant at better than the 1 percent level. In the final column, we include the drug use variables together, whose point estimates are little changed and thus remain insignificant (both individually and jointly).[27] It is also worth noting that in these last three columns

[26] Note that even though we are better controlling for other attributes of the child's household, we are still not making claims of causality. It may, in fact, be the case that it is an inability to meet the child's nutritional needs has resulted in the adult becoming depressed, rather than the other way around. Note Powers (2013) also discusses this directional uncertainty in her study of parenting and very low food security among children.

[27] The results for columns (10) to (12) are essentially identical if the SNAP variable is excluded.

none of the demographic variables are significant, other than being employed being significantly negative at the 10% level in the final column (coefficients not shown).

Recall from Figure 1b that like in the CPS, very low food security among children in the NHANES declines sharply as the household's income to poverty ratio increases. Thus, it is important to keep in mind that even though many of the characteristics explored above are not directly tied to income levels (as many of the CPS program participation variables were), they may still be highly correlated. In that case, these characteristics may still be proxies for income. Figure 3 shows the means of selected NHANES variables by 50 percentage point income-to-poverty bins (we use fewer bins due to the smaller sample sizes in the NHANES). Interestingly, the social support variables that were so highly correlated with food security status do not seem very positively related to income, although financial support in particular does rise notably for the highest income group.[28] As for physical and mental health, the fraction in less than good health and the fraction suffering from depression both decline somewhat with income. However, having days of inactivity due to either mental or physical health problems is quite a bit more stable over the income groups. Finally, having been to rehab does not appear to have a completely monotonic relationship with income class. Rather, after being fairly stable across the two groups below the poverty line, it declines markedly before rising again for the group between 250 and 300% of the poverty line.

While all of the tables in this report should be thought of as correlational, not causal, Table 10 does provide some insight into the types of household

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[28] Remember that as described above, the questions on financial and emotional support are not asked for the full sample; this may affect the interpretation of these findings.

characteristics that are likely to lead to unobserved and unmet needs. In particular, there is strong evidence that good mental health in particular, and social support structures more broadly, may play an important role in keeping children out of very low food security status. While the NHANES sample sizes are too small (and the behaviors too rare) to draw statistically significant conclusions about serious drug abuse, the coefficients point strongly in the direction of this being a serious problem for children's food security. Thus, it may well be the case that an emphasis on adult mental health and wellbeing (which includes building social support networks and addressing addiction issues) could have beneficial spillover effects on children's food security status.

C.   *Results from the American Time Use Survey*

Table 11 repeats the exercise with the American Time Use Survey to measure how behavior predicts VLFS status. As in the previous two tables, each column reports a regression with the dependent variable being an indicator for VLFS among children. The regressions in columns (1) through (4) each control for income bin indicators, year indicators, household size, and indicators whether the sampled adult in the household is African-American, a high school dropout, a US citizen, and employed, plus the time use category shown on the left. To limit the number of decimal places and make the table more readable, time use is reported in hours instead of minutes. After conditioning on covariates, additional time spent sleeping continues to positively predict the likelihood of VLFS among children in column (1). Column (2) investigates time use relating to food and shows that more time spent in food preparation is positively associated with VLFS among children, while time

spent shopping for food is negatively associated with it, and there is no correlation

to time spent eating and drinking. Column (3) considers the other time-use

categories that comprise most of the day, and finds a positive association between

time spent on household activities (such as cleaning) and VLFS among children, but

no association with time spent working or in leisure. In column (4) we include all of

the categories at once and find that sleep and food shopping continue to

significantly predict VLFS among children. Because sleep might be serving as a

marker for depression here, this table provides additional suggestive support for

the hypothesis that adult mental health plays an important role in predicting

children's VLFS status.

V. Additional Results: Predicting VLFS Among Children, Conditional on Broader Measures of Income

An alternative explanation for the fact that some covariates continue to

systematically predict VLFS among children is that income may be systematically

mismeasured for some groups. To address this, we take two approaches. First, we

attempt to measure "permanent income" using a longer time period of income

observations. Second, we attempt to better measure disposable income by adjusting

for taxes and transfers using the Supplemental Poverty Measure framework.

A.   Using Permanent Income from the PSID

Table 12 uses the PSID to examine how the different measures of income

correlate with VLFS among children. The left panel shows results for the overall

sample of 12,766 observations. Recall that there are 92 observations with VLFS

among children. The right panel presents the same information, but for households that ever have income less than 200 percent of the poverty line. There are 80 observations for which this is the case.[29]

Our analyses will follow the logic of our work above in Section III. The fact that among households with similar measured income levels, some are able to protect their children's food security and some are not may suggest that there are unmeasured resources or needs. Income is typically considered to be measured with error, and if we see households with similar reported income levels, but very different VLFS among children, that may be an indication that income or needs are not properly measured.

Considered from another perspective, one would think that families would try to smooth access to food over good and bad years. Thus, if families have access to credit markets that allow them to smooth consumption through good and bad periods, then permanent income should determine food consumption. Our measure of "mean total income to needs" is an average of income across all the years for which we see a household with a valid income measure. This should come closer to what is meant by "permanent income" than most measures available in typical data sets. Thus, we can examine whether the "permanent" components of income are more highly correlated with food insecurity than the transitory components.

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[29] Recall that in the CPS samples, we focus on 300 percent of the poverty line, but given that we have more observations on household income here it seems appropriate to examine outcomes for this more disadvantaged group. Additionally, we use linear measures of income here as our investigations suggest the relationship is well-proxied as linear (at least above the lowest income to needs levels).

Lest we push the permanent income hypothesis too far, it is important to keep several caveats in mind. First, our measure is an average of imperfectly measured annual income measures. Thus, our "mean income" will average out some of the measurement error contained in the current income measures. Assuming classical measurement error, we would expect a larger coefficient on this "mean income" measure, regardless of whether consumers are obeying the permanent income hypothesis. Secondly, food insecurity is not the same as food consumption, and thus households may be smoothing consumption, even if they are not able to smooth their food security status. Finally, in the absence of well-functioning credit markets, nature provided a way of smoothing out the lean and plentiful times in terms of food: we can gain and lose weight.

Similar to the analyses in Section III, we ask whether there are characteristics of household that are systematically related to this rare outcome of VLFS among children. If it were just the case that there are random shocks to income or needs that plunge families into the extremes of poverty, then there should not be characteristics that are systematically correlated with VLFS among children. If there are, then these may indicate that there are unmeasured resources or unmet needs in households. The logic of this exercise is to ask if we use better measures of income, those that smooth out measurement error or are better correlated with long-term outcomes, then do these characteristics of the household cease to explain VLFS among children?

Before examining how controlling for these different measures of income change the coefficients on other household characteristics, we will examine how

these various income measures correlate with VLFS among children, before

controlling for characteristics. PSID Table 12a includes the full sample of 12,766

observations; these are households across the three years in which we observe food

security status. The first column of Table 12 includes a measure of current total

income on the right-hand-side (measured in thousands). These are linear

probability models so the coefficient suggests that a one thousand dollar increase in

annual income is associated with a 0.003 percentage point reduction in VLFS among

children. The next column measures income relative to the household's measure of

needs. The fact that the coefficient is larger is not surprising since a one unit now

means something quite different. The next column includes the measure of mean

total income relative to needs, perhaps capturing permanent income or simply

averaging out measurement error. The coefficient on mean total income to needs is

much larger than on the current income relative to needs. The coefficient on the

transitory component (measured as this year minus the average) is negative, but not

statistically significant. This suggests that, conditional on "permanent income," VLFS

among children is not generated by being hit with a bad shock in a given year, for

the overall sample.

Column 4 of Table 12 further disaggregates income into mean and transitory

versions of earned income, government transfer income, and other sources of

income. Here we again see that it is the "permanent" components that seem to

explain variation in VLFS among children. Note that the coefficient on mean income

from government transfers is positive, indicating that the types of households that

consistently qualify for and take up transfer programs are much more likely to have

VLFS among children. It is important to keep in mind that these coefficients are correlations, and this cannot be interpreted as a causal effect of transfer programs on VLFS among children.

Turning to the sample of low-income households in the right-hand panel of Table 12, we see some similar, but not identical patterns. Column 5 again shows that the measure of "permanent" income to needs is negative and statistically significant. However, now the measure of transitory total income to needs is also statistically significant. This suggests that, conditional on a measure of permanent income, in bad years low-income households are thrust into distress that is correlated with VLFS among children. The last column, which disaggregates income into permanent and transitory components of earnings, government transfers, and other income, also suggests this interpretation. Both the permanent and transitory components of earnings are negative and significantly correlated with VLFS among children. In this sample, none of the other coefficients are statistically significant, but the size and sign of the coefficient on government transfers is similar to the overall sample. This is a much smaller sample, and so we do not have the power to reject even potentially large effects. The fact that both the permanent and transitory components of earned income are statistically significant in this sample indicates that both are important in determining VLFS among children in this relatively low-income sample.

Next we turn to our thought experiment: if there are just random shocks that throw households into VLFS among children, then once we control for the households' income-relative-to-needs, nothing else should be statistically

significant. If income is mis-measured, and that mis-measurement is correlated with these characteristics, then getting better measures of income, or measures that more closely indicate "true" access to resources (or needs) should "knock out" the "effect" of these other household characteristics. For this exercise, we will focus on the low-income sample of households, results reported in Table 13.

The structure of the table is very similar to that of the tables just described. Columns 1 through 4 add various measures of income, income to needs, divided into mean and transitory components, and components from different sources. Here we begin by focusing on the coefficients for other measured characteristics of the households. In column 1, where current total income of the household is held constant, education of the household head, age of the head, and the head being disabled are statistically significantly correlated with VLFS among children. Consider the coefficient on age of the head of the household. This is positively and marginally statistically significantly related to VLFS among children. However, as we add more detailed measures of permanent and transitory components of income, the coefficient falls and becomes statistically insignificant. Similarly, although the coefficient on African American head of household is never statistically significant, once mean and transitory components of income are held constant, the coefficient is an order of magnitude smaller. Thus, for some characteristics associated with VLFS among children, there is modest evidence that if we can better measure incomes, we can explain why these characteristics are correlated with this outcome. However, there remain systematic relationships between VLFS among children and the

education level of the head and the disability status of the head that appear to transcend income.[30]

Perhaps, if we could truly measure income perfectly in its permanent and transitory components, neither education nor disability status of the head would matter for VLFS among Children. However, the results here are consistent with the following interpretation. Households are not able to smooth perfectly across good and bad years. Further, households where the head is better educated are better able to protect their children from VLFS, perhaps because they are able to make better use of the resources at hand. Households where the head is disabled, on the other hand, are consistently less able to protect their children from VLFS. This may indicate that there are unmet financial needs, or alternately, that disability inhibits the household heads' ability to convert his or her time into food security, because shopping and or cooking are more difficult in these households.

B.   Using the Supplemental Poverty Measure of Income

The household income measure in the March CPS, while very complete in terms of sources of income, is explicitly a pre-tax, pre-transfer measure. Thus, it may not accurately capture differences across households in resources. Fortunately, the data also include the value of in-kind transfers such as SNAP, school lunch, and subsidized housing, as well as health care via Medicaid, Medicare or employer health insurance contributions. It also provides information on taxes, including not

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[30] We tried a similar exercise with the CPS samples. Here, our measure of "mean income" is simply averaging across the two merged years of income available in the CPS. For these samples, average income-to-poverty is often statistically significantly associated with VLFS among kids, but the measure of transitory income is never statistically significant on its own. Other results are broadly consistent with the PSID. For example, "home owner" ceases to be significant when mean income is held constant, suggesting that being a home owner is correlated with permanent income.

only state and federal income taxes owed, but also payroll taxes and the EITC. Using

this information, along with the original cash income measure, we can calculate a

post-tax, post-transfer income measure that comes much closer to capturing the

household's available resources.[31] Using this new income measure relative to the

poverty line, Figure 4 recreates the relationship between VLFS among children and

the income/poverty ratio shown in Figure 1A. The scales used on the y-axis are

identical to aid in making comparisons. What is immediately obvious is that using

the SPM-like adjusted income measure results in a much flatter relationship. To the

extent that most of the households in this lower income sample have their income

adjusted upward, this flattening is to be expected. Essentially, some of the

households with VLFS among their children that have very low cash incomes are

moved up via in-kind transfers to higher income/poverty bins with non-VLFS

households.

We can also repeat the regressions shown in Table 9, but now controlling for

the post-tax, post-transfer income bins. These are shown in Table 14. Broadly

speaking, the results are very similar to before. Again, having a teenager-heavy

household increases the probability of the household's children having VLFS, as

does having a head who is disabled, a female head or a recent immigrant. Being a

homeowner decreases the probability, as does receipt of Veterans' benefits, while

both free/reduced price lunch and the EITC are positively correlated with having

VLFS children. Thus, while one might think that including the value of these

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[31] This adjusted income measure is motivated by the Supplemental Poverty Measure, which uses a post-tax, post-transfer concept of income to measure poverty. See Meyer and Sullivan (2012) and Fox et al. (2014) for discussions of the SPM and its effect on measurement of poverty.

programs in the income controls would reduce their impact in these regressions, it does not. It still appears that participation in these important programs is a proxy for some unmeasured aspect of need.

