"The Longer Term Effects of Head Start on SNAP"

Kimberly Reitema

Spring 2016

Advisor: Francesco Renna

Abstract

While much research has been conducted on the determinants of both participation in the Supplemental Nutrition Assistance Program (SNAP) and the longer term effects of participation in the Head Start preschool program, little is known about the long term effects that participation in the Head Start program as a child might have on the probability of SNAP participation as an adult. This paper draws on the data collected by the National Longitudinal Survey of Youth 79 Children and Young Adults (NLSY79 Child/YA) provided by the Bureau of Labor Statistics. Findings suggest that participation in the program as a child decreases the probability of receiving SNAP benefits as an adult by 17.42 percent compared to siblings that do not participate in the Head Start program as children, though further research is need to determine the statistical significance of the findings.

Table of Contents

I.   Introduction, Hypothesis, and Motivation

In 2014, 48.1 million people were food insecure, which means that they lacked access, at all times, to enough food for an active, healthy life (United States Department of Agriculture, 2016). This translates to a national average of 14% of all households, and broken down even further, 19.2% of all households with children and 35.3% of all households headed by a single mother. Being food secure is a basic desire for all human beings. In an effort to alleviate this very serious problem, the U.S. government has instituted a number of programs, among which the Supplemental Nutrition Assistance Program is (SNAP), formerly known as food stamps. As of 2015 fiscal year there were over 45.767 million people enrolled in the SNAP totaling a cost of over $73.97 billion for taxpayers (Supplemental Nutrition Assistance Program, 2016). SNAP is one of the largest food assistance programs in effect in the United States and has been since its inception 41 years ago. One of the most unique features of the program is that there are very few participation requirements. A person is only required to meet the program's monthly income cutoff to be eligible to receive benefits. While SNAP is a great resource to those in need, it is a temporary band aid in addressing the much larger and more complex issue of food insecurity. It concentrates on the symptoms of the problem, and leaves the root cause untouched. A better policy may be to address the causes of poverty at the core by helping children develop a toolbox of skills that will last a lifetime.

The technology skill formation, the basis for the development of human capital, is a dynamic process that begins at birth (Cunha, Heckman, 2007). Our capabilities as an adult were developed in our most formative years as a child. There are specific times in a child's life when he/she is better able to develop certain skills and when certain inputs are more effective in the

production of the skills. Making children more able to develop strong noncognitive tools early on has to the potential to decrease their reliance on social programs in the future.

One such program in effect is the federally funded preschool program Head Start. The program began in the 1960's as part of the War on Poverty. It is targeted at economically disadvantaged preschool aged children, and currently, it serves over 800,000 children. Local branches operate under federal guidelines. In addition to providing an educational and nurturing environment for the children, Head Start also provides access to preventative medical care, such as vaccinations, nutritious snacks and meals, and institutes various components of parental involvement. Though there is much "skepticism about the value of the program" despite the growth in enrollment rates (Deming, 2009). Much research exposes a "fade-out" of gains in cognitive measures such as test scores in the short run, but many studies have found that participation can have a profound impact in the long run on many outcomes as an adult. This study will test to see if participation in the Head Start Program produces lasting skills as a child that will decrease the likelihood of receiving SNAP benefits as an adult.

II.   Literature Review

Craig Gundersen and Victor Oliveira (2001) modeled the participation in the food stamp program, now known as SNAP, and food insufficiency with a utility maximizing framework, where "a household utility function (U) defined over food (F) and other goods (OG). The income available to a household to maximize its utility differs depending upon its participation decision" Participation is a function of current earned income, transfer income, other income, the size of the food stamp benefit, price of good and price of other goods. The model further encompasses a disutility that is comprised of the stigma associated with program participation, transaction costs,

and the level of food insufficiency. Stigma encompasses both personal distaste for receiving benefits, desire to "avoid disapproval," as well as external disapproval from others when redeeming benefits or disapproval from case workers (Gundersen, Oliveira, 2001). Transaction costs are defined as the amount of time spent in attempting to receive the benefits, difficulty in finding the necessary paperwork and information needed, as well as any burden incurred as a result. For example, a burden might occur with having to find and pay for child care if it is necessary to go into the office to fill out paperwork in person. The disutility associated with the level of food insufficiency. A household's disutility from food insufficiency is multiplied by the probability that the household will be food insufficient if it does not participate in the program. Data came from the 1985-86 Continuing Survey of Food Intake by Individuals. The results found that the higher the benefit amount awarded, the greater the probability of food stamp participation. Single parent households were 57 percent more likely to apply and receive benefits. Employment status had a large effect. A person who was employed was 20 percent less likely to participate that an unemployed individual. They also found that the greater the stigma associated with the program was the less likely an individual was to apply for benefits. The most significant variables for decreasing the likelihood of needing assistance were homeownership, no children, and at least a high school education.

Steven T. Yen, Margaret Andrews, Zhuo Chen, and David B. Eastwood (2008) looked at the effect of food stamp program (FSP) participation on food insecurity, and whether it ameliorates or exacerbates food insecurity. The results found that participation in the FSP does decrease food insecurity. The driving factors behind decreasing the probability of food insecurity and subsequent FSP participation are similar to those of Gundersen and Oliveira. Higher income,

homeownership, marital status, residing in the Midwest as well as urban areas all decrease the probability of needing food stamps.

Yunhee Chang, Swarn Chatterjee, and Jinhee Kim (2014) took a different approach in addressing food insecurity, but had similar findings. Using data from the Panel Study of Income Dynamics (PSID) from 2003, they modeled food insecurity as a function of a household's accumulated wealth and assets. The idea behind this being that a household's ability to borrow and save provides a buffer against food insecurity. Utilizing the idea of the inter-temporal consumption model, they stated that "the risk of food insecurity increases upon negative income shocks if the household is liquidity-constrained, that is, if the household lacks sufficient liquid assets and/or has difficult borrowing" (Chang, Y., Chatterjee, S., Kim, J., 2014). The results suggest that income, homeownership, and vehicle ownership are all negative determinates of food insecurity. Moreover, the study found that a 1 percent increase in income was associated with a 1.8-2.8 percent reduction in the likelihood of food insecurity.

Turning to the literature on the effects of the Head Start program, Janet Currie and Duncan Thomas (1995) looked at the short term effects of the Head Start program on school performance, cognitive attainment, preventative medical care, and the health and nutritional status of the children who participated in the program. The data comes from the National Longitudinal Survey of Youth (NLSY) and the National Longitudinal Survey's of Child-Mother file (NLSCM). A fixed effects model is used to compare children who have attended the program to their siblings who have not participated. The results of their study find that big gains for Head Start, but most of these benefits are enjoyed by whites. Academic performance measured by the Picture Peabody Vocabulary Test (PPVT) increases 6 percentile points whites who participated, but there is no difference for African Americans. Whites who attend the program are 47 percent

less likely to repeat a grade relative to their siblings that did not attend preschool, but no effect for African Americans. There is an 8-9 percent increase in the probability of being immunized for both African Americans and whites.

Eliana Garces, Duncan Thomas and Janet Currie (2002) further explored the program and addressed the question of whether or not the Head Start has lasting longer-term benefits for those who participate. Many studies have shown that the short-term benefits gained through participation in the program "fade-out", but these focus on cognitive measures. The study focuses on "four adult outcomes: completion of high school, attendance at some college, ln(earnings) if the household member worked, and whether the household member ever reported being booked or charged with a crime" (Garces, Thomas, Currie, 2002). The data comes the Panel Survey of Income Dynamics (PSID) that began in 1968 with 4,802 households. A retrospective supplement was added in 1995 asking about preschool program participation. The supplement requires the respondent to recall information about family background and household environment from up to a quarter of a century prior. The OLS results indicate that those who attended Head Start were 9 percent less likely to graduate from high school and attend college, but this most likely reflected the fact that those who participate in the program were from a disadvantaged background to begin with. In fact, the estimates using the fixed effects model found that white children who attend Head Start are 20 percent more likely to graduate high school and 28 percent more likely to attend college than their siblings who did not attend Head Start. The effect is even greater for those whose mother had less than a high school education, particularly in regards to future earnings. African Americans are 12 percent less likely to report being booked or charged of a crime if they participated in Head Start than their siblings.

