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***January 2022***

*Institute for the Study of Free Enterprise  
Working Paper 47*

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<http://isfe.uky.edu/>

## FEATURED ARTICLE

# Do state Supplemental Nutrition Assistance Program policies influence program participation among seniors?

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## Funding information

US Department of Agriculture, Food, and  
 Nutrition Service, Grant/Award Number:  
 12319818C0010

## Abstract

Senior participation in the Supplemental Nutrition Assistance Program (SNAP) has traditionally been lower than other groups among those eligible, with historical estimates below 50%. We examine the impacts of state SNAP policies on program participation among low-income senior (age 60 and older) and nonsenior households using data from the 2001 to 2014 December Current Population Survey Food Security Supplement. Our results suggest that policies designed to expand SNAP eligibility modestly increased participation among seniors but led to larger increases among nonseniors. In contrast, we find little evidence of effects of policies related to transaction costs, stigma, or outreach on either group.

## KEYWORDS

eligibility, participation, seniors, SNAP

## JEL CLASSIFICATION

I38, J14, Q18

Among those eligible to receive benefits, participation in the Supplemental Nutrition Assistance Program (SNAP) has traditionally been well below 100%, especially among seniors (Currie, 2006; Haider et al., 2003). In 2018, 82% of eligible individuals of all ages participated in SNAP, but only 48% of eligible seniors did (60 years and older) (Cunyngham, 2021). Despite this low participation

rate, there is a persistent need for nutrition assistance among millions of seniors. In 2016, 13.6% of seniors in the United States were marginally food-insecure, 7.7% were food-insecure, and 2.9% had very low food security (Ziliak & Gundersen, 2018). Existing research suggests that seniors are particularly vulnerable to food insecurity and may experience severe health consequences (Leroux et al., 2020). Relative to food-secure seniors, food-insecure seniors have lower nutrient intakes and are at a higher risk of a wide variety of adverse health conditions, including diabetes, depression, activities of daily living limitations, high blood pressure, congestive heart failure, heart attack, and asthma (Gundersen & Ziliak, 2015, 2017; Leroux et al., 2020).

Although SNAP is thought of primarily as a federal program, states have had the latitude to implement several policies in the period following welfare reform in 1996. These policies can increase SNAP eligibility by loosening the income and asset restrictions on households—and often do so more generously for households with seniors than without. Alternately, they can introduce or remove aspects of program administration that influence transaction costs or stigma, or they can increase program awareness through outreach. Ultimately, these state policies may substantially impact SNAP participation.

The purpose of this paper is to examine the impact of these policy changes on the SNAP participation of low-income senior households as compared to low-income nonsenior households. To our knowledge, ours is the first paper to investigate the roles of several state SNAP policies in senior household participation decisions nationally using a quasi-experimental econometric framework. Our primary dataset is the December Current Population Survey Food Security Supplement (CPS-FSS) between 2001 and 2014. We collect detailed information on 11 state policies and estimate their impacts on the probability of household SNAP participation using a model with state and year fixed effects as well as controls for household characteristics. Then, in an effort to obtain more precise estimates, we reestimate the models with a single “simulated eligibility” measure representing overall generosity of eligibility criteria in place of individual eligibility variables, the six policies related to transaction costs combined into a single count variable, and single stigma and outreach policies.

We hypothesize that policies increasing the benefits and lowering the cost of SNAP participation will increase such participation. It is less clear whether such policies will have a differential impact on seniors. On the one hand, these policies are designed to be more generous for seniors in many cases. On the other hand, senior SNAP participation typically tends to be below that of nonseniors. Thus, the differential impact of these policies on seniors is ultimately an empirical question.

We find that expanding SNAP eligibility leads to statistically significant increases in participation for both seniors and nonseniors, but the effects are larger for nonseniors. For each 10-percentage point increase in simulated eligibility, participation increases by 4.4 percentage points for nonseniors but just 1.4 percentage points for seniors. We find little evidence that policies related to transaction costs or outreach increase participation for either age group. Our results suggest that existing policy levers are insufficient to address the low SNAP participation rate among seniors.

## LITERATURE REVIEW

There is a large literature on the determinants of the take-up of transfer programs, including multiple comprehensive reviews (Currie, 2006; Nicoll, 2015). Categories of determinants typically include transaction cost levels, information availability, and perceptions of stigma



(Currie, 2006; Daponte et al., 1999). These participation determinants may be influenced by programmatic features and household characteristics such as age or immigration status. Evaluating the relative impact of these different determinants requires accurate information about eligibility and take-up, both of which are often subject to measurement error (Meyer et al., 2015). In this section, we review the literature on the determinants of SNAP participation with a special focus on seniors, whose participation has traditionally been lower than that of nonseniors (Currie, 2006; Haider et al., 2003; Nicoll, 2015).

Programmatic features of SNAP have been shown to generally influence SNAP participation through increases in generosity (Nicoll, 2015; Nord & Prell, 2011), expansions in eligibility (Capps et al., 2004; Jones, 2020), reductions in transaction costs (Currie, 2006; Dickert-Conlin et al., 2021; Ganong & Liebman, 2018), and increases in outreach (Bartlett et al., 2004; Ratcliffe et al., 2008). Ziliak (2015) decomposed changes in SNAP participation driven by policy and economic factors and found that policy had a larger long-term impact than previously estimated.