To further investigate how taxes and transfers affect the resources of households with and without VLFS children, Table 15 presents the results of the following experiment carried out on our main sample households (i.e. those with cash income under 300 percent of the poverty line). Separately by the children's food security status, we calculate the overall mean of cash income/poverty line ratio and the adjusted post-tax, post-transfer income/poverty line ratio. Then starting with cash income, we adjust income one element at a time. Finally, we add all in-kind transfers (excluding health benefits), then all health benefits, and then make all tax system adjustments (including the EITC). We repeat this exercise by quantile, where the quantiles are defined based on the overall cash income/poverty ratio.[32] Focusing on the first column in the upper panel, we see that using the standard cash income measure, the average household with VLFS among children is 14 percent above the poverty line. When taking into account all taxes and transfers, though, this median household rises 30 percentage points, from 114 percent of the poverty line to 144 percent. Turning to the first column of the lower panel, we see that this increase is much smaller for the households without a VLFS child. These households start much better off, at 162 percent of the poverty line, but rise only 14 percentage points, to 176 percent of the poverty line.

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[32] Thus, numbers of observations are approximately equal across quantiles when combining households with and without VLFS children, not when looking at them separately.

Looking now at which taxes and transfers are most important, we see in the top panel that on its own, SNAP moves the average household with a VLFS child up to 122 percent of the poverty line. This is one of the larger single programs, along with Medicaid, which raises the household to 125 percent of the poverty line by itself, and EITC, which raises it to 123 percent of the poverty line. Also playing a large role is employers' health insurance contributions, raising the average household with a VLFS child up to 121 percent of the poverty line. Interestingly, for households without VLFS children, SNAP is less of a major factor on its own, raising the average household without a VLFS child just 4 percentage points, to 166 percent of the poverty line. Employer health insurance contributions have the biggest impact of 12 percentage points while Medicaid and the EITC each imply a 7 percentage-point impact.

Turning to the bottom three rows of each panel, where we combine in-kind transfer programs, then combine health subsidies, and then combine tax impacts, there are clear differences across the households with and without VLFS children. For those with VLFS children, the tax system is essentially neutral, with the EITC exactly offsetting any tax payments. By contrast, those without are hit fairly hard by the tax system, reducing them to 149 percent of the poverty line. At the same time these households benefit greatly from health subsidies, which increase them 22 percentage points to 184 percent of the poverty line, while in-kind transfers have a modest impact of a 6 percentage-point increase. Those with VLFS children benefit more from in-kind transfers, seeing an 11 percentage-point increase due to these

programs. These households also see a large benefit from health subsidies, with a 20 percentage-point increase bringing them to 134 percent of the poverty line.

Looking more closely at the distribution provides further insights. First, it is noticeable that households with VLFS children are more likely to be very poor than those without. Thus, about half of the households are in the lowest quartile, a bit over a quarter are in the second quartile, and under a quarter are in the top two quartiles combined. Within each quartile, though, the two types of households are more similar than they were overall, making clear that these overall differences in households with and without VLFS children are driven by the larger fraction of the former group being in the lowest quartile. When we focus on this quartile, in columns (3) and (13), the patterns for the upper panel are fairly similar to what we saw overall, although this group is much poorer. Taking into account taxes and transfers, we see these households increase from 56 percent of the poverty line to 82 percent. For this group, SNAP is playing the largest role, leading to a 10-percentage-point increase, followed by the EITC with a 9-percentage-point increase. Interestingly, Medicaid seems quite a bit less important for this quartile than for the group overall, an increase of only 4 percentage points.

Turning to the lower panel, we see a similar pattern in which SNAP and the EITC are the largest contributors toward an increased income/poverty ratio, raising households without VLFS children from 58 percent of the poverty line to 65 and 66 percent respectively. Again Medicaid adds only 4 percentage points. Note that even within this lowest quartile, the households without VLFS children are a bit better off than those with when focusing on their pre-tax, pre-transfer income/poverty ratio.

Interestingly, though, it is the household with VLFS children who benefit slightly more from taxes and transfers, as they reach 82 percent of the poverty line compared to just 77 percent for those without. This finding that households with VLFS children have a lower cash income/poverty ratio than those with, but a higher measure post-tax, post-transfer continues for the next two quartiles. In the top quartile, these households actually have a higher ratio in both measures (although they are quite a small fraction of the overall group in this panel).

Returning to the second quartile, in columns (5) and (15), we see that taking into account taxes and transfers increases the income/poverty ratio from 133 to 171 for households with a VLFS child and from 136 to 161 for those without. In the upper panel, it is clear that Medicaid is playing a large role – increasing these households to 149 percent of the poverty by itself. The EITC is also doing some heavy lifting, raising households to 143 percent of the poverty line on its own. Employer health insurance contributions and SNAP also play an important role, raising households up to 140 and 139 percent of the poverty line, respectively. As with the previous quartile, there is very little effect from the tax system overall, although the EITC slightly outweighs taxes owed, such that households see a 1-percentage-point increase post-tax. This is not the case for households without VLFS children, where the post-tax income/poverty ratio is 4-percentage points below the pre-tax measure, and at 132 is below that in the top panel. That said, the pattern is again very much like that above, where Medicaid and the EITC are very important, although in this case employer health insurance contributions are equal to Medicaid.

Moving on to the third quartile, in columns (7) and (17), we see the value of health benefits moving up in importance. For the top panel, Medicaid adds 16 percentage points to the income/poverty ratio and employer health insurance contributions add 15. The next closest program in importance is the EITC, adding just 7 percentage points. In the lower panel, it is employer health insurance contributions that are clearly the most important, adding 17 percentage points, while Medicaid only adds 9. The EITC is also less important, adding just 4 percentage points. It is important to note, though, that the households without VLFS children are quite a bit better off in this quartile pre-tax and transfer, as they are at 202 percent of the poverty line. Also of note, is that this is the first quartile for which net taxes are negative for both groups. For those with VLFS children the income/poverty line is reduced from 193 to 180, while for those without it has a bigger drop, from 202 to 183. In both cases, payroll taxes are taking an especially big bite, resulting in a drop of about 13 percentage points due to FICA.

Finally, looking at the top quartile in columns (9) and (19), we see an interesting phenomenon. The households with VLFS among children are slightly better off pre-tax, pre-transfer at 269 percent of the poverty line versus 267 for those without, and they are much better off post-tax, post-transfer at 293 percent of the poverty line versus 263. The top quartile in the bottom panel is the first time that we see taxes outweigh transfers, leading to a reduction in the income/poverty ratio. In this panel, there is a very small positive impact of in-kind transfers, a larger impact of health subsidies, and a very large negative effect of taxes. In this case, there is only a very small positive impact of EITC, with taxes owed at the state and

federal level, and FICA again playing a large role, such that the post-tax

income/poverty ratio is 232. By contrast, in the top panel the EITC remains a bit

more positive, state and federal taxes owed are not as large, and even FICA does not

reduce things quite as badly. As a result, the post-tax income/poverty ratio is 246

for this group. These households with VLFS children also have larger in-kind

transfers and larger health benefits. Interestingly, these families benefit from food-

related transfers, while those without VLFS children do not.

A plausible potential explanation for the differences in VLFS among children

for households with similar measured incomes is that this pre-tax, pre-transfer

measure is inadequate and that a post-tax, post-transfer measure that best reflects

resource availability will do a better job. The results in Table 15 seem to rule out

this explanation however. While it is true that on average households with VLFS

children are poorer, within smaller cash-income groups these households are

actually better off in terms of measured resources than households without VLFS

children when we include the taxes and transfers. While including taxes and

transfers does a better job of measuring resources, we still may not be adequately

capturing need. One possible interpretation of the lower tax burdens computed for

the households with VLFS children is that they have more tax deductions that reflect

higher expenses. For example, for large medical expenses, or even simply for having

more children, if the increase in the poverty line per capita does not sufficiently

capture the expense of additional children. As we saw earlier, households with a

disabled head or with more teenagers were more likely to have a VLFS child.

Alternatively, this finding that households with VLFS children are actually doing

better that those without when we add taxes and transfers may just be further evidence that idiosyncratic household attributes, that are difficult to observe in standard data sets, are driving the incidence of VLFS among children. This idea is consistent with the earlier findings from the NHANES of the seeming importance of depression, social support and substance abuse.

VI. Results: Transitions

VLFS among children is not only a very rare phenomenon, we find that it is often quite transient. We more deeply explore children's transitions in and out of very low food security, using the sample of March-December merged households that could be matched across years. We pulled out the 168 households with VLFS among children in either of the two consecutive years of merged data. Figure 5a takes the 95 households that currently have a VLFS child and breaks down the household and child food security status in the previous year. Interestingly, almost 23 percent of the households were completely food secure in the previous year. At the same time, 10.9 percent had low food security status at the household level, but had food secure children, with another 2.8 percent having VLFS, but still managed to keep the children food secure. Thus, 36.5 percent of households who currently have VLSF among children had no food insecurity among their children the previous year (although over a third of these households were not actually food secure). Another quarter of households had been VLSF themselves, but had children who were only low, with another 21 percent also having had low children while also maintaining low security for themselves. Finally, just over 17 percent of these households had

VLFS overall and for their children in the previous year. Thus, almost 83 percent of households with VLFS children have just transitioned to that status in the current year.

Figure 5b looks at transitions out of VLFS among children, but breaking out the following year status for the 91 households that currently have a VLFS child. In this case, the plurality of almost 34 percent move out of VLFS among their children to both the household and the children being fully food secure. At the same time, 11.6 percent move their children to security while the household has low food security, with another 2.4 percent making their children secure even as the household has VLFS. Thus, almost half of the households (47.7 percent) that started with VLFS among children have fully food secure child in the next year. However, there are also just under 20 percent have children that remain VLFS in the second year, with the household similarly having VLFS. Finally, another third of the households with VLFS among children transition to just low food security among the children, but a third of the households within this group still have VLFS themselves.

Table 16 presents additional summary statistics on the CPS sample that has been merged across years.[33] Column (4) in Table 16 shows that 44 percent of households that are currently food insecure entered that state this year – that is, they were not food insecure last year. Similarly, column (7) shows that almost 61 percent of household with very low food security just entered that state this year, with 32 percent considered food secure in the previous year. Finally, in column (10) we see that almost 82 percent of households with very low food security among

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[33] See Kennedy et al. (2013) for a detailed analysis of transitions into and out of food security.

children had protected their children from this status last year. In fact, 52 percent of households with very low food security among children were not very low food security households last year, and over 21 percent were not at all food insecure last year. The good news from this information on transitions is that very low food security among children may not be a persistent state. The bad news is that poor nutrition, even for brief periods, if those periods are critical for development, may have long-lasting consequences. If very low food security among children is a state that happens suddenly, policies to address it must be able to act quickly, without long screening delays.

The remaining rows of Table 16 reflect changes in program participation across the year. There are a few interesting patterns across the columns. First, perhaps not unexpectedly, more households began getting SNAP, the more severe the food security situation. This result is consistent with the fact that many households were newly facing food insecurity problems, as such households would now have a reason to apply for SNAP. Interestingly, while there are some increases in the fraction of households newly receiving free/reduced price lunch, it is not as noticeable as it is for SNAP. New SNAP receipt increases from 7.4 percent for the full sample of poor households to 17.7 percent for households with very low food security among their children. By contrast, school lunch participation increases only from 12.2 percent to 17.2 percent. The other programs with noticeable increases in new receipt across columns are mainly the same programs that had noticeable patterns in Table 2. New welfare beneficiaries increase from 2.8 percent of poor

households to 9.6 percent of the very low food security among children sample, while new SSI claimants double from 2.9 percent to 5.8.

The ability to link a subset of our data across two years opens up additional possibilities for helping us to understand why households with seemingly similar incomes vary in their ability to protect their children from VLFS. Because only about a 20 percent subset of the data can be linked across years, we first estimate the same models from Table 9 on these data. While the results in Appendix Table 3 are fairly similar, with this much smaller sample it is more difficult to reach significance, particularly in the model with all of the covariates combined. Overall, though, we see that receipt of some non-means-tested programs is beneficial in protecting the household's children from VLFS, while having a disabled household head increases the probability. In the columns with groups of control variables included separately, we still see the deleterious effect of having more teenagers and the protective effect of being a homeowner. Broadly speaking, then, this smaller sample gives results that are fairly consistent with the previous findings from Table 9.

