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Symposium: Food Insecurity Among Children in the United States

Multigenerational Families and Food Insecurity

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The prevalence of multigenerational families is on the rise in the United States, as is food insecurity. We estimate the association of resident grandchildren on transitions in food insecurity using longitudinally linked two-year panels of the Current Population Survey from 2001 to 2010. We find that rates of food insecurity in families with a grandchild present are at least twice as high in a typical year compared with families without a resident grandchild, and the extent of very low food security increased substantially faster among these households over the past decade. The rise in food insecurity during and after the Great Recession is due to both increased entry into food insecurity and decreased exit out of food insecurity. A similar trend accounts for the rise in multigenerational households during the recession—grandchildren were more likely to move in with their grandparents, and once there, were less likely to move out. Our transition models show that whether grandchildren remain, or in periods of transition, multigenerational families are at heightened risk of entering food insecurity and remaining in this state. However, the entry of a grandchild may not always be a negative for the family's food security, nor the exit of the child a positive. Entrance of a child seems to buffer the family from extreme forms of food insecurity while exit exposes the family to risk of deeper food insecurity.

1. Introduction

The prevalence of multigenerational families is on the rise in the United States. From 1980 to 2008, the number of Americans living with at least two adult generations, or a grandparent with a grandchild, increased by one-third to 49 million (Taylor et al. 2010). This includes one in five single mother families. Given that over this period the fraction of children born to unwed mothers rose from about 15% to nearly 40%, there is likely to be continued upward secular pressure on the proportion of families that are multigenerational (Cancian and Reed 2009). On top of the secular trends, the Great Recession resulted in substantially weakened financial balance sheets, and thus many families pooled generations to help make ends meet, especially among families headed by an older adult (Taylor et al. 2010).

Alongside this increase in multigenerational families, food insecurity has emerged as a pressing public health challenge facing the nation. The health consequences associated with food insecurity are manifest in children (Siefert et al. 2004; Heflin, Siefert, and Williams 2005; Cook et al. 2006; Skalicky et al. 2006; Whitaker, Phillips, and Orzol 2006; Carmichael et al. 2007; Eicher-Miller et al.

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2009; Gundersen and Kreider 2009; Hernandez and Jacknowitz 2009; Muirhead et al. 2009; Yoo, Slack, and Holl 2009; Huang, Matta Oshima, and Kim 2010; Kirkpatrick, McIntyre, and Potestio 2010; Howard 2011; Melchior et al. 2012; Chi et al. 2014) and adults (Lee and Frongillo 2001; Tarasuk 2001; McIntyre et al. 2003; Stuff et al. 2004; Kirkpatrick and Tarasuk 2007; Seligman et al. 2007; Seligman, Laraia, and Kushel 2009; Ziliak and Gundersen 2013). The health consequences are even more serious in light of the recent increase in food insecurity: after holding steady at about 11% of households from 1999 to 2006, food insecurity accelerated over 30% after the onset of the recession to encompass 14.3% of all households by 2013 (Coleman-Jensen et al. 2014), suggesting that health problems are likely to be exacerbated in coming years.

Despite the burgeoning literature on food insecurity in the United States (for recent reviews see Gundersen, Kreider, and Pepper 2011 and Gundersen and Ziliak 2014), there has not been research on transitions into and out of food insecurity among multigenerational families. We fill this gap in the literature through the use of data from the Current Population Survey (CPS) spanning 2001 to 2010 to present the first evidence on food insecurity in adult households with and without grandchildren present. For our purposes, a multigenerational family is defined as one headed by an adult householder age 40 or older and with three generations (grandparent, parent, child) or grandparent and grandchild with no adult parent (so-called skipped generation). While most adults in their 40s are not grandparents, low-income adults in this age category are overrepresented in the population of grandparents and thus potentially at heightened risk of food insecurity. Limiting our sample to seniors over the age of 50 or even 60 would miss this vulnerable group of young grandparents raising grandchildren.

Our research exploits a little utilized feature of the CPS that permits the matching of the same individual from one December survey to the following to create a series of two-year panels. A few have examined food insecurity in a panel-data setting (Wilde and Nord 2005; Heflin and Ziliak 2008; Mykerezi and Mills 2010; Kennedy et al. 2013), but none have documented the role of grandchildren in accounting for adult food insecurity transitions. We formally estimate transition models as a function of macroeconomic and demographic risk factors, including the entrance and exit of grandchildren.

Our results show that in a typical year, rates of food insecurity among multigenerational families are at least twice as high as families without resident grandchildren. By 2010, after the sharp increase due to the Great Recession, food insecurity affected 23% of multigenerational families as compared to 11% of other families. The rise in food insecurity during and after the Great Recession is due to both increased entry into food insecurity and decreased exit out of food insecurity. A similar trend accounts for the rise in multigenerational households during the recession—grandchildren were more likely to move in with their grandparents, and once there, were less likely to move out.

The multivariate analyses show the strong protective factor of income against risk of food insecurity, especially in multigenerational families. We find that a family in poverty is nearly 10 percentage points more likely to enter food insecurity than a family not in poverty. Likewise, a poor family has a nearly 20 percentage point reduction in the probability of exit into food security. The estimates also suggest that whether grandchildren remain, or in periods of transition, multigenerational households are at heightened risk of entering food insecurity and remaining in this state. However, the entry of a grandchild may not always be a negative for the family's food security, nor the exit of a grandchild a positive. Entrance of a grandchild seems to buffer the family from extreme forms of food insecurity, most likely owing to the fact that additional resources from Supplemental Nutrition Assistance Program (SNAP) and other safety-net programs flow into the family when the grandchild arrives, and flow out when the child departs.

2. Trends in Multigenerational Families and Food Insecurity

The data for our analyses on multigenerational families and food insecurity comes from the December supplements of the CPS spanning the 2001 through 2010 calendar years. The CPS is a nationally representative survey conducted by the Census Bureau for the Bureau of Labor Statistics, providing employment, income and poverty statistics. Households are selected to be representative of civilian households at the state and national levels, and thus do not include information on individuals living in group quarters including nursing homes or assisted living facilities. In December of each year, 50,000 households respond to a series of 18 questions (10 if there are no children present) that make up the Core Food Security Module (CFSM), in addition to questions about food spending and the use of government and community food assistance programs. The CFSM in the CPS is the official data employed by the U.S. Department of Agriculture (USDA) to estimate food insecurity rates annually in the general population. Examples of questions include: "I worried whether our food would run out before we got money to buy more," (the least severe item); "Did you or the other adults in your household ever cut the size of your meals or skip meals because there wasn't enough money for food?"; "Were you ever hungry but did not eat because you couldn't afford enough food?"; and "Did a child in the household ever not eat for a full day because you couldn't afford enough food?" (the most severe item for households with children). Each question is qualified by the stipulation that the outcomes are due to financial issues.

