

Food Stamp Enrollment and Mental Health: An Implicit Tax on the Poor

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March 18, 2021

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Abstract

Objectives. This study examines whether food stamp participation status impacts the mental health of its recipients.

Methods. We use 2017 data from the Michigan Panel Study of Income Dynamics to construct a propensity score model to match treated and control individuals, circumventing inherent selection bias and estimating causal effects.

Results. We find that enrolling in food stamps within the past 30 days increases the frequency of emotional distress over the same timeframe, manifesting specifically in more frequent feelings of sadness, nervousness, hopelessness, ‘everything being an effort,’ and worthlessness.

Conclusions. Food stamp enrollment harms mental health more than it benefits it, reaffirming previous literature that identified this effect. We hypothesize that either logistical barriers to accessing the program and stigma from oneself and others contribute to this, creating costs that are unnecessary, suggesting that program reform and/or changing cultural narratives can remedy this implicit tax on the poor.

Keywords: Food Stamps, Mental Health

JEL: D90, I38

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1. Introduction

The Supplemental Nutrition Assistance Program (SNAP) is a federal program run through the US Department of Agriculture. President Johnson cemented the program as a quintessential anti-poverty initiative in 1964, and since then it has continued to grow as one of the most relied on direct subsidies for struggling families, with almost ten percent of Americans utilizing it today, and 15.2 percent of Americans utilizing it at its enrollment peak in 2013 (USAFacts 2020). SNAP works to alleviate food security concerns for its recipients by providing credits that can only be spent at select stores on select items, providing aid with constraints. Investment in the program has grown steadily to match increase in demand for it overtime. In fiscal year 2011, funding for the program exceeded \$75 billion dollars, cementing it as one of the largest social safety programs in the United States (Caswell 2013). Program enrollment closely follows the business cycle historically, indicating it serves as an automatic stabilizer as well. SNAP is objectively a good program from an efficiency standpoint, which may shield it from budget cuts and make it a priority for expansionary efforts in the future, which Congress has followed through with historically, emphasizing the relevance of studying it. Charitable programs have an administrative cost percentage, which dictates for every dollar that program or entity receives, how much of it goes to the targeted groups and how much goes toward administrative costs. SNAP's administrative cost percentage is 7.7 percent, compared to even the most efficient private charities' 10-15 percent (Llobrera 2019), making the program an extremely efficient vehicle for anti-poverty aid. This may

prove critical to the program's political appeal on both sides of the aisle and has caught the eye of economists and other social scientists who have taken to studying the program recently.

Previous literature on this topic suggests that food stamp enrollment can both benefit and worsen mental health outcomes, although papers that specifically analyzes this connection between the two, namely Heflin and Ziliak (2008) and Whiting and Ward (2010), have concluded more negative effects. In section 2.2 we discuss three key links between food stamp enrollment and mental health: beneficial connections from improvements in food security, and detrimental connections from both difficulties navigating logistical barriers and stigma.

This paper uses 2017 data from the Michigan Panel Study of Income Dynamics (PSID) Family-level to investigate if there is a relationship between food stamp enrollment and mental health regarding heads of households in early 2017. We construct a propensity score model, matching over 21 covariates to circumvent selection bias regarding food stamp qualification and enrollment, allowing us to estimate the average treatment effect on the treated with a causal effect interpretation. We conclude that enrolling in food stamps increases the frequency of mental distress regarding feelings of sadness, nervousness, hopelessness, 'everything being an effort,' and worthlessness. Our paper is unique relative to Heflin and Ziliak (2008) and Whiting and Ward (2010), whom we draw the most similarities to regarding research question, in that we utilize a propensity score model. We share a data source with Heflin and Ziliak (2008), but we utilize more recent data and dive deeper into the specific connections to emotions instead of general distress, which we discuss later in section three. To our knowledge this paper is the first paper in 11 years to re-investigate this idea, creating a more robust literature pool by proving this effect has persisted over time and is strong enough to appear with different methods as well.