Moving to Table 17 we repeat the same set of models, but rather than focusing on the probability of the children being VLFS in the current year, we use the change in that probability.[34] Very few of the current characteristics are statistically significantly correlated with the change in VLFS. The only significant effects are that receipt of veterans' benefits is correlated with leaving VLFS status, while receipt of financial assistance is correlated with entering VLFS status. Note that these coefficients should not be interpreted as causal. For example, it is likely

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[34] Thus, the dependent variable is 0 if there is no change, 1 if the children in the family entered VLFS status and -1 if they left VLFS status.

that an external shock resulted in a household both entering VLFS among their children and applying for financial assistance.

The columns (5) through (8) maintain as the dependent variable the change in VLFS status, but regresses this change on *changes* in the covariates, rather than the levels.[35] In this case, we see more significant correlates. Here, starting to receive food stamp benefits is positively correlated with entering VLFS. Again, this is best interpreted as reflecting an external shock to the household's resources that resulted in both the entering (or exiting) of VLFS status and the beginning (or ending) SNAP receipt. The significantly positive impact of EITC can be interpreted similarly. As in the other models, receipt of Veterans' benefits is significantly negatively correlated with VLFS, and in this model, so is energy assistance, albeit the significance is only at the 10 percent level. While not significant when all of the covariates are included together, a change in homeownership status has a negative effect when included only with other demographics. Surprisingly, so does a change in disability status, implying that the household head becoming disabled is correlated with leaving VLFS status for the household's children. Given that this significance fades when including program participation, it is probable that becoming disabled is associated with increases in participation in many safety net programs that support children's food security.

Overall, focusing on the change in VLFS status in the sample matched December-to-March across two years has provided little additional insight into why some families are better able to protect their children from VLFS than others. Given

[35] The income bin controls are not included in changes, rather we control for bins of the average income/poverty ratio over the two years.

its rarity, though, the vast majority of this sample never experiences VLFS among children. Thus, we now focus on the limited sample (fewer than 170 observations) made up of only households that have ever experienced VLFS among children. As was seen in Figures 5a and 5b, over 80 percent of households with VLFS among children in a given year are not in this state in an adjacent year. The hope is that by focusing on this very volatile sample, we will have a better opportunity to pin down what is behind these transitions in and out of VLFS among children.[36]

Table 18 presents estimates on this very small, volatile subsample. The first set of models estimate the probability the household is currently facing VLFS among its children as a function of current household composition, demographics of the head, and program participation. As before, all models control for 20-percentage-point bins of the income/poverty ratio.[37] Interestingly, in this sample we actually see evidence of a food program being negatively related with VLFS among children – in this case it is participation in the free or reduced lunch program. Because this sample is already restricted to those households that have demonstrated problems with food insecurity, there may be less ability for program participation to simply proxy for being this type of household. Thus, among this sample participating in the school lunch program may help protect the children from VLFS. Controlling for all covariates implies a 27.3 percentage point lower probability of being VLFS if the child participates in the school lunch program. At the same time, though, we are still seeing marginally significant positive effects of financial assistance and EITC,

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[36] For sample comparison, Appendix Table 4 provides estimates to parallel Table 9 for this restricted sample.

[37] Rather than reduce the sample further, we do not limit ourselves to less than 300 percent of the poverty line, but instead capture those few households above that limit as the base group.

evidence that there are likely still selection issues driving some of the observed correlations.

Moving over to the next set of estimates, we again see that participation in the school lunch program has a negative and significant coefficient. In this case, controlling for all other covariates, the implication is that school lunch reduces the probability of moving into (or increases the probability of moving out of) VLFS among children by 52.8 percentage points. Receiving financial assistance remains marginally significantly positive, but only when controlling for all of the covariates. When program participation alone is controlled for, there are no significant effects of any program except school lunch. Finally, we regress changes on changes. Changes in the demographics of the household head are likely to occur when the reported head of the household changes – thus a change in the head being female is not due to a spate of sex change operations, but rather to separations and marriages. Note also that recent immigrant is defined as having arrived within the last 5 years, so a stable household head could change from recent to not recent if we observe them cross the 5-year mark.

In these final columns, there are several significant covariates. As was the case with the full matched sample, the change in food stamps is positive and the change in Veterans' benefits is negative. Unlike before, receipt of health insurance is now negative as well, at least when controlling for all covariates. When program participation alone is included the coefficient is not significantly different from zero, but workers' compensation is significantly positive. Turning to the household head demographics, becoming a homeowner is marginally significantly negative, implying

that losing one's home is positively correlated with the children becoming VLFS. If the head switches to being a recent immigrant, there is a large and significantly positive correlation with becoming VLFS, while if the head switches to a high school dropout the correlation is large and negative. Given that a recent immigrant may also be a high school dropout, it is possible that these correlations are driven by a very small number of households changing their household head to/from a recent immigrant high school dropout. Overall, there are quite a few differences in the size and significance of effects across the last four columns, implying a large degree of correlation across the covariates.

VII. Discussion & Conclusion

The goal of this project is to explain why very low food security status among children varies even among families with very similar measured income levels. If income relative to needs perfectly predicted very low food security status among children, then a regression of VLFS among children on income would have an R-squared of one. Backing away from that extreme example, if income relative to needs were the only thing that systematically explained VLFS among children, then measures of income relative to needs would be statistically significant in a regression of VLFS among children, and nothing else about the household would be, as VLFS among children would be driven by idiosyncratic shocks unobservable to the econometrician.

Our analysis examines what else, besides measured income relative to needs, is systematically correlated with VLFS among children. We loosely organize these

elements into environment, resources, and behavior. We examine whether various ways of capturing access to resources makes a difference for what else is systematically correlated with VLFS among children. For example, we examine whether using long-term measures of income to needs (averaged across many years in the PSID or two years in the CPS) changes what is systematically related to VLFS among children. We also examine whether measures of resources that explicitly take into account the tax and transfer system – as discussed in the literature around the Supplemental Poverty Measure – changes these correlates. To get further insight into VLFS among children, we examine transitions of households into and out of this state.

Although precisely parallel analyses are not possible across all the data sets, the results that emerge from this provide some informative patterns. First, we find little evidence that the geographic environment, and thus things that are correlated with geography such as persistent differences in prices across states, are correlated with VLFS among children. Second, no matter what measure of income-to-needs we use, there continue to be characteristics of the household or household "behaviors" that are systematically correlated with VLFS among children. These include household composition: households with more teenage children are more likely to suffer from VLFS among children, suggesting unmet needs as children grow and require more food. Further, a work limiting disability of the household head, depression, lack of emotional support, drug use, and time spent sleeping (which may all pick up related problems) are correlated with VLFS among children, even when controlling for income-to-needs. Next, households with VLFS among children are

more likely to participate in transfer programs meant to address such needs than are other similar households. When we control for income-to-needs, participation in programs directed at poverty alleviation indicates selection into these programs by needy households. Our analysis post-tax and post-transfer income to needs, inspired by the supplemental poverty measure, suggests that after taking program participation into account, households with very low food security among children have higher measured income-relative-to-measured needs than do households where the children are not food insecure. Thus, it seems that these households are applying for an receiving programmatic help, but other factors make it such that their access to resources are inadequate to insulate their children from VLFS status. Our analysis of transitions into and out of VLFS status among children suggests that for many households, this is a new and unexpected state.

The patterns of findings suggest several pathways for policy to address VLFS among children. First, the role of parents' mental and physical disabilities needs further study. Do households with significant health challenges need more income – perhaps because there are other uncompensated expenses – to keep their children food secure? Or, potentially, does disability mean that these households cannot turn other resources – like time – into food security because activities like food shopping or cooking are so much more burdensome in the face of these challenges? If so, then direct help, or resources to hire such help, may be required. The fact that having more teenage children is correlated with VLFS among children suggests that programs should adjust not only for the number of children, but for their ages.

Finally, the fact that for many households VLFS among children is a transitory state, is good news. However, if programs are going to shield children from the effects of VLFS among children, even if it is a short-term state, the policies need to be able respond quickly without long administrative delay.

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Table 1: State Characteristics by Food Security Status

	All Households <300% of Poverty		All Food Insecure Households		All Householdswith Very Low Food		Households with Very Low Food Secure Kids	
	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
State unemployment rate	6.4	2.2	6.7	2.3	6.7	2.3	6.8	2.3
SNAP participants/population	0.098	0.038	0.101	0.038	0.104	0.040	0.102	0.037
Lunch participants/population	0.060	0.016	0.061	0.017	0.061	0.017	0.061	0.017
WIC participants/population	0.027	0.007	0.028	0.007	0.028	0.007	0.028	0.007
TANF participants/population	0.016	0.010	0.016	0.010	0.015	0.010	0.015	0.011
SNAP benefits per HH participants	2768	569	2831	583	2858	580	2906	577
TANF benefits per HH participants	4766	10203	4606	8998	4526	7522	4476	2353
Sample size	32571		9077		2516		430	

Notes: Data are from the Current Population Surveys merged with state by year information on unemployment rates and program participation.

Table 2: Characteristics of CPS Households with Children and Below 300% of Poverty Line

	All Households <300% of Poverty Line		All Food Insecure Households		All Households with Very Low Food Security		Households with Very Low Food Security Among Children	
	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Receives Free/Reduced Price Lunch	0.377	0.485	0.542	0.498	0.600	0.490	0.686	0.465
Receives SNAP	0.235	0.424	0.396	0.489	0.445	0.497	0.450	0.498
Receives Energy Assistance	0.066	0.249	0.114	0.318	0.138	0.345	0.140	0.347
Receives Unemp. Compensation	0.105	0.307	0.132	0.339	0.141	0.349	0.137	0.344
Receives Workers' Compensation	0.015	0.119	0.020	0.140	0.021	0.142	0.021	0.144
Receives Social Security	0.115	0.319	0.132	0.338	0.149	0.356	0.157	0.364
Receives SSI	0.056	0.230	0.090	0.286	0.111	0.314	0.123	0.328
Receives Public Assistance/Welfare	0.062	0.240	0.106	0.307	0.120	0.325	0.140	0.347
Receives Veterans' Benefits	0.010	0.097	0.009	0.095	0.013	0.112	0.001	0.024
Receives Survivors' Benefits	0.006	0.075	0.005	0.069	0.006	0.079	0.002	0.049
Receives Disability Benefits	0.012	0.110	0.019	0.135	0.018	0.133	0.011	0.105
Receives Retirement Benefits	0.024	0.153	0.017	0.128	0.014	0.116	0.024	0.153
Receives Education Benefits	0.079	0.270	0.087	0.282	0.083	0.276	0.065	0.246
Receives Financial Benefits	0.020	0.141	0.032	0.177	0.042	0.199	0.035	0.185
Receives Medicaid	0.462	0.499	0.627	0.484	0.670	0.470	0.684	0.466
Receives Health Insurance	0.587	0.492	0.452	0.498	0.416	0.493	0.411	0.493
Receive EITC	0.507	0.500	0.579	0.494	0.574	0.495	0.649	0.478
# of Children Under Age 5	0.565	0.776	0.565	0.779	0.501	0.752	0.428	0.787
# of Children Age 5 to 12	0.976	0.988	1.012	1.007	1.027	1.008	0.993	1.032
# of Children Age 13 to 18	0.629	0.830	0.655	0.844	0.722	0.860	0.944	0.915
Total Household Size	4.283	1.743	4.219	1.778	4.132	1.730	4.301	1.754
Live in Rural Area	0.210	0.408	0.194	0.395	0.198	0.399	0.164	0.371
Household Head is Female	0.577	0.494	0.671	0.470	0.708	0.455	0.721	0.449
Household Head is Black	0.208	0.406	0.265	0.442	0.271	0.444	0.317	0.466
Head is Other Nonwhite	0.062	0.241	0.053	0.223	0.048	0.214	0.049	0.216
Head is Recent Immigrant	0.030	0.170	0.034	0.181	0.036	0.185	0.066	0.248
Household Head is Disabled	0.062	0.242	0.106	0.308	0.141	0.348	0.139	0.346
Household Head is a Homeowner	0.530	0.499	0.382	0.486	0.348	0.476	0.302	0.460
Household Head is HS Dropout	0.212	0.408	0.267	0.443	0.254	0.435	0.306	0.461
Fract. Year Looking for Work	0.037	0.106	0.052	0.123	0.056	0.125	0.057	0.115
Fract. Year Working	0.552	0.310	0.498	0.328	0.465	0.339	0.414	0.324
Household is Food Insecure	0.284	0.451	1.000	0.000	1.000	0.000	1.000	0.000
Household has VLFS	0.077	0.267	0.272	0.445	1.000	0.000	0.996	0.059
Children have VLFS	0.013	0.115	0.047	0.211	0.172	0.377	1.000	0.000
Sample size	32,572		9,078		2,502		431	

Table 3: Food Security Status of CPS Households with Children and Below 300% of Poverty Line by Selected Characteristics