Several studies have investigated the role of stigma in welfare participation, as some eligible individuals may view participating in a means-tested transfer program such as SNAP as an outward sign of personal failure (Nicoll, 2015). These studies find different results that depend partly on the definition of stigma being used (Bartlett et al., 2004; Ranney & Kushman, 1987).

Turning our attention to seniors, Levy (2022) finds that the long-run risk of food insufficiency is substantially higher than the risk at a given point in time. In particular, she finds that one-fifth of older Americans will experience food insufficiency over a 20-year window in later life. Giordono et al. (2022) find that lower overall participation rates among 51–69-year-olds are more a product of low take-up rather than a lack of persistence. Haider et al. (2003) use data from the 1998 wave of the Health and Retirement Survey to comprehensively examine the determinants of SNAP participation of individuals aged 50 and older. They consider whether the differences in SNAP participation by age can be explained by the factors described above, including mismeasurement of eligibility and a host of behavioral factors that might influence how responsive seniors are to SNAP policy changes. These behavioral factors include imperfect information about eligibility (Issar, 2010), beliefs that the expected benefit of SNAP participation is low (Daponte et al., 1999), the cost of applying and renewing coverage is high, or that participation is associated with some sort of stigma (Nicoll, 2015).

It could also be the case that seniors do not perceive a personal need for SNAP benefits. Haider et al. (2003) find that measurement error in eligibility does not explain the differentially low take-up of SNAP among seniors. Their results also suggest that behavioral factors only account for a modest fraction of the relatively lower take-up rate among seniors. They find suggestive evidence that eligible seniors who do not enroll appear to be less needy relative to those who do.

Some studies have examined a handful of state demonstration projects focused on SNAP participation among the elderly. Cody and Ohls (2005) found that reducing the application burden was associated with increased participation in some states. Similarly, Kauff et al. (2014) found that simplifying the application process and focusing on seniors likely to be SNAP-eligible based on other program participation was associated with increased participation in certain states. Finally, Levin et al. (2020) find a positive association in some states between SNAP caseloads and interventions such as the Combined Application Project (CAP) and the Standard Medical Deduction (SMD). CAP allows the elderly applying for Supplemental Security Income (SSI) to apply simultaneously for SNAP. The SMD simplifies the SNAP rules for deducting medical expenses for the elderly.

Other papers have also examined different aspects of the age gradient in SNAP participation. Cunningham (2010) presents descriptive evidence suggesting that the characteristics of the elderly SNAP-eligible population often appear to vary from those of the elderly SNAP-participating population. Further, the characteristics of both populations frequently varied by state and occasionally over time. This variation appeared to be related to state SNAP eligibility policies and state demographics and economic climates. Lim (2011) finds that low participation rates among seniors are more likely associated with age effects than cohort effects. Wu (2009) found that lower average benefit levels, lack of information about SNAP eligibility, and a preference for other types of nutrition assistance contribute to low elderly SNAP participation. This lower participation rate did not negatively affect elderly nutritional well-being on average. According to focus group results described in Gabor et al. (2002), elderly SNAP nonparticipation was associated with stigma, the belief that the benefits would not be worth the effort, and perceptions of an overly complicated and intrusive application process. Finally, Wilde and Dagata (2002) found that seniors also reported difficulties with transportation and the use of electronic benefit transfer cards.

Unlike the previous literature, we focus specifically on differential responses to SNAP policies on SNAP participation by age. The closest paper in the previous literature is Haider et al. (2003). In contrast to their focus on individual beliefs and behaviors, we analyze the comprehensive set of state SNAP policies that have been implemented over the past two decades in a quasi-experimental econometric framework. This contrasts with previous studies examining interventions in a handful of states. We construct distinct versions of the policy variables for seniors and nonseniors and consider composite measures that combine related policies to improve precision. Finally, we also study a broader range of ages, comparing policy responses of nonseniors (those under 60 years) to seniors (those aged 60 and older).

## DATA

This section starts by describing the CPS-FSS from which we construct our household sample. We then describe recent SNAP policy changes. Finally, we describe how we use these policy changes in conjunction with an additional household sample from the Survey of Income and Program Participation (SIPP) to construct composite measures of policies related to eligibility and transaction costs.

### CPS-FSS data

Our primary dataset is the CPS-FSS between 2001 and 2014 (Flood et al., 2020). The CPS-FSS is a December supplement to the CPS monthly labor force survey of roughly 50,000 households, administered since 1995. The CPS-FSS serves as the main instrument for measuring US national and state-level food insecurity based on its 18-item food security module regarding various degrees of food-related hardships. The CPS-FSS also contains an indicator of household SNAP receipt over the past year that we use as the outcome of interest, as well as publicly available information on the state of residence, allowing us to study the effects of changing state policies.

We restrict the sample in several ways. We exclude households living in Alaska and Hawaii due to differences in state benefit formulas complicating analyses employing the simulated eligibility variable (SEV). We exclude households living in California due to the likely impact on



senior SNAP participation from the state's SSI "cashout" policy during the sample period in which SSI recipients were excluded from SNAP. We restrict the sample to low-income households with income at or below 185% of the federal poverty level (FPL). The CPS-FSS screens out households with income above 185% FPL that also indicate no food hardship from questions about SNAP, so this restriction limits our sample to households asked about SNAP participation who are also more likely to be affected by income eligibility expansions.<sup>1</sup> Finally, we exclude households with any missing characteristics used as controls.