2. Institutional Context: Food Stamp's Utilization and Consequences

2.1 Government's Implementation Strategy and Ramifications

Any household that drops below a specific income threshold laid out by the USDA can qualify for food stamps, with number of children and elderly in the household serving as variables that shift the threshold within a given region. SNAP benefits drop off at a ratio of 30 cents for every additional dollar of income an individual makes a month (beyond the income applicants initially applied with), as the USDA expects families to devote 30% of their income to their food needs (Caswell 2013).

SNAP's implementation has led to a variety of effects that are worth noting. Kaiser (2008) details how a significant quantity of people who qualify for SNAP do not enroll, finding barriers to connecting individuals with the service. Among women specifically, Kaiser (2008) finds that individuals below the age of 25, above the age of 54, and Hispanic individuals in general are less likely to enroll even if they qualify. This can be explained by either an information problem of what programs the government offers or technical/cultural barriers to accessing them. More interestingly, they write that some individuals refuse to enroll in food stamps because they do not feel entitled to it (Kaiser 2008). This "lack of personal entitlement" idea lines up with DeParle and Gebeloff (2009), who hypothesize personal stigma against the program as a possible driver of this effect. In terms of greater enrollment trends across the entire US population, aggregately two-thirds of individuals who qualify for the program enroll in it (DeParle and Gebeloff 2009).

Those who utilize it, as the correlation matrix Figure 1 shows, are likely to utilize it for a long period of time. The figure showcases among observations in our dataset, the correlation between being on food stamps for any two months. As the correlations all are above 0.7, there is very strong correlation between food stamp enrollment between all months in 2016 and our period

of inquiry in early 2017, meaning that those who enroll tend to stay enrolled for a significant period. This is further supported by existing literature. Mabli et al. (2011) find that median participation duration for SNAP among a weighted 2004 cohort was about ten months. 25 percent of individuals who left the program returned within six months, and 50 percent of those who left returned within 20 months (Mabli et al. 2011). Therefore, any effects, positive or negative, brought on from enrolling in food stamps are therefore likely to be magnified as individuals experience them continually.

2.2 Links Between SNAP and Mental Health

Food stamps are meant to combat food security, and the link between the two is well established in literature. Food insecurity is associated with worse physical health outcomes for both adults (Dinour 1961) and minors (Cook 2004), from undernutrition, malnutrition, and obesity, which negatively impact mental health via multiple well established direct and indirect relationships (Ohrnberger et al. 2017). How families allocate their assistance relative to their budget impacts the effects SNAP can have on them. If families who qualify for food stamps are already consuming the amount of food they desire, upon receiving food stamps according to the rational actor hypothesis, they will simply substitute their budget from food to other expenditures and replace it with food credits, especially if they have other, more pressing non-food needs. A paper from Hastings and Shapiro (2018) however, finds that people consume more food when assistance is given in the form of food stamps instead of just as a cash grant, contradicting the rational actor hypothesis. The marginal propensity to consume food is much higher when the currency is food stamps and not cash, even if the stamps are lower than the preexisting food budget for enrollees, a situation where food stamps are synonymous with cash transfers considering budget substitutions. This direct increase in food consumption supports literature like Kreider et

al (2012) and Gundersen and Oliveira (2001) who find clear relationships between SNAP enrollments and improvements in food security outcomes, which bring direct benefits to enrollees physically and therefore mentally.

While the benefits of SNAP enrollment are explicit and intuitive, many of the personal costs associated with enrollment are implicit and thus harder to observe. Whiting and Ward (2010) write that, “Households primarily using Food Stamps are the most likely to experience high levels of stress. Interviews with Food Stamp recipients show that potential sources of stress include inadequate allocations of Food Stamps, difficulty achieving and maintaining eligibility, challenges to complying with paperwork and appointment requirements, as well as personal obstacles and community barriers...” (Whiting and Ward 2010). On top of logistical factors, stigma exists as another implicit cost to enrollees. DeParle and Gebeloff (2009) highlight that conservative efforts to critique welfare programs negatively impact public perception of SNAP as well as those utilizing it, which can manifest in external scorn and cognitive dissonance among users, especially among those who harbor prejudice themselves yet still enroll. Heflin and Ziliak (2008) identify negative mental health outcomes from food stamp enrollment that are incurred during the initial periods of enrollment, and scale upwards with SNAP award value, indicating a dosage effect that worsens mental health outcomes the more an enrollee benefits from SNAP.

