

## **The Influence of Nutrition Assistance Program Participation in Childhood on Improved Young Adult Food Security**

### ***Introduction***

In the United States, 13% of the population is food insecure, including 21% of all children.<sup>1,2</sup> The Supplemental Nutrition Assistance Program (SNAP) and the Special Supplemental Nutrition Program for Women, Infants and Children (WIC), two of the biggest federal nutrition programs, aim to improve nutrition and food security among low-income Americans.<sup>3-5</sup> One in seven Americans receives SNAP benefits and one in two children born each year receive WIC benefits.<sup>4,5</sup> While some evidence suggests that SNAP and WIC participation improves short-term food security at the time benefits are received, the effect of program participation on long-term food security is unknown.<sup>6-11</sup>

In this research, we examined whether participation in SNAP and/or WIC during childhood improved food security in young adulthood. Below, we describe our data, sample, methods, preliminary results, and our next steps. We set out to answer the question: Is participation in SNAP and/or WIC during childhood protective against long-term food insecurity?

### ***Data***

Data were obtained from the Panel Study of Income Dynamics (PSID). PSID is the world's longest running nationally representative household panel survey. Data collection began in 1968 and has followed the original sample and their families since that time. For this study we use data from the Original Childhood Development Supplement (CDS) which, starting in 1997 collected additional information about children aged 0-12 years old in 1997 and in follow up waves in 2002 and 2007. To construct the analytic sample, we created a balanced panel of individuals from the CDS who had SNAP and income information from their family units from 1984-2015 (n=2,394). We then limited the sample to individuals who were living independently in 2015 as a head/spouse/partner of their own family unit above the age of 19 (n=1,279).

### ***Key Measures:***

**Improved Food Security:** The outcome for all analyses was improved food security in 2015. Food insecurity was measured using the USDA 18-question food insecurity module, which is used to create a four-category food insecurity measure: high food security, marginal food security, low food security or very low food security. We created two binary measures of food security over time in which family units were classified as 'More Secure' if they had a higher food security score in 2015 than 1999, and 'Less Secure' if they had a lower score in 2015 than 1999.

**SNAP participation:** SNAP participation is measured in all years from birth through age 18. We examined SNAP participation in two ways. We used the question "Did you (or anyone in your family) use government food stamps at any time in [previous year]?" to create binary variables for whether or not a family received SNAP benefits in the prior year, which is available for waves 1994-2015. We then used data from 1984-2013 to code whether or not individuals received SNAP benefits at different stages of childhood. For years 1984-1992 a binary indicator of SNAP participation was created from the question "For how many months did you use food stamps in [previous year]?" We created three, binary SNAP participation indicator variables for whether or not an individual's family received SNAP benefits at any point when they were 0-5 years old, 6-11 years old or 12-18 years old, in order to capture SNAP receipt in early, middle, and late childhood.

**WIC Participation:** In the CDS, Primary Caregivers (PCGs) are asked whether *that child* received WIC benefits in the PCG-Child Interview. They are asked whether they received benefits when pregnant with that child, as well as during childhood. WIC is only available to children when they are 0-5 years old, so we created a binary indicator of whether or not that individual received WIC at any point when they were

0-5 years old. We also created a four category variable to capture whether family units received benefits from (1) SNAP only, (2) WIC only, (3) both SNAP and WIC, or (0) neither SNAP or WIC, when they were 0-5 years old.

Other Covariates: There are also several individual and family level measures included in the fully adjusted models. Individual level measures include age in 2015 (continuous), sex, race (Non-Hispanic White, non-Hispanic Black, Hispanic, other), marital status in 2015 (married, never married, divorced or widowed), educational attainment in 2015 (less than high school, high school/GED, some college, college plus), employment in 2015 (employed, unemployed, out of the labor force, non-working student), and time since ‘launch’ (i.e. the wave in which the individual split-off from the parental family unit). Family level covariates not already mentioned above included low-income status in all waves (categorized as  $\leq 200\%$  of the Federal Poverty Level), log of total family income in 2015, region of residence in 2015 (Northeast, South, Midwest, West), metro/non-metro status in 2015, and family unit size in 2015.