David Deming (2009) provided further evidence that there are long-term benefits from participation in the Head Start program. There is much "skepticism about the value of the program" despite the growth in enrollment rates. The data used comes from the National Longitudinal Mother-Child Supplement (CNLSY), which surveyed the children of the National Longitudinal Survey of Youth (NLSY) 1979. The data is restricted to children who were at least 4 years of age by 1990, as well as to those with siblings. This allows to control for maternal factors, which tests for "spill over" effect gained from either an older siblings participation in the program or parental skill developed by the participation of the first child. No evidence of this was found. The author uses a family fixed effects model. Head Start participants score 0.265 standard deviations higher than their siblings who attended no preschool in terms of grade retention. If they have a learning disability it is also much more likely to be identified and treated if they are a Head Start participant, making the child more capable in future learning. Cognitive test score gains for African Americans fade out to nearly 0 by ages 11, but whites and Hispanics do not have this experience although results are weak. Participants are 8.5 percent more likely to graduate from high school, 6 percent more likely to attend at least 1 year of college, 7 percent less likely to be idle, and 7 percent less likely to report being in poor health. The children whose mother had the lowest scores on the Armed Forces Qualification Test benefited from the program the most. Head Start was found to be nearly as effective long term as the Perry Preschool Project.

III.   Theoretical Model

The theoretical model used in this paper is a combination of the assets and wealth model outlined by Chang, et al., the utility model of food stamp participation outlined by Gundersen and Oliviera, and the technology of skill formation outlined by Cuhna and Heckman. There are

two types of households: those that have high wealth and high liquid assets and those with low wealth and low liquid assets. When the high wealth household experiences a negative exogenous shock it has enough accumulated assets that act as a "cushion" or buffer that it does not experience food insecurity. This household will never be faced with the utility function associated with participation because they will never have a need for participation in SNAP. When a low wealth and low liquid household experiences a negative exogenous shock it is faced with a utility function that weighs the utility gained from receiving benefits against the disutility associated with participation. As stated in the literature review, the disutility is a function of stigma, transaction costs, and level of food insecurity. Stigma encompasses both external disapproval from others as well as personal distaste associated with receiving benefits. Another possible component of this may very well be entitlement. For example, a young recent college graduate that is working a retail job while looking for a more permanent career may not choose to apply and receive benefits because he/she believes that his/her income will increase in the near future, or perhaps because of strong disapproval from parents, or because of the safety net of parental income, etc. Even though he/she might qualify for the benefits, he/she might not think of him/herself as someone who needs the benefits. If the combination of the disutility factors is greater than the utility received from the benefit, then the household will not participate in SNAP. However, if the disutility associated with receiving benefits is less than the utility gained then the household will participate. The factors that are encompassed in both the wealth accumulation and asset portion as well as those that are important is determine the level disutility can be affected by the skills accumulated earlier on in life.

James Heckman's theory of the technology of skill formation further builds on the theory of human capital formation. He stated that the economic model of described development consists

of multiple stages and because of this there are "sensitive periods," where acquisition of certain skills is easier, and "critical periods," where certain skills can only develop at certain stages (Cunha, Heckman, 2007). Development in the next stage depends on the skills curated in the prior stage. They are the foundation. They augment the future skills. This is termed *self-productivity* (Cunha, Heckman, 2007). "Skills produced at one stage raise the productivity of investment at subsequent stages" (Cunha, Heckman, 2007). This is *dynamic complementarity* (Cunha, Heckman, 2007). Both of these together produce a multiplier effect meaning skills beget skills. Even though it has been widely accepted in other disciplines such as psychology, economics previously viewed child development as a single life cycle period (see e.g., Gary S. Becker and Nigel Tomes 1994; S. Rao Aiyagari, Jeremy Greenwood and Aranth Seshadri, 2002). The problem with this approach is that it assumes that skill development at different stages are perfect substitutes, which is not the case. Heckman's theory argues that "inputs at different stages are complements" (Cunha, Heckman, 2007).

Heckman's theory establishes that investment in the development of both cognitive and noncognitive skills early on "makes children more productive when they are adults" (Cunha, Heckman, 2007). They become more self-sufficient and adept. This in turn decreases what might be considered by society negative and increases positive outcomes. Parenting skills, abilities, and character play a vital role in development of a child's skills, as do early educational experiences. Ability gaps between individuals and across socioeconomic groups begin to open at very early ages for both cognitive and noncognitive skills and by targeting investments at earlier stages later skills are more efficiently acquired (Cunha, Heckman, 2007). Positive adult outcomes from participation in high quality preschool programs include higher levels of education, higher

earnings, better general health, and healthier behaviors, such as a decrease in smoking. All of which lead to an increase in the development of human capital.

The chart below describes the relationship between Heckman's theory and SNAP participation. The boxes highlighted in red represent the areas affected by the increase in human capital developed earlier in life as a result of Head Start participation. Skills acquired during critical periods in childhood development directly affect the development of human capital during the life cycle, which in turn directly affects earning capacity and wealth accumulation as well as tastes and preferences. When a negative exogenous shock occurs it affects high wealth and low wealth households in different ways.
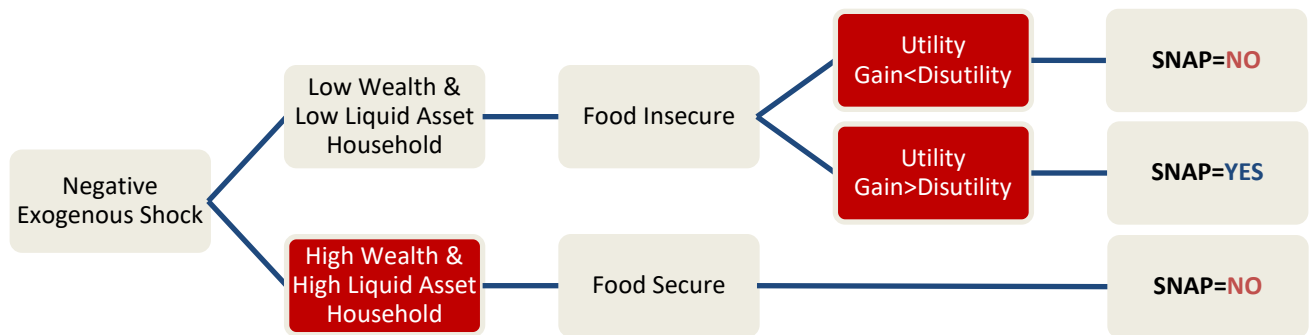
IV.   Data and Methodology

All of the data used for this project comes from the National Longitudinal Survey of Youth 79 Children and Young Adults (NLSY79 Child/YA). It is provided by the Bureau of Labor Statistics. The NLSY79 Children and Young Adults began in 1986 and is a rich panel data. It contains information on the children of the women who participated in the NLSY79,

which was a cohort of men and women between the ages of 14-22 in 1979 and includes information ranging from labor force participation to fertility and prenatal care. The children in the NLSY79 Child/YA were interviewed every 2 years. It contains a "battery of child cognitive, socioemotional, and physiological assessments as well as a variety of attitude, aspiration, and psychological well-being questions have been administered biennially for age appropriate children." (Bureau of Labor Statistics, 2016). It includes information about home environment, social development, temperament, behavioral problems, as well as cognitive test scores. This study uses a linear probability model, probit model, and a mother one way fixed effects model to examine both the effect of Head Start on SNAP participation later in life across peer groups and within families. The mother fixed effects model will allow me to control for an unobserved heterogeneity. Data used for this paper comes from 1986-2012.