If food stamps have an impact on mental health, there are a variety of ways it can manifest as literature discussed earlier points out. The positive effects include providing more and better-quality food for those facing food insecurity, leading to better health outcomes and thus better mental health. Giving impoverished individuals a consistent source of aid can help them establish stability which can help with budgeting and planning, potentially relieving stress or causing it depending on aid consistency. Negative effects might include stress attempting to fill out

paperwork, ensuring continued qualification, receiving awards on time, and stigma from others or oneself. These positive and negative effects relative to mental health could either not exist, both exist but cancel each other out, or one could be stronger than the other, all as possible outcomes to explain results.

3. Data

Data was collected by the Michigan Panel Study of Income Dynamics (PSID) which is a longitudinal survey of a representative sample of individuals in the U.S. Despite attrition out of the program since its unveiling, the sample is and will continue to be representative according to analysis from Fitzgerald et al. (1998) and therefore is still a quality source of data. Data was gathered via questionnaires and surveys, with some data scraped from public sources about the participants in question. The data comes from the Family-level section, meaning mental health variables are in terms of the heads of each family unit. To our knowledge, Heflin and Ziliak (2008) are the only other authors who utilize this data to investigate the relationship between food stamps and mental health, although we utilize more recent data, more mental health variables including theirs, and propensity score methods in contrast.

Our dependent variables of interest for mental health include sadness, nervousness, restlessness, hopelessness, 'everything being an effort,' worthlessness, and a psychological distress scale. The six variables regarding specific emotions take on a range of quantitative values from 1-5 in their original form, with never feeling (5), sometimes feeling (4), feeling often (3), feeling usually (2), and feeling constantly (1), and are reported in the summary statistics Table 1 as such. Each of these six emotion variables are in the scope of the past 30 days. The psychological distress variable is a quantitative scale from 1-24 that is constructed as follows from the other six

dependent variables; each observation is assigned a score depending on their answers to the previously mentioned six emotion variables, with ‘feeling constantly’ = 4 points, ‘feeling usually’ = 3 points, ‘feeling often’ = 2 points, ‘sometimes feeling’ = 1 point, and ‘never feeling’ = 0 points. The point values are totaled across all six emotion variables for each observation making up the score.

Considering our response variables take on quantitative values as representations of qualitative data, for our main analysis we converted these six emotion variables to binary indicators using three distinct cutoffs which are distinguished by three panels in Tables 4. Cutoff 2, dubbed High Frequency, means that variable values for the six emotion variables of 1 and 2 are sent to 1, and 3, 4, and 5 are sent to 0. Cutoff 3, dubbed Moderate Frequency, means that variable values of 1, 2, and 3 are sent to 1, and 4 and 5 are sent to 0. Cutoff 4, dubbed Low Frequency, means that variable values of 1, 2, 3, and 4 are sent to 1, and 5 is sent to 0. The interpretation of these cut offs is discussed in the results section. This allows for us to determine non-zero directional movements more easily between frequency classification, while not impacting the psychological distress scale as its values come from the Michigan PSID itself. This analysis however comes at the expense of magnitude, which we work to include in Table 5.

Our treatment variable is “Stamp Enrollment” which takes a value of 1 if the individual has received food stamps in the last 30 days, and 0 otherwise. This timeline of 30 days is important as it is also the same timeline for the response variables in question.

4. Empirical Strategy

Inherent selection bias is present in the treated population relative to the control population as SNAP benefits are only distributed to those who qualify, which is determined by income

thresholds. Without controlling for this bias, food stamp enrollment would serve as an indicator for poverty as our observations are representative of the entire United States, which would bias our estimates. A propensity score model allow us to circumvent this bias, Ono et al. (2020) summarize the empirical strategy of a propensity score model effectively, “A propensity score refers to the predicted probability and enables the effects of multiple confounding factors to be calculated as a single score ... paired subjects matched one-to-one based on the propensity score are comparable or “exchangeable”, which achieves quasirandomization for a simple observational study” (Ono et al. 2020).