	Don't Receive Free/ Reduced Price Lunch		Do Receive Free/ Reduced Price Lunch		Don't Receive SNAP		Do Receive SNAP	
	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev
Household is Food Insecure	0.209	0.406	0.409	0.492	0.224	0.417	0.480	0.500
Household has Very Low Food Security	0.050	0.217	0.123	0.328	0.056	0.230	0.146	0.354
Child has Very Low Food Security	0.007	0.082	0.024	0.154	0.010	0.097	0.026	0.158
Number of Observations	20,832		11,740		25,294		7,278	
	Don't Receive EITC		Do Receive EITC		Don't Receive Public Assist/Welfare		Do Receive Public Assist/Welfare	
	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev
Household is Food Insecure	0.243	0.429	0.324	0.468	0.271	0.444	0.487	0.500
Household has Very Low Food Security	0.067	0.250	0.087	0.282	0.072	0.259	0.150	0.357
Child has Very Low Food Security	0.010	0.097	0.017	0.129	0.012	0.110	0.030	0.171
Number of Observations	16,482		16,090		30,498		2,074	
	Household Contains No Teenagers		Household Contains Teenagers		Household Head is Male		Household Head is Female	
	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev
Household is Food Insecure	0.275	0.447	0.295	0.456	0.221	0.415	0.331	0.470
Household has Very Low Food Security	0.069	0.253	0.088	0.283	0.053	0.225	0.095	0.293
Child has Very Low Food Security	0.009	0.092	0.019	0.137	0.009	0.093	0.017	0.128
Number of Observations	18,046		14,526		14,015		18,557	
	Household Head Finished High School		Household Head is HS Dropout		Household Head is White		Household Head is Black	
	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev
Household is Food Insecure	0.264	0.441	0.359	0.480	0.265	0.442	0.363	0.481
Household has Very Low Food Security	0.073	0.260	0.093	0.290	0.072	0.259	0.101	0.301
Child has Very Low Food Security	0.012	0.108	0.019	0.138	0.012	0.107	0.020	0.141
Number of Observations	26,447		6,125		25,103		5,163	
	Household Head Is Not Disabled		Household Head Is Disabled		Household Head Is Not a Homeowner		Household Head Is a Homeowner	
	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev
Household is Food Insecure	0.272	0.445	0.485	0.500	0.373	0.484	0.205	0.404
Household has Very Low Food Security	0.071	0.257	0.175	0.380	0.107	0.309	0.051	0.219
Child has Very Low Food Security	0.012	0.110	0.030	0.171	0.020	0.139	0.008	0.087
Number of Observations	30,356		1,957		14,420		18,152	

Table 4: Summary Statistics for by Very Low Food Security among Children
(Standard Deviations in Parentheses)

	VLFS for Children=0 (1)	VLFS for Children=1 (2)
Current Total Income (in thousands)	85.78 (106.79)	22.44 (18.56)
Total Income to Needs	4.09 (4.92)	1.18 (0.919)
Mean Total Income to Needs	3.96 (3.57)	1.44 (0.949)
Transitory Total Income to Needs	-0.132 (3.06)	0.265 (0.727)
Mean Earned Income to Needs	3.51 (3.23)	1.00 (0.969)
Transitory Earned Income to Needs	-0.133 (2.54)	0.293 (0.597)
Mean Gov. Transfer Income to Needs	0.126 (0.200)	0.368 (0.321)
Transitory Gov. Transfer Income to Needs	0.010 (0.252)	-0.029 (0.247)
Mean Other Income to Needs	0.318 (0.745)	0.076 (0.196)
Transitory Other Income to Needs	-0.010 (1.24)	0.002 (0.257)
Observations	12674	92

Notes: Data are for households with children in PSID years 1999, 2001, 2003. "Mean" income variables are averaged across all years in which the household has valid value for that income type. "Transitory" income is current income minus the mean of that income type, so positive numbers indicate a better than average year. Income is in real dollars.

Table 5: Characteristics of NHANES Households with Children and Below 300% of Poverty Line

	All Households < 300% of Poverty Line			All Food Insecure Households			All Households with Very Low Food Security			Households with Very Low Food Secure Kids		
	Mean	Std Dev	N	Mean	Std Dev	N	Mean	Std Dev	N	Mean	Std Dev	N
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Have someone for financial support?	0.684	0.465	1,914	0.506	0.500	568	0.386	0.488	167	0.351	0.483	40
Have someone for emotional support?	0.911	0.285	1,917	0.885	0.319	568	0.855	0.353	168	0.717	0.456	40
Ever been to rehab?	0.058	0.234	3,552	0.082	0.275	1,172	0.111	0.315	330	0.161	0.371	53
Smoked pot in last 30 days?	0.124	0.330	3,552	0.178	0.383	1,172	0.233	0.423	330	0.177	0.385	53
Used heroin in last 30 days?	0.001	0.034	3,736	0.003	0.054	1,221	0.008	0.087	345	0.015	0.123	60
Used meth in last 30 days?	0.005	0.071	3,736	0.004	0.059	1,221	0.008	0.089	345	0.000	0.000	60
Used cocaine in last year?	0.019	0.136	6,508	0.023	0.150	1,973	0.018	0.134	591	0.024	0.154	108
Average daily # of drinks	2.36	3.09	7,238	2.50	3.18	2,160	2.26	2.98	636	2.46	2.99	113
Suffering from depression?	0.089	0.285	5,849	0.147	0.354	1,854	0.198	0.399	548	0.237	0.427	108
Days inactive due to health problems	1.76	5.48	11,410	2.44	6.46	3,738	2.97	7.22	1,179	4.17	8.79	253
Health is not good?	0.192	0.394	11,429	0.268	0.443	3,745	0.283	0.451	1,182	0.357	0.480	255
Currently employed?	0.628	0.483	11,526	0.544	0.498	3,548	0.514	0.500	1,083	0.463	0.500	242
Currently married?	0.589	0.492	12,245	0.525	0.499	3,782	0.492	0.500	1,161	0.371	0.484	260
Never married?	0.270	0.444	12,245	0.310	0.463	3,782	0.315	0.465	1,161	0.359	0.481	260
High school dropout?	0.484	0.500	15,002	0.591	0.492	4,636	0.601	0.490	1,455	0.687	0.464	317
Homeowner?	0.535	0.499	23,422	0.378	0.485	7,110	0.371	0.483	2,171	0.273	0.446	491
US citizen?	0.879	0.326	28,022	0.837	0.369	8,768	0.872	0.334	2,682	0.868	0.339	573
Black?	0.175	0.380	28,063	0.200	0.400	8,790	0.230	0.421	2,685	0.289	0.454	573
Household size	4.54	1.39	28,063	4.72	1.47	8,790	4.61	1.44	2,685	4.55	1.51	573
Income/Poverty ratio	1.444	0.796	28,063	1.065	0.659	8,790	1.012	0.641	2,685	0.786	0.534	573
Current BMI	24.9	7.8	23,314	25.2	8.1	7,414	25.4	8.6	2,304	25.6	8.5	500
Daily calories (from food diary)	2024	931	25,676	2017	930	8,120	2061	936	2,491	2044	1001	526
Percent of meals eaten at home	72.87	25.64	25,676	75.07	25.45	8,120	74.16	26.06	2,491	73.58	28.78	526
Percent of meals from fast food	7.63	12.96	25,676	7.80	13.14	8,120	7.82	13.18	2,491	7.23	13.15	526
Percent of recommended nutrients	63.63	31.30	28,063	62.65	31.59	8,790	63.23	31.29	2,685	63.56	32.18	573
Received SNAP?	0.755	0.430	28,063	0.806	0.395	8,790	0.816	0.388	2,685	0.903	0.297	573
Household is food insecure?	0.259	0.438	28,063	1.000	0.000	8,790	1.000	0.000	2,685	1.000	0.000	573
Household has very low food security?	0.083	0.276	28,063	0.322	0.467	8,790	1.000	0.000	2,685	1.000	0.000	573
Children have very low food security?	0.015	0.121	28,063	0.058	0.233	8,790	0.179	0.383	2,685	1.000	0.000	573

Table 6: Food Security Status of NHANES Households with Children and Below 300% of Poverty Line by Selected Characteristics

	Health Good		Health Not Good		Not Depressed		Depressed	
	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev
Household is Food Insecure	0.231	0.421	0.391	0.488	0.248	0.432	0.437	0.496
Household has Very Low Food Security	0.071	0.256	0.133	0.340	0.072	0.259	0.184	0.388
Child has Very Low Food Security	0.007	0.083	0.024	0.152	0.010	0.101	0.033	0.180
Number of Observations	4,795		1,817		5,064		544	
	Have Nobody for Emotional Support		Have Someone for Emotional Support		Have Nobody for Financial Support		Have Someone for Financial Support	
	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev
Household is Food Insecure	0.340	0.475	0.248	0.432	0.403	0.491	0.189	0.392
Household has Very Low Food Security	0.138	0.346	0.079	0.269	0.162	0.369	0.048	0.213
Child has Very Low Food Security	0.050	0.218	0.011	0.105	0.030	0.171	0.008	0.087
Number of Observations	238		1,847		672		1,409	
	Did Not Smoke Pot Past 30 Days		Smoked Pot Past 30 Days		Did Not Use Cocaine Past Year		Used Cocaine Past Year	
	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev
Household is Food Insecure	0.257	0.437	0.396	0.490	0.248	0.432	0.303	0.461
Household has Very Low Food Security	0.068	0.251	0.149	0.356	0.082	0.274	0.079	0.271
Child has Very Low Food Security	0.009	0.094	0.014	0.117	0.013	0.112	0.016	0.127
Number of Observations	3,076		417		6,334		115	
	Did Not Use Heroin Past 30 Days		Used Heroin Past 30 Days		Did Not Use Meth Past 30 Days		Used Meth Past 30 Days	
	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev
Household is Food Insecure	0.273	0.445	0.717	0.504	0.274	0.446	0.190	0.406
Household has Very Low Food Security	0.078	0.268	0.529	0.558	0.078	0.268	0.124	0.341
Child has Very Low Food Security	0.010	0.099	0.135	0.382	0.010	0.100	0.000	0.000
Number of Observations	3,672		5		3,662		15	
	Have Never Been in Rehab		Have Been in Rehab		Under 5 Drink Daily Average		5+ Drink Daily Average	
	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev
Household is Food Insecure	0.267	0.442	0.390	0.489	0.243	0.429	0.281	0.450
Household has Very Low Food Security	0.073	0.261	0.148	0.356	0.082	0.274	0.079	0.270
Child has Very Low Food Security	0.009	0.092	0.027	0.162	0.012	0.106	0.016	0.127
Number of Observations	3,295		198		6,109		1,129	

Note: only observations of adult sample members used.

Table 7: Characteristics of Children Under Age 13 in NHANES Households Below 300% of Poverty Line

	All Households <300% of Poverty Line			All Food Insecure Households			All Households with Very Low Food			Households with Very Low Food		
	Mean	Std Dev	N	Mean	Std Dev	N	Mean	Std Dev	N	Mean	Std Dev	N
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Daily calories (from dietary recall)	1,699	705	12,262	1,727	720.5	3,842	1,786	717.0	1,154	1,860	829.9	226
Percent of meals eaten at home	76.37	24.20	12,262	77.64	24.14	3,842	75.06	24.99	1,154	72.54	25.83	226
Percent of meals from fast food	5.487	10.59	12,262	5.696	10.63	3,842	5.438	10.01	1,154	6.227	10.86	226
Percent of recommended nutrients	64.14	28.21	13,539	64.84	28.33	4,198	66.37	28.00	1,249	67.33	30.27	247
Received SNAP?	0.318	0.466	13,526	0.493	0.500	4,192	0.540	0.499	1,248	0.572	0.496	247
Age (years)	5.934	3.732	13,539	6.109	3.774	4,198	6.465	3.700	1,249	6.864	3.569	247
Household size	4.658	1.372	13,539	4.840	1.450	4,198	4.749	1.446	1,249	4.842	1.465	247
Income/Poverty ratio	1.372	0.799	13,539	0.979	0.628	4,198	0.924	0.583	1,249	0.765	0.483	247
Male?	0.515	0.500	13,539	0.527	0.499	4,198	0.530	0.499	1,249	0.608	0.489	247
Black?	0.178	0.383	13,539	0.198	0.399	4,198	0.240	0.428	1,249	0.293	0.456	247
Hispanic?	0.268	0.443	13,539	0.384	0.486	4,198	0.316	0.465	1,249	0.345	0.476	247
US citizen?	0.963	0.188	13,525	0.944	0.230	4,190	0.952	0.214	1,249	0.938	0.241	247
Household if food insecure?	0.258	0.438	13,539	1	0	4,198	1	0	1,249	1	0	247
Household has very low food security	0.0789	0.270	13,539	0.306	0.461	4,198	1	0	1,249	1	0	247
Children have very low food security	0.0147	0.121	13,539	0.0571	0.232	4,198	0.187	0.390	1,249	1	0	247

Table8

Table 8: Characteristics of ATUS Households with Children

	All Households		All Households with Income <185% Poverty		All Food Insecure Households		All Households with Very Low Food Security		Households with Very Low Food Secure Kids	
	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Personal Care	558	163	578	179	585	191	590	188	606	144
w/out Sleep	44	67	44	78	45	75	44	57	42	39
Sleep	515	153	535	167	540	189	546	182	565	133
HH Activities	106	158	112	179	112	162	118	188	127	216
Food Prep	34	63	40	80	40	78	42	87	47	107
% Doing Food Preparation	*0.58*		*0.59*		*0.59*		*0.57*		*0.55*	
Care for HH member	58	109	59	104	57	99	53	115	35	79
Care for Non HH member	7	53	9	67	9	78	9	56	9	51
Leisure	228	237	254	241	254	277	256	230	243	230
Work	212	298	178	292	174	288	160	311	169	383
% Reporting Work	*0.43*		*0.35*		*0.37*		*0.33*		*0.30*	
Eating Drinking	62	61	57	52	53	51	52	58	58	71
Shopping	22	47	22	53	20	52	18	43	14	49
Food Shopping	10	32	11	35	11	35	9	32	4	16
Education	44	169	42	170	42	191	43	169	38	159
Use of services	6	40	6	40	8	40	9	40	6	40
Sports	22	68	18	66	17	64	20	84	22	68
Religious/Volunteer	17	69	15	59	15	62	14	57	17	48
Telephone	6	38	7	40	6	40	7	42	16	86
Travel	79	104	73	117	73	151	81	242	75	106
Sample Size	17341		5237		2413		613		100	

Note: Time use in minutes. Service use includes personal care, household and government services.