The full analysis sample includes 170,929 households. We define two additional subsamples—a "senior" sample of households with respondents aged 60 or older and a "non-senior" sample of households with respondents aged 59 or younger. The senior sample makes up about 34% of the full sample, and the nonsenior sample makes up about 66%. Alternatively, we could have defined the senior sample as households with *any* senior, but this distinction is of minimal consequence, as it would only reclassify 3% of the sample. Control variables for our analysis include the household respondent's age in years, gender (indicator for female), race-ethnicity (indicators for non-Hispanic black, non-Hispanic American Indian or Alaskan, non-Hispanic other, and Hispanic), nativity (indicator for foreign-born), marital status (indicators for married, divorced, widowed, and separated), educational attainment (indicators for high school, associate, bachelor's, and advanced degrees), and employment status (indicators for employed and unemployed) as well as the household's size (number of people and indicators for single-person household and presence of children) and family income (indicators for under \$5000, \$2500 increments up to \$15,000, \$5000 increments up to \$40,000, \$10,000 increments up to \$60,000, and \$15,000 increments up to \$100,000).

## State SNAP policy changes

Although SNAP is a federal program, states have had the latitude to implement several policies in recent decades targeting SNAP participation. Following Stacy et al. (2018), we classify these policies as primarily impacting one of four factors affecting the participation decision—eligibility to receive benefits; transaction costs involved in applying, enrolling, or maintaining benefits; stigma associated with participation; and outreach efforts in spreading information related to eligibility criteria and how to receive benefits. We gather information on policies affecting eligibility, transaction costs, and stigma from the United States Department of Agriculture (USDA), Economic Research Service's (ERS) SNAP Policy Database (2021a), and additional information on a policy affecting outreach from ERS's SNAP Policy Index (2021b). We gather additional details on state policies related to SNAP eligibility and benefit determination from 2001 to 2014 from the USDA SNAP Policy Database (2021a), various Food and Nutrition Service and other reports (Aussenberg & Falk, 2019; Cronquist et al., 2020; Horng & Dean, 2002; Laird & Trippe, 2014; Trippe & Gillooly, 2010), state SNAP policy manuals—reports, and direct contact with state SNAP administrators.<sup>2</sup> Unless otherwise specified, we construct annual policy measures for each policy described below representing the percentage of the year that policy was in place in each state.

Policies increasing SNAP eligibility may increase SNAP participation through extending eligibility to previously ineligible households or by inducing a "woodwork effect" among already-eligible households. Households are typically eligible for SNAP if they meet a gross income test of 130% of the FPL (households with senior or disabled members need not meet the gross income test), a net income test of 100% of the FPL, and a countable resource test of \$2250

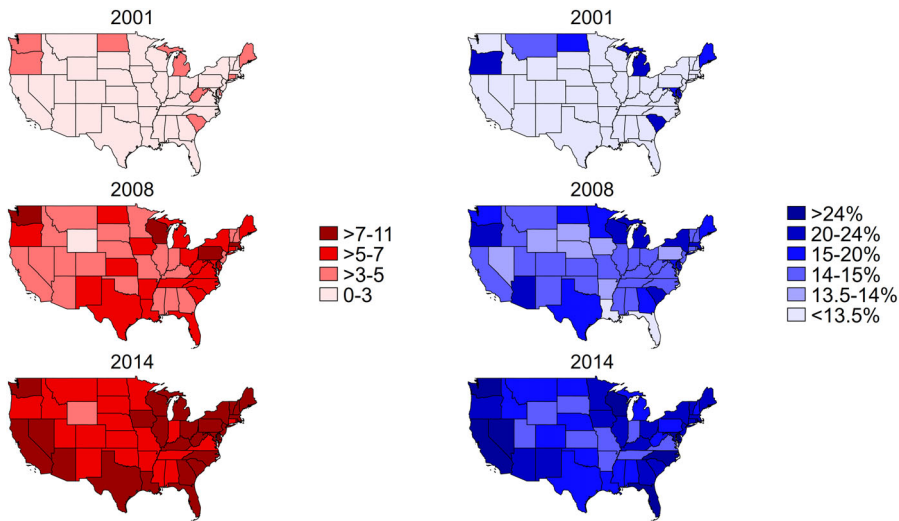


(households with senior or disabled members may have up to \$3500) or if they are determined to be categorically eligible through their participation in another qualifying welfare program. Since 1996, states have been permitted to extend SNAP eligibility beyond the federal criteria in various ways. First, states can implement a broad-based categorical eligibility policy (BBCE) to directly expand categorical eligibility to households with income or assets above the federal limits. Second, states can align their vehicle valuation rules to exclude one or more vehicles from the resource test. Last, states can make legal noncitizens eligible for SNAP or similar state-funded food assistance. The SNAP Policy Database (2021a) provides separate information on whether states extended eligibility to legal noncitizen adults and seniors (age 65+), which we incorporate separately in analyses of the full/nonsenior or senior samples, respectively.

Policies reducing transaction costs may increase SNAP participation by making it easier for households to apply for SNAP, enroll in SNAP, and/or maintain SNAP benefits. States can alter their policies affecting how SNAP is administered in several ways affecting transaction costs. First, states can use simplified reporting, which reduces requirements for households with earnings to report changes in their circumstances. Second, states can allow households to submit SNAP applications online instead of requiring an in-person application. Third, states can operate SNAP call centers. Fourth, states can conduct recertification interviews over the phone instead of requiring in-person certification. Fifth, states can operate a CAP, streamlining the SNAP application process for SSI recipients. Sixth, states can change how frequently households must recertify to continue receiving SNAP. The SNAP Policy Database (2021a) provides monthly information on the proportions of SNAP units of various types with recertification periods of 1–3 or 4–6 months. We separately construct the monthly proportion of SNAP units with “short” recertification periods of 6 months or less for SNAP units with earnings and for senior SNAP units and use the annual average of these monthly proportions in analyses of the full/nonsenior or senior samples, respectively.