### ***Analysis***

To generate nationally representative estimates and account for sample attrition, clustering, and strata, all analyses used PSID provided 2015 longitudinal survey weights. First, we created cross tabulations to examine transitions into and out of SNAP participation and food insecurity across the study period. We estimated logit models in which the outcome was improved food security from 1999 to 2015. The models use the covariates listed above, including interactions between low-income status and SNAP participation at the three age periods of childhood (Early Childhood (0-5), Middle Childhood (6-11) and Late Childhood (12-18)). We run these models in the full sample, followed by three separate models in which we look at sub-samples to examine the effect of SNAP only among those who were eligible to participate in the program. Next, to examine the effect of WIC, we estimated the same logit model as above with WIC and the four category SNAP/WIC variable in the model as the key independent variable. All analyses were conducted with Stata 15. Survey weights were applied with *svyset* commands, and post estimation *margins* commands were also used to generate predicted probabilities of improved food security.

### ***Results***

Characteristics of the study sample are compared, both for the overall sample and by food insecurity status in 2015. Twenty-nine percent of the sample received SNAP at some point when they were aged 0-5 years, 23% received SNAP when they were aged 6-11 years, and 19% of the sample received SNAP when they were aged 12-18 years old. There are significant differences in the SNAP receipt between the Food Secure and Food Insecure group (defined as low or very low food security), which is to be expected, since many of the food secure family units are higher income and would not qualify for SNAP. The same is true when looking at income, where a much higher portion of the Food Insecure sub-sample is defined as low income. We also see significantly higher proportions of non-Hispanic black families in the Food Insecure group (27.4% as compared to 14.2% non-Hispanic white). We also see that food insecure family units are less likely to have a college education, more likely to be unmarried, and more likely to be unemployed.

We have used data from the PSID and the Original CDS to examine whether participating in the nutrition assistance programs SNAP and WIC during childhood improves food insecurity in young adulthood (in 2015 when individuals in our sample were 20-31 years old). We examined SNAP participation during different age stages of childhood (early: 0-5 years, middle: 6-11 years, and late: 12-18 years) using PSID data from 1984-2013. **Figure 1** shows the transition between food insecurity status between 1999 and 2015. 68.1% of the sample were food secure at both time points, 29.6% of the sample had decreased food security, while 12.8% of the sample had improved food security status from 1999-2015.

**Figure 1. Food Security Transitions 1999-2015 (weighted, n=1,279)**

		Food Security Status in 2015				
		Secure	Marginal	Low	Very low	Total
Food Security Status in 1999	Secure	68.1%	14.9%	9.3%	7.8%	100%
	Marginal	55.0%	19.6%	15.1%	10.3%	100%
	Low	53.5%	17.7%	9.7%	19.1%	100%
	Very low	58.0%	29.0%	5.2%	7.8%	100%
	Total	65.5%	15.8%	9.7%	9.0%	100%

We find that SNAP and WIC participation during childhood significantly increases the odds of improving food security in young adulthood. **Table 1** shows the odds-ratios for obtaining SNAP if low income at various stages of childhood in the fully adjusted model. Seen in **Model 1**, participating in SNAP in early and late childhood while low income are statistically significantly associated with a 2.34 and 2.64 increased odds of becoming more food secure in young adulthood, as compared to low-income families without SNAP. **Model 2** shows that SNAP participation in any stage of childhood does not increase or decrease the odds-ratios for becoming less food secure in young adulthood.