Table 9: Correlates of Very Low Food Security Among Children in CPS Households Below 300% of Poverty Line

	(1)	(2)	(3)	(4)
# of Children Under Age 5	-0.001			-0.001
	(0.001)			(0.001)
# of Children Age 5 to 12	0.001			-0.000
	(0.001)			(0.001)
# of Children Age 13 to 18	0.006***			0.006***
	(0.001)			(0.001)
Total Household Size	-0.001			0.000
	(0.001)			(0.001)
Household Head is Black		0.004**		0.002
		(0.002)		(0.002)
Household Head is Other Nonwhite		-0.002		-0.003
		(0.003)		(0.003)
Household Head is Recent Immigrant		0.014***		0.015***
		(0.004)		(0.004)
Household Head is Female		0.003**		0.002*
		(0.001)		(0.001)
Household Head is Disabled		0.013***		0.009***
		(0.003)		(0.003)
Live in Rural Area		-0.002		-0.002
		(0.002)		(0.002)
Household Head is a Homeowner		-0.006***		-0.007***
		(0.001)		(0.001)
Household Head is HS Dropout		0.003*		0.001
		(0.002)		(0.002)
Receives Medicaid			0.000	0.001
			(0.002)	(0.002)
Receives Free/Reduced Price Lunch			0.012***	0.009***
			(0.001)	(0.002)
Receives SNAP			0.002	0.002
			(0.002)	(0.002)
Receives Energy Assistance			0.003	0.003
			(0.003)	(0.003)
Receives Unemployment Compensation			0.003	0.004*
			(0.002)	(0.002)
Receives Workers' Compensation			0.007	0.006
			(0.005)	(0.005)
Receives Social Security			0.001	0.002
			(0.002)	(0.002)
Receives SSI			0.008***	0.006*
			(0.003)	(0.003)
Receives Public Assistance/Welfare			0.007**	0.006**
			(0.003)	(0.003)
Receives Veterans' Benefits			-0.013**	-0.012*
			(0.007)	(0.007)

(Continued)

	(2)	(3)	(4)	(5)
Receives Survivors' Benefits			-0.009	-0.009
			(0.009)	(0.009)
Receives Disability Benefits			-0.005	-0.008
			(0.006)	(0.006)
Receives Retirement Benefits			0.002	0.005
			(0.004)	(0.004)
Receives Education Benefits			-0.004	-0.004
			(0.002)	(0.002)
Receives Health Insurance			0.001	0.002
			(0.002)	(0.002)
Receives Financial Benefits			0.005	0.005
			(0.005)	(0.005)
Receive EITC			0.004**	0.003*
			(0.002)	(0.002)
Fraction of the Year Working			-0.009***	-0.003
(per potential worker)			(0.003)	(0.003)
Fraction of the Year Looking for Work			0.003	0.007
(per potential worker)			(0.006)	(0.006)
Constant	0.017***	0.013***	0.009**	0.004
	(0.004)	(0.004)	(0.004)	(0.005)
Observations	32,312	32,312	32,312	32,312
R-squared	0.009	0.010	0.011	0.015

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 10: Correlates of Very Low Food Security Among Children
in NHANES Households Below 300% of Poverty Line

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Health is not good	0.011***									0.006		
	(0.004)									(0.004)		
Days inactive due		0.001***								0.000		
to health problems		(0.000)								(0.000)		
Depressed			0.017**							0.016**		
			(0.007)							(0.007)		
Have someone for				-0.032**							-0.028*	
emotional support				(0.014)							(0.015)	
Have someone for					-0.018**						-0.014*	
financial support					(0.007)						(0.007)	
Smoked pot						0.002						-0.000
in last 30 days						(0.005)						(0.005)
Used heroin							0.121					0.110
in last 30 days							(0.132)					(0.132)
Ever been to rehab								0.016				0.015
								(0.010)				(0.010)
Received SNAP									0.009**	0.001	0.008	-0.004
									(0.004)	(0.004)	(0.011)	(0.005)
Observations	6,398	6,387	5,377	2,082	2,078	3,422	3,606	3,422	8,704	4,564	2,074	3,399
R-squared	0.014	0.017	0.016	0.040	0.039	0.009	0.012	0.011	0.016	0.019	0.043	0.013

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

All regressions include 20 percentage point income/poverty bin dummies, year dummies, household size and dummies for the sample adult being African-American, a high school dropout, a US citizen, a homeowner, and employed

Table 11: Correlates of Very Low Food Security Among Children in the American Time Use Survey

	(1)	(2)	(3)	(4)
Sleep	0.0008***			0.0009***
	(0.0003)			(0.0003)
Eating/drinking		-0.0001		0.0002
		(0.0008)		(0.0008)
Food preparation		0.0016**		0.0011
		(0.0007)		(0.0009)
Food shopping		-0.0034**		-0.0033**
		(0.0014)		(0.0014)
Household activities			0.0005*	0.0005
			(0.0003)	(0.0004)
Work			0.0001	0.0003
			(0.0002)	(0.0002)
Leisure			-0.0001	0.0000
			(0.0002)	(0.0002)
Observations	17,341	17,341	17,341	17,341
R-squared	0.0141	0.0142	0.0139	0.0148

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
Time measured in hours.

Table 12: Correlates of Very Low Food Security Among Children in the PSID

	Left Panel: All Income Levels				Right Panel: Less than 200 Percent of Poverty			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Current Total Income (in thousands)	-0.00003***				-0.00064**			
	(0.000)				(0.000)			
	0.000				0.012			
Total Income to Needs		-0.00071***				-0.01594**		
		(0.000)				(0.006)		
		0.000				0.012		
Mean Total Income to Needs			-0.00116***				-0.01880***	
			(0.000)				(0.007)	
			0.000				0.004	
Transitory Total Income to Need			-0.00012				-0.01224**	
			(0.000)				(0.006)	
			0.357				0.049	
Mean Earned Income to Needs				-0.00080***				-0.01948***
				(0.000)				(0.007)
				0.001				0.006
Transitory Earned Income to Needs				-0.00024				-0.01396**
				(0.000)				(0.007)
				0.123				0.032
Mean Gov. Transfer Income to Needs				0.03144***				0.02850
				(0.009)				(0.019)
				0.001				0.131
Transitory Gov. Transfer Income to Needs				0.00302				0.00935
				(0.004)				(0.016)
				0.403				0.562
Mean Other Income to Needs				-0.00102**				-0.00395
				(0.000)				(0.010)
				0.036				0.682
Transitory Other Income to Nee				0.00024				-0.00343
				(0.000)				(0.009)
				0.292				0.690
Observations	12,766	12,766	12,766	12,766	4,632	4,632	4,632	4,632
R-squared	0.002	0.002	0.003	0.010	0.005	0.005	0.007	0.016

Robust standard errors in parentheses; p-valu
*** p<0.01, ** p<0.05, * p<0.1

Table 13: Correlates of Very Low Food Security among Children in the PSID
(Households Less than 200% Poverty Line)

	(1)	(2)	(3)	(4)
Current Total Income	-0.00043*			
(in thousands)	(0.000)			
	0.073			
Total Income to Needs		-0.01154**		
		(0.006)		
		0.047		
Mean Total Income to Needs			-0.01509**	
			(0.006)	
			0.013	
Transitory Total Income to Needs			-0.00907	
			(0.006)	
			0.116	
Mean Earned Income to Needs				-0.01627***
				(0.006)
				0.007
Transitory Earned Income to Needs				-0.00995*
				(0.005)
				0.068
Mean Gov. Transfer Income to Needs				0.00037
				(0.023)
				0.987
Transitory Gov. Transfer Income to Needs				-0.00168
				(0.017)
				0.923
Mean Other Income to Needs				-0.00877
				(0.010)
				0.378
Transitory Other Income to Needs				-0.00620
				(0.009)
				0.475
African American	0.00358	0.00335	0.00096	0.00021
Household Head	(0.008)	(0.008)	(0.008)	(0.008)
	0.650	0.674	0.906	0.979
H.S. Grad Head of HH	-0.01840***	-0.01790***	-0.01660***	-0.01572***
	(0.006)	(0.006)	(0.006)	(0.006)
	0.002	0.003	0.005	0.006
Some College	-0.00271	-0.00217	0.00169	0.00254
Head of HH	(0.013)	(0.013)	(0.013)	(0.013)
	0.829	0.864	0.899	0.846
College Grad	0.00093	0.00123	0.00919	0.00959
Head of HH	(0.012)	(0.012)	(0.013)	(0.013)
	0.940	0.921	0.477	0.446
Family Size	-0.00119	-0.00329	-0.00347	-0.00280
	(0.003)	(0.003)	(0.003)	(0.003)
	0.695	0.274	0.248	0.390
Number of kids (0 to 17)	-0.00046	-0.00011	-0.00038	-0.00091
	(0.004)	(0.004)	(0.004)	(0.004)
	0.904	0.976	0.920	0.819
Female Head of HH	0.00589	0.00544	0.00455	0.00331
	(0.007)	(0.007)	(0.007)	(0.007)
	0.423	0.458	0.528	0.641
Age of Head of HH	0.00043*	0.00044*	0.00044*	0.00031
	(0.000)	(0.000)	(0.000)	(0.000)
	0.088	0.080	0.084	0.294
Disabled Head of HH	0.03570***	0.03536***	0.03424***	0.03137**
	(0.012)	(0.012)	(0.011)	(0.012)
	0.002	0.002	0.003	0.011
Observations	4,632	4,632	4,632	4,632
R-squared	0.028	0.029	0.030	0.031

Robust standard errors in parentheses; p-value below.