We use the nomenclature of the USDA and consider in this article four mutually exclusive characterizations of food security: fully food secure (FFS), marginally food secure (MFS), low food secure (LFS), and very low food secure (VLFS). To be FFS the respondent answers no to all questions on the CFSM; to be MFS they must answer yes to one or two questions; to be LFS they must answer yes to three to five questions (three to seven questions if children are living in the household); and to be very LFS they must answer yes to six or more questions (eight or more if children are living in the household). For some of our analysis we instead focus on the nonmutually exclusive categories of marginally food insecure (MFI), which comprises MFS, LFS, and VLFS, and food insecure (FI), which comprises LFS and VLFS.

In our sample, we focus on adult heads of household age 40 and older. In order to be classified as multigenerational there must be a grandchild living in the household, with or without the child's parent. All other family types (married/unmarried, children/no children) are classified as single or dual-generation families. The CPS employs a rotating survey design so that a respondent is in sample for 4 months, out 8 months, and in another 4 months. This makes it possible to match approximately one-half of the sample from one December interview to the next. For the two-year panels, we follow recommended Census procedures by performing an initial match of individuals on the basis of five variables: month in sample (months 1–4 for year 1, months 5–8 for year 2); gender; line number (unique person identifier); household identifier; and household number. We then cross check the initial match on three additional criteria: race, state of residence, and age of the individual. If the race or state of residence of the person changes then we delete that observation. Likewise, if the age of the person falls or increases by more than two years (owing to the staggered timing of the initial and final interviews), then we delete those observations on the assumption that they were bad matches.

We note that the sampling frame of the CPS is a household address, and not a household. This has two primary implications for our work. First, if a family moves from one year to the next they are not followed and thus are not matched. If the decision to move is correlated with food insecurity (our dependent variable) then there might be some concerns about consistency of our

estimates. However, if moving is a function of observed covariates (i.e., selection on observables) then our multivariate models that control for these confounding factors will be consistent under the missing conditional at random assumption (Bollinger and Hirsch 2013). If moving is also a function of unobservables (i.e., selection on unobservables), but these factors are time-invariant, then our transition models that focus on changes in food insecurity will sweep out this potential form of attrition bias (Wooldridge 2002). Second, the focus of our study is on adults over the age of 40. As a consequence, we observe when a grandchild or grandchildren moving into such a household with or without parent(s). However, we do not observe cases where a grandparent moves into a household headed by a parent. The resulting series of two-year panels we use contains 163,777 unique longitudinal matches.

Prevalence

We begin by presenting summary statistics from repeated cross sections of our sample, including trends in food insecurity and multigenerational households.[1] Table 1 contains weighted averages of selected characteristics for the whole sample and by presence of grandchildren. The weight used in all analyses is the supplemental person weight provided in the December CPS survey and is used to adjust the averages to reflect the whole population age 40 and over. Among all adults, 15.7% are MFI, 8.9% are FI, and 3.2% are VLFS. With respect to our other central variable, the presence of a grandchild, 4.2% of adult households have a grandchild living in the home. Of those, about three-fourths are made up of three generations (grandparent, adult child, and grandchild) and the other fourth are households with only the grandparent and grandchild present.[2] In terms of other variables, the majority of households have incomes above 200% of the poverty line, are white, married, a homeowner, live in a metro area, are employed or retired, and have a high school diploma or more.

A comparison of columns 2 and 3 in Table 1 shows that there are substantive differences in the demographics of adult households without and with grandchildren present, and with few exceptions, these differences are statistically significant at the 5% level. The food insecurity rates for each measure are substantially higher among households with grandchildren. For example, 32.5% of households with a grandchild present are MFI versus 15.0% for households without a grandchild. Insofar as independence is seen as a normal good, the higher food insecurity rates among households with grandchildren present is as expected. Also as expected, households with a grandchild present are worse-off over the other demographic characteristics.[3]

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[1] For the pooled cross sections, to ensure that no household is included more than once, the sample includes households observed for the second time in 2001 through 2010. This results in a pooled sample of 263,102 families between the ages of 40 and 90. Our matched panels consist of a subset of this sample.

[2] All cases of households where there is a grandparent(s) and a grandchild(ren) but no parent present are obviously cases of a grandparent raising a grandchild. In contrast, we do not know in cases where there are grandparents, parents, and children present if the parents are caring for the grandparent, the grandparent is caring for the child because the parent cannot do so, etc.

[3] We also considered two additional splits of the multigenerational families, one where we considered those with an adult parent present (i.e., at least three generations) versus those with a skipped generation (i.e., grandparent and grandchild only), and one where we considered single grandchild families versus those with multiple grandchildren. Both are motivated by the presumption that skipped generation families and those with multiple grandchildren are each at greater risk of food insecurity than three generation families or those with one grandchild, respectively. Indeed we find that skipped generation families are more likely to be poor, to be African American, to be non-Hispanic, to live in non-metro areas and the South, and to be a high school dropout. However, there was no qualitative or statistical difference

Table 1. Selected Characteristics of Adults Age 40+ in the Current Population Survey, 2001–2010

	All	No Grandchildren Present	Grandchildren Present
Marginal food insecure	15.69	14.96	32.46[a]
Food insecure	8.93	8.48	19.18[a]
Very low food secure	3.18	3.07	5.55[a]
Grandchild or parent present			
No grandchild or parent	95.78	100.00	0.00[b]
Grandchild and parent	3.10	0.00	73.34[a]
Grandchild only	1.13	0.00	26.66[a]
Income categories			
Below 50% of the poverty line	2.30	2.15	5.57[a]
Between 50% and 100% of the poverty line	5.92	5.64	12.17[a]
Between 100% and 200% of the poverty line	14.22	13.79	23.96[a]
Above 200% of the poverty line	56.61	57.56	35.00[a]
Missing income	20.95	20.84	23.31[a]
Racial categories			
White	83.81	84.42	69.96[a]
African American	10.76	10.20	23.33[a]
Other	5.43	5.38	6.71[a]
Hispanic ethnicity	9.24	8.83	18.59[a]
Marital status			
Married	65.42	65.70	59.13[a]
Widowed	10.45	10.30	13.79[a]
Divorced or separated	15.38	15.21	19.26[a]
Never married	8.74	8.78	7.83[a]
Homeowner	81.48	81.58	79.21[a]
Geographic location			
Non-metro	18.76	18.74	19.08
Northeast	19.39	19.56	15.58[a]
Midwest	22.64	22.87	17.38[a]
South	36.10	35.74	44.24[a]
West	21.88	21.83	22.80[a]
Age			
40 to 44	16.65	16.82	12.74[a]
45 to49	16.83	16.86	16.25
50 to 54	15.40	15.38	15.89
55 to 59	13.17	13.06	15.64[a]
60 to 64	10.51	10.38	13.42[a]
65 to 69	8.09	8.01	9.75[a]
70 to 74	6.53	6.52	6.76
75 to 79	5.68	5.72	4.92[a]
80 and older	7.14	7.26	4.63[a]
Employment status			
Employed	57.05	57.37	49.81[a]
Unemployed	2.87	2.84	3.50[a]
Retired	26.97	27.07	24.69[a]
Disabled	13.09	12.70	21.99[a]
Education level			
Less than high school	14.75	14.14	28.55[a]
High school diploma	32.33	32.10	37.65[a]
Some college	25.39	25.50	22.81[a]
College degree	27.53	28.26	10.99[a]