The covariates used in this paper to predict treatment status include: whether an individual owns or rents their home, how often the individual drinks alcohol, how often the individual performs mentally demanding activities, how the individual rates their physical health, total income, total income squared, total hours worked a week, total hours worked a week squared, personal education, personal education squared, number of children, and indicators for White, Black, Asian, male, employed, unemployed, retired, student, mother’s completion of high school, and father’s completion of high school. These are all present in summary statistics Table 1. These covariates were chosen in accordance with both economic theory from literature review and statistical indicators from the data to balance model selection philosophies.

Utilizing this model, average treatment effect on the treated (ATT) was calculated and is displayed in Table 4. The weighting scheme utilized by the propensity score model to calculate scores was weights for each covariate equal to the inverse of the variances.

4.1 Identifying Assumptions

Our propensity score model relies on the assumption that by matching control and treatment observations by important covariates we can ultimately neutralize significant differences

in those covariates between control and treatment groups, allowing us to create causal effect interpretation via quasirandomization. Table 2 details the effectiveness of this effort. As the table shows, our model is extremely effective at taking the control and treatment groups that differ in a statistically significant ways across almost every covariate and creating a control and treatment group with nearly identical covariate distributions. Only one statistically significant difference remains, but the actual size of the difference makes this fact irrelevant.

Figure 2 details the distribution of propensity scores between the entire control and treatment groups. Overlap was imposed to purge both all control observations with lower propensity scores than treatment observations' scores, and all treatment observations with higher propensity scores than all control observations' scores. Because of the higher density of treatment observations with high propensity scores than control observations, matching was done with replacement to minimize bias.

4.2 Limitations

We identify two limitations to our model; first, we do not account for previous experience with food stamps before our period of interest. Potentially previous experience enrolling in food stamps can mitigate logistical barriers as individuals develop an aptitude for navigating government resources. Although we would expect the potential effects of stigma to persist as well as other concerns discussed by Warding and White (2010) earlier. As our literature review suggests in accordance with our findings in Figure 1, most of our treatment observations have enrolled in food stamps prior to Stamp Enrollment's period of inquiry. Looking into this more concretely in Table 3, we find that only 12.7 percent of our treated observations had not enrolled in food stamps in 2016 at all, with 69.5 percent of treated observations enrolled for all 12 months. It is important to note here as well that our propensity score model does control for income, so we would expect

a similar allotment of experience with poverty level income in both control and treatment groups after matching. Second, we do not account for the total value of food stamps given, i.e. a dosage effect, just the fact that an individual is enrolled in some form of food stamp assistance. Heflin and Ziliak (2008) specifically link negative mental health outcomes to both identified limitations. Compared to their methods, our model is more general, but can more easily draw causal effects.

5. Results

Because mental health statistics were evaluated at different cutoffs, different interpretations exist for statistics from one panel versus another and are separated as such below. It is important to remember that all these variables are over a period of 30 days.

5.1 Panel 1: High Frequency

Table 4, Panel 1 represents users moving from feeling emotions either at no, low, or moderate frequency to a high level of frequency relative to the other panels. None of the terms are statistically significant from zero. This indicates, for example, that food stamp enrollment does not take individuals who feel sad never, sometimes, or often, and cause them to feel sad usually, or constantly.

