

The Influence of Family Foodways on Young Adult Food Security

Introduction

Nutritional knowledge is an important predictor of diet quality and healthy weight outcomes, however less is known about the relationship between nutritional knowledge and food security.¹⁻⁴ It is possible that nutritional knowledge, and participation in programs (such as WIC and SNAP-Ed (the educational program of SNAP)) may improve low-income families ability to not only consume a healthy diet, but also to more efficiently manage food resources thereby resulting in improved food security.⁵⁻⁷ Similarly, involvement in food preparation during childhood may build cooking skills and confidence that are important for management of food resources and consumption of a healthy diet.⁸⁻⁹ More knowledge in this area is important as evidence suggests that strong cooking skills are associated with higher food security.¹⁰ In this research, we examined whether parental nutritional knowledge or child involvement in food preparation positively influence food security in young adulthood. Below, we describe our sample, methods, preliminary results, and our next steps.

We set out to answer two main research questions:

- 1) Does childhood food involvement protect against food insecurity and obesity in young adulthood?
- 2) Does parental nutritional knowledge influence the relationship between SNAP/WIC participation and food insecurity?

Data

Data were obtained from the Panel Study of Income Dynamics (PSID), 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 Core PSID and 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 1,047 individuals who also had time diary information on food shopping, preparation and eating activities in middle childhood (ages 5-12).

Key Measures:

Food Insecurity: The outcome for all analyses was food insecurity in 2015 and/or 2017. 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 a binary measure of food security in which family units were classified as food insecure if they had low or very low food security, and food secure if they had marginal or high food security. The 2017 data were obtained from the early release file (released January 2018) and do not include imputations.

Childhood food involvement: Time diaries were collected for children in the CDS in 1997, 2002 and 2007. We used time diary information to generate minutes per week children were involved in food shopping, food preparation (including meal preparation, serving food, doing dishes, and cleaning up) and eating. Time diaries were completed for one week day and one weekend day, and only those who had completed both time diaries were included in this subsample. We used the primary activity codes to generate minutes per weekday and minutes per weekend day in these three activities. We then multiplied the weekday amount by five and the weekend amount by two to create an estimated weekly measure of time spent in each activity. We then created three category measures of spending (1) no time, (2) a low (below the weighted mean) amount of time or (3) a high (above the weighted mean) amount of time, for food preparation and food shopping, where cut points for low or high were based on the weighted mean of each among those who spent >0 minutes in the activity. Time spent eating was divided into weighted quartiles.

Parental Nutritional Knowledge: In the 1999 wave, respondents were asked questions to assess nutritional knowledge about fat, fiber, calcium, cholesterol, and overweight status being linked to health problems. We coded responses to these five questions as correct or incorrect then summed the correct responses to create a continuous nutritional knowledge score. We also created a three-category nutritional knowledge variable in which 1= a score of 0-2= a score of 2-3, and 3= a score of 4-5.

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), a binary measure of SNAP participation in 2015, 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 (categorical indicators of low income), 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. When they are released, 2017 weights will be applied for final analyses. First, we used cross tabulations to examine transitions into and out of SNAP participation and food insecurity across the study period. We estimated logistic regression models in which the outcome was food insecurity status in 2015/2017. To examine the role of parental nutritional knowledge, we added the three-category nutritional knowledge score to the fully adjusted models described above. Because nutritional knowledge was measured in 1999, we examined nutritional knowledge in connection with SNAP receipt in 1999-2003. We then examined the time diary data by adding examining the unadjusted effect of time spent in food shopping, preparation and eating on food insecurity, and gradually building towards the fully adjusted model. 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 food insecurity.

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.

Table 1 shows the transition between food insecurity status between 1999-2003 and 2015-2017. 64% of the sample were food secure at both time points, and 7% were food insecure at both time points. 17% were food secure in 1999-2003 but food insecure in 2015-2017 and 13% were food insecure in 1999-2003 and food secure in 2015-2017.