The economic model used is as follows:

$$SNAPben_{if} = \beta_0 + \beta_1 HeadStart_{if} + \beta_2 PreSchool_{if} + \beta_3 X_{if} + \mu_f + \varepsilon_i$$

Where,

HeadStart and *Preschool* are derived from the technology of skill formation (Cuhna, Heckman, 2007).

X are the determinants of receiving SNAP benefits and include *Hispanic, Black, female, Age, Assets, lnTotInc2,* and *Marital*

μ is the mother fixed effects

HeadStart is a binary variable that measures an individual's participation in the Head Start program as a child. Since Head Start not only focuses on cognitive, but also social development of children "through the provision of educational, health, nutritional, social, and other services to enrolled children and families," it is expected to have a positive effect on later adult outcomes, which will in turn decrease the probability of receiving SNAP benefits (Deming, 2009).

Preschool is a binary variable that measures an individual's participation in some form of preschool other than Head Start. It is expected to have a negative effect on the dependent variable, because it, similarly to Head Start, provides an environment for the development of both cognitive and noncognitive skills, and thus increases the capabilities of accruing more human capital later in life.

Hispanic is a binary variable that equals 1 if the individual is Hispanic. Although identifying as Hispanic would categorize an individual as a minority, the expected sign for this variable is potentially unknown. Describing oneself as Hispanic might imply such things as a language barrier. The U.S. Department of Agriculture found the major categories of reasons for not applying and/or receiving benefits included: "being unaware of SNAP or how to apply; perceiving oneself as ineligible; wanting to avoid dependence on government assistance; perceiving SNAP application…as too burdensome; feeling social stigma associated with SNAP participation" (Burstein, Patrabansh, Hamilton,Siegel, 2009). If a person is a first generation immigrant to the U.S. understanding how to even begin the process of applying for benefits could seem as an insurmountable task. Furthermore, if they are living in the U.S. illegally they may want to avoid contact with the government as much as possible out of fear of deportation. There may also be something that is cultural that is simply not captured by the model. All of these would be captured by the disutility grouping of transaction costs and stigma in the utility

function. They would increase the disutility of receiving benefits and, therefore, have a negative effect on the probability of participating in SNAP.

Black is a binary variable that equals 1 if an individual identifies as African American. While the majority of those who receive SNAP benefits are white, the percentage of those receiving benefits within the African American community is higher (Pew Research Center, 2012). This means that if an individual is African American the probability of receiving benefits is higher. The expected sign is positive.

Female is a binary variable that equals 1 if an individual identifies as female. If this variable were to not be included it would be assuming that men and women would have the same coefficient. This accounts for gender differences. While not every woman respondent will be a mother, being a woman certainly does impact whether she is a mother. The literature finds that motherhood, particularly single motherhood, has a positive effect on receiving SNAP benefits (Burstein, Patrabansh, Hamilton, Siegel, 2009).

Age measures the age of the respondent. The expected sign is positive.

Assets is a binary variable that denotes whether an individual owns or makes payments on a house, vehicle, or other real estate. This grouping of variables provides a "financial cushion" (Burstein, Patrabansh, Hamilton, Siegel, 2009; Chang, Chatterjee, Kim, 2014). In order to be eligible to receive SNAP benefits an applicant cannot exceed certain asset requirements. It is expected to have a negative effect.

lnTotInc2 is the logarithmic form of the variable *TotInc2*, which measures the total annual income from all wages, salary, commission or tips for 2011. To be eligible to receive SNAP benefits an individual/household must meet certain income requirements. An increase in earnings

makes them less likely to meet those requirements and be eligible. Income is also part of the "financial cushion" outlined by the USDA. As this cushion becomes larger the less likely an individual is to become food insecure and, thus, need assistance (Farrell et. al., 2003, Bhattarai *et al.*, 2005; Chang, Chatterjee, Kim, 2014). Expectations about future income also affect the probability of applying for and receiving benefits Households with higher expected long term income are less likely to receive SNAP. The measurement of total income is over the entire previous year, while SNAP eligibility is on a month to month basis.

Marital is a binary variable that measures the marital status of an individual. Studies have shown that households headed by a married couple are less likely to be dependent on SNAP benefits (Farrell *et al.*, 2003, Gundersen and Oliveira, 2001).

Variables that capture the education level of a respondent, employment history, and the presence of children in the household were all excluded from the model even though theory states that they are important determinants of SNAP participation. They omitted because of the loss of observations incurred by their inclusion. This is a very large limitation of the model.

V. Results

Table 1 shows the results for a linear probability model (LPM), probit model, and mother one way fixed effects model. A little over 20 percent of the respondents participated in the Head Start program as a child and about 13 percent received SNAP benefits in the 2011 calendar year. Nearly all of the results for the LPM and probit models are significant, but very few remain as significant in the fixed effects model. The third column reports the results from the mother fixed effects model. Restricting the sample to comparison of siblings allows for controlling for both observed and unobserved mother characteristics (unobserved heterogeneity) that have an effect on outcomes. The mother fixed effects results show that participation in head start does decrease

the probability of receiving SNAP benefits relative to other siblings. The swapping of the signs on the coefficient suggests that the effect in the results of the LPM and probit models may have more to do with the fact that Head Start itself targets more economically disadvantaged children. A comparison of economically disadvantaged children versus relatively more advantaged children will produce biased results. One of the most significant and interesting results in all of the models is that of the *marital* variable. Being married increases the likelihood of receiving benefits as an adult in all models by about 5 percentage points. This is surprising considering the literature suggests that households headed by two people are less likely to rely on SNAP. This is an area that requires more research.

The results of the linear probability model show that participation in the Head Start program as a child does in fact increase the likelihood of receiving SNAP benefits as an adult by 4.52 percentage points. This is also significant at the 5 percent confidence level. Based on the review of the literature though, this result is not entirely surprising seeing as that the Head Start program itself is targeted toward those from a disadvantaged socioeconomic background to begin with. They begin life from a more disadvantaged standings than those who do not qualify for the program. Though the results of the LPM are not without their limitations. We cannot make a prediction that the dependent variables take on a value of 1 that is less than zero or greater than one. The LPM attempts to do just that. A model with a better fit for the data, and which shall be discussed hence forth is the probit model. The probit model also finds that Head Start greatly increases the likelihood of receiving SNAP benefits as an adult, but the effect is actually less than the LPM model. Head Start increases the likelihood of receiving benefits by 3.79 percentage points. This finding, once again, is not out of line with the results found in previous studies. Participation in a general preschool program seems to decrease the probability of receiving

benefits by 2.35 percentage points in the probit model. Being either Hispanic or African American increases the likelihood, but it is to a much greater degree for African Americans. Along with being a female, being African American seems to have the greatest effect on whether or not a respondent received SNAP benefits as an adult. Both of these variables increase the likelihood by about 10 percentage points.