Policies increasing the stigma of SNAP participation may disincentivize and decrease participation. We consider only one such policy—whether states require fingerprinting of SNAP applicants. Policies raising awareness of SNAP may increase participation among eligible non-participants who previously were unaware of the program or thought themselves ineligible. We consider only one such policy—whether states had federally funded TV or radio ad campaigns intended to raise awareness of SNAP among eligible nonparticipants.

Two policies are more applicable to nonsenior than senior households—the proportion of SNAP units with earnings with short recertification periods and/or the state making legal non-citizen adults (18–64) eligible for SNAP or similar state-funded food assistance. We, therefore, create senior-specific versions of these variables for use in the senior sample—the proportion of senior SNAP units with short recertification periods and/or the state making legal noncitizen seniors (65+) eligible for SNAP or similar state-funded food assistance. The left panel of Figure 1 illustrates the variation in the measures described above as represented by a modified sum of each of the 11 measures with higher values representing more generous policies in place.<sup>3</sup> States tend to adopt more SNAP policies over time expected to increase participation, though there is substantial variation in when these policies are adopted. Appendix Figure 1 similarly illustrates the variation in the sum of the policies described above using the senior versions where applicable. Appendix Tables 1A, 1B, and 1C show the proportions of the full, nonsenior, and senior samples, respectively, living in a state where each policy we consider is in effect for each year.



**FIGURE 1** Policy variation illustrations. The left panel shows state variation in the sum of the 11 policy measures included in Table 2 using the nonsenior versions where applicable and adding two minus the fingerprinting and short recertification period measures due to their negative expected effect on participation. The right panel shows state variation in the simulated eligibility variable calculated using the full SIPP sample, including both senior and nonsenior households. Related figures are presented in Appendix

## SNAP policy summary measures

Several studies construct index measures of state SNAP policies to summarize overall policy generosity (Dickert-Conlin et al., 2021; Ganong & Liebman, 2018; Schmidt et al., 2016; Stacy et al., 2018). Such an approach is likely to improve the precision of econometric estimates at the cost of being unable to disentangle the distinct roles of different types of policies. We aim to balance these considerations by consolidating the 11 policy variables into four measures reflecting the categories of eligibility, transaction costs, stigma, and outreach. Since there is only one stigma variable and one outreach variable, the overall measure for those categories is simply equal to the lone variable. We construct composite measures for two policy categories that include multiple policies. Those two categories are eligibility (which has three individual policies to combine) and transaction costs (which has six individual policies to combine).

We combine information on two of the policies related to eligibility (BBCE and vehicle exemptions) as well as additional information on standard medical expense deductions into a SEV that computes the proportion of a fixed national sample eligible for SNAP under a given state's SNAP policy environment in a given year.<sup>4</sup> Applying changing eligibility rules to a fixed national sample to determine the average eligibility of that sample circumvents potential endogeneity issues from the composition of states' populations or economic characteristics (such as average household income) changing over time. Accordingly, the identifying variation comes only from plausibly exogenous changes in state policies related to the generosity of SNAP. Simulated eligibility strategies were first introduced by Cutler and Gruber (1996) and Currie and Gruber (1996) in studies on the effects of Medicaid. Han (2016, 2020) and Jones (2020) developed SEVs for SNAP. Our novel contribution is to construct separate SEVs for seniors and nonseniors.



We use a SEV rather than a simple count of eligibility-related policies since each expands SNAP eligibility in differing and potentially interacting ways. States can alter how vehicles are applied to the countable resource test by aligning to the rule they use under a Temporary Assistance for Needy Families (TANF) or state Maintenance of Effort (MOE) funded assistance program if the rule they transition to is less restrictive than the federal minimum. States can also use BBCE to directly expand categorical eligibility to households if they qualify for a non-cash TANF–MOE-funded benefit. BBCE expansions effectively extend SNAP eligibility to households that would not be eligible under the federal rules through eliminating or loosening some combination of the gross income, net income, or asset tests. Some states' BBCE expansions also target different subcategories of households—like those with senior or disabled members—in different ways. In particular, many states' BBCE policies expanded eligibility for households with seniors more than for households without them. Some states have additionally implemented standard medical expense deductions for senior households, which increases the deduction for households with low out-of-pocket medical expenses and reduces their net income. Variation in the extent to which eligibility is altered along these various dimensions, the combination of how it is altered, and the groups targeted means that the nature of SNAP eligibility expansion in any given state and year can differ greatly from others that have similar policies in place.

Formally, the SEV for state  $s$  in year  $t$  is computed as.

$$SEV_{st} = \frac{\text{Number of individuals simulated as eligible for a positive benefit}_{st}}{\text{Total number of individuals}} \quad (1)$$

where the individuals are from the national sample, but the policy variation is by state. A higher proportion simulated as eligible in a state and year indicates a more generous policy set and should predict a higher likelihood of SNAP participation.