Table 1. (*Continued*)

	All	No Grandchildren Present	Grandchildren Present
SNAP recipient	4.49	3.96	16.53[a]
Female	52.92	52.56	61.13[a]
Living alone	17.99	18.79	0.00[b]

[a]Denotes the difference in means between samples with and without grandchildren are statistically different from zero at the 5% level. There are 263,102 observations (10,299 with grandchild present; 258,803 without).
[b]Denotes no basis for comparison.

Figure 1 depicts trends in the fraction of households headed by an adult with a grandchild present overall and by race. The figure shows that there has been growth of about 19% in the fraction of multigenerational families 40 and older from 4.1% in 2001 to 4.8% in 2010, albeit this is growth on a relatively small base. There is a significant racial gap in the percentage of families with a grandchild in that African American households are two to three times more likely to have a grandchild present than whites. Moreover, after falling in the early part of the decade, there has been a strong upward trend since the start of the Great Recession in 2007 in African American multigenerational households (an increase of nearly 30% from 2007 to 2010; the corresponding increase was 22% among white households).

In Figure 2, we show trends in food insecurity by the presence of grandchildren in the household. Given their preponderance in the adult population, it is not surprising that the trends facing households with no grandchild present mirror the overall trends of food insecurity with a sharp increase from 2007 to 2008 and remaining at that level through 2010.Consistent with the results of Table 1, rates of marginal food insecurity, food insecurity, and VLFS in households with a grandchild present are generally at least two times higher in a typical year. Although the overall percentage increase for those facing food insecurity is similar across households with and without grandchildren, the trends followed slightly different paths. For example, families living with grandchildren actually saw a modest decline in food insecurity rates in the years leading up to the Great Recession, whereas rates were stable in families with no grandchildren present. While both groups experienced large increases after 2007, the post-recession trends differed as well. After an increase in VLFS of 125% between 2007 and 2008 in multigenerational families, the rates fell over the next 2 years but were still 53% higher than in 2007. These trends suggest that the level and trend of food hardship facing adult households poses a serious public policy challenge, and multigenerational households are at even greater risk.

Transitions

Table 2 presents simple transition probabilities across the four mutually exclusive categories from the matched CPS panels. The rows of the table show the food security status of the family in year 1 of the survey, while the columns show that the year 2 food security status is conditional on year 1. This means that across columns in each row the probabilities sum to 1. We present estimates for the full sample, and by presence of grandchild in year 1, year 2, both years, or neither year.

in food insecurity. We find a similar result that families with multiple grandchildren have lower socioeconomic status than families with a sole grandchild, but also that there is a qualitative and statistical difference in rates of food insecurity. However, because of concerns over small samples among these sample splits, especially for the transition models, we pool these groups together for our analyses.

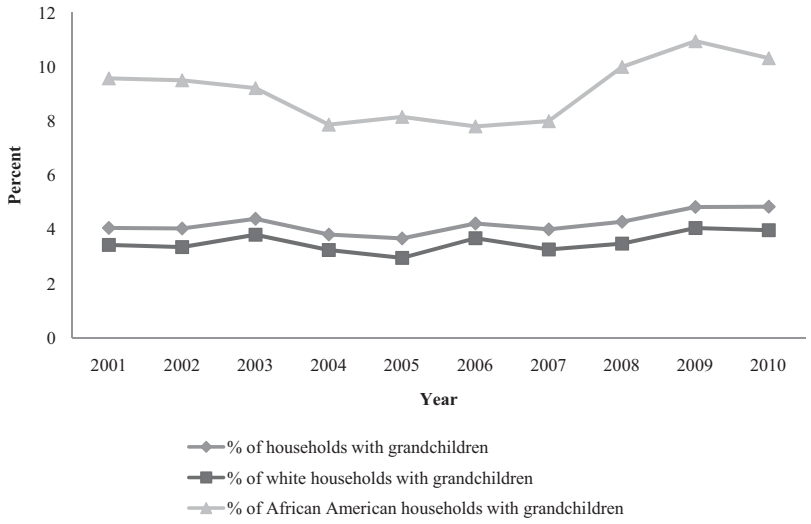

Figure 1. Percent of Householders Age 40+ with Grandchildren Present by Race.

In the first panel of Table 2 pertaining to the sample as a whole, 93% who are FFS in year 1 are FFS in year 2. At the other end, 40% of those who are very LFS in year 1 remain in that status in year 2. In general as we move down the table we see that the two-year boundary cases of FFS-FFS and VLFS-VLFS have the highest probabilities. The exception is that a substantial fraction move from MFS or LFS in year 1 to FFS in year 2, suggesting that exit from food insecurity is a regular occurrence. At the same token, a nontrivial proportion of adults experience worsening of food security—9% of FFS in year 1 are in some food insecurity category in year 2; 18% of MFS in year 1 end up in either LFS or VLFS in year 2; and 12% of LFS in year 1 transition to VLFS in year 2.

There are some important distinctions across family structure in the food security transition rates in Table 2. Comparing the sample with no grandchildren present in either year to those with

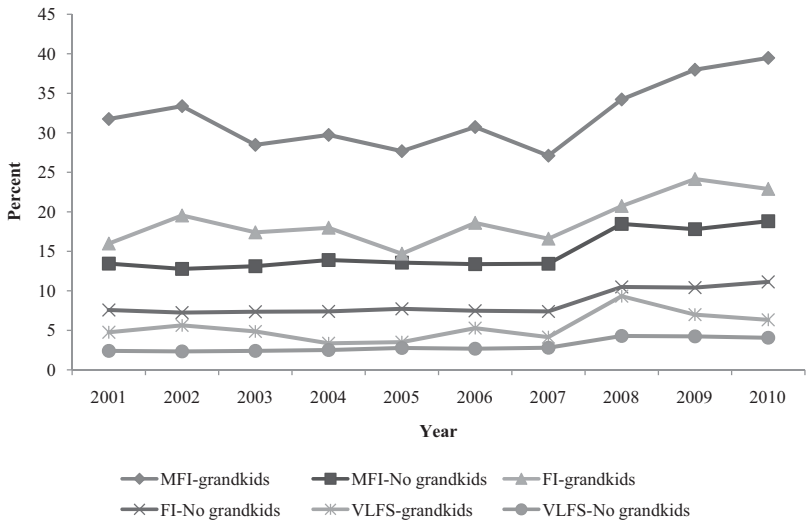

Figure 2. Food Insecurity among Householders Age 40+ with and without Grandchildren Present.