The most interesting results though are found in the mother fixed effects model. This model compared siblings. The sign on the coefficient of the main variable of interest, Head Start, actually changes and now has a negative effect on receiving benefits as an adult. Head Start participation as a child decreases the likelihood of receiving SNAP benefits by 2.32 percentage points compared to a sibling that did not participate in the program, and while this is not statistically significant, it certainly could be categorized as economically significant. The mean for SNAP participation is just over 13 percent (see Table 2 in Appendix). The fixed effects result for Head Start means that participation actually decreases the probability of receiving SNAP benefits as an adult by 17.42 percent compared to a sibling that did not participate in Head Start. This is a substantial amount and would have been more statistically significant had there been more observations. The most significant variable, both economically and statistically, in all models is the gender of the respondent. Being female increases the probability of receiving benefits by 6.3 percentage points or 47.29 percent. This is a massive increase. The accumulation of assets also decreases the probability in the fixed effects model. If a respondent does have assets it decreases the likelihood of receiving benefits by 4.44 percentage points compared to siblings with no accumulation of assets, which translates to a decrease of 33.33 percent in the probability of receiving benefits as an adult. This falls in line with the literature that the

accumulation of wealth and assesses provides a buffer that makes an individual less likely to

become food insecure, and therefore, less likely to be dependent on SNAP.

Table 1- Relationship Between Head Start Participation and SNAP

Variable	Parameter Estimate and Standard Error		
	Linear Probability Model	**Probit Model [Marginal Effects]**	**Mother Fixed Effects Model**
Intercept	0.0466	-1.7861***	0.2260
	0.0523	0.280686	0.1967
HeadStart	0.0452**	0.2195**	-0.0232
	0.0181	0.092643	0.0441
		[0.0378651]	
PreSchool	-0.0278*	-0.1364*	0.0013
	0.0145	0.081588	0.0320
		[-0.0235244]	
Hispanic	0.0127	0.1694	.
	0.0181	0.1091	.
		[0.0292253]	
Black	0.1114***	0.5969***	.
	0.0166	0.09188	.
		[0.1029442]	
Female	0.1091***	0.6303***	0.0630***
	0.0133	0.077391	0.0232
		[0.1087135]	
Age	0.0198***	0.0922***	0.0124***
	0.0018	0.009331	0.00362
		[0.0159056]	
Assets	-0.0285*	-0.1696**	-0.0444
	0.01472	0.081185	0.0273
		[-0.0292505]	
lnTotInc2	-0.0513***	-0.2456***	-0.0226*
	0.0061	0.032039	0.0117
		[-0.0423673]	
Marital	0.0546**	0.3026**	0.0541
	0.0229	0.116208	0.0399
		[0.0521993]	
R-Squared	0.1556		0.5984
Adjusted R-Squared	0.1523		.
Number of Obs.	2282		513/1130
F-Value	46.53		1.31
*,**, and *** denote significance at the 10%, 5%, and 1% confidence levels			

VI.   Conclusion

While participation in Head Start does increase the probability of receiving SNAP benefits later in life using LPM and probit estimations of the model, the sign on the parameter estimate actually reverse in the fixed effects model. This does coincide with theory that perhaps there are some unobserved skills that are acquired in Head Start. Unfortunately, the fixed effects parameter estimate is not significant at any level, but it is economically significant in that participation in the program as a child decreases the probability of receiving SNAP benefits as an adult by 17.42 percent compared to siblings that did not participate in the program. Increasing the number of observations might have an effect on the result. Participation in some other type of preschool program seems to be insignificant as well. A case could be made for the fact that quality of preschools vary greatly.

There are many limitations of this paper. The first, and presumably most important, limitation is the loss of observations in the fixed effects model. It had only 513 cross sections and a 1130 time series length, meaning that there were 513 mothers with 1130 children. Then within that number one child needed to participate in the Head Start program and one did not, which most likely decreased the number even more. A larger sample size would produce more accurate and unbiased results. The second limitation is that no regional effects were accounted for in the model. There might be a difference between SNAP participation in the Northeast compared to the South, for example, and this is not accounted for. The omission of the key variables that capture the education level of a respondent, employment history, and the presence of children in the household is a very large limitation. A larger sample size might be able to account for the need to omit these variables thereby producing a more accurate model. Further research should address these issues.

Further research of the effect of Head Start participation as a child on the probability of receiving SNAP benefits as an adult is needed before any real policy implications can be discussed. While the statistical significance of the Head Start variable is very low, the economic significance merits further examination. Participation in Head Start decreased the probability of receiving SNAP benefits as an adult by 17.42 percent compared to siblings that did not participate in the program. This is a very large amount and suggests that perhaps, the Head Start program is more effective than standard LPM and probit models suggest. If this effect were to become statistically significant in future research, it would imply that a heavier investment in the preschool program could ultimately decrease the number of people participating in SNAP in the future.

VII. Appendix

Table 2- Descriptive Statistics

Variable	Label	N	Mean	Standard Deviation	Min	Max
SNAPben	Received SNAP benefits in 2011	2282	0.133217	0.339883	0	1
HeadStart	Dummy Variable; 1 if participated in Head Start Program	2282	0.201139	0.4009398	0	1
PreSchool	Dummy Variable; 1 if participated in PreSchool Program	2282	0.6617	0.4732348	0	1
Hispanic	Dummy Variable; 1 if race of child is Hispanic	2282	0.201139	0.4009398	0	1
Black	Dummy Variable; 1 if race of child is Black	2282	0.332603	0.4712489	0	1
Female	Dummy Variable; 1 if child is female	2282	0.481595	0.4997707	0	1
Age	Age of individual	2282	24.89527	4.4641869	16	41
Assets	Own/Making payments on home, real estate or vehicle	2282	0.612182	0.4873594	0	1
TotInc2	Total annual income	2282	19809.39	20485.05	9	153150.00
Marital	Marital status	2282	0.096845	0.2958112	0	1

References

Becker, G. S., & Tomes, N. (1994). Human capital and the rise and fall of families. In Human Capital: A Theoretical and Empirical Analysis with Special Reference to Education (3rd Edition) (pp. 257-298). The University of Chicago Press.

Aiyagari, S. R., Greenwood, J., & Seshadri, A. (2002). Efficient investment in children. Journal of Economic Theory, 102(2), 290-321.

Burstein, N., Patrabansh, S., Hamilton, W., & Siegel, S. (2009). Understanding the determinants of supplemental nutrition assistance program participation. Alexandria, VA: US Department of Agriculture, Food and Nutrition Service, Office of Research and Analysis.

A Bipartisan Nation of Beneficiaries. (2012). Retrieved April 13, 2016, from http://www.pewsocialtrends.org/2012/12/18/a-bipartisan-nation-of-beneficiaries/

Burstein, N., Patrabansh, S., Hamilton, W., & Siegel, S. (2009). Understanding the determinants of supplemental nutrition assistance program participation. Alexandria, VA: US Department of Agriculture, Food and Nutrition Service, Office of Research and Analysis.