For the constant national sample, we pool all available waves of the SIPP from 1996 to 2013, which contain around 340,000 household-year observations. The SIPP provides information on household size, income, assets, expenses, and other characteristics like member age and disabilities necessary to determine SNAP eligibility. Household financial variables are adjusted for inflation each year before applying the combined eligibility criteria in each state and year resulting from the policies described above. In analyses of the full sample, we use a SEV calculated using the full sample of individuals in SIPP households following Jones (2020). In addition, we are the first to use the simulated eligibility method to study the SNAP participation of senior households instead of nonsenior households, so we also construct new versions of the SEV specific to each group. Specifically, the *nonsenior SEV* is the fraction of individuals simulated eligible in the 230,000 SIPP households with respondents under age 60. The *senior SEV* is the fraction of individuals simulated eligible in the 110,000 SIPP households with respondents age 60 or older.

The right panel of Figure 1 illustrates state variation in the full sample version of the SEV across 3 years spanning the sample period. The SEV tends to increase or stay constant over time as most states only expand SNAP eligibility during the sample period. However, a few states reverse expansions or change their policies such that the SEV falls. There is also a slight decline in the SEV in later years in many states due to the 2013 expiration of the American Recovery and Reinvestment Act (ARRA) temporary benefit increase, making some higher-income SIPP households lose eligibility. Appendix Figure 2 similarly illustrates the variation in the nonsenior and senior versions of the SEV.



Since it is less obvious how to parameterize the composite measure of transaction costs, for that category, we simply use the total number of policies in place out of the six possibilities:

$$\text{Transaction Cost Policy Index}_{st} = \sum_{i=1}^6 \text{Policy}_{ist} \quad (2)$$

where  $s$  indicates state,  $t$  indicates year, and  $i$  indicates a policy contributing to the index. Each policy variable  $\text{Policy}_{ist}$  is an annual average of a monthly indicator equal to 1 if a policy is in place in a given month, and therefore, represents the percentage of the year that a policy was in place (except for the policy variable indicating the proportion of SNAP units with a recertification period of 6 months or less, though that variable also ranges from 0 to 1). Proportion of SNAP units with short recertification periods enters the index as  $(1 - \text{Policy}_{ist})$  so that a value of 1 indicates the more generous possibility. A higher value of the index, therefore, unambiguously, means lower transaction costs.

## Summary statistics and descriptive figures

Table 1 provides summary statistics for the outcome and policy variables for our full sample of households, as well as stratified by senior versus nonsenior households, while Appendix Table 2A does the same for the control variables. About 23% of the full sample reported receiving SNAP benefits in the past year. Only 14% of senior households received benefits, about half the percentage of nonsenior households that did (28%). The senior and nonsenior samples differ in other noticeable ways. Predictably, the average age of senior respondents is higher. Senior respondents are more frequently female, white, native-born, widowed, less educated, and not in the labor force. Senior households are also, on average smaller, more likely to contain just one member and much less likely to include children. Table 1 also shows the average value of the policy variables and summary measures described above.

## METHODS

We estimate how state SNAP policy changes related to eligibility, transaction costs, stigma, and outreach affect SNAP participation using linear probability models of the form

$$\text{SNAP}_{jst} = \beta_0 + \beta_1 \text{Policy}_{st} + \beta_2 \mathbf{X}_{jt} + \beta_3 \text{SFE}_s + \beta_4 \text{YFE}_t + \epsilon_{jst} \quad (3)$$

where  $\text{SNAP}_{jst}$  is an indicator for self-reported receipt of SNAP benefits in the past year for household  $j$  in state  $s$  and year  $t$ ,  $\text{Policy}_{st}$  is a vector of either the 11 policy variables or the four summary measures,  $\mathbf{X}_{jt}$  is a vector of the control variables,  $\text{SFE}_s$  is a vector of state fixed effects,  $\text{YFE}_t$  is a vector of year fixed effects, and  $\epsilon_{jst}$  is the error term. We cluster robust standard errors by state in all regressions.<sup>5</sup>

We are interested in estimating  $\beta_1$ , which represents the average treatment effects of various state policies on low-income household SNAP participation under the assumption that policy adoption is uncorrelated with unobserved time-varying state-level characteristics.<sup>6</sup> Because we are interested in how  $\beta_1$  differs between senior and nonsenior households, we estimate Equation (3) for each of three samples—the full sample, including all households, the

**TABLE 1** Sample means for Supplemental Nutrition Assistance Program (SNAP) receipt and state policies

Sample	Full	Nonsenior	Senior
Outcome: received SNAP in the past year	0.233	0.282	0.140
State uses BBCE	0.462	0.463	0.461
State excludes one or more vehicles from asset test	0.786	0.780	0.795
State has eligibility for all legal noncitizens aged 18–64/65+ <sup>a</sup>	0.0906	0.0874	0.125
State has simplified reporting for households with earnings	0.811	0.813	0.806
Online applications accepted statewide	0.377	0.373	0.383
Call centers operated statewide	0.297	0.297	0.298
Telephone recertification in at least part of state	0.476	0.478	0.472
State operates a Combined Application Project for SSI recipients	0.288	0.289	0.287
% with earnings/seniors with 1–6 months recertifications <sup>a</sup>	0.530	0.537	0.0743
Fingerprinting of applicants required statewide	0.0828	0.0902	0.0689
State has federally funded TV or radio ad outreach campaign	0.107	0.108	0.105
Simulated eligibility variable <sup>a</sup>	0.175	0.172	0.186
Transaction costs policy count (0–6) <sup>a</sup>	2.719	2.714	3.172
Total policy count (0–11) <sup>a</sup>	5.082	5.062	6.561
Number of households	170,929	112,184	58,745

*Note:* Analysis samples include households with income less than 185% of the federal poverty level. Full sample includes all such households, nonsenior sample includes households with respondents aged under 60, and senior sample includes households with respondents aged 60 or older.