5.2 Panel 2: Moderate Frequency

Table 4, Panel 2 represents users moving from feeling emotions either at no or low frequency to a moderate or high level of frequency relative to the other panels. Sad, hopeless, and ‘everything being an effort’ are statistically different from zero at a one percent level. Nervous, restless, and worthless are statistically different from zero at a five percent level. All significant estimates are positive. This indicates that food stamp enrollment increases emotional distress across the four mentioned emotions. A 0.088 estimate for sadness in column 7 indicates that 8.8

percent of individuals who enroll in food stamps go from feeling sad never or sometimes, to feeling sad either often, usually, or constantly. The same interpretation holds true for 5.8 percent of individuals regarding nervousness, 6.4 percent of individuals regarding restlessness, 5.8 percent of individuals regarding hopelessness, and 8.1 percent of individuals regarding ‘everything being an effort,’ and 4.2 percent of individuals regarding worthlessness.

5.3 Panel 3: Low Frequency

Table 4, Panel 3 represents users moving from feeling emotions at no frequency to either a low, moderate, or high level of feeling frequency relative to the other panels. Sad, restless, ‘everything being an effort,’ and worthless are statistically different from zero at a one percent level, with nervous and hopeless significant at a five percent level. All significant estimates are positive. A 0.104 estimate for sadness in column 13 indicates that 10.4 percent of individuals who enroll in food stamps go from feeling sadness never, to feeling sadness either sometimes, often, usually, or constantly. The same interpretation holds true for 6.1 percent of individuals regarding nervousness, 8.6 percent of individuals regarding restlessness, 5.3 percent of individuals regarding hopelessness, 8.1 percent of individuals regarding ‘everything being an effort,’ and 5.5 percent of individuals regarding worthlessness.

5.4 Results from Raw Values

The focus of Table 5 is the distress scale variable in column 7. As mentioned before, the distress scale is made up of a linear combination of the six emotion variables where for each of the six emotion variables, values of ‘feeling constantly (1)’ = 4 points, ‘feeling usually (2)’ = 3 points, ‘feeling often (3)’ = 2 points, ‘sometimes feeling (4)’ = 1 point, and ‘never feeling (5)’ = 0 points. These point values are then totaled to form the distress scale value for each observation. For the analysis present in Table 5, each emotion variable was programmed to reflect its point value (5 to

0, 4 to 1, 3 to 2, 2 to 3, and 1 to 4). This is evident as the sum of the estimates for the six emotion variables equals the estimate of the distress variable in Table 5.

Because these estimates are affected by both direction and magnitude, unlike estimates from Table 4 which just involve direction, it is impossible to distinguish whether these estimates represent a shallow shift among many individuals, or a more concentrated shift among fewer individuals, which is important to consider regarding our interpretation. Sad, restless, hopeless, worthless, and the distress scale are statistically different from zero at a one percent level, with nervous and ‘everything being an effort’ significant at a five percent level. All significant estimates are positive. Our interpretation of the distress scale and thus the specific emotion estimates exists as follows as not to distort this consideration: among 1,000 individuals who enroll in food stamps, 974 additional points will be accumulated among them in total across the six emotions. We can directly trace 208 of these frequency points to sadness, 146 of these frequency points to nervousness, 188 of these frequency points to restlessness, 130 of these frequency points to hopelessness, 181 of these frequency points to ‘everything being an effort,’ and 122 of these frequency points to worthlessness. To clarify again, one additional point in a category is a moving up of one frequency unit in that category (e.g. from never feel sad to sometimes feel sad).

6. Discussion and Conclusion

Using 2017 data collected from the Michigan Panel Study of Income Dynamics Family Unit Section, we have demonstrated that food stamp enrollment worsens mental health outcomes among the heads of households who enroll in food stamps, specifically manifesting in more frequent feelings of sadness, nervousness, hopelessness, ‘everything being an effort,’ and worthlessness. Heflin and Ziliak (2008), whom our paper matches with the most, only utilize

the psychological distress scale in their analysis, where we show specific connections to each of the six emotion variables and how food stamp enrollment specifically manifests in each of them using more recent data. Our utilization of an effective propensity score model allows us to draw causal effect connections more easily between food stamp enrollment and mental health via quasirandomization.