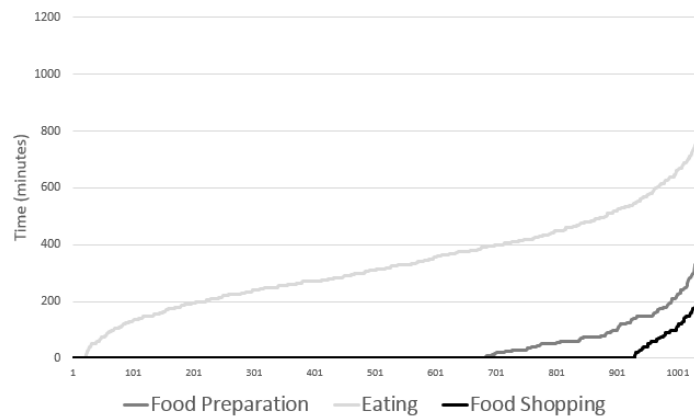
Table 1. Food Security Transitions (1999-2017)

		2015-2017		
		Secure	Insecure	Total
1999-2003	Secure	63.6% 757	16.7% 243	80.3% 1,000
	Insecure	12.7% 182	6.9% 123	19.7% 305
	Total	76.3% 939	23.7% 366	100% 1,305

* Insecure in any/all of the waves specified = Insecure

Child foodways are estimated using time spent in an average week doing the following activities: food preparation, eating, and food shopping. This information was taken from the time diary data included in the Original Child Development Supplement. **Figure 1** shows the unweighted distribution of time that each child (n=1,047) spent doing each of these activities. Time spent in food preparation and food shopping are left skewed, with the majority of children not recording taking part in either of these activities on the randomly selected weekday or weekend day. Time spent eating varied widely, though all children reported some value of time spent eating. In order to obtain information about children during middle childhood, time diary data was taken from the 1997 time diary for children aged 5 and up in 1997, while those who were below age 5 in 1997 had information pulled from their 2002 time diary when they were age 5-10 years old.

Figure 1. Distribution of Time Spent in Foodways in Minutes (min to max unweighted)



In order to work with the skewed distribution of responses to food preparation and food shopping, we generated two categorical variables. Each of these variables was created in the same way, where a value of 0 corresponds to no time spent in the activity, 1 corresponds to being in the lower half of the weighted distribution of those with at least one minute of participation, and 2 corresponds to being in the upper half of the weighted distribution. The 50th percentile for time spent in food preparation was 75 minutes, and 112 minutes for Food Shopping in the weighted analysis. Time spent eating was divided into quartiles, where weights were applied to the sample. By including these measures in our full model controlling for all previously mentioned covariates (except childhood SNAP participation), we see a statistically significant protective odds ratio for being in the ‘high’ group for time spent preparing food. This is significant at the $p < .01$ level, showing that having a high amount of time spent preparing food in middle childhood is protective against being food insecure (low, very low) in young adulthood. Table 2 shows the statistically significant protective odds ratio that a high level of food preparation on food insecurity.

Table 2. Food Preparation, Food Shopping, & Eating and Food Insecurity

Variable	OR	SE	t	p-value	95% CI	
Food Preparation Category (ref=None)						
Low	1.095	0.229	0.440	0.666	0.716	1.676
High	0.432	0.120	-3.020	0.005	0.246	0.761
Food Shopping Category (ref=None)						
Low	1.296	0.494	0.680	0.502	0.596	2.818
High	1.462	0.712	0.780	0.441	0.542	3.940
Eating Quartiles (ref=Quartile 1)						
Quartile 2	1.086	0.324	0.270	0.785	0.591	1.995
Quartile 3	1.452	0.377	1.440	0.161	0.856	2.463
Quartile 4	1.725	0.515	1.820	0.077	0.939	3.169

Looking at the post estimation predicted probabilities of the fully adjusted models, having spent no time in food preparation and a ‘low’ amount of time are not significantly different, with predicted probabilities of being food insecure in 2015-2017 of approximately 24-25%. However, being in the ‘high’ group for time spent in food preparation shows a significant difference of over 10 percentage points lower, meaning those with a ‘high’ value for food preparation time have a predicted probability of 13.2% for being food insecure in young adulthood when 20-31 years old (2015-2017).