Chang, Y., Chatterjee, S., & Kim, J. (2014). Household finance and food insecurity. Journal of Family and Economic Issues, 35(4), 499-515. doi:http://dx.doi.org/10.1007/s10834-013-9382-z

Cunha, F., & Heckman, J.. (2007). The Technology of Skill Formation. *The American Economic Review*, 97(2), 31-47. Retrieved from http://www.jstor.org/stable/30034418

Currie, J., & Thomas, D.. (1995). Does Head Start Make a Difference?. *The American Economic Review*, 85(3), 341–364. Retrieved from http://www.jstor.org/stable/2118178

Currie, J. (2001). Early childhood education programs. *Journal of Economic Perspectives, 15*(2), 213-238. doi:http://dx.doi.org/10.1257/jep.15.2.213

Deming, D. (2009). Early childhood intervention and life-cycle skill development: Evidence from head start. *American Economic Journal: Applied Economics*, 1(3), 111-134. doi:http://dx.doi.org/10.1257/app.1.3.111

Garces, E., Thomas, D., & Currie, J.. (2002). Longer-Term Effects of Head Start. *The American Economic Review*, 92(4), 999–1012. Retrieved from http://www.jstor.org/stable/3083291

Gundersen, C., & Oliveira, V.. (2001). The Food Stamp Program and Food Insufficiency. American Journal of Agricultural Economics, 83(4), 875–887. Retrieved from http://www.jstor.org/stable/1244700