Table 2. Two-Year Transition Probabilities in Food Security Status

Year 1 Status	Year 2 Food Security Status Conditional on Year 1 Status			
			Full Sample	
	FFS	MFS	LFS	VLFS
FFS	0.93	0.04	0.02	0.01
MFS	0.60	0.22	0.14	0.04
LFS	0.40	0.21	0.28	0.12
VLFS	0.24	0.12	0.24	0.40
			No Grandchildren	
	FFS	MFS	LFS	VLFS
FFS	0.93	0.04	0.02	0.01
MFS	0.60	0.22	0.13	0.04
LFS	0.40	0.21	0.27	0.12
VLFS	0.24	0.12	0.23	0.41
			Grandchildren both years	
	FFS	MFS	LFS	VLFS
FFS	0.84	0.10	0.06	0.01
MFS	0.55	0.22	0.19	0.04
LFS	0.35	0.19	0.34	0.11
VLFS	0.23	0.18	0.28	0.31
			Grandchildren year 1 only	
	FFS	MFS	LFS	VLFS
FFS	0.87	0.06	0.04	0.03
MFS	0.51	0.20	0.18	0.11
LFS	0.44	0.23	0.20	0.13
VLFS	0.10	0.08	0.29	0.52
			Grandchildren year 2 only	
	FFS	MFS	LFS	VLFS
FFS	0.85	0.07	0.06	0.02
MFS	0.45	0.27	0.24	0.04
LFS	0.30	0.26	0.34	0.11
VLFS	0.21	0.07	0.41	0.32

Data from 163,777 longitudinal matches of the 2001–2010 December Current Population Surveys.

FFS, Fully Food Secure; MFS, Marginally Food Secure; LFS, Low Food Insecure; VLFS, Very Low Food Secure

a grandchild in one or both years it is clear that the probability of being FFS in both years with a grandchild present is much lower. In addition, multigenerational families are less likely to move from some level of food insecurity to FFS (though rates of moving from VLFS to FFS do not differ substantively except for families with the grandchild in year 1 only). However, it does appear that there is more churning across categories in multigenerational families than among those with no grandchild present.

At any given point in time, the nation's food insecurity rate is a function of the prior period's food insecurity rate along with flows into and out of food insecurity. A similar characterization holds for the proportion of the population that is in multigenerational families. In Figure 3, the entry rate into marginal food insecurity (MFI) is computed as the probability of being MFI in year 2 conditional on being FFS in year 1. Conversely, the exit rate is thus the probability of being FFS in year 2 conditional on being MFI in year 1. Because the baselines used to compute entry and exit differ, the rates differ significantly and thus are shown on separate axes. After 2007 there was a significant increase in entry into food insecurity, coupled with a decline in exit rates, which has the dual effects of maintaining the elevated levels of food insecurity after the Great Recession.

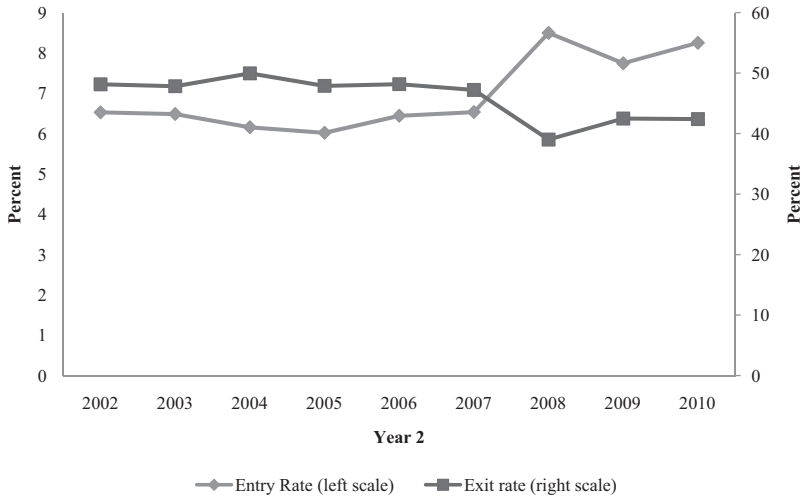

Figure 3. Entry and Exit Rates into Marginal Food Insecurity.

In Figure 4, we display the entry and exit rates of grandchildren. There is a spike in both entry and exit rates between 2007 and 2008, followed by reduced entry and exit after 2008. Because the exit rate fell faster, and by 2010 was lower than the 2007 value, while the 2010 entry rate remained above the 2007 rate, the overall rate of multigenerational families remained elevated in the aftermath of the Great Recession.[4]

3. Family Structure and the Determinants of Food Insecurity Transitions

In this section, we examine possible links between family structure dynamics and food security dynamics. Moreover, we examine whether other socioeconomic changes, such as falling into poverty, affect the risk of entry into food insecurity, as well as the influence of macroeconomic changes in labor markets on food security.

The baseline transition regression model is:

$$\Delta FI_{it} = Z_{i1}\beta + \Delta Z_{it}\theta + \eta_1 GC_{it}^1 + \eta_2 GC_{it}^2 + \eta_3 GC_{it}^3 + u_{it} \quad (1)$$

where ΔFI refers to the entry into or exit from food security, Z_{i1} refers to year 1 demographics and state-level macroeconomic conditions, ΔZ_{it} refers to changes in demographics (for those that can change, but excluding grandchildren variables) and state macro conditions between years 1 and 2, GC_{it}^1 equals 1 if a grandchild moves in from period 1 to 2, GC_{it}^2 equals 1 if a grandchild moves out from period 1 to 2, and GC_{it}^3 equals 1 if a grandchild is present in both periods. As the sample for the regression model contains families with and without grandchildren present, this means the reference (omitted) group is those households with no grandchild present in either period. The demographic controls include race (white is omitted) and Hispanic ethnicity, age, female gender, education (less than high school is omitted), marital status (never married is omitted), family size, employment status (employed is omitted), homeownership, and region (Midwest is omitted). The

[4] For more on the formation of multigenerational households see Keene and Batson (2010).