It is widely agreed upon that poverty alone is detrimental to mental health. Subjecting those individuals already prone to mental disorders with additional stressors in the form of logistical factors and social stigma is frankly cruel. No benefits are accrued by society when an individual struggles to navigate logistical barriers or faces discrimination for their utilization of a welfare program. It is clear therefore that in the long run (after fixed costs associated with changing these issues are spent), the elimination of these barriers and stigma is a pareto improvement, benefiting those who need society's aid the most with no continual variable costs. Therefore, it is imperative that government entities and advocacy groups investigate how we can create program reform and change cultural norms regarding welfare programs.

Future papers that wish to investigate this matter further might investigate using data from other years, and combine the methods used in this paper with those in others such as Heflin and Ziliak (2008), allowing for a more complete picture to be drawn regarding the relationship between food stamps and mental health. Investigating the mental health ramifications from enrolling in other forms of financial assistance, such as private charities and food banks, could also help isolate effects specific to government assistance.

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8. Tables

Table 1: Summary Statistics

Statistic	N	Mean	St. Dev.	Min	Pctl(25)	Pctl(75)	Max
Stamp Enrollment	6,672	0.156	0.362	0	0	0	1
Number of Children	6,672	0.808	1.193	0	0	1	11
Working Hours	6,672	29.987	21.840	0	0	42	112
Own or Rent Property	6,672	0.465	0.499	0	0	1	1
Alcohol Consumption	6,672	1.967	1.939	0	0	4	6
Mental Activities	6,672	0.629	0.483	0	0	1	1
Health Status	6,672	0.815	0.388	0	1	1	1
Family Income	6,672	55,223	45,269	-84,022	26,000	78,000	2,229,087
White	6,672	0.576	0.494	0	0	1	1
Black	6,672	0.402	0.490	0	0	1	1
Asian	6,672	0.013	0.115	0	0	0	1
Male	6,672	0.643	0.479	0	0	1	1
Father's Education	6,672	0.658	0.474	0	0	1	1
Mother's Education	6,672	0.707	0.455	0	0	1	1
Education	6,672	13.378	2.419	0	12	16	17
Employed	6,672	0.693	0.461	0	0	1	1
Student	6,672	0.014	0.118	0	0	0	1
Unemployed	6,672	0.067	0.250	0	0	0	1
Retired	6,672	0.151	0.358	0	0	0	1
Sad	6,672	4.558	0.857	1	4.8	5	5
Nervous	6,672	4.171	1.022	1	3	5	5
Restless	6,672	4.099	1.091	1	3	5	5
Hopeless	6,672	4.709	0.734	1	5	5	5
Effort	6,672	4.122	1.213	1	3	5	5
Worthless	6,672	4.775	0.665	1	5	5	5
Distress Scale	6,672	3.566	4.050	0	0	6	24

Data are from the Michigan PSID 2017 Family Unit Section. White, Black, Asian, Father's Education, Mother's Education, Employed, Student, Unemployed, and Retired were created and are not originally found in the dataset. Negative values for Family's Income indicate losses. Values for dependent variables Sad – Worthless are presented in their original form as never feeling (5), sometimes feeling (4), feeling often (3), feeling usually (2), and feeling constantly (1), as multiple cutoffs are utilized to convert to binary in different models.

Table 2: Quality of Overlap in Propensity Score Model

	<i>Covariates:</i>			
	Own or Rent Property (1)	Alcohol Consumption (2)	Mental Activities (3)	Health Status (4)
Mean Difference Before Matching	0.280***	0.641***	0.246***	0.151***
Mean Difference After Matching	0.022	0.112	0.014	0.025
	Total Income (5)	Total Income ² (6)	Working Hours (7)	Working Hours ² (8)
Mean Difference Before Matching	34952***	837e + 7***	12.25***	641.4***
Mean Difference After Matching	6748	236e+7	3.053	279.3
	Education (9)	Education ² (10)	Number of Children (11)	White (12)
Mean Difference Before Matching	1.357***	36.20***	0.695***	0.257***
Mean Difference After Matching	0.596	14.76	0.133	0.020
	Black (13)	Asian (14)	Male (15)	Employed (16)
Mean Difference Before Matching	0.266***	0.010***	0.264***	0.222***
Mean Difference After Matching	0.027	0.005	0.005*	0.013
	Unemployed (17)	Retired (18)	Student (19)	Mother's Education (20)
Mean Difference Before Matching	0.106***	0.042***	0.001	0.097***
Mean Difference After Matching	0.016	0.036	0.004	0.026
	Father's Education (21)			
Mean Difference Before Matching	0.097***			
Mean Difference After Matching	0.037			