*** p<0.01, ** p<0.05, * p<0.1

Table 14: Correlates of Very Low Food Security Among Children in CPS Households Below 300% of Poverty Line (Controlling for Post-Tax, Post-Transfer Income)

	(1)	(2)	(3)	(4)
# of Children Under Age 5	-0.001	0.000		
	(0.001)	(0.001)		
# of Children Age 5 to 12	-0.000	0.002		
	(0.001)	(0.001)		
# of Children Age 13 to 18	0.006***	0.007***		
	(0.001)	(0.001)		
Total Household Size	-0.000	-0.001**		
	(0.001)	(0.001)		
Household Head is Black	0.002		0.005**	
	(0.002)		(0.002)	
Household Head is Other Nonwhite	-0.004		-0.003	
	(0.002)		(0.002)	
Household Head is Recent Immigrant	0.015**		0.013*	
	(0.007)		(0.007)	
Household Head is Female	0.003**		0.004***	
	(0.001)		(0.001)	
Household Head is Disabled	0.009*		0.014***	
	(0.005)		(0.004)	
Live in Rural Area	-0.002*		-0.002	
	(0.001)		(0.001)	
Household Head is a Homeowner	-0.006***		-0.007***	
	(0.002)		(0.001)	
Household Head is HS Dropout	0.001		0.004*	
	(0.002)		(0.002)	
Receives Medicaid	0.001			0.001
	(0.002)			(0.002)
Receives Free/Reduced Price Lunch	0.009***			0.011***
	(0.002)			(0.002)
Receives SNAP	0.003			0.004
	(0.003)			(0.003)
Receives Energy Assistance	0.004			0.003
	(0.004)			(0.004)
Receives Unemployment Compensation	0.004			0.003
	(0.003)			(0.003)
Receives Workers' Compensation	0.007			0.008
	(0.007)			(0.007)
Receives Social Security	0.001			0.001
	(0.003)			(0.003)
Receives SSI	0.007			0.009*
	(0.005)			(0.005)
Receives Public Assistance/Welfare	0.008			0.008
	(0.005)			(0.005)
Receives Veterans' Benefits	-0.012***			-0.013***
	(0.002)			(0.001)

	(1)	(2)	(3)	(4)
Receives Survivors' Benefits	-0.008			-0.008*
	(0.005)			(0.005)
Receives Disability Benefits	-0.007			-0.005
	(0.007)			(0.007)
Receives Retirement Benefits	0.003			0.001
	(0.005)			(0.005)
Receives Education Benefits	-0.004			-0.004
	(0.003)			(0.003)
Receives Health Insurance	0.002			0.001
	(0.002)			(0.002)
Receives Financial Benefits	0.006			0.005
	(0.007)			(0.007)
Receive EITC	0.004**			0.005***
	(0.002)			(0.002)
Fraction of the Year Working	-0.004			-0.009***
(per potential worker)	(0.003)			(0.003)
Fraction of the Year Looking for Work	0.009			0.005
(per potential worker)	(0.008)			(0.008)
Constant	0.000	0.017***	0.013**	0.005
	(0.007)	(0.006)	(0.006)	(0.006)
Observations	34,241	34,241	34,241	34,241
R-squared	0.016	0.009	0.010	0.012

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
All models include dummies for 20 percentage point income/poverty ratio bins and year dummies.
Note that income/poverty ratio is calculated with post-tax, post-transfer income.

Table 15: Alternate Income/Poverty Ratios by VLFS and Cash-Income/Poverty Quartile

VARIABLES	(1) VLFS mean	(2) N	(3) VLFS quartile 1 mean	(4) N	(5) VLFS quartile 2 mean	(6) N	(7) VLFS quartile 3 mean	(8) N	(9) VLFS quartile 4 mean	(10) N
Pre-Tax, Pre-Transfer	114	430	56	201	133	126	193	70	269	33
Post-Tax, Post-Transfer	144	427	82	198	171	126	219	70	293	33
Just + SNAP	122	427	66	198	139	126	195	70	271	33
Just + School Lunch	117	430	59	201	135	126	194	70	271	33
Just + Medicare	117	430	56	201	137	126	196	70	278	33
Just + Medicaid	125	430	60	201	149	126	209	70	284	33
Just + Subsidized Housing	115	430	56	201	133	126	193	70	269	33
Just + Health Insurance	121	430	58	201	140	126	208	70	289	33
Just + EITC	123	430	65	201	143	126	200	70	272	33
Just - Federal Taxes	113	430	56	201	132	126	189	70	260	33
Just - State Taxes	113	430	55	201	132	126	189	70	265	33
Just - FICA Taxes	108	430	53	201	126	126	180	70	256	33
Just - Federal Ret Taxes	114	430	56	201	133	126	192	70	269	33
Just + All In-Kind	125	427	70	198	142	126	197	70	273	33
Just + All Health Related	134	430	62	201	161	126	228	70	313	33
Just +/- All Tax Programs	114	430	61	201	134	126	180	70	246	33

VARIABLES	(11) not VLFS mean	(12) N	(13) not VLFS quartile 1 mean	(14) N	(15) not VLFS quartile 2 mean	(16) N	(17) not VLFS quartile 3 mean	(18) N	(19) not VLFS quartile 4 mean	(20) N
Pre-Tax, Pre-Transfer	162	32,141	58	7,942	136	8,017	202	8,073	267	8,109
Post-Tax, Post-Transfer	176	31,726	77	7,732	161	7,896	214	8,027	263	8,071
Just + SNAP	166	31,726	65	7,732	139	7,896	204	8,027	267	8,071
Just + School Lunch	164	32,141	60	7,942	138	8,017	203	8,073	267	8,109
Just + Medicare	165	32,141	58	7,942	139	8,017	206	8,073	270	8,109
Just + Medicaid	169	32,141	61	7,942	148	8,017	211	8,073	272	8,109
Just + Subsidized Housing	163	32,141	58	7,942	136	8,017	202	8,073	267	8,109
Just + Health Insurance	174	32,141	60	7,942	146	8,017	219	8,073	288	8,109
Just + EITC	169	32,141	66	7,942	146	8,017	206	8,073	268	8,109
Just - Federal Taxes	157	32,141	56	7,942	134	8,017	197	8,073	255	8,109
Just - State Taxes	159	32,141	57	7,942	134	8,017	198	8,073	260	8,109
Just - FICA Taxes	152	32,141	54	7,942	127	8,017	188	8,073	249	8,109
Just - Federal Ret Taxes	162	32,141	57	7,942	136	8,017	202	8,073	266	8,109
Just + All In-Kind	168	31,726	68	7,732	141	7,896	205	8,027	268	8,071
Just + All Health Related	184	32,141	64	7,942	160	8,017	231	8,073	296	8,109
Just +/- All Tax Programs	149	32,141	61	7,942	132	8,017	183	8,073	232	8,109

Table 16: Changes in Characteristics of CPS Matched Households with Children and Below 300% of Poverty Line

	All Households < 300% of Poverty Line			All Food Insecure Households			All Households with Very Low Food Security			Households with Very Low Food Secure Kids		
	Mean	Std Dev	N	Mean	Std Dev	N	Mean	Std Dev	N	Mean	Std Dev	N
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Household became food insecure	0.112	0.315	6,805	0.444	0.497	1,679	0.319	0.467	453	0.218	0.415	86
Household became very low food secure	0.043	0.202	6,805	0.169	0.375	1,679	0.608	0.489	453	0.523	0.502	86
Child became very low food secure	0.010	0.101	6,805	0.041	0.199	1,679	0.148	0.355	453	0.815	0.391	86
Began getting Medicaid	0.000	0.000	6,805	0.000	0.000	1,679	0.000	0.000	453	0.000	0.000	86
Began getting free/reduced price lunch	0.122	0.327	6,805	0.166	0.372	1,679	0.145	0.353	453	0.172	0.380	86
Began getting SNAP	0.074	0.261	6,805	0.130	0.336	1,679	0.142	0.349	453	0.177	0.384	86
Began getting energy assistance	0.000	0.000	6,805	0.000	0.000	1,679	0.000	0.000	453	0.000	0.000	86
Began getting unemployment compensation	0.060	0.238	6,805	0.082	0.274	1,679	0.094	0.292	453	0.041	0.200	86
Began getting workers' compensation	0.011	0.105	6,805	0.015	0.122	1,679	0.016	0.125	453	0.000	0.000	86
Began getting Social Security benefits	0.042	0.200	6,805	0.053	0.224	1,679	0.050	0.218	453	0.062	0.242	86
Begain getting SSI benefits	0.029	0.169	6,805	0.051	0.220	1,679	0.074	0.262	453	0.058	0.236	86
Began getting public assistance/welfare	0.028	0.166	6,805	0.053	0.223	1,679	0.063	0.243	453	0.096	0.296	86
Began getting veterans' payments	0.005	0.074	6,805	0.005	0.071	1,679	0.015	0.122	453	0.000	0.000	86
Began getting survivors' benefits	0.004	0.066	6,805	0.002	0.040	1,679	0.001	0.030	453	0.000	0.000	86
Began getting disability benefits	0.009	0.095	6,805	0.014	0.116	1,679	0.007	0.081	453	0.000	0.000	86
Began getting retirement benefits	0.017	0.130	6,805	0.017	0.129	1,679	0.015	0.122	453	0.020	0.141	86
Began getting education benefits	0.051	0.219	6,805	0.055	0.227	1,679	0.041	0.198	453	0.028	0.165	86
Began getting health insurance	0.080	0.272	6,805	0.068	0.251	1,679	0.081	0.274	453	0.106	0.310	86
Began getting financial benefits	0.014	0.117	6,805	0.023	0.151	1,679	0.028	0.166	453	0.049	0.218	86
Began getting EITC	0.147	0.354	6,805	0.136	0.343	1,679	0.147	0.354	453	0.171	0.379	86

Table 17: Correlates of Changes in Very Low Food Security Among Children
in CPS Households Below 300% of Poverty Line
(Controlling for Post-Tax, Post-Transfer Income)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
# of Children Under Age 5	-0.002	-0.000			-0.002	0.001			0.012	0.008		
	(0.003)	(0.003)			(0.004)	(0.004)			(0.009)	(0.008)		
# of Children Age 5 to 12	-0.000	0.001			-0.001	-0.001			0.001	-0.001		
	(0.002)	(0.002)			(0.003)	(0.003)			(0.006)	(0.006)		
# of Children Age 13 to 18	0.004	0.005**			-0.001	0.000			-0.009	-0.010		
	(0.003)	(0.002)			(0.004)	(0.004)			(0.007)	(0.006)		
Total Household Size	-0.000	-0.002			0.001	0.000			0.000	0.001		
	(0.002)	(0.001)			(0.002)	(0.002)			(0.003)	(0.003)		
Household Head is Black	0.005		0.006		0.005		0.003		-0.222		-0.206	
	(0.006)		(0.006)		(0.007)		(0.007)		(0.187)		(0.173)	
Household Head is Other Nonwhite	-0.005		-0.005		-0.002		-0.001		-0.054		-0.052	
	(0.004)		(0.004)		(0.005)		(0.005)		(0.051)		(0.044)	
Household Head is Recent Immigrant	0.034		0.033		0.036		0.036		0.033		0.025	
	(0.021)		(0.021)		(0.023)		(0.023)		(0.029)		(0.026)	
Household Head is Female	0.003		0.005*		-0.004		-0.004		0.002		0.005	
	(0.003)		(0.003)		(0.004)		(0.004)		(0.008)		(0.007)	
Household Head is Disabled	0.016*		0.016*		-0.002		-0.002		-0.016		-0.028**	
	(0.009)		(0.009)		(0.013)		(0.013)		(0.010)		(0.014)	
Live in Rural Area	-0.003		-0.002		0.004		0.003		-0.001		0.002	
	(0.003)		(0.003)		(0.004)		(0.004)		(0.005)		(0.005)	
Household Head is a Homeowner	-0.005		-0.007**		-0.004		-0.005		-0.007		-0.017**	
	(0.004)		(0.004)		(0.005)		(0.005)		(0.005)		(0.007)	
Household Head is HS Dropout	-0.000		0.001		0.001		0.001		-0.010		-0.011	
	(0.005)		(0.005)		(0.006)		(0.006)		(0.024)		(0.021)	
Receives Medicaid	0.001			0.001	0.005			0.005	0.002			0.002
	(0.004)			(0.004)	(0.006)			(0.005)	(0.005)			(0.005)
Receives Free/Reduced Price Lunch	0.005			0.007*	-0.006			-0.005	0.003			0.002
	(0.005)			(0.004)	(0.006)			(0.006)	(0.005)			(0.005)
Receives SNAP	0.008			0.008	0.001			0.000	0.014*			0.014*
	(0.007)			(0.007)	(0.009)			(0.009)	(0.008)			(0.008)
Receives Energy Assistance	0.005			0.004	0.007			0.006	-0.021*			-0.022*
	(0.009)			(0.009)	(0.010)			(0.010)	(0.011)			(0.011)
Receives Unemployment Compensation	0.001			-0.000	0.007			0.007	-0.006			-0.006
	(0.006)			(0.006)	(0.007)			(0.007)	(0.006)			(0.006)
Receives Workers' Compensation	-0.009***			-0.009***	0.001			0.001	0.012			0.013
	(0.003)			(0.003)	(0.004)			(0.003)	(0.009)			(0.009)
Receives Social Security	-0.006			-0.005	-0.005			-0.007	-0.017			-0.017
	(0.006)			(0.005)	(0.009)			(0.008)	(0.011)			(0.011)
Receives SSI	0.001			0.005	-0.005			-0.005	0.000			-0.000
	(0.010)			(0.009)	(0.010)			(0.010)	(0.010)			(0.010)
Receives Public Assistance/Welfare	0.012			0.013	0.008			0.008	0.007			0.007
	(0.012)			(0.012)	(0.015)			(0.015)	(0.011)			(0.011)
Receives Veterans' Benefits	-0.009*			-0.010**	-0.061*			-0.061*	-0.059*			-0.058*
	(0.005)			(0.004)	(0.035)			(0.035)	(0.033)			(0.033)