**Table 1. SNAP Participation and Food Security Outcomes**

Variable	Odds-Ratio	Std. Err.	t	p-value	95% CI	
<b>MODEL 1: More secure (vs. less secure or no change)</b>						
SNAP age 0-5 (& low income)	<b>2.338</b>	<b>0.996</b>	<b>1.99</b>	<b>0.055</b>	<b>0.982</b>	<b>5.570</b>
SNAP age 6-11 (& low income)	0.969	0.376	-0.08	0.936	0.440	2.136
SNAP age 12-18 (& low income)	<b>2.639</b>	<b>1.161</b>	<b>2.20</b>	<b>0.035</b>	<b>1.076</b>	<b>6.470</b>
<b>MODEL 2: Less secure (vs. more secure or no change)</b>						
SNAP age 0-5 (& low income)	0.616	0.184	-1.62	0.116	0.335	1.134
SNAP age 6-11 (& low income)	1.367	0.436	0.98	0.334	0.714	2.618
SNAP age 12-18 (& low income)	0.777	0.241	-0.81	0.421	0.413	1.460

As seen by the predicted probabilities in Table 2, young adults are twice as likely to be more food secure in 2015 if they receive SNAP in early childhood as compared to those who do not receive SNAP, and more than twice as likely to be more food secure in 2015 if they receive SNAP in late childhood.

**Table 2. Predicted Probabilities of SNAP Participation and Food Security Outcomes**

	SNAP	No SNAP	Difference	p-value
<b>MODEL 1 Margins: More secure (vs. less secure or no change)</b>				
Age 0-5	<b>13.4</b>	<b>6.7</b>	<b>6.7</b>	<b>0.07</b>
Age 6-11	13.8	14.1	-0.3	0.94
Age 12-18	<b>24.4</b>	<b>11.6</b>	<b>12.8</b>	<b>0.07</b>

We find that SNAP and WIC participation during childhood significantly increase the odds of improving food security in young adulthood. **Table 3** shows the odds-ratios for obtaining both SNAP and WIC if low income in early childhood (ages 0-5) in the fully adjusted models. Seen in **Model 3**, participating in SNAP and WIC in early childhood while low income is statistically significantly associated with a 4.46 increased odds of becoming more food secure in young adulthood, as compared to low-income families without SNAP or WIC. **Model 4** shows that SNAP and/or WIC participation in early childhood does not increase or decrease the odds-ratios for becoming less food secure in young adulthood.

**Table 3. SNAP/WIC Participation and Food Security Outcomes**

Variable	Odds-Ratio	Std. Err.	t	p-value	95% CI	
<b>MODEL 3: More secure (vs. less secure or no change)</b>						
SNAP only	1.933	1.102	1.16	0.256	0.605	6.126
WIC only	1.154	0.513	0.32	0.749	0.4667	2.856
<b>Both SNAP and WIC</b>	<b>4.459</b>	<b>1.748</b>	<b>3.81</b>	<b>0.001</b>	<b>2.006</b>	<b>9.911</b>
<b>MODEL 4: Less secure (vs. more secure or no change)</b>						
SNAP only	0.784	0.288	-0.66	0.512	0.371	2.656
WIC only	1.016	0.312	0.05	0.958	0.544	1.898
Both SNAP and WIC	0.793	0.282	-0.65	0.518	0.384	1.636

As seen by the predicted probabilities in **Table 4**, young adults are more than three times as likely to be more food secure in 2015 if they receive SNAP and WIC in early childhood as compared to those who do not receive SNAP or WIC (24.9% versus 7.5%).

**Table 4. Predicted Probabilities of SNAP/WIC Participation and Food Security Outcomes**

	Predicted Probability	Difference	p-value
<b>MODEL 3 Margins: More secure (vs. less secure or no change)</b>			
Neither SNAP or WIC	7.5	[ref]	
SNAP only	13.2	5.7	0.28
WIC only	8.5	1.0	0.75
<b>Both SNAP and WIC</b>	<b>24.9</b>	<b>17.4</b>	<b>0.001</b>

**Discussion and Next Steps**

Our results show that SNAP and WIC participation during childhood have a statistically significant positive association with higher food security during young adulthood. Evidence shows that SNAP is effective at mitigating concurrent or short-term food insecurity as well as long-term food insecurity. We hypothesized that via improved food and economic security in the short term, longer-term risk of food insecurity might also be improved. This hypothesis has been supported by our preliminary results. Our next steps are to look into the amount of SNAP benefits to see what proportion of food expenditures are covered by SNAP and WIC, as well as looking at other outcomes including individual level obesity.

## References

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