Note:

*p<0.1; **p<0.05; ***p<0.01

Data are from the Michigan PSID 2017 Family Unit Section. e+7 refers to scientific notation 10⁷. Mean Difference Before Matching refers to the difference in mean covariate values of the total treated group and total control group. Mean Difference After Matching refers to the mean difference in covariate values between each matched pair. Each column is a covariate utilized in the propensity score model.

Table 3: History of Enrollment Among Treated Observations

Number of 2016 Months Observations Enrolled in SNAP	0	1	2	3	4	5	6	7	8	9	10	11	12
The Count	132	10	17	24	16	16	20	21	13	12	12	5	721

Data are from the Michigan PSID 2017 Family Unit Section. The interpretation is as follows for example; 132 observations were not enrolled in food stamps during 2016, while 21 observations were enrolled for 7 out of 12 months.

Table 4: Effects of Food Stamp Enrollment on Mental Health

Panel 1						
<i>Dependent variable:</i>						
	Sad (1)	Nervous (2)	Restless (3)	Hopeless (4)	Effort (5)	Worthless (6)
Stamp Enrollment	0.017 (0.013)	0.021 (0.016)	0.026 (0.018)	0.012 (0.011)	0.020 (0.022)	0.016 (0.010)
Original N	6,672	6,672	6,672	6,672	6,672	6,672
Treated N	1,038	1,038	1,038	1,038	1,038	1,038
Matches	1,038	1,038	1,038	1,038	1,038	1,038

Panel 2						
<i>Dependent variable:</i>						
	Sad (7)	Nervous (8)	Restless (9)	Hopeless (10)	Effort (11)	Worthless (12)
Stamp Enrollment	0.088*** (0.023)	0.058** (0.026)	0.064** (0.026)	0.058*** (0.020)	0.081*** (0.027)	0.042** (0.019)
Original N	6,672	6,672	6,672	6,672	6,672	6,672
Treated N	1,038	1,038	1,038	1,038	1,038	1,038
Matches	1,038	1,038	1,038	1,038	1,038	1,038

Panel 3						
<i>Dependent variable:</i>						
	Sad (13)	Nervous (14)	Restless (15)	Hopeless (16)	Effort (17)	Worthless (18)
Stamp Enrollment	0.104*** (0.026)	0.061** (0.027)	0.086*** (0.027)	0.053** (0.023)	0.081*** (0.027)	0.055*** (0.021)
Original N	6,672	6,672	6,672	6,672	6,672	6,672
Treated N	1,038	1,038	1,038	1,038	1,038	1,038
Matches	1,038	1,038	1,038	1,038	1,038	1,038

Note:

*p<0.1; **p<0.05; ***p<0.01

Data are from the Michigan PSID 2017 Family Unit Section. Standard errors of the estimates are in parenthesis below. All dependent variables are binary. Original values for each binary dependent variable are never feeling (5), sometimes feeling (4), feeling often (3), feeling usually (2), and feeling constantly (1). Each Panel represents a

different cut off for conversion of each dependent variable to binary, with Panel 1 representing cut off 2, Panel 2 representing cut off 3, and Panel 3 representing cut off 4.