Abbreviations: BBCE, broad-based categorical eligibility policy; SSI, Supplemental Security Income.

<sup>a</sup>Variable is defined differently for different samples as described in the data section.

nonsenior sample, including the two-thirds of the full sample with respondents aged under 60, and the senior sample, including the third of the sample with respondents aged 60 or older. We then present and compare the estimates of  $\beta_1$  side by side to determine whether senior households respond differently to state SNAP policies. For each policy variable, we also conduct *t*-tests of the equality of its coefficient for seniors and nonseniors.

We are aware of the well-known problem of SNAP misreporting and the growing literature on how such measurement error biases the estimated causal effects of the program (Meyer et al., 2015; Nguimkeu et al., 2019). Some solutions address misclassification in the dependent variable of binary choice models (Bollinger & David, 1997, 2005; Hausman et al., 1998; Meyer & Mittag, 2017). We do not pursue these approaches in our primary analyses because some rely on external information on misclassification probabilities that are not readily available, especially for our senior sample. However, we have estimated our primary model specification based on Hausman et al.'s (1998) approach, and our qualitative findings are unchanged. These results are available from the authors upon request.

## RESULTS

Table 2 reports the results from regressions of household SNAP participation on the set of 11 separate state SNAP policy variables for each of the analysis samples. The senior sample



regression uses senior-specific versions of the two variables indicated in the table by superscript “a”. Each policy variable ranges from zero to one, with one indicating that the relevant policy was in place all year or that all SNAP units had a short recertification period during the year. The policy variables are categorized as primarily targeting eligibility, transaction costs, stigma, or outreach. All of the policies are expected to increase SNAP participation except two expected to decrease it—the proportion of SNAP units with short recertification periods and requiring that applicants be fingerprinted.

**TABLE 2** Regressions of Supplemental Nutrition Assistance Program (SNAP) participation on state SNAP policies

Sample	Full	Nonsenior	Senior
Eligibility			
Uses BBCE	0.00881 (0.00653)	0.0105 (0.00730)	0.00411 (0.00771)
Excludes one or more vehicles from asset test	−0.00199 (0.00856)	0.00331 (0.0107)	−0.0124 (0.00986)
Eligibility for all legal noncitizens aged 18–64/65+ <sup>a</sup>	−0.00295 (0.0191)	0.00390 (0.0248)	−0.0133 (0.0145)
Transaction costs			
Simplified reporting for households with earnings	0.00647 (0.00685)	0.00969 (0.00854)	−0.00388 (0.00879)
Online SNAP applications accepted statewide	0.00448 (0.00624)	−0.0000285 (0.00715)	0.0115 (0.00741)
Operates call centers statewide	−0.00473 (0.00613)	−0.00236 (0.00660)	−0.0110 (0.00710)
Telephone recertification in at least part of state	−0.00378 (0.00536)	−0.00316 (0.00694)	−0.00452 (0.00611)
Operates a combined application project for SSI recipients	0.0123 (0.00748)	0.0120 (0.00921)	0.0128* (0.00725)
% with earnings/seniors with 1–6 months recertifications <sup>a</sup>	−0.0210** (0.00789)	−0.0214** (0.00845)	−0.0406 (0.0373)
Stigma			
Requires fingerprinting of applicants statewide	−0.0294* (0.0151)	−0.0290** (0.0111)	−0.0291 (0.0300)
Outreach			
Has federally funded TV or radio ad outreach campaign	0.00757 (0.0157)	−0.00292 (0.0176)	0.0224 (0.0185)
Number of observations	170,929	112,184	58,745
F-statistic from test of joint significance of policies	2.526	3.309	2.231
Mean of outcome	0.233	0.282	0.140

*Note:* Standard errors, in parentheses, are heteroscedasticity-robust and clustered by state. Asterisks indicate statistically significant at \* $p < 0.10$ , \*\* $p < 0.05$ , and \*\*\* $p < 0.01$ . Plus signs indicate that the nonsenior and senior estimates are statistically different at + $p < 0.10$ , ++ $p < 0.05$ , and +++ $p < 0.01$ .

Abbreviations: BBCE, broad-based categorical eligibility policy; SSI, Supplemental Security Income.

<sup>a</sup>Variable is defined differently for different samples. Each regression includes individual-level and household-level controls and state and year fixed effects.

We find no evidence of effects on SNAP participation among the full, nonsenior, or senior samples for most policy variables we consider. We do find evidence that shorter recertification periods of 6 months or less for SNAP units with earnings reduce the probability of household SNAP participation. Our estimates indicate that households in both the full and nonsenior samples are about 2.1 percentage points less likely to have received benefits in the last year in states where all households with earnings are subject to a short recertification period. Living in states with applicant fingerprinting requirements reduces SNAP participation by about 2.9 percentage points for the full and nonsenior samples. Only one policy variable is statistically significant at the 10% level for seniors—senior households are 1.3 percentage points more likely to participate if their state streamlines the SNAP application process for SSI recipients through a CAP.