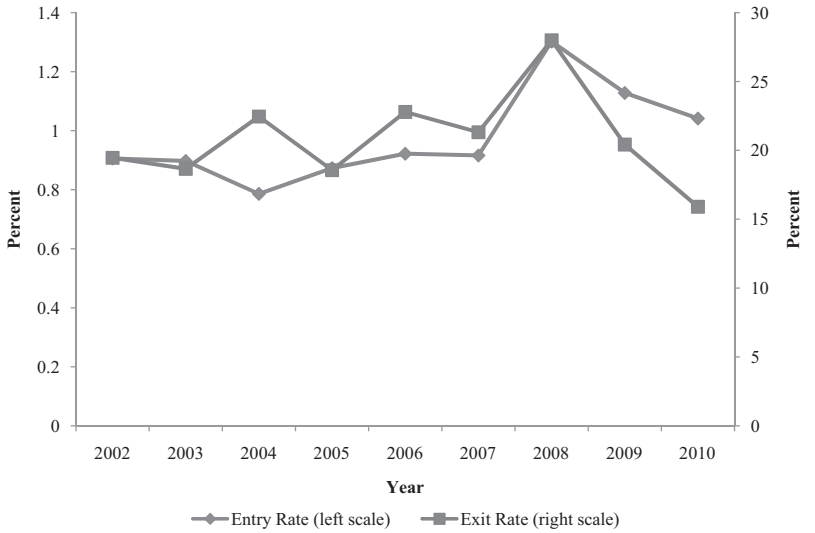

Figure 4. Entry and Exit Rates of Grandchildren.

macroeconomic controls include state unemployment rates and state employment per population. We assume that after controlling for the demographics, business cycle, and year fixed effects the error term, u_{it}, is uncorrelated with the variables on the right hand side of Equation 2 and thus we estimate the models with ordinary least squares.

We begin in Table 3 with entry and exit models utilizing the nonmutually exclusive categories of MFI and FI; that is, the entry models define the dependent variable as 1 for an individual who is FFS in year 1 and either MFI (column 1) or FI (column 2) in year 2. The exit models define the dependent variable as 1 if the person is MFI in year 1 (column 3) and FFS in year 2, or FI in year 1 (column 4) and FFS in year 2.

The results in Table 3 indicate that poverty status in year 1 is a strong predictor of entry into food insecurity, and a barrier to exit. An adult in poverty is 15.9% points more likely to enter marginal food insecurity and 9.8% points more likely to enter food insecurity than an adult not in poverty. Likewise, being in poverty results in nearly a 20% point reduction in the probability of exit into full food security. Controlling for poverty status and other risk factors, African Americans and Hispanics are much more likely to enter MFI or FI than similarly situated white persons. They are, however, no more or less likely to exit marginal food insecurity to full food security, and are actually more likely to exit food insecurity to full food security (by 2.6 and 5.1 percentage points, respectively). This suggests that there is more churning of food insecurity status among non-whites than whites.

Table 3 shows that age is protective of entry into food insecurity, and hastens exit, albeit both effects are small in magnitude. On the other hand, higher education is substantively protective of entry—a college graduate is 7.7 and 3.8% points less likely to enter MFI or FI, respectively, than a high school dropout—suggesting that formal human capital attainment has positive benefits in preventing food insecurity over and above the increased income associated with more education.[5] Marriage protects against entry and fosters exit from MFI relative to being never married, but

[5] Another possible explanation is that, to the extent income is measured with error and education is reported accurately, educational attainment could be portraying the effect of income as well as education.

Table 3. The Determinants of Entry into and Exit from Food Insecurity

	Entry		Exit	
	(1)	(2)	(3)	(4)
VARIABLES	FFS to MFI	FFS to FI	MFI to FFS	FI to FFS
Year 1 Values				
Below federal poverty line	0.159***	0.098***	−0.188***	−0.195***
	(0.009)	(0.008)	(0.009)	(0.013)
African American	0.058***	0.035***	0.005	0.026**
	(0.004)	(0.003)	(0.009)	(0.013)
Other race	0.006*	0.005*	0.014	0.014
	(0.004)	(0.003)	(0.013)	(0.019)
Hispanic	0.058***	0.042***	0.011	0.051***
	(0.004)	(0.004)	(0.010)	(0.015)
Age	−0.001***	−0.001***	0.003***	0.003***
	(0.000)	(0.000)	(0.000)	(0.001)
Female	−0.001	−0.002**	−0.022***	−0.029***
	(0.001)	(0.001)	(0.007)	(0.010)
High school	−0.037***	−0.021***	0.024***	0.029**
	(0.003)	(0.002)	(0.008)	(0.012)
Some college	−0.051***	−0.024***	0.026***	0.015
	(0.003)	(0.002)	(0.009)	(0.014)
College	−0.077***	−0.038***	0.054***	0.038**
	(0.003)	(0.002)	(0.012)	(0.018)
Married	−0.019***	−0.012***	0.026**	0.006
	(0.003)	(0.002)	(0.011)	(0.016)
Widowed	0.010**	0.002	0.001	−0.019
	(0.004)	(0.003)	(0.014)	(0.021)
Divorced/separated	0.022***	0.011***	−0.046***	−0.056***
	(0.004)	(0.003)	(0.011)	(0.016)
Family size	0.009***	0.005***	−0.000	0.002
	(0.001)	(0.001)	(0.002)	(0.003)
Retired	0.010***	0.008***	−0.055***	−0.076***
	(0.002)	(0.001)	(0.013)	(0.019)
Unemployed	0.075***	0.047***	−0.119***	−0.123***
	(0.008)	(0.006)	(0.016)	(0.022)
Disabled	0.046***	0.031***	−0.129***	−0.132***
	(0.003)	(0.002)	(0.009)	(0.012)
Homeowner	−0.062***	−0.037***	0.055***	0.060***
	(0.003)	(0.002)	(0.007)	(0.010)
Non-metro	0.004***	−0.001	−0.007	−0.021*
	(0.002)	(0.001)	(0.007)	(0.011)
South	0.002	0.003**	0.009	0.037**
	(0.002)	(0.002)	(0.011)	(0.016)
West	0.002	0.002	0.001	0.012
	(0.002)	(0.001)	(0.010)	(0.015)
Northeast	0.002	0.000	0.009	0.031**
	(0.002)	(0.001)	(0.010)	(0.015)
State unemployment rate	0.001	0.0012**	0.002	0.007
	(0.001)	(0.0006)	(0.004)	(0.006)
State employment per capita	−0.069**	−0.025	−0.221	−0.040
	(0.034)	(0.024)	(0.157)	(0.230)

Table 3. (*Continued*)