Table 5: Raw Findings

Table 6: Effect of enrolling in Food Stamps on Mental Health Raw

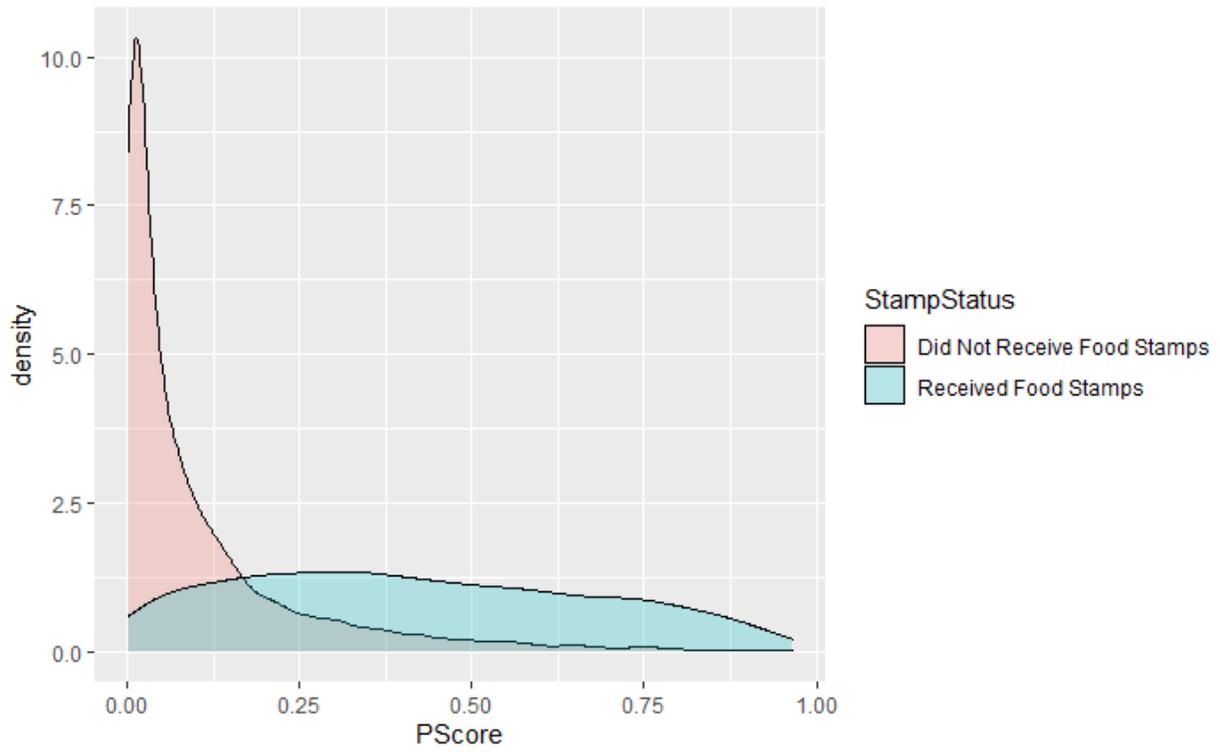
	<i>Dependent variable:</i>						
	Sad (1)	Nervous (2)	Restless (3)	Hopeless (4)	Effort (5)	Worthless (6)	Distress (7)
Stamp Enrollment	0.208*** (0.057)	0.146** (0.064)	0.188*** (0.067)	0.130*** (0.051)	0.181** (0.077)	0.122*** (0.046)	0.974*** (0.266)
Original N	6,672	6,672	6,672	6,672	6,672	6,672	6,672
Treated N	1,038	1,038	1,038	1,038	1,038	1,038	1,038
Matches	1,038	1,038	1,038	1,038	1,038	1,038	1,038

Note:

*p<0.1; **p<0.05; ***p<0.01

Data are from the Michigan PSID 2017 Family Unit Section. Standard errors of the estimates are in parenthesis below. All dependent variables are converted to match the values associated with their corresponding point values in the Distress variable. Original values for each dependent variable are never feeling (5), sometimes feeling (4), feeling often (3), feeling usually (2), and feeling constantly (1). This was mapped to never feeling (0), sometimes feeling (1), feeling often (2), feeling usually (3), and feeling constantly (4) in accordance with the formula for the distress scale.

Figure 2: Propensity Score Distributions for Treated and Control Observations



Data are from the Michigan PSID 2017 Family Unit Section. Overlap was imposed on data by eliminating both treated observations with higher propensity scores than all control observations, and control observations with lower propensity scores than all treated observations.