Supplemental Nutrition Assistance Program (SNAP). (n.d.). Retrieved May 11, 2016, from http://www.fns.usda.gov/pd/supplemental-nutrition-assistance-program-snap

```sas
options nocenter validvarname=any;


*---Read in space-delimited ascii file;

data XandY;


infile 'UpdatedXandY.dat' lrecl=77 missover DSD DLM=' ' print;
input
  C0000100
  C0000200
  C0005300
  C0005400
  C0005700
  C5727300
  C5740400
  C5740500
  Y2635200
  Y2652300
  Y2678300
  Y2893700
  Y2922700
  Y2925400
  Y2925600
  Y2925700
  Y2926000
  Y2928200
  Y2928500
  Y2928800
  Y2929900
;
array nvarlist _numeric_;


*---Recode missing values to SAS custom system missing. See SAS
      documentation for use of MISSING option in procedures, e.g. PROC FREQ;

do over nvarlist;
  if nvarlist = -1 then nvarlist = .R;  /* Refused */
  if nvarlist = -2 then nvarlist = .D;  /* Dont know */
  if nvarlist = -3 then nvarlist = .I;  /* Invalid missing */
  if nvarlist = -7 then nvarlist = .M;  /* Missing */
end;

  label C0000100 = "ID CODE OF CHILD";
  label C0000200 = "ID CODE OF MOTHER OF CHILD";
  label C0005300 = "RACE OF CHILD (FROM MOTHERS SCREENER 79)";
  label C0005400 = "SEX OF CHILD";
  label C0005700 = "DATE OF BIRTH OF CHILD - YEAR";
  label C5727300 = "CH HAS CONDIT THAT REQS MED  ATTN 2012";
  label C5740400 = "CHILD HEALTH COVRD BY HLTH INSURNCE 2012";
  label C5740500 = "CHILD HEALTH COVERED BY MEDICAID 2012";
  label Y2635200 = "# MONTHS AGO R MOVED TO CURRENT RESIDENCE 2012";
  label Y2652300 = "CURRENT MARITAL STATUS 2012";
  label Y2678300 = "R HAVE HS DIPLOMA OR PASSED HS EQUIV OR GED TEST? 2012";
  label Y2893700 = "R BEEN WITHOUT HEALTH CARE COVERAGE IN PAST 12 MO 2012";
```

```
    label Y2922700 = "AMT PER WK R REC IN UNEMP COMP LAST MO REC IN 11 2012";
    label Y2925400 = "R/SP/PTR REC CASH ASSIST (LIKE AFDC) ANY MO IN 11 2012";
    label Y2925600 = "AMT/MO R/SP/PTR REC IN CASH ASSIST LAST MO REC 11 2012";
    label Y2925700 = "R/SP/PTR REC GOVT FOOD STAMPS IN ANY MO IN 11 2012";
    label Y2926000 = "R/SP/PTR REC SSI/PUBLIC ASSISTANCE/WELFARE IN 11 2012";
    label Y2928200 = "R/SP/PTR OWN/MAKE PAYMENTS ON THIS HOUSE/APT 2012";
    label Y2928500 = "R/SP/PTR OWN REAL ESTATE OTH THAN CURR RESIDENCE 2012";
    label Y2928800 = "R/SP/PTR OWN ANY MOTOR VEHICLES FOR PERSONAL USE 2012";
    label Y2929900 = "TOTAL FAMILY INCOME FROM ALL SOURCES (BEST EST) 11 2012";


run;

proc means data=XandY n mean min max;
run;

data work.combo;
merge XandY HSandPre;
by   C0000100;
run;

data work.triple;
merge combo mom;
by C0000100;
run;

data work.seniorproject;
merge triple house;
by   C0000100;
rename C0000100=ChildID;
rename C0000200=MomID;
rename C0005300=Race;
rename C0005400=Gender;
rename C0005700=DOB;
rename C5727300=HealthCondition;
rename C5740400=HealthIns;
rename C5740500=Medicaid;
rename Y2635200=Move;
rename Y2652300=Married;
rename Y2678300=Diploma;
rename Y2893700=HealthCoverage;
rename Y2922700=UnempBen;
rename Y2925400=CashAsstAFDC;
rename Y2925600=CashAsst;
rename Y2925700=SNAP;
rename Y2926000=PublicAsst;
rename Y2928200=Home;
rename Y2928500=RealEstate;
rename Y2928800=Vehicle;
rename Y2929900=TotalInc;
rename C0591800=PreSch1;
rename C0592000=HS1;
rename C0811200=PreSch2;
rename C0811400=HS2;
rename C1001200=PreSch92;
rename C1001400=HS92;
rename C1204800=PreSch94;
```

```
rename C1205000=HS94;
rename C1524800=PreSch96;
rename C1525000=HS96;
rename C1771200=PreSch98;
rename C1771400=HS98;
rename C2244200=PreSch00;
rename C2244700=HS00;
rename C2687700=PreSch02;
rename C2688300=HS02;
rename C2969200=PreSch04;
rename C2969600=HS04;
rename C3549200=PreSch06;
rename C3549600=HS06;
rename C3893600=PreSch08;
rename C3894000=HS08;
rename C5142600=PreSch10;
rename C5143000=HS10;
rename C5719800=PreSch12;
rename C5720300=HS12;
rename C0007000=MomAge;
rename C0297200=MomPay12;
rename C0298900=MomPay13;
rename C0300600=MomPay14;
rename C0302300=MomPay15;
rename C0304000=MomPay16;
rename C0305700=MomPay17;
rename C0307400=MomPay18;
rename C0309100=MomPay19;
rename C0310800=MomPay20;
rename C0311114=MomPay21;
rename C0311214=MomPay22;
rename C0311314=MomPay23;
rename C0311414=MomPay24;
rename C5526200=HighestGradeMom;
rename C5526300=HighestGradeMomRev;
rename Y0677500=MomRace;
rename C5526400=HouseMem;
rename C5528000=FamHouseMem;
rename Y2678400=DiplomaOrGed;
rename Y2748800=Job1;
rename Y2748900=Job2;
rename Y2749000=Job3;
rename Y2749100=Job4;
rename Y2749200=Job5;
rename Y2921600=TotInc2;

drop Y2749300 Y2749400 Y2749500 Y2929800;
run;



data work.Spro;
set work.seniorproject;
/*telling it that if a minority then gets 1 else 0*/
Hispanic=0;
Black=0;
if Race=1 then Hispanic=1;
```

```sas
if Race=2 then Black=1;


/*telling it that if the person is male then 1 and female is 0*/
if gender=1 then female=0;
else female=1;

/*telling it that if married or seperated then = 1*/
if Married=7 then Married=0;
if Married=1 then Married=1;
if Married=2 then Married=1;
if Married=3 then Married=0;
if Married=6 then Married=0;
if Married=0 then Married=0;

/*if the mom is a minority then she is 1 otherwise = 0*/
MomHispanic=0;
MomBlack=0;
if MomRace=1 then MomHispanic=1;
if MomRace=2 then MomBlack=1;

if UnempBen=1 or CashAsstAfDC=1 or CashAsst=1 or PublicAsst=1 then
Assistance=1;
else Assistance=0;

if Home=1 or RealEstate=1 or Vehicle=1 then Assets=1;
else Assets=0;


AverageWage=Mean(MomPay12, MomPay13, MomPay14, MomPay15, MomPay16, MomPay17,
MomPay18, MomPay19, MomPay20, MomPay21, MomPay22, MomPay23, MomPay24);

if FamHouseMem=1 then PovertyLine=908*12;
if FamHouseMem=2 then PovertyLine=1226*12;
if FamHouseMem=3 then PovertyLine=1545*12;
if FamHouseMem=4 then PovertyLine=1863*12;
if FamHouseMem=5 then PovertyLine=2181*12;
if FamHouseMem=6 then PovertyLine=2500*12;
if FamHouseMem=7 then PovertyLine=2818*12;
if FamHouseMem=8 then PovertyLine=3136*12;
if FamHouseMem=9 then PovertyLine=3455*12;
if FamHouseMem=10 then PovertyLine=3774*12;
if FamHouseMem=11 then PovertyLine=4093*12;
if FamHouseMem=12 then PovertyLine=4412*12;
if FamHouseMem=13 then PovertyLine=4731*12;
if FamHouseMem=14 then PovertyLine=5050*12;
if FamHouseMem=15 then PovertyLine=5369*12;
if FamHouseMem=16 then PovertyLine=5688*12;

if TotInc2>PovertyLine then Poverty=0;
if TotInc2<PovertyLine then Poverty=1;

if HS1=1 or HS2=1 or HS92=1 or HS94=1 or HS96=1 or HS98=1 or HS00=1 or HS02=1
or HS04=1 or HS06=1 or HS08=1 or HS10=1 or HS12=1 then HeadStart=1;
else HeadStart=0;
```

```sas
if PreSch1=1 or PreSch2=1 or PreSch92=1 or PreSch94=1 or PreSch96=1 or
PreSch98=1 or PreSch00=1 or PreSch02=1 or PreSch04=1 or PreSch06=1 or
PreSch08=1 or PreSch10=1 or PreSch12=1 then PreSchool=1;
else PreSchool=0;
run;



proc reg data=work.Spro;
model SNAP= Hispanic
                Black
                Female
                DOB
                HealthIns
                Medicaid
                Married
                HealthCoverage
                Assistance
                Assets
                TotInc2
                FamHouseMem
                Poverty
                MomAge
                HighestGradeMomRev
                AverageWage
                HeadStart
                PreSchool
                ;

title 'First Run at Regression';
run;

proc means data=spro;
run;

libname Rework "E:\Spring 2016\Senior Project\Data Set\Cleaned Up Data
Sets\All My SAS";

data work.Spro;
set rework.spro;
run;

data work.payment;
set rework.payment;
run;

data work.payment;
set work.payment;
rename C0000100=ChildID;
rename C0000200=MomID;
run;

data work.payment;
set work.payment;
if Y2930500=1 or Y2930503=1 then BehindHC=1;
else BehindHC=0;
if Y2930501=1 or Y2930502=1 or Y2930504=1 or Y2930505=1 then BehindBills=1;
```

```sas
        else BehindBills=0;
        run;

        data work.Final;
        merge payment spro;
        by ChildID;
        if HealthIns=1 or Medicaid=1 then InsCoverage=1;
        else InsCoverage=0;

        lnTotInc2=log(TotInc2);
        age=2012-DOB;
        run;

        proc means data=work.final;
        run;

        /*creating a data set with only the variables that will be used in the
        regression including the mom and child IDs*/
        data work.Regress;
        set work.final;
        keep  HeadStart
                Preschool
                Hispanic
                Black
                female
                Age
                InsCoverage
                Assistance
                Assets
                TotInc2
                lnTotInc2
                SNAPQualified
                HighestGradeMomRev
                Married
                BehindBills
                BehindHC
                ChildID
                MomID;
        label Hispanic="Dummy Variable; 1 if race of child is Hispanic";
        label Black="Dummy Variable; 1 if race of child is Black";
        label Female="Dummy Variable; 1 if child is female";
        label Age="Age of individual";
        label HealthIns="Covered by private health insurance";
        label Medicaid="Covered by Medicaid";
        label HealthCoverage="Been without health coverage in past year";
        label Assistance="Rec any form of govt asst other than SNAP in previous
        year";
        label Assets="Own/Making payments on home, real estate or vehicle";
        label TotInc2="Total of wages, salary, commission or tips for 2001-Gross";
        label FamHouseMem="Number of family members living in the household";
        label SNAPQualified="TotInc2 < Gross Monthly Income cutoff annualized";
        label AverageWage="Ave hourly wage of mother during child's preschool age
        years";
        label HighestGradeMomRev="Highest grade completed by mother";
        label AverageWage="Ave hourly wage earned by mother between the 12th and 24th
        quarter of child's life";
        label HeadStart="Dummy Variable; 1 if participated in Head Start Program";
```

```sas
label PreSchool="Dummy Variable; 1 if participated in PreSchool Program";
label Married="Marital status";
label SNAP="Received SNAP benefits in 2011";
label ChildID="Identification code of individual";
label MomID="Identification code of individual's mother";
label BehindHC="60 days or more late on mortgage or car pmt";