(Continued)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Receives Survivors' Benefits	-0.010*			-0.011**	-0.000			-0.002	-0.002			0.000
	(0.005)			(0.005)	(0.005)			(0.004)	(0.003)			(0.003)
Receives Disability Benefits	-0.020***			-0.015***	-0.001			-0.001	-0.001			-0.002
	(0.005)			(0.004)	(0.006)			(0.004)	(0.004)			(0.004)
Receives Retirement Benefits	0.006			0.003	-0.003			-0.003	-0.004			-0.005
	(0.007)			(0.007)	(0.014)			(0.014)	(0.008)			(0.008)
Receives Education Benefits	-0.003			-0.003	-0.007			-0.007	-0.004			-0.004
	(0.006)			(0.006)	(0.008)			(0.008)	(0.005)			(0.005)
Receives Health Insurance	-0.000			-0.001	0.000			-0.001	-0.006			-0.006
	(0.004)			(0.004)	(0.005)			(0.005)	(0.006)			(0.006)
Receives Financial Benefits	0.033			0.032	0.052**			0.051**	0.003			0.003
	(0.025)			(0.025)	(0.025)			(0.025)	(0.005)			(0.004)
Receive EITC	0.002			0.003	0.006			0.006	0.010***			0.011***
	(0.004)			(0.004)	(0.005)			(0.005)	(0.004)			(0.004)
Fraction of the Year Working	-0.001			-0.006	-0.008			-0.008	0.003			0.003
(per potential worker)	(0.008)			(0.008)	(0.010)			(0.009)	(0.006)			(0.006)
Fraction of the Year Looking for Work	-0.003			-0.006	-0.055			-0.056	0.002			-0.000
(per potential worker)	(0.020)			(0.020)	(0.036)			(0.036)	(0.016)			(0.016)
Constant	-0.002	0.016	0.006	0.003	-0.016	-0.015	-0.012	-0.014	0.008	0.001	-0.001	0.007
	(0.013)	(0.013)	(0.012)	(0.012)	(0.021)	(0.019)	(0.017)	(0.019)	(0.008)	(0.008)	(0.008)	(0.008)
Observations	6,779	6,779	6,779	6,779	6,779	6,779	6,779	6,779	6,103	6,642	6,642	6,103
R-squared	0.022	0.012	0.016	0.016	0.012	0.003	0.005	0.010	0.022	0.005	0.007	0.015

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

All models include dummies for 20 percentage point post tax and transfer income/poverty ratio bins and year dummies.

Dependent variable in Columns (1) to (4) is in an indicator for very low food security among children.

Dependent variable in columns (5) to (12) is change in the very low food security among children indicator.

Covariates in columns (9) to (12) are in changes.

Table 18: Correlates of Changes in Very Low Food Security Among Children
in CPS Households That Ever Have a Child with Very Low Food Security
(Controlling for Post-Tax, Post-Transfer Income)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
# of Children Under Age 5	-0.082	0.014			-0.085	0.095			0.245	0.305		
	(0.166)	(0.144)			(0.321)	(0.277)			(0.252)	(0.188)		
# of Children Age 5 to 12	-0.000	-0.012			0.011	0.015			-0.395	-0.313*		
	(0.112)	(0.086)			(0.220)	(0.165)			(0.275)	(0.186)		
# of Children Age 13 to 18	0.015	0.026			0.093	0.071			-0.381	-0.520***		
	(0.099)	(0.096)			(0.197)	(0.183)			(0.263)	(0.183)		
Total Household Size	-0.014	-0.036			-0.026	-0.080			0.094	0.040		
	(0.076)	(0.058)			(0.149)	(0.110)			(0.195)	(0.106)		
Household Head is Black	-0.056		0.002		-0.098		-0.015		0.903		0.188	
	(0.135)		(0.125)		(0.263)		(0.238)		(1.033)		(0.577)	
Household Head is Other Nonwhite	-0.181		0.007		-0.374		-0.070					
	(0.249)		(0.205)		(0.529)		(0.369)					
Household Head is Recent Immigrant	0.336		0.196		0.819*		0.544		2.449***		1.394***	
	(0.257)		(0.214)		(0.488)		(0.406)		(0.860)		(0.478)	
Household Head is Female	-0.189		-0.101		-0.232		-0.163		0.721		0.897**	
	(0.121)		(0.110)		(0.235)		(0.207)		(0.673)		(0.412)	
Household Head is Disabled	-0.095		0.035		-0.090		0.169		-0.076		-0.728***	
	(0.175)		(0.139)		(0.343)		(0.274)		(0.578)		(0.251)	
Live in Rural Area	-0.068		0.023		0.037		0.054		-0.311		0.036	
	(0.159)		(0.133)		(0.292)		(0.249)		(0.328)		(0.259)	
Household Head is a Homeowner	-0.085		-0.067		-0.198		-0.162		-0.526*		-0.710**	
	(0.121)		(0.108)		(0.241)		(0.207)		(0.309)		(0.286)	
Household Head is HS Dropout	-0.035		-0.019		-0.035		-0.043		-1.023**		-0.286	
	(0.132)		(0.125)		(0.253)		(0.240)		(0.476)		(0.613)	
Receives Medicaid	0.019			-0.007	0.067			0.038	0.123			0.074
	(0.133)			(0.126)	(0.264)			(0.244)	(0.250)			(0.271)
Receives Free/Reduced Price Lunch	-0.273**			-0.230*	-0.528**			-0.421*	0.152			-0.018
	(0.129)			(0.118)	(0.257)			(0.236)	(0.165)			(0.200)
Receives SNAP	0.126			0.066	0.195			0.062	0.443**			0.267
	(0.141)			(0.121)	(0.278)			(0.238)	(0.206)			(0.215)
Receives Energy Assistance	0.146			0.135	0.160			0.141	-0.293			-0.212
	(0.152)			(0.140)	(0.283)			(0.259)	(0.310)			(0.298)
Receives Unemployment Compensation	-0.106			-0.055	-0.221			-0.150	-0.323			-0.066
	(0.176)			(0.156)	(0.343)			(0.304)	(0.244)			(0.231)
Receives Workers' Compensation												
Receives Social Security	-0.201			-0.203	-0.281			-0.321	1.686			1.258*
	(0.193)			(0.161)	(0.364)			(0.305)	(1.088)			(0.713)
Receives SSI	0.231			0.208	0.055			0.022	-0.249			-0.520
	(0.220)			(0.194)	(0.404)			(0.368)	(0.389)			(0.319)
Receives Public Assistance/Welfare	0.061			0.063	0.165			0.194	-0.486			-0.295
	(0.174)			(0.157)	(0.331)			(0.313)	(0.534)			(0.465)
Receives Veterans' Benefits	-0.160			-0.248	-0.536			-0.710	-0.017			-0.175
	(0.280)			(0.256)	(0.546)			(0.489)	(0.440)			(0.436)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Receives Survivors' Benefits	0.145			0.044	-0.694			-0.656	-1.083**			-0.881*
	(0.371)			(0.295)	(0.692)			(0.573)	(0.489)			(0.453)
Receives Disability Benefits	-0.162			-0.122	0.020			0.007	-0.602			-0.821
	(0.276)			(0.282)	(0.565)			(0.561)	(0.619)			(0.581)
Receives Retirement Benefits	-0.099			-0.140	-0.180			-0.211	-0.576			-0.468
	(0.182)			(0.152)	(0.345)			(0.295)	(0.494)			(0.502)
Receives Education Benefits	-0.003			-0.073	-0.082			-0.223	-0.491**			-0.261
	(0.143)			(0.132)	(0.294)			(0.260)	(0.228)			(0.211)
Receives Health Insurance	0.511*			0.391	1.042*			0.784	-0.986			-0.262
	(0.292)			(0.279)	(0.563)			(0.557)	(0.743)			(0.734)
Receives Financial Benefits	0.249*			0.272**	0.362			0.388	0.087			0.439
	(0.140)			(0.132)	(0.274)			(0.263)	(0.289)			(0.267)
Receive EITC	-0.406			-0.220	-0.712			-0.425	0.251			-0.238
	(0.252)			(0.204)	(0.486)			(0.401)	(0.393)			(0.409)
Fraction of the Year Working	-0.511			-0.361	-0.952			-0.834	0.791			-0.241
(per potential worker)	(0.342)			(0.307)	(0.669)			(0.599)	(0.691)			(0.724)
Fraction of the Year Looking for Work	1.238**	0.604	0.639	0.814**	1.429	0.237	0.375	0.782	-0.815	0.473	-0.007	-1.249*
(per potential worker)	(0.496)	(0.406)	(0.401)	(0.393)	(0.959)	(0.811)	(0.790)	(0.771)	(0.765)	(0.502)	(0.782)	(0.667)
Constant	162	162	162	162	162	162	162	162	123	157	157	123
	0.344	0.182	0.186	0.300	0.303	0.151	0.167	0.260	0.563	0.250	0.247	0.419

Observations

R-squared

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

All models include dummies for 20 percentage point post tax and transfer income/poverty ratio bins and year dummies.

Dependent variable in Columns (1) to (4) is in an indicator for very low food security among children.

Dependent variable in columns (5) to (12) is change in the very low food security among children indicator.