	Entry		Exit	
	(1)	(2)	(3)	(4)
Changes from Year 1 to Year 2				
Grandchild enters household	0.058***	0.040***	−0.097***	−0.069**
	(0.010)	(0.008)	(0.024)	(0.033)
Grandchild exits household	0.017	0.019**	−0.031	0.010
	(0.011)	(0.009)	(0.026)	(0.038)
Grandchild present both years	0.043***	0.015***	−0.023*	−0.009
	(0.006)	(0.005)	(0.014)	(0.019)
Enter marriage	−0.008	−0.019**	0.065*	0.117**
	(0.012)	(0.007)	(0.037)	(0.051)
Exit marriage	0.031***	0.027***	−0.083***	−0.093**
	(0.008)	(0.006)	(0.028)	(0.040)
Enter employment	−0.018***	−0.017***	0.080***	0.094***
	(0.005)	(0.004)	(0.017)	(0.024)
Exit employment	0.045***	0.032***	−0.097***	−0.090***
	(0.004)	(0.003)	(0.014)	(0.020)
Enter poverty	0.147***	0.101***	−0.150***	−0.163***
	(0.007)	(0.006)	(0.012)	(0.017)
Exit poverty	−0.100***	−0.061***	0.106***	0.119***
	(0.011)	(0.009)	(0.013)	(0.017)
Change in state unemployment rate	0.003	0.001	−0.007	−0.015
	(0.002)	(0.001)	(0.008)	(0.012)
Change in state employment per capita	0.206	0.199	−0.836	−0.716
	(0.186)	(0.132)	(0.897)	(1.311)
Constant	0.245***	0.127***	0.380***	0.239
	(0.022)	(0.016)	(0.100)	(0.147)
Observations	140487	134849	23290	10517

All regressions control for time effects. Robust standard errors in parentheses.
FFS, Fully Food Secure; MFI, Marginally Food Insecure; FI, Food Insecure
***$p < 0.01$
**$p < 0.05$
*$p < 0.1$

never married adults are much less likely than divorced or separated adults to enter food insecurity and more likely to exit, which suggests that instability in family structure spills over into instability in food security. Likewise, compared to employed adults, retirees, the unemployed, and the disabled are more likely to enter, and less likely to exit, either marginal food insecurity or food insecurity. The quantitative magnitudes for the unemployed and disabled are quite large suggesting they are particularly at risk of entering and remaining in food insecurity. On the other hand, as the only proxy for wealth available in the December CPS, home owners are much less likely to enter and more likely to exit MFI or FI. This is perhaps due to the fact that these households can borrow against the equity in their homes to avoid a spell of food insecurity. Controlling for personal characteristics, state economic conditions do not have a consistent influence on food insecurity transitions.

The last set of variables in Table 3 focus on demographic and economic "shocks" to the household. The focal family structure variables of interest are the three capturing presence of grandchildren. Relative to a family with no grandchild present in either year, if a grandchild enters the household between years 1 and 2, the family is 5.8% points more likely to enter MFI and 4% points more likely to enter FI. Likewise, they are 9.7 and 6.9% points less likely to exit MFI or FI,

respectively. If the grandchild exits between periods one and two, there is little evidence of change in food security status (except for some evidence of increased risk to enter FI, and reduced risk to exit MFI). If the grandchild is present in both years the family remains at elevated risk of entering either form of food insecurity, and they are less likely to exit MFI. Combined, the estimates suggest that whether grandchildren remain, or in periods of transition, multigenerational families are at heightened risk of entering food insecurity and remaining in this state.

Changes in marital status also have a substantive impact on food insecurity transitions, and these magnitudes are especially large in the exit models. Likewise, employment shocks into and out of employment, and income shocks of falling into or exiting from poverty, have large impacts on the risk of entering and exiting food insecurity. Finding a job or exiting poverty both reduce the chances of entering food insecurity, and increase the odds of exiting food insecurity. The opposite occurs when the adult loses a job or enters employment. Again, we find that once we control for person-specific socioeconomic changes in income and employment status, state-level portrayals of macroeconomic shocks in employment and unemployment do not influence the odds of entering or exiting food insecurity.

In Table 4, we unpack the nonmutually exclusive categories of MFI and FI to examine heterogeneity of transitions across mutually exclusive categories. In this case we examine sequential models of entry from FFS to MFS, from MFS to LFS, and from LFS to VLFS. Likewise, we estimate sequential models of exit from MFS to FFS, LFS to MFS, and VLFS to LFS. Because each of these transitions becomes increasingly less common, the sample sizes necessarily get smaller and thus reduce efficiency of the point estimates relative to the pooled models in Table 3.

The estimates in Table 4 show that most of the poverty-inducing effect of entry into food insecurity in Table 3 comes from movements from FFS to MFS or MFS to LFS and not from changes from LFS to VLFS. However, the "absorbing" effect of poverty status on reduced exits from food insecurity appears to be strong across all three exit models in columns 4 to 6. The race and ethnicity variables suggest that the bulk of the risk for food insecurity among African Americans and Hispanics is in moving into MFS. Interestingly, Hispanics are less likely to transition into LFS from MFS compared to whites, and are more likely to exit VLFS to LFS, suggesting again that there is substantial churning across food security states among Hispanic adults. Age is protective against food insecurity entry, except at the extreme level of VLFS, but older Americans are more likely to exit any given state of food insecurity to a greater level of food security. Higher education has a similar effect on entry, but no consistent statistically significant effect across food insecurity exits. Among the marital status and employment related variables, disability has the overwhelmingly largest effect across the individual categories in terms of moving into higher levels of food insecurity, and staying there.

The entry of a grandchild into the household appears to have the largest effect of moving families from fully food secure to marginal, and from marginal to low, and to inhibit exit from marginal food security to full food security. However, when a grandchild does enter, a family is more likely to exit the most extreme form of insecurity to a less extreme form. At the same time, in the next row we see that the exit of a grandchild increases the odds of entering VLFS from LFS by 13.8% points. In terms of the other socioeconomic shocks, exiting employment or entering poverty each have fairly consistent effects of enhancing entry into worsening food security states and of staying in those worse states.