Note that, with 11 policy variables, we would expect roughly one hypothesis to be rejected at the 10% level or better by chance in each of the three regressions. This is exactly the number we find for the senior sample, and the full and nonsenior samples only revealed two significant effects. Moreover, we find no evidence that any of the effects statistically differ for seniors and nonseniors. Therefore, our results are perhaps best interpreted as providing little evidence that expansionary SNAP policies effectively boost participation for either age group.

That said, including 11 separate policy variables in a single regression is quite demanding of the data, so the relative lack of statistical significance in Table 2 could simply reflect insufficient statistical power to detect plausible effect sizes. Table 3, therefore, presents the results from the specification that consolidates the 11 policies into 4 variables—the SEV representing the extent of state eligibility policy, the transaction cost index that incorporates all six associated policies, and the lone stigma and outreach policies.

The first row in the table shows that the SEV is statistically significant at the 5% level or better for all three samples. Each 10-percentage point increase in eligibility raises participation by 3.1 percentage points for the full sample, 4.4 for nonseniors, and 1.4 for seniors. The effect for seniors is, therefore, less than a third as large as that for nonseniors, and the difference is

**TABLE 3** Regressions of Supplemental Nutrition Assistance Program (SNAP) participation on composite policy measures

Sample	Full	Nonsenior	Senior
Simulated eligibility variable <sup>a</sup>	0.313*** (0.0827)	0.443*** (0.0940)	0.139*** <sup>+++</sup> (0.0591)
Transaction costs <sup>a</sup>	0.00350 (0.00264)	0.00310 (0.00303)	0.00147 (0.00295)
Fingerprinting of applicants required statewide	−0.0281 (0.0170)	−0.0302** (0.0139)	−0.0261 (0.0284)
Has federally funded TV or radio ad outreach campaign	0.00628 (0.0152)	−0.00680 (0.0168)	0.0262 <sup>+</sup> (0.0181)
Number of observations	170,929	112,184	58,745
F-statistic from test of joint significance of policies	5.480	7.558	2.873
Mean of outcome	0.233	0.282	0.140

*Note:* Standard errors, in parentheses, are heteroscedasticity-robust and clustered by state. Asterisks indicate statistically significant at \* $p < 0.10$ , \*\* $p < 0.05$ , and \*\*\* $p < 0.01$ . Plus signs indicate that the nonsenior and senior estimates are statistically different at <sup>+</sup> $p < 0.10$ , <sup>++</sup> $p < 0.05$ , and <sup>+++</sup> $p < 0.01$ .

<sup>a</sup>Variable is defined differently for different samples. Each regression includes individual-level and household-level controls and state and year fixed effects.



statistically significant at the 1% level. We note that given the participation rate for nonseniors is twice that of seniors, the estimates imply that the corresponding percent change for nonseniors is only one and a half times as large as those for seniors (i.e., 15.7% vs 9.9% for the former and latter, respectively).

The estimates appear to imply that take-up rates for newly eligible households are much smaller than the overall take-up rates mentioned in the introduction (44% for nonseniors and 14% for seniors compared to 83% and 42%, respectively). While we caution that our estimates cannot be strictly interpreted as take-up rates (e.g., simulated eligibility based on a national sample is not exactly the same as actual eligibility in the state, woodwork effects could mean that some of the new enrollees are not newly eligible, and some of the newly eligible may not be included in our sample of under 185% of the FPL), the magnitudes of those differences are nonetheless striking.

The subsequent rows in Table 3 provide little evidence that SNAP policies related to transaction costs or outreach effectively increase participation among either nonseniors or seniors. We find a 3 percentage point reduction in participation among nonseniors from fingerprinting requirements, suggesting that reducing stigma is another effective way to increase participation. We estimate an effect of similar magnitude among seniors, though it is not significantly different from zero or the nonsenior effect.<sup>7</sup>

## CONCLUSION

We examine the impact of 11 different state SNAP policies related to eligibility, transaction costs, stigma, or outreach on the probability of SNAP participation among households with senior or nonsenior respondents. Consolidating several eligibility-related policies into a single SEV, we find that expanding SNAP eligibility increases participation among seniors and nonseniors. However, the effect for nonseniors is more than three times as large as that for seniors, and both effects imply marginal take-up rates that are smaller than the overall take-up rates for the program. We find some evidence that lengthening the recertification period and eliminating fingerprinting requirements would modestly increase participation among nonseniors, but there is little evidence that policies related to transaction costs or outreach meaningfully impact participation rates among eligible seniors.

Our findings are of interest to policymakers and researchers interested in the factors explaining low senior SNAP participation relative to nonseniors. While some existing policy levers might modestly increase participation, there does not appear to be any feasible policy combination that would make meaningful progress toward closing this gap. Given that many eligible seniors do not participate relative to nonseniors, it makes sense that eligibility expansions would not strongly increase senior participation. However, we do not find evidence that policies reducing transaction costs or stigma increase senior participation. This could indicate that it is not high participation costs driving lower senior participation, but lower benefits. As Haider et al. (2003) find eligible seniors appear to have relatively low unmet need despite their low take-up of SNAP. Future research can investigate the unmet need hypothesis among seniors using measures of food insufficiency following Gundersen and Ribar (2011).