label BehindBills="60 days or more late on bill pmt";
label InsCoverage="Covered by public or private health ins.";
run;


proc means data=work.regress;
run;



/*dropping missing variables*/
data work.Drop;
set work.regress;
if BehindHC=. then delete;
if BehindBills="." then delete;
if married="M" then delete;
if HeadStart="M" then delete;
if Preschool="M" then delete;
if Hispanic=. then delete;
if Black =. then delete;
if female=. then delete;
if Age=. then delete;
if InsCoverage=. then delete;
if Assistance=. then delete;
if Assets=. then delete;
if TotInc2="M" then delete;
if lnTotInc2=. then delete;
if SNAPQualified=. then delete;
if HighestGradeMomRev="M" then delete;
if ChildID="M" then delete;
if MomID="M" then delete;
run;

/*created a dataset of just the variables in the regression to do a proc
means*/
Data work.means;
set work.regress;
drop ChildID MomID lntotinc2;
run;

proc means data=work.means;
run;


libname Rework "E:\Spring 2016\Senior Project\Data Set\Cleaned Up Data
Sets\All My SAS\Final Data Sets and SAS";

data work.Spro;
set rework.spro;
run;

data work.payment;
set rework.payment;
```

```sas
run;

data work.payment;
set work.payment;
rename C0000100=ChildID;
rename C0000200=MomID;
run;

data work.payment;
set work.payment;
if Y2930500=1 or Y2930503=1 then BehindHC=1;
else BehindHC=0;
if Y2930501=1 or Y2930502=1 or Y2930504=1 or Y2930505=1 then BehindBills=1;
else BehindBills=0;
run;

data work.Final;
merge payment spro;
by ChildID;
if HealthIns=1 or Medicaid=1 then InsCoverage=1;
else InsCoverage=0;

/*trying to create a new variable for Total Income that drops the missing
values. Neither of the following are working*/
/*Totinc2+0=Income*/
/*Income=sum(totinc2*1);*/

lnTotInc2=log(TotInc2);
age=2012-DOB;


/*drops the missing values for married by creating a new variable.THIS ISNT
WORKING! IT WONT LET ME RUN A PROC MEANS ON IT*/
if married=1 then marital=1;
if married=0 then marital=0;

if SNAP=1 then SNAPben=1;
if SNAP=0 then SNAPben=0;



/*drops the missing values for mom's highest edu by creating a new variable.
THIS ISNT WORKING! IT WONT LET ME RUN A PROC MEANS ON IT*/
if HighestGradeMomRev=0 then MomEdu=0;
if HighestGradeMomRev=1 then MomEdu=1;
if HighestGradeMomRev=2 then MomEdu=2;
if HighestGradeMomRev=3 then MomEdu=3;
if HighestGradeMomRev=4 then MomEdu=4;
if HighestGradeMomRev=5 then MomEdu=5;
if HighestGradeMomRev=6 then MomEdu=6;
if HighestGradeMomRev=7 then MomEdu=7;
if HighestGradeMomRev=8 then MomEdu=8;
if HighestGradeMomRev=9 then MomEdu=9;
if HighestGradeMomRev=10 then MomEdu=10;
if HighestGradeMomRev=11 then MomEdu=11;
if HighestGradeMomRev=12 then MomEdu=12;
if HighestGradeMomRev=13 then MomEdu=13;
```

```sas
if HighestGradeMomRev=14 then MomEdu=14;
if HighestGradeMomRev=15 then MomEdu=15;
if HighestGradeMomRev=16 then MomEdu=16;
if HighestGradeMomRev=17 then MomEdu=17;
if HighestGradeMomRev=18 then MomEdu=18;
if HighestGradeMomRev=19 then MomEdu=19;
if HighestGradeMomRev=20 then MomEdu=20;
run;


proc means data=rework.spro;
var Diploma
       DiplomaOrGed;
run;


/*creating edu data set and going to merge it with Final data set*/
data work.edu;
set work.spro;
keep  Diploma
             DiplomaORGED
             ChildID
             MomID;
if Diploma="." then delete;
if DiplomaOrGED="." then delete;
run;

data work.edu;
set work.edu;
if Diploma=1 then graduate=1;
if Diploma=0 then graduate=0;
run;
data work.edu;
set work.edu;
if graduate="." then delete;
run;
data work.edu;
set work.edu;
keep  ChildID
             MomID
             graduate;
run;

proc means data=work.edu;
run;

data work.Final;
merge final edu;
by ChildID;
run;
/*creating a permant dataset with the education variable in it*/
data rework.final;
set work.final;
run;

/*creating a library with ONLY the final data sets*/
```

```sas
libname Final "E:\Spring 2016\Senior Project\Data Set\Cleaned Up Data
Sets\All My SAS\Final Data Sets and SAS\Only Datasets for final runs";

data final.final;
set work.final;
run;

/*creating a data set with only the variables that will be used in the
regression including the mom and child IDs*/
data work.Regress;
set work.final;
keep  HeadStart
            Preschool
            Hispanic
            Black
            female
            Age
            InsCoverage
            Assistance
            Assets
            TotInc2
            lnTotInc2
            SNAPQualified
            /*HighestGradeMomRev*/
            MomEdu
            /*married*/
            Marital
            BehindBills
            BehindHC
            ChildID
            MomID
            SNAPben;
label Hispanic="Dummy Variable; 1 if race of child is Hispanic";
label Black="Dummy Variable; 1 if race of child is Black";
label Female="Dummy Variable; 1 if child is female";
label Age="Age of individual";
label HealthIns="Covered by private health insurance";
label Medicaid="Covered by Medicaid";
label HealthCoverage="Been without health coverage in past year";
label Assistance="Rec any form of govt asst other than SNAP in previous
year";
label Assets="Own/Making payments on home, real estate or vehicle";
label TotInc2="Total of wages, salary, commission or tips for 2001-Gross";
label lntotinc2="log form of TotInc2";
label SNAPQualified="TotInc2 < Gross Monthly Income cutoff annualized";
label MomEdu="Highest grade completed by mother";
label HeadStart="Dummy Variable; 1 if participated in Head Start Program";
label PreSchool="Dummy Variable; 1 if participated in PreSchool Program";
label Marital="Marital status";
label SNAPben="Received SNAP benefits in 2011";
label ChildID="Identification code of individual";
label MomID="Identification code of individual's mother";
label BehindHC="60 days or more late on mortgage or car pmt";
label BehindBills="60 days or more late on bill pmt";
label InsCoverage="Covered by public or private health ins.";
/*label graduate="Respondent graduate from HS or has GED";*/
run;
```

```sas
data work.regress;
set work.regress;
if BehindHC="." then delete;
if BehindBills="." then delete;
if marital="." then delete;
if HeadStart="." then delete;
if Preschool="." then delete;
if Hispanic="." then delete;
if Black ="." then delete;
if female="." then delete;
if Age="." then delete;
if InsCoverage="." then delete;
if Assistance="." then delete;
if Assets="." then delete;
if TotInc2="." then delete;
if lnTotInc2="." then delete;
if SNAPQualified="." then delete;
if MomEdu="." then delete;
if ChildID="." then delete;
if MomID="." then delete;
if SNAPben="." then delete;
run;

data final.regress;
set work.regress;
run;

proc means data=work.regress;
var    HeadStart
            Preschool
            Hispanic
            Black
            female
            Age
            InsCoverage
            Assistance
            Assets
            TotInc2
            SNAPQualified
            MomEdu
            marital
            BehindBills
            BehindHC
            SNAPben;
run;

/*making a seperate dataset that includes the graduate variable. doing this
because it significantly cuts down the number of observations and I might
just leave it out*/
data work.RegressEdu;
set work.final;
keep  HeadStart
            Preschool
            Hispanic
            Black
            female
```

```
                Age
                InsCoverage
                Assistance
                Assets
                TotInc2
                lnTotInc2
                SNAPQualified
                /*HighestGradeMomRev*/
                MomEdu
                /*married*/
                Marital
                BehindBills
                BehindHC
                ChildID
                MomID
                SNAPben
                graduate;
label Hispanic="Dummy Variable; 1 if race of child is Hispanic";
label Black="Dummy Variable; 1 if race of child is Black";
label Female="Dummy Variable; 1 if child is female";
label Age="Age of individual";
label HealthIns="Covered by private health insurance";
label Medicaid="Covered by Medicaid";
label HealthCoverage="Been without health coverage in past year";
label Assistance="Rec any form of govt asst other than SNAP in previous
year";
label Assets="Own/Making payments on home, real estate or vehicle";
label TotInc2="Total of wages, salary, commission or tips for 2001-Gross";
label lntotinc2="log form of TotInc2";
label SNAPQualified="TotInc2 < Gross Monthly Income cutoff annualized";
label MomEdu="Highest grade completed by mother";
label HeadStart="Dummy Variable; 1 if participated in Head Start Program";
label PreSchool="Dummy Variable; 1 if participated in PreSchool Program";
label Marital="Marital status";
label SNAPben="Received SNAP benefits in 2011";
label ChildID="Identification code of individual";
label MomID="Identification code of individual's mother";
label BehindHC="60 days or more late on mortgage or car pmt";
label BehindBills="60 days or more late on bill pmt";
label InsCoverage="Covered by public or private health ins.";
label graduate="Respondent graduate from HS or has GED";
run;



data work.regressEdu;
set work.regressEdu;
if BehindHC="." then delete;
if BehindBills="." then delete;
if marital="." then delete;
if HeadStart="." then delete;
if Preschool="." then delete;
if Hispanic="." then delete;
if Black ="." then delete;
if female="." then delete;
if Age="." then delete;
if InsCoverage="." then delete;
```

```sas
     if Assistance="." then delete;
     if Assets="." then delete;
     if TotInc2="." then delete;
     if lnTotInc2="." then delete;
     if SNAPQualified="." then delete;
     if MomEdu="." then delete;
     if ChildID="." then delete;
     if MomID="." then delete;
     if SNAPben="." then delete;
     if graduate="." then delete;
run;

proc means data=work.regressedu;
var   HeadStart
           Preschool
           Hispanic
           Black
           female
           Age
           InsCoverage
           Assistance
           Assets
           TotInc2
           SNAPQualified
           MomEdu
           marital
           BehindBills
           BehindHC
           SNAPben
           graduate;
run;

data final.regressedu;
set work.regressedu;
run;


/*OLS including Assistance*/
proc reg data=work.regress;
model SNAPben=    HeadStart