The finding that the presence of a grandchild at once increases the odds of entering food insecurity, and yet buffers the household from more extreme versions of food hardship, could be a

Table 4. The Determinants of Entry and Exit using Mutually Exclusive Food Security Categories

	Entry Models			Exit Models		
	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	FFS to MFS	MFS to LFS	LFS to VLFS	MFS to FFS	LFS to MFS	VLFS to LFS
Year 1 Values						
Below federal poverty line	0.104***	0.081***	0.033	−0.111***	−0.056**	−0.072***
	(0.008)	(0.025)	(0.022)	(0.019)	(0.022)	(0.024)
African American	0.032***	0.025	−0.033	0.006	−0.035	0.029
	(0.003)	(0.024)	(0.022)	(0.015)	(0.022)	(0.026)
Other race	0.001	0.082**	0.010	0.025	−0.100***	−0.010
	(0.003)	(0.035)	(0.033)	(0.020)	(0.032)	(0.037)
Hispanic	0.026***	−0.064**	−0.026	−0.035**	−0.003	0.073**
	(0.004)	(0.026)	(0.025)	(0.017)	(0.025)	(0.031)
Age	−0.001***	−0.003***	−0.000	0.001**	0.003***	0.003**
	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Female	0.001	0.011	−0.000	−0.010	−0.016	−0.025
	(0.001)	(0.017)	(0.017)	(0.010)	(0.017)	(0.019)
High school	−0.022***	−0.005	0.024	0.014	0.013	0.007
	(0.003)	(0.021)	(0.021)	(0.014)	(0.020)	(0.024)
Some college	−0.034***	0.012	0.032	0.021	0.004	−0.015
	(0.003)	(0.024)	(0.024)	(0.015)	(0.023)	(0.026)
College	−0.048***	−0.055*	−0.003	0.031*	0.018	−0.036
	(0.003)	(0.029)	(0.031)	(0.017)	(0.030)	(0.036)
Married	−0.008***	0.019	−0.043	0.035*	−0.000	−0.030
	(0.002)	(0.028)	(0.027)	(0.018)	(0.027)	(0.032)
Widowed	0.008***	0.045	−0.038	0.042*	−0.005	−0.059
	(0.003)	(0.036)	(0.037)	(0.023)	(0.035)	(0.040)
Divorced/separated	0.014***	0.074**	0.001	0.018	−0.027	−0.024
	(0.003)	(0.029)	(0.028)	(0.020)	(0.027)	(0.030)
Family size	0.005***	0.006	−0.018***	0.003	−0.000	0.037***
	(0.001)	(0.006)	(0.005)	(0.004)	(0.005)	(0.007)
Retired	0.003*	0.011	0.025	−0.042**	−0.017	−0.033
	(0.002)	(0.030)	(0.032)	(0.018)	(0.031)	(0.039)
Unemployed	0.040***	0.056	0.040	−0.040	0.010	−0.017
	(0.006)	(0.041)	(0.038)	(0.027)	(0.036)	(0.039)
Disabled	0.022***	0.011	0.054**	−0.091***	−0.039*	−0.045*
	(0.003)	(0.022)	(0.021)	(0.015)	(0.021)	(0.024)
Homeowner	−0.035***	−0.033*	−0.020	0.016	0.019	0.004
	(0.003)	(0.018)	(0.018)	(0.012)	(0.017)	(0.020)
Non-metro	0.005***	−0.015	−0.033*	−0.010	−0.023	0.018
	(0.001)	(0.018)	(0.018)	(0.011)	(0.018)	(0.021)
South	−0.001	0.009	−0.025	−0.003	0.078***	−0.003
	(0.002)	(0.027)	(0.027)	(0.016)	(0.027)	(0.031)
West	0.001	0.014	0.001	0.001	0.069***	−0.036
	(0.002)	(0.026)	(0.026)	(0.015)	(0.025)	(0.029)
Northeast	0.001	0.008	0.011	−0.010	0.044*	−0.017
	(0.002)	(0.025)	(0.027)	(0.015)	(0.026)	(0.028)
State unemployment rate	0.000	0.028***	−0.013	0.004	0.004	0.002
	(0.001)	(0.010)	(0.010)	(0.006)	(0.010)	(0.011)
State employment per capita	−0.050*	0.460	−0.078	−0.398*	0.701*	−0.805*
	(0.028)	(0.393)	(0.417)	(0.233)	(0.408)	(0.455)

Table 4. (*Continued*)

	Entry Models			Exit Models		
	(1)	(2)	(3)	(4)	(5)	(6)
Changes from Year 1 to Year 2						
Grandchild enters household	0.027***	0.080	−0.065	−0.100**	0.018	0.164**
	(0.008)	(0.056)	(0.056)	(0.045)	(0.054)	(0.065)
Grandchild exits household	0.000	0.092	0.138**	0.001	0.095	−0.116
	(0.008)	(0.064)	(0.070)	(0.042)	(0.066)	(0.075)
Grandchild present both years	0.036***	0.076**	−0.023	−0.004	−0.054*	0.023
	(0.006)	(0.036)	(0.029)	(0.024)	(0.029)	(0.047)
Enter marriage	0.011	−0.160	0.098	0.018	0.027	0.030
	(0.010)	(0.116)	(0.104)	(0.064)	(0.098)	(0.103)
Exit marriage	0.007	0.073	0.006	−0.014	−0.046	−0.001
	(0.006)	(0.072)	(0.067)	(0.047)	(0.066)	(0.075)
Enter employment	−0.004	−0.036	0.018	0.045*	0.016	0.046
	(0.004)	(0.041)	(0.040)	(0.027)	(0.039)	(0.047)
Exit employment	0.019***	0.058*	0.109***	−0.068***	−0.023	−0.015
	(0.003)	(0.034)	(0.035)	(0.023)	(0.034)	(0.042)
Enter poverty	0.078***	0.117***	0.061**	−0.056**	−0.027	−0.057*
	(0.006)	(0.031)	(0.029)	(0.022)	(0.028)	(0.031)
Exit poverty	−0.073***	−0.144***	−0.004	0.032	0.010	0.095***
	(0.010)	(0.033)	(0.030)	(0.025)	(0.030)	(0.032)
Change in state unemployment rate	0.002	−0.006	0.027	−0.003	−0.035*	−0.002
	(0.001)	(0.020)	(0.021)	(0.012)	(0.020)	(0.023)
Change in state employment per capita	0.046	1.931	0.509	−0.903	−0.658	−2.463
	(0.150)	(2.159)	(2.122)	(1.376)	(2.142)	(2.541)
Constant	0.144***	0.111	0.444*	0.833***	−0.093	0.504*
	(0.018)	(0.250)	(0.266)	(0.145)	(0.250)	(0.290)
Observations	136405	3811	3322	8611	4062	2804

All regressions control for time effects. Robust standard errors in parentheses.

FFS, Fully Food Secure; MFS, Marginally Food Secure; LFS, Low Food Insecure; VLFS, Very Low Food Secure

***$p < 0.01$

**$p < 0.05$

*$p < 0.1$.

direct result of changes in family resources when the child enters and leaves the household. To explore this possible mechanism, we first examine what happens to family-size adjusted income when a grandchild enters the home. Specifically, we deflate before-tax income by the family-size specific federal poverty guideline, which yields an income-to-needs ratio. We then compute what fraction of families have an increase in income-to-needs from period one to period two. Doing so reveals that 50% of families with no grandchild present in either year have an increase in income-to-needs, and 57% of families with grandchildren present both years have an increase. However, only 40% of families have an increase in the year when the grandchild enters the home, while 76% have an increase when the grandchild exits. That is, when the grandchild enters there is a below-average increase in income growth, and when the child exits there is above-average growth. Since these income changes are adjusted for economies to scale in the family, it appears that the grandchild is extracting resources from the family.