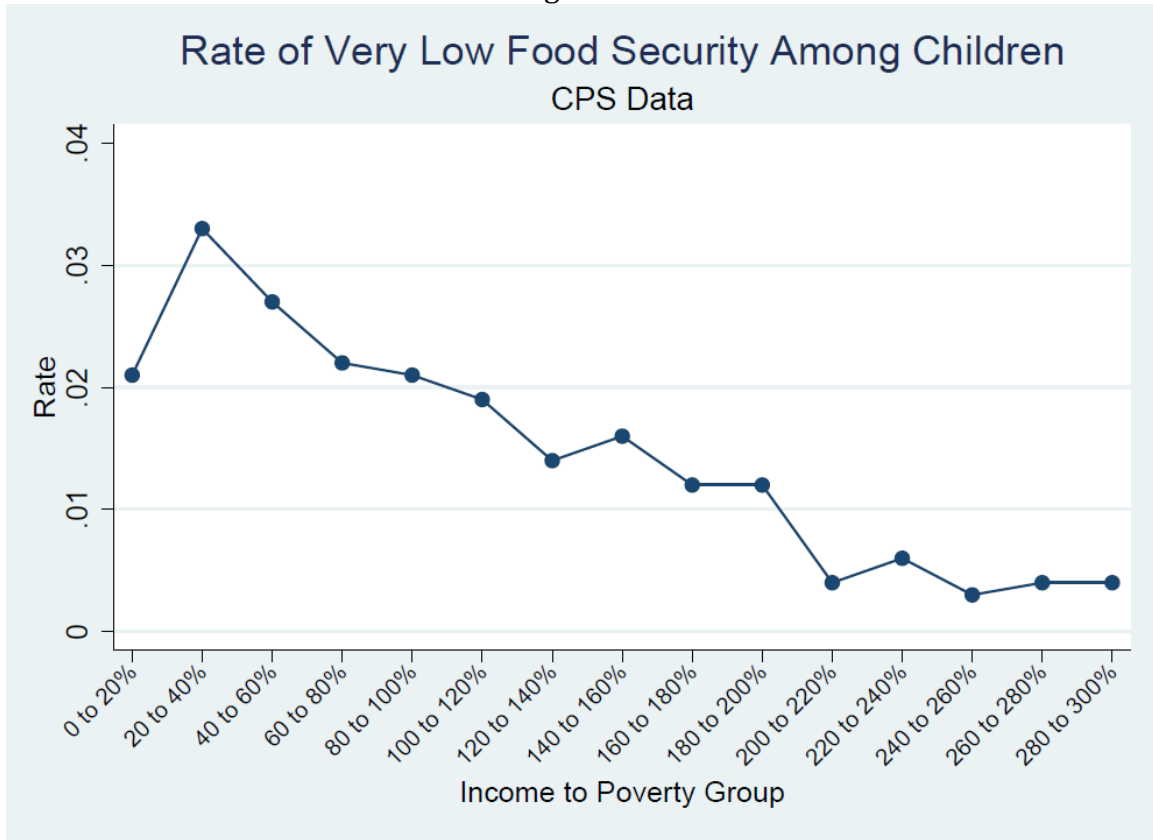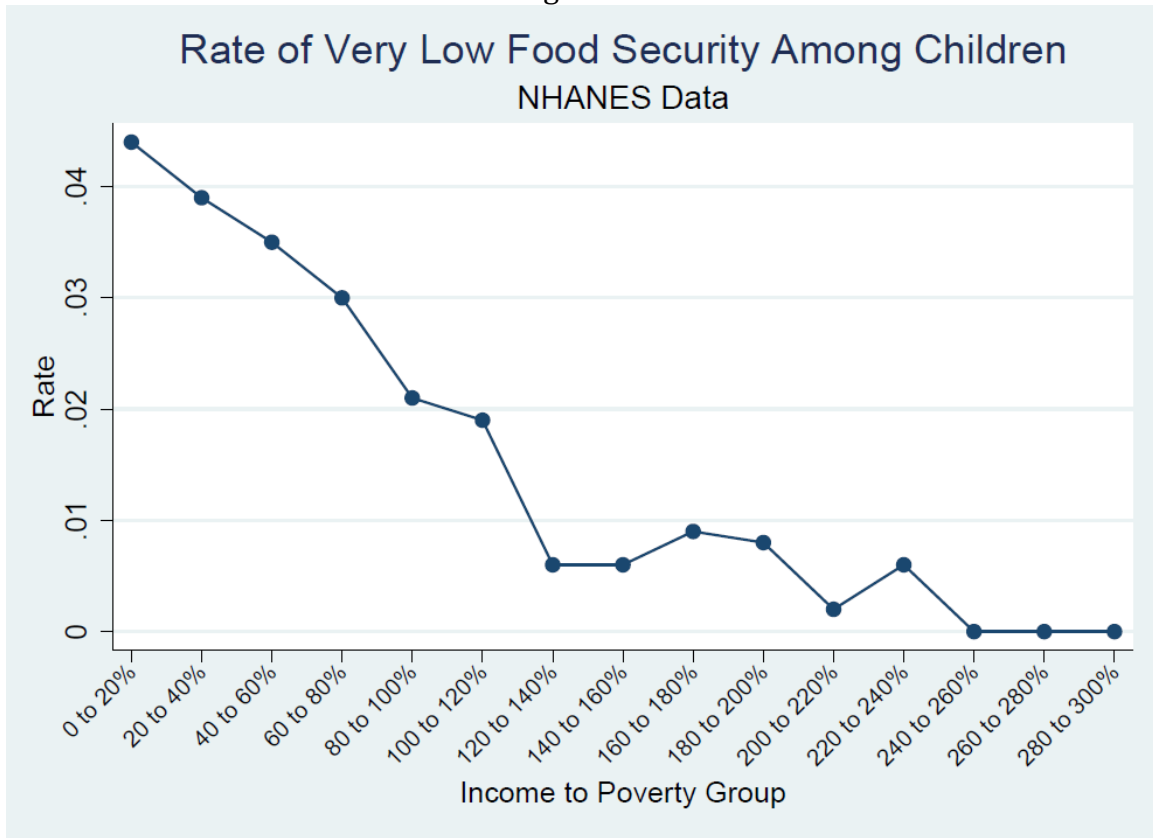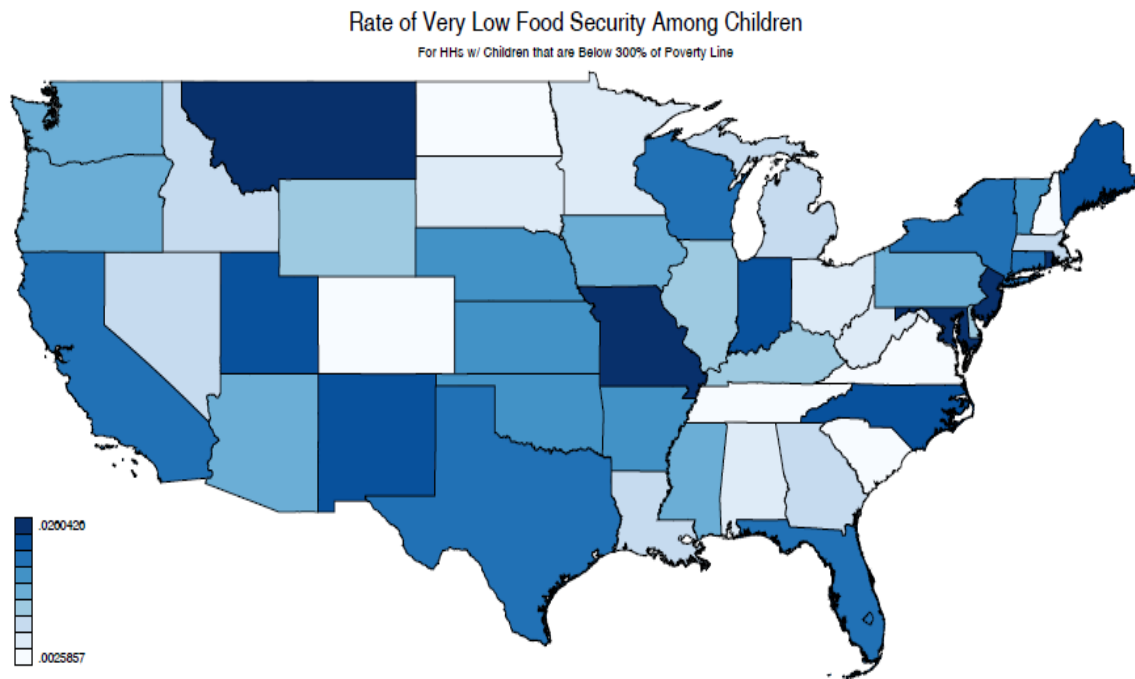Covariates in columns (9) to (12) are in changes.

Figure 1a

Rate of Very Low Food Security Among Children
CPS Data

Rate of Very Low Food Security Among Children
NHANES Data

Figure 2

Rate of Very Low Food Security Among Children
For HHs w/ Children that are Below 300% of Poverty Line

Figure 3

Selected NHANES Characteristics
by Income to Poverty Ratio

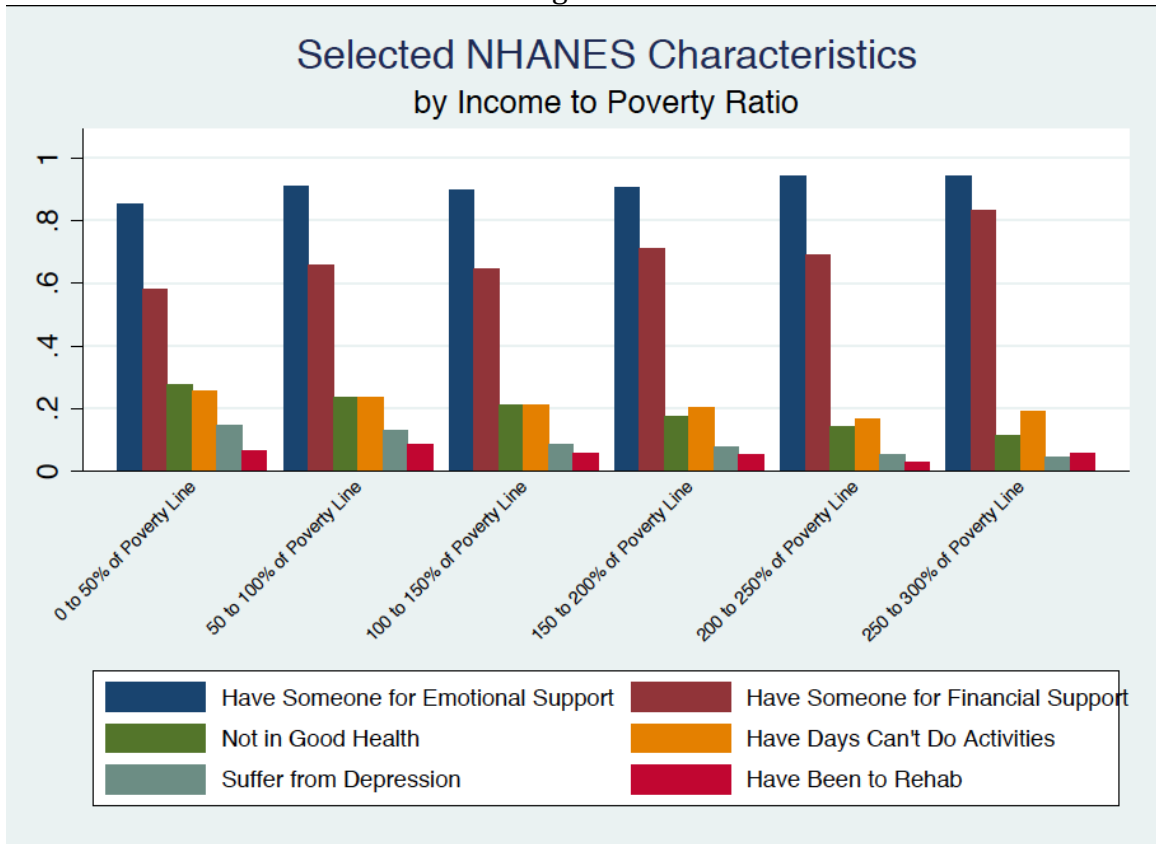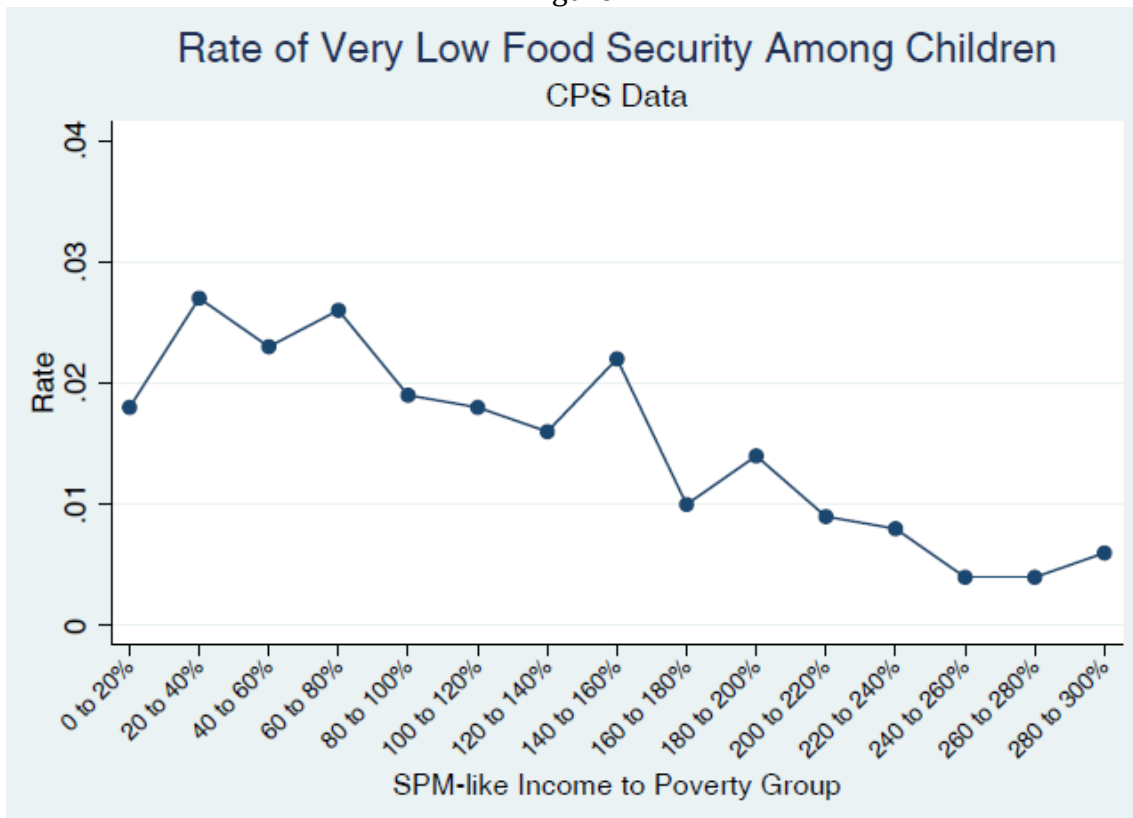Figure 4

Rate of Very Low Food Security Among Children
CPS Data

Figure 5a
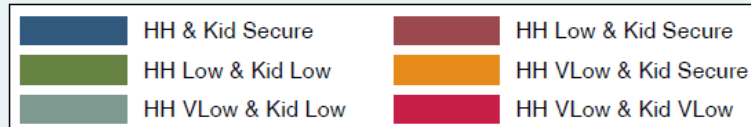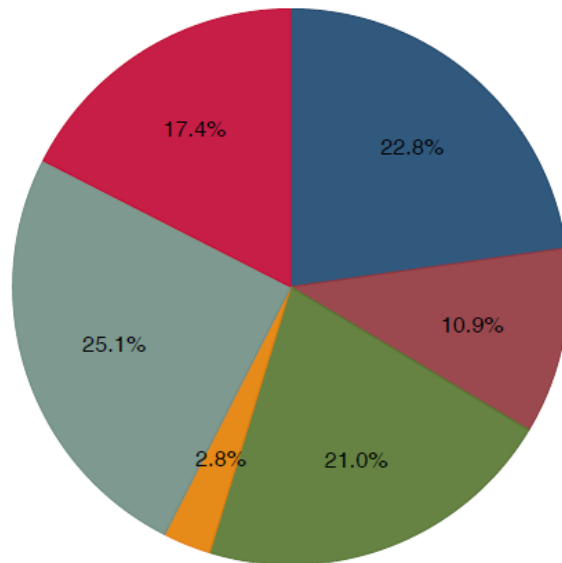
Previous Year Status of VLFS HHs with VLFS Kids

Figure 5b

Following Year Status of VLFS HHs with VLFS Kids