

questions necessary to construct the food insecurity scale were not asked in 1995 as part of the SIPP. They were, however, asked as part of the SPD, and the study uses these data in some sensitivity analyses. In particular, we respecify the conditional food insufficiency models, using the food insecurity indicator (columns (1) and (2) of table 6) and food insecurity numerical scale (columns (3) and (4) of table 6) as the dependent variables. The binary food insecurity indicators—food secure or food insecure (with or without hunger)—are modeled using logit specifications, while the food insecurity scale variables are estimated using tobit specifications. A tobit model is necessary because households that are completely food secure—that is, who answered no to each of the 18 questions—are not assigned a value on the food insecurity scale. The models are estimated using essentially the same subsamples as the food insufficiency entry and exit models—that is, the estimates are conditional on living in a food-sufficient or food-insufficient household in 1995.¹⁷ Because of differences in the definitions of the initial and terminal conditions, the specifications are not transition models as such. Nevertheless, they help show whether the use of the food insecurity measures leads to dramatic changes in the results.

The results differ somewhat between the food insufficiency and food insecurity models in table 6. Most of the differences, however, are changes in significance rather than changes in estimated directions of associations. There are no instances of significant sign reversals. Robust results for the models estimated on the subset of people who were initially food sufficient (the entry subsample) include the negative coefficients for age squared, the indicator for women, the income-to-needs ratio in 1997, and the positive coefficient for disability status. However, none of the significant results from the food insufficiency exit models was consistently replicated in the food insecurity models. Consequently, it appears that some of the study's findings are sensitive to the way that food problems are measured.

Relationship Between Food Insufficiency and the Income-to-Needs Ratio

Our conclusions that food insufficiency and poverty capture different dimensions of economic hardship are based on models that make a strong assumption about the relationship between these two variables. In particular, our models include the income-to-needs ratio as a linear determinant of the propensity to enter or exit

¹⁷The samples used in the models for table 6 are slightly smaller because of a small amount of item nonresponse in the food insecurity measure.

food insufficiency. If this assumption is incorrect, our findings might simply represent a rejection of this specification. To determine whether our results were sensitive to the specification of poverty, we reestimated our models using a flexible, nonlinear function of the income-to-needs ratio (not shown). Our results did not change qualitatively when we did this, which supports our conclusion that food insufficiency and poverty are distinct processes.

Household Heads

The foregoing analyses were conducted using all of the adults who were not enrolled in school in each household. However, as we noted, food insufficiency and insecurity information was reported only by the household head. The information on food problems and the other explanatory variables might not be well matched for people who move in and out of households. Similarly, if individual characteristics affect the way an individual perceives or reports food insufficiency or insecurity, there may be a problem with including household members other than the head. To see if these types of reporting issues might have affected the results, we reestimated our models on a restricted sample of household heads. The results from these models (which are not shown) were qualitatively similar to the results for all individuals.

Conclusions

This research uses data from the 1993 panel of the SIPP and the SPD to examine both the incidence of household food insufficiency and family poverty and transitions between these outcomes. The study considers these outcomes in the context of a theoretical economic model in which households smooth consumption to buffer negative income shocks and avoid food sufficiency problems. It provides descriptive statistics and cross-tabulations of food insufficiency and poverty outcomes. It also estimates multivariate logit models of the transitions between different food insufficiency and poverty states.

The empirical analyses revealed that the incidence of food problems in the United States is low. In 1997, less than 3 percent of people were estimated to live in households that were food insufficient (households in which there sometimes or often was not enough to eat), and less than 4 percent were in households that were food insecure with hunger. Persistence in food problems appears to be low as well. Four-fifths of the people who were in households that were food insufficient in 1994-95 were in food-sufficient households 2 years later.