Table 3. Food Involvement and Food Insecurity Predicted Probabilities

	Predicted Prob	Difference	p-value
Food Preparation			
None	23.4	ref	ref
Low	24.8	1.4	0.667
High	13.2	-10.2	0.002
Food Shopping			
None	21.2	ref	ref
Low	24.9	3.7	0.519
High	26.7	5.5	0.462

We also examined the role of parental nutritional knowledge and time spent in food shopping, food preparation and eating activities during middle childhood and how those are related to future food insecurity. We found that more time spent in food preparation led to lower odds of food insecurity as a young adult. This is consistent with other evidence that strong food preparation skills can be protective against food insecurity among low-income women.¹¹⁻¹² and that participation in cooking and food preparation with parents during childhood is associated with improved dietary habits in young adulthood.¹³ We do not see the same significant differences among time spent food shopping, though this is not particularly surprising. In creating the variables we expected to see that all individuals would report some time eating during the day, but whether they spent time in food preparation or food shopping on those specific days was uncertain, as food shopping or preparation are events that may not occur daily. The finding that experience with food preparation can better equip an individual against food insecurity may show that spending time preparing food during childhood may indeed be important for management of food resources and consumption of a healthy diet in young adulthood.

Next Steps

We plan to more deeply examine the parental nutritional knowledge in terms of differences based on who answered the question (i.e. father vs. mother, primary food preparer). We will also examine obesity outcomes, particularly for the food involvement and time diary models where we can also control for additional factors that might be important for obesity, but not food security (including sleep and physical activity).

References

1. Kozłowska-Wojciechowska M, Uramowska-Zyto B, Jarosz A, Makarewicz-Wujec M. [Impact of school children's nutrition education program on the knowledge and nutritional behavior of their parents]. *Roczniki Państwowego Zakładu Higieny* 2002;53:253-8.
2. Paasche-Orlow MK, Wolf MS. The causal pathways linking health literacy to health outcomes. *American journal of health behavior* 2007;31 Suppl 1:S19-26.
3. Shepherd R, Stockley L. Nutrition knowledge, attitudes, and fat consumption. *Journal of the American Dietetic Association* 1987;87:615-9.
4. Vereecken C, Maes L. Young children's dietary habits and associations with the mothers' nutritional knowledge and attitudes. *Appetite* 2010;54:44-51.
5. Rivera R, Eicher-Miller HA, Maulding MK, Abbott AR, Wang Q. SNAP-Ed Improves Long-Term Household Food Security Despite Participation in SNAP or WIC at Recruitment. *Journal of nutrition education and behavior*;48:S100.
6. Bird CL, McClelland JW. Educating limited resource older adults for better choices to lower risk of food insecurity. *International Journal of Consumer Studies* 2017;41:225-33.
7. Caspi CE, Davey C, Friebur R, Nanney MS. Results of a Pilot Intervention in Food Shelves to Improve Healthy Eating and Cooking Skills Among Adults Experiencing Food Insecurity. *Journal of Hunger and Environmental Nutrition* 2017;12:77-88.
8. Rodriguez J, Applebaum J, Stephenson-Hunter C, Tinio A, Shapiro A. Cooking, Healthy Eating, Fitness and Fun (CHEFFs): Qualitative evaluation of a nutrition education program for children living at urban family homeless shelters. *American journal of public health* 2013;103.
9. Engler-Stringer R. Food, cooking skills, and health: A literature review. *Canadian Journal of Dietetic Practice and Research* 2010;71:141-5.
10. Engler-Stringer R, Stringer B, Haines T. Complexity of Food Preparation and Food Security Status: In Low-income Young Women. *Canadian Journal of Dietetic Practice and Research* 2011;72:133-6.
11. Engler-Stringer R. The domestic foodscapes of young low-income women in montreal: Cooking practices in the context of an increasingly processed food supply. *Health Education and Behavior* 2010;37:211-26.
12. Engler-Stringer R. Food selection and preparation practices in a group of young low income women in Montreal. *Appetite* 2011;56:118-21.
13. Laska MN, Larson NI, Neumark-Sztainer D, Story M. Does involvement in food preparation track from adolescence to young adulthood and is it associated with better dietary quality? Findings from a 10-year longitudinal study. *Public health nutrition* 2012;15:1150-8.