Table 5. Two-Year Transition Probabilities in SNAP Participation by Presence of Grandchildren

Year 1 Status	**Year 2 Status**	
	No Grandchildren	
	No SNAP	SNAP
No SNAP	0.96	0.01
SNAP	0.01	0.02
	Grandchildren both years	
	No SNAP	SNAP
No SNAP	0.78	0.06
SNAP	0.06	0.10
	Grandchildren y1 only	
	No SNAP	SNAP
No SNAP	0.84	0.03
SNAP	0.09	0.04
	Grandchildren y2 only	
	No SNAP	SNAP
No SNAP	0.82	0.11
SNAP	0.02	0.05
Year 1 Status	**Average Income < 200% FPL**	
	No Grandchildren	
	No SNAP	SNAP
No SNAP	0.80	0.05
SNAP	0.05	0.10
	Grandchildren both years	
	No SNAP	SNAP
No SNAP	0.59	0.09
SNAP	0.10	0.22
	Grandchildren year 1 only	
	No SNAP	SNAP
No SNAP	0.64	0.06
SNAP	0.17	0.13
	Grandchildren year 2 only	
	No SNAP	SNAP
No SNAP	0.62	0.20
SNAP	0.05	0.13

Data from 163,777 longitudinal matches of the 2001–2010 December Current Population Surveys.

At the same time, the income measure in the December CPS only contains income from private sources and cash transfers from the government, but not in-kind transfers. Notably missing is the value of assistance from the SNAP. SNAP is the cornerstone food assistance program in the United States, serving one in seven Americans in 2013 at a cost of $80 billion. The program is means tested based on the income and asset status of the household. Specifically, gross income is required to be below 130% of the federal poverty guideline that varies by household size, and net income after deductions is required to be below the poverty line. The gross income test is waived for families with a member age 60 or older, or with a person with a disability, and in recent years some states have received waivers to raise the gross income limit for nonelderly/nondisabled families, though this generally has not exceeded twice the poverty line. In Table 5, we present two-year transition rates into and out of the SNAP by presence of grandchildren, both for the whole sample

and for those with two-year average incomes below twice the poverty line as they are at greater risk of participating in SNAP. The top panel shows that across the income distribution 11% of families that have a grandchild enter between years 1 and 2 join SNAP when the child enters, compared with only 2% of those families who are on SNAP in year 1 but not year 2 and 5% of those families on the program both years. The bottom panel shows that this number jumps to 20% when we restrict it to families with incomes below 200% of poverty, compared to 5% and 13%, respectively. Likewise, for those families with the grandchild present in year 1 but not year 2, Table 5 makes clear that SNAP participation falls when the child exits. While this evidence is not causal, it is suggestive that SNAP buffers the family from extreme forms of food hardship when a grandchild enters, and this risk is heightened when the child exits.

4. Conclusion

Using data from the 2001–2010 CFSM in the CPS we find that rates of food insecurity in households with a grandchild present are at least twice as high as households without a grandchild present and very low food security increased substantially faster among these households over the past decade. Our estimates from the longitudinally linked CPS data showed that the rise in food insecurity among adults age 40 and above after the onset of the Great Recession has occurred both because of increased entry into food insecurity and reduced exit. The rise in multigenerational families in the United States during the same recessionary period also came from increased entry and reduced exit of grandchildren into households, each relative to prerecessionary levels. In our multivariate regression analyses of transitions into and out of food insecurity we find that multigenerational families are at heighted risk of entering food insecurity and remaining in this state. We also find that employment and income shocks have strong effects on entry and exit of food insecurity, as well as disability status.

The transition models suggest a substantial amount of churning in food security states across periods. Our estimates especially point to the important role of family structure change on food security. In general, we find that the presence of a grandchild is destabilizing and exposes the adult householder to greater food security risk. However, the entry of a grandchild may not always be a negative for the household's food security, nor the exit of the child a positive. Entrance of the child seems to buffer the family from extreme forms of food insecurity, perhaps owing to the fact that additional resources such as SNAP flow into the family when the child arrives, and flow out when the child departs.

The findings from this article yield some implications for policymakers and program administrators. First, the resources available from assistance programs geared towards children and their parents are often overlooked for households headed by grandparents. For example, an Annie E. Casey Foundation report shows that less than 12% of kinship families receive assistance from Temporary Assistance for Needy Families even though they are eligible.[6] Second, given the demonstrated importance of SNAP in alleviating food insecurity (see Kreider et al., 2012 and references therein), increasing participation in SNAP among grandparents raising grandchildren is another path to improving the well-being of multigenerational households. Efforts to increase

[6] http://www.aecf.org/~/media/Pubs/Initiatives/KIDS%20COUNT/S/SteppingUpforKids2012PolicyReport/SteppingUpForKidsPolicyReport2012.pdf

participation may be especially well-directed towards those in the 40-to-60 age group which have lower participation rates, net of other factors including income volatility than other groups (Gundersen and Ziliak 2009). Third, in some cases, grandparents with grandchildren in the household may not be eligible for some benefits due to assignment of caregiver responsibilities. For example, for some programs unless a parent gives up paternal rights, even if grandparents have a grandchild living with them, they cannot receive benefits. Giving programs more flexibility in terms of who receives benefits on behalf of the children may be worthwhile to pursue.

This is the first article to examine the impact of multigenerational households on food insecurity. We believe there are different directions that future research could take. First, the impact of living with a grandparent on child well-being should be examined. While our results indicate that having a grandchild in the household is associated with worse outcomes for grandparents, the impact on the grandchildren may differ (Kennedy et al. 2013). For example, due to potentially bringing in extra resources to a household (e.g., more time for child care) having a grandparent present may protect children from worse outcomes. This would be consistent with DeLeire and Kalil (2002), who find that teenagers in single-mother families are less likely to engage in risky behaviors such as drinking and sexual activity after the entrance of a grandparent. Second, compiling information on participation in assistance programs in multigenerational households would be quite useful. As noted above, obvious policy recommendations include enhancing assistance program participation by grandparents raising grandchildren. To most effectively increase participation, however, requires an understanding of where lower participation rates than expected occur. Finally, while we believe the causality goes from family structure to food insecurity, there are likely to be instances where grandparents recognize that their grandchildren are becoming FI or being in danger of becoming FI, and in response, have the grandchildren and children move in with them. Investigating this causal issue is worth pursuing.

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