Table 6—Results for conditional food insecurity models

	Food insecurity: Logit		Food insecurity scale: Tobit	
	Food sufficient in 1995 (1)	Food insufficient in 1995 (2)	Food sufficient in 1995 (3)	Food insufficient in 1995 (4)
Age	0.020 (0.020)	0.054 (0.049)	0.068 (0.045)	0.187* (0.107)
Age ² (/100)	-0.046** (0.019)	-0.044 (0.050)	-0.152*** (0.044)	-0.163 (0.109)
Female	-0.364*** (0.116)	-0.121 (0.222)	-0.872*** (0.280)	0.319 (0.501)
Black or African American	0.464*** (0.163)	-0.198 (0.353)	1.110** (0.441)	-0.011 (0.782)
Hispanic	0.131 (0.177)	-0.156 (0.406)	0.642 (0.445)	-0.204 (0.714)
U.S. citizen	-0.305 (0.237)	-0.579 (0.600)	-0.658 (0.654)	-1.175 (0.973)
Completed high school	-0.200 (0.128)	-0.196 (0.299)	-1.156*** (0.311)	0.165 (0.612)
Completed college	-0.303 (0.230)	0.580 (0.687)	-1.361** (0.544)	1.849 (1.560)
Female-headed household, 1995	0.494** (0.231)	-0.331 (0.661)	1.196** (0.598)	-0.923 (1.329)
Number of children under age 18, 1995	0.118 (0.081)	0.021 (0.163)	0.252 (0.190)	0.282 (0.316)
Disabled, 1995	0.509*** (0.131)	-0.273 (0.276)	1.636*** (0.331)	-0.288 (0.602)
Low-asset income, 1995	1.042*** (0.259)	0.300 (0.822)	2.634*** (0.460)	0.132 (2.301)
Own home, 1995	-0.099 (0.142)	-0.251 (0.320)	-0.298 (0.345)	-0.761 (0.627)
Annual hours of work (/1,000), 1995	0.109 (0.080)	0.349* (0.190)	0.054 (0.200)	0.375 (0.390)
Received food stamps, 1995	0.403** (0.192)	-0.163 (0.401)	1.514*** (0.461)	0.237 (0.709)
Income-to-needs, 1995	-0.222*** (0.069)	-0.452** (0.216)	-0.319* (0.167)	-0.869* (0.516)
Female-headed household, 1995	0.123 (0.224)	0.535 (0.648)	0.191 (0.548)	0.674 (1.296)
Number of children, under age 18, 1997	-0.078 (0.079)	0.070 (0.181)	-0.267 (0.194)	-0.158 (0.377)
Disabled, 1997	0.040 (0.227)	0.190 (0.529)	0.400 (0.585)	0.416 (0.924)
Changed household, 1997	0.139 (0.151)	0.275 (0.315)	0.594 (0.375)	0.298 (0.616)
Annual hours of work (/1,000), 1997	-0.127 (0.083)	-0.224 (0.178)	-0.309 (0.198)	-0.333 (0.372)
Received food stamps, 1997	0.549*** (0.196)	0.288 (0.413)	1.847*** (0.481)	1.086 (0.787)
Income-to-needs, 1997	-0.363*** (0.076)	-0.305* (0.183)	-1.169*** (0.165)	-0.844** (0.408)
Constant	-1.579*** (0.645)	0.286 (1.551)	-2.400 (1.469)	1.560 (3.637)
Log likelihood	-1,733.25	-243.94	-5,398.79	-900.30
Observations	9,092	416	9,092	416

*Significant at 0.10 level; **Significant at 0.05 level; ***Significant at 0.01 level.

Notes: Hispanics may be of any race. Conditional logit and tobit models estimated using weighted data from the 1993 SIPP and 1998 SPD. Estimated standard errors in parentheses account for repeated observations in households.

However, while the incidence and persistence of food problems are low, the study's descriptive analysis showed that state dependence is still strongly evident; that is, the past matters in determining food sufficiency status. People who were in food-insufficient households in 1994-95 were 10 times more likely than others to be in food-insufficient households in 1997.

The study's theoretical analysis demonstrates how income poverty and food insufficiency are related, yet distinct, processes. Poverty and food insufficiency are both indicators of economic hardship. However, if a household is able to borrow and save, bouts of poverty need not result in food problems. The multivariate empirical analysis confirms that food insufficiency depends on more than just poverty status, a result that indicates that poverty and food insufficiency capture fundamentally different dimensions of economic hardship. A low level of asset income (an indicator of the household's ability to smooth consumption) has a consistent positive association with food problems. In some specifications, home ownership (another indicator of net financial worth) is negatively related to food problems.

The multivariate analyses of transitions in food insufficiency generate other consistent findings. Female-headed households are significantly more likely to transition into food insufficiency and significantly less likely to exit from it than other households. Disability status at the start of the transition period and changes in household composition also appear to be associated with entry into food insufficiency. High school completion is consistently found to increase the chances of leaving food insufficiency.

The study also examined the relationship between food stamp use and food sufficiency problems. It found that food stamp use in 1994-95 had a significant positive association with food problems in 1997—that is, led to

lower rates of exit from food insecurity, but that food stamp use in 1997 was generally not significantly associated with concurrent food problems. As Gundersen and Oliveira (2001) have shown, endogeneity may be affecting the results. In particular, the food stamp variable may be picking up unmeasured aspects of the household's resources or possibly differential concerns regarding food consumption. Either of these effects could bias the associations downward. In any event, the study provides no evidence that food stamps alleviate food problems.

The research results are relevant to several other aspects of food assistance policy. First, the finding that the incidence of food insufficiency is low and transient supports the general design of the Food Stamp Program and other food assistance programs as a safety net for low-income people and, in particular, for those who have unexpected income difficulties. However, our finding that food problems might exhibit state dependence suggests that more targeted efforts would be beneficial for some households. Second, like the analysis by Winship and Jencks (2002), the finding that food insufficiency trends have followed trends in poverty suggests that welfare reform has not led to increases in food sufficiency problems. Third, the findings that assets and home ownership are important factors reinforce Gundersen's and Gruber's (2001) findings that improved access to credit for low-income persons might help households maintain food sufficiency. At the same time, these results indicate why asset tests continue to be used to determine food stamp eligibility—households with assets are less likely to experience food insufficiency. Finally, our finding that food insufficiency is related to, yet distinct from, poverty supports ongoing efforts by USDA to collect and analyze data on food sufficiency in order to further understand economic hardship.