                      Preschool
                      Hispanic
                      Black
                      female
                      Age
                      InsCoverage
                      Assistance
                      Assets
                      lnTotInc2
                      SNAPQualified
                      MomEdu
                      marital
                      BehindBills
                      BehindHC;
title 'Pooled OLS';
run;
```

```sas
/*OLS without Assistance*/
proc reg data=work.regress;
model SNAPben=    HeadStart
                  Preschool
                  Hispanic
                  Black
                  female
                  Age
                  InsCoverage
                  Assets
                  lnTotInc2
                  SNAPQualified
                  MomEdu
                  marital
                  BehindBills
                  BehindHC;
title 'Pooled OLS without Assistance Variable';
run;

/*ols with gradute variable*/
proc reg data=work.regressedu;
model SNAPben=    HeadStart
                  Preschool
                  Hispanic
                  Black
                  female
                  Age
                  InsCoverage
                  Assistance
                  Assets
                  lnTotInc2
                  SNAPQualified
                  MomEdu
                  marital
                  BehindBills
                  BehindHC
                  graduate;
title 'Pooled OLS with Assistance and Graduate Variable';
run;

/*ols with graduate and without assistance*/
proc reg data=work.regressedu;
model SNAPben=    HeadStart
                  Preschool
                  Hispanic
                  Black
                  female
                  Age
                  InsCoverage
                  Assistance
                  Assets
                  lnTotInc2
                  SNAPQualified
                  MomEdu
                  marital
                  BehindBills
                  BehindHC
```

```
                          graduate;
title 'Pooled OLS without Assistance and with Graduate Variable';
run;


data work.count;
set work.regress;
count +1;
drop assistance;
run;


data final.countedu;
set work.regressedu;
count +1;
drop assistance;
run;

proc means data=work.count noprint;
var childid;
by momid;
output out = avg_var;
run;

data work.avg_var;
set work.avg_var;
if _STAT_="MIN" then delete;
if _STAT_="MAX" then delete;
if _STAT_="MEAN" then delete;
if _STAT_="STD" then delete;
run;

data work.MomFreq;
set work.avg_var;
keep MomId
        _FREQ_;
run;

/*data final.Momfreq;
set work.momfreq;
run;*/

data work.count_2;
set work.count;
merge count Momfreq;
by MomID;
run;

data work.count_2;
set work.count_2;
if _FREQ_<2 then delete;
run;

/*data final.count_2;
set work.count_2;
run;*/
```

```sas
proc means data=work.count_2;
var              HeadStart
                        Preschool
                        Hispanic
                        Black
                        female
                        Age
                        InsCoverage
                        Assets
                        TotInc2
                        SNAPQualified
                        MomEdu
                        marital
                        BehindBills
                        BehindHC
                        SNAPben;
run;


proc sort data=work.count_2;
by MomID;
run;


proc panel data=work.count_2;
id MomID ChildID;
model SNAPben=    HeadStart
                        Preschool
                        Hispanic
                        Black
                        female
                        Age
                        InsCoverage
                        Assets
                        lnTotInc2
                        SNAPQualified
                        MomEdu
                        marital
                        BehindBills
                        BehindHC/FIXONE;
title "One Way Mother Fixed Effects WITHOUT Graduate Variable";
run;


proc means data=work.count_2;
var              SNAPben
                        HeadStart
                        Preschool
                        Hispanic
                        Black
                        female
                        Age
                        InsCoverage
                        Assets
                        lnTotInc2
```

```
                                  SNAPQualified
                                  MomEdu
                                  marital
                                  BehindBills
                                  BehindHC;
        run;




        proc means data=final.regress;
        var             SNAPben
                                  HeadStart
                                  Preschool
                                  Hispanic
                                  Black
                                  female
                                  Age
                                  InsCoverage
                                  Assets
                                  lnTotInc2
                                  SNAPQualified
                                  MomEdu
                                  marital
                                  BehindBills
                                  BehindHC;
        run;

        proc means data=final.regressedu;
        var             SNAPben
                                  HeadStart
                                  Preschool
                                  Hispanic
                                  Black
                                  female
                                  Age
                                  InsCoverage
                                  Assets
                                  lnTotInc2
                                  SNAPQualified
                                  MomEdu
                                  marital
                                  BehindBills
                                  BehindHC
                                  graduate;
        run;


        ods pdf file="E:\Spring 2016\Senior Project\Data Set\Cleaned Up Data Sets\All
        My SAS\Final Data Sets and SAS\final pdfs and coding\Proc Means Fixed Effects
        for both Runs.pdf";
        proc means data=final.count_2;
        var             SNAPben
                                  HeadStart
                                  Preschool
                                  Hispanic
                                  Black
                                  female
```

```
                                    Age
                                    InsCoverage
                                    Assets
                                    lnTotInc2
                                    SNAPQualified
                                    MomEdu
                                    marital
                                    BehindBills
                                    BehindHC;
run;

proc means data=final.count_2Edu;
var               SNAPben
                                    HeadStart
                                    Preschool
                                    Hispanic
                                    Black
                                    female
                                    Age
                                    InsCoverage
                                    Assets
                                    lnTotInc2
                                    SNAPQualified
                                    MomEdu
                                    marital
                                    BehindBills
                                    BehindHC
                                    graduate;
run;
ods pdf close;

data work.countedu;
set final.countedu;
run;

proc means data=work.countedu noprint;
var childid;
by momid;
output out = avg_varEdu;
run;

data work.avg_varEdu;
set work.avg_varEdu;
if _STAT_="MIN" then delete;
if _STAT_="MAX" then delete;
if _STAT_="MEAN" then delete;
if _STAT_="STD" then delete;
run;

data work.MomFreqEdu;
set work.avg_varEdu;
keep MomId
        _FREQ_;
run;

data work.count_2Edu;
set work.countedu;
```

```
merge countedu Momfreqedu;
by MomID;
run;

data work.count_2Edu;
set work.count_2Edu;
if _FREQ_<2 then delete;
run;

data final.count_2Edu;
set work.count_2Edu;
run;

proc means data=work.count_2Edu;
var             HeadStart
                        Preschool
                        Hispanic
                        Black
                        female
                        Age
                        InsCoverage
                        Assets
                        TotInc2
                        SNAPQualified
                        MomEdu
                        marital
                        BehindBills
                        BehindHC
                        SNAPben
                        graduate;
run;

proc sort data=work.count_2Edu;
by MomID;
run;


proc panel data=work.count_2Edu;
id MomID ChildID;
model SNAPben=    HeadStart
                        Preschool
                        Hispanic
                        Black
                        female
                        Age
                        InsCoverage
                        Assets
                        lnTotInc2
                        SNAPQualified
                        MomEdu
                        marital
                        BehindBills
                        BehindHC
                        graduate/FIXONE;
title "One Way Mother Fixed Effects With Graduate Variable";
run;
```

```
ods pdf file="E:\Spring 2016\Senior Project\Data Set\Cleaned Up Data Sets\All
My SAS\Final Data Sets and SAS\final pdfs and coding\Proc Means for Fixed
with graduate.pdf";
proc means data=work.count_2Edu;
var             SNAPben
                        HeadStart
                        Preschool
                        Hispanic
                        Black
                        female
                        Age
                        InsCoverage
                        Assets
                        lnTotInc2
                        SNAPQualified
                        MomEdu
                        marital
                        BehindBills
                        BehindHC
                        graduate;
run;
ods pdf close;
```