We note that while we find limited effects of the noneligibility policies on participation, the same policies can affect the program's administrative costs. Homonoff and Somerville (2021) find that the SNAP recertification process imposes administrative burdens that decrease recertification success and long-term program participation. Moreover, Mills et al. (2014) find



that the phenomenon of churn—the reentry of disenrolled SNAP recipients within 4 months or less—imposes considerable time and monetary costs on the agencies administering the program, with estimates ranging from one to 4% of total certification costs. Thus, notwithstanding our limited results of noneligibility policies on participation, policymakers may still factor their impacts on the administrative burden in their decision-making.

In addition, our findings may be relevant for researchers interested in using SNAP policy instruments in instrumental variables (IV) frameworks. Several studies have employed state-level policies as instruments for SNAP participation but have frequently had difficulty obtaining precise estimates (Almada et al., 2016; Denteh, 2017; Meyerhoefer & Pylypchuk, 2008; Ratcliffe et al., 2011; Yen et al., 2008). Tables 2 and 3 include *F*-statistics for the policy variables in each regression to show those variables' potential as instruments for SNAP participation. In no specification do the policy variables jointly meet the common rule of thumb that the first stage *F*-statistic exceed 10. However, the *F*-statistic for the SEV alone in Table 3 is about 13 for the full sample and 22 for the nonsenior sample, consistent with the values found by Jones (2020) in state panel analyses of the effects of SNAP on food retail establishments and Medicaid expenditures.<sup>8</sup> Unfortunately, the SEV has less promise as an instrument for analyses focused on seniors, as the *F*-statistic is just 5.5. A related methodological issue that is open for future research is whether the state adoption of policies is plausibly exogenous to the take-up of SNAP. While we maintain this assumption in this paper, further work is needed to probe it, considering that such investigation entails studying the staggered adoption of multiple state policies (some of which are nonbinary).

We encourage researchers to continue to investigate other policy levers that could meaningfully influence SNAP participation among seniors, especially using data covering additional post-Great Recession years. Perhaps more qualitative work with seniors building upon Gabor et al. (2002) and Levin et al. (2021) would help better identify policy levers that may work. Not only would this inform efforts to close the participation gap, but it would also provide a plausible pathway to identifying how participation affects food security and other health outcomes of this important and understudied population. In light of the beneficial effects of SNAP on food insecurity among elderly adults in Georgia during the COVID-19 pandemic (Lee et al., 2022), such future work deepening our understanding of senior participation in SNAP would enhance policymaking.

## ACKNOWLEDGMENTS

This project was supported with a grant from the University of Kentucky Center for Poverty Research through funding by the US Department of Agriculture, Food, and Nutrition Service, Contract Number 12319818C0010. The opinions and conclusions expressed herein are solely those of the author(s) and should not be construed as representing the opinions or policies of the UKCPR or any agency of the Federal Government. We thank Craig Gundersen, Jim Ziliak, Chris Bollinger, three anonymous referees, and participants at the Senior Hunger Research Symposium for valuable feedback.

## ENDNOTES

<sup>1</sup> Restricting the sample to those with income at or below 185% FPL means that we likely exclude a small group of higher-income households that may be eligible due to the presence of a senior or disabled household member (in which case the household is not subject to a gross income limit) or due to BBCE as described later in this section.



- <sup>2</sup> The state policies we consider here are not exhaustive. Additional policies such as work requirements and associated time limits, combined processing of Medicaid applications, and others are also likely to impact SNAP participation in various ways.
- <sup>3</sup> We add each of the 11 measures representing the percentage of the year each policy was in place, using the nonsenior versions where applicable, except for the fingerprinting and short recertification period measures. Since these measures have a negative expected effect on participation, we add two and subtract these measures from the result so that the modified sum is higher if these policies are not in place.
- <sup>4</sup> Lubotsky and Wittenberg (2006) propose an alternative approach for estimating the coefficient of interest on an unobserved variable by including all the available proxy variables simultaneously and combining their coefficient estimates after that into a summary measure. Our approach to constructing the simulated eligibility measure differs because we use a fixed national sample to address the potential endogeneity issues from the composition of states' populations.
- <sup>5</sup> We elect not to utilize the sampling weights in our main analysis since our focus is on age-based subsamples rather than obtaining population-level estimates. Moreover, we are able to control for all the characteristics (age, race, and gender) that the CPS uses to construct the sampling weights. In such cases, Solon et al. (2015) argue against the use of weights, showing that they do not improve the reliability of coefficient estimates but likely inflate their standard errors. We present results from weighted models corresponding to Tables 2 and 3 in Appendix Tables 3 and 4 for the interested reader.
- <sup>6</sup> Recently, a literature has emerged identifying potential problems with two-way fixed-effects models with staggered treatment time. See Cunningham (2021, pp. 461–510) for a detailed discussion. While some solutions have been proposed for settings with single, binary treatments, we are unaware of any that are applicable with multiple, nonbinary treatments like ours.
- <sup>7</sup> We test the sensitivity of these findings to several alternative models, several of which include additional controls (metropolitan area status, state unemployment rate, and state political environment) and one of which includes households living in California. These changes do not significantly alter our findings. We present these results in Appendix Tables 5 to 9.
- <sup>8</sup> One can compute  $F$ -statistics for individual variables in our tables by squaring the  $t$ -statistic, which in turn is given by dividing the coefficient estimate by the standard error.

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**How to cite this article:** Jones, Jordan W., Charles Courtemanche, Augustine Denteh, James Marton, and Rusty Tchernis. 2022. "Do state Supplemental Nutrition Assistance Program policies influence program participation among seniors?." *Applied Economic Perspectives and Policy* 1–18. <https://doi.org/10.1002/aepp.13231>