Senior Project
Department of Economics

"Effects of Child Care Subsidies on Female Labor Force Participation"

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Abstract

Since the 1990's welfare reform, states have been allowed to create their own policies for child care subsidies regarding eligibility. This research focuses on the North East Central Midwest Region of the United States, and examines mothers eligible for child care subsidies. Research shows low-income mothers spend the highest percentage of family income on child care out of any group. It is important to understand the effectiveness of child care subsidies effectiveness on increasing the probability of labor force participation because it could provide a justification for focusing more intently on providing low-income mothers with these effective subsidies. A number of other factors are observed in this study through OLS and Probit regression analysis. Some conclusions add to current research by better understanding differences between factors that influence labor force participation between eligible mothers above and below the poverty level.

TABLE OF CONTENTS

I. INTRODUCTION

Significant changes were made to the welfare system in the late 1990s and they affected how states make payments to parents receiving special care for services like child care subsidies and transportation subsidies. Child care subsidies used to be paid by the federal government to the recipients, and the states had requirements to match those amounts. However, the Personal Responsibility and Work Opportunity Reconciliation Act of 1996 consolidated this funding into one block grant given to each state. Child care subsidy funds come from the block grant program called the Child Care and Development Fund (CCDF), and funds are dispersed through the Office of Child Care (OCC). The changes in state requirements left questions concerning the future of payments to child care subsidies. With this change the states could create their own qualifications for recipiency. Federally, the qualification maximum cutoff for recipiency is capped at a family income of 85% of the state's median income (Herbst and Tekin, 2008). Currently, state requirements for recipiency vary from state to state.

This study focuses on states in the North East Central Midwest region of the United States, which includes Ohio, Michigan, Indiana, Illinois and Wisconsin. These states all have no minimum work requirement for a family to receive a child care subsidy, so they are not required to be in the labor force. However, the states do require that recipients be involved in some kind of education or training program if not working. Subsidies are paid directly to care providers who are certified by the Center for Job and Family Services (CDJFS), or the comparable organization, in the state. The certified providers range from Head Start programs to relative care, provided the relatives fill out an application with the CDJFS. In most cases, a co-pay is required when receiving a subsidy for child care, however the presence of a subsidy theoretically

allows the mother to make a higher wage overall (explained in greater detail in the theory section), so the co-pay is not a significant problem.

A problem regarding welfare recipiency is the high level of underutilization. Explanations for underutilization include barriers to entering the labor force, motivation, demographics, the ignorance some people hold towards their own eligibility and social stigmas associated with enrolling in the programs (Lee et al., 2004). Other sources support the theory that underutilization is a problem because "CCDBG has been so underfunded that just 1 in 6 eligible families actually receive child care subsidies" (ASPE, 2019).

According to the White House, "The hourly cost of center-based child care for a four-year old in 2017 ranged from $2.34 in Mississippi to $9.33 in the District of Columbia. On average, these costs represent 24 percent of the median hourly wage across States" (The White House, 2019). Also, for low-income mothers, the costs of child care are a larger percentage of total family income than for higher-income mothers. The problem of high costs leads to many mothers needing help with paying for child care. Past research has shown child care subsidies increase the likelihood of labor force participation (Connelly et al., 2003, Lee et al., 2004). According to the Bureau of Labor Statistics, mothers with young children are less likely to be in the labor force than those with older children. In 2018, the labor force participation rate of mothers with children under age 6, at 65.1 percent, (34.9% out of labor force) was lower than the rate of those whose youngest child was age 6 to 17, at 76.4 percent. Among mothers with children under age 3, the participation rate of married mothers was lower than the rate of mothers with other marital statuses—59.6 percent versus 67.2 percent" (Bureau of Labor Statistics, 2019). High costs of child care and relatively low participation rates create an opportunity for

probable correlation between child care subsidies and labor force participation. I hope to better understand how state policies and programs aimed at fixing these problems are actually working.

This research will focus on the effectiveness of child care subsidies on increasing the probability of labor force participation for low-income mothers in the North East Central Midwest Region. If the subsidies are most effective for the lowest income level mothers with children under the age of 5, then policies must be changed to provide more child care assistance to mothers with low levels of income. If the child care subsidies are found to be effective overall, then there should be more focus placed on helping people through the subsidy recipiency process because labor force participation rates are lowest for the low-income group. This could mean that difficulties with obtaining and retaining subsidies are making the subsidy system less effective for this group, and previous research has found this to be a significant problem (Herbst and Tekin, 2008, ASPE, 2019). Previous research has focused on policies that affect the labor force decisions of low-income mothers, but most have not focused on child care subsidy effectiveness among various low-income groups. The goal is to determine if the child care subsidy system is effective for increasing the labor force participation rates of low-income mothers with children under the age of 5 between two low-income level groups, below the poverty level and above the poverty level.

The method used for testing the hypothesis in this research is a proc probit conducted in SAS software. Before analyzing the data, I will lay out the knowledge base of child care subsidy impacts on labor force participation for women. Previous research has focused on married, single, low-income and other types of mothers. This research gives a foundational background to theory and model specification. I will use various findings, theories and variables from these studies to inform both the theoretical and empirical models. After reviewing the data and models

I will perform regression analysis using combined data from all five East North Central Midwest states, including all eligible individuals regardless of the income variance. Following the initial base-line model using pooled data, I will reproduce the same analysis for each income level (described in the data section). From the first analysis, I will begin to understand how significantly child care subsidies predict the labor force participation status of all low-income, mothers generally. The second analysis will show which income level subsidies are most effective in predicting labor force participation. The results and conclusions from these two analyses will be displayed in tables and will be related to the initial hypothesis and research question. Finally, we will discuss some limitations of the research along with possibilities for advancing the current research for future studies along with some policy implications.

II. LITERATURE REVIEW

Previous research has focused on child care subsidies effects on labor supply, employment and wages of mothers, both single or married. The research by Connelly and Kimmel (2003) examined the effects of child care costs on the probability of both employment status and welfare recipiency of single mothers. This finding underlies the basic assumptions of both this research and the theoretical model. High costs of child care decrease the probability of employment and therefore decrease the probability that someone will be in the labor force.

The most important findings from this research are that the probability of employment is low when the price of child care is high. The research found the probability of employment to be very high (68.7%) when there is a 50% child care subsidy given for those mothers eligible to receive a subsidy (Connelly et al., 2003). The research found that many single mothers have low levels of income. The main issue is, mothers expect low wages and pay a high percentage of those wages to purchase reliable quality care. The authors also found that employment of single

mothers is sensitive to the predicted hourly price of child care, and would likely be just as sensitive in a reciprocal way to child care subsidies. Employment elasticity with respect to the predicted cost of child care is estimated to be between -0.32 and -0.42, which was similar to other studies according to Connelly and Kimmel (Connelly et al., 2003). I use this elasticity as a main justification for my model and the rationale for the theoretical effectiveness of child care subsidies on increasing the probability of labor force participation among low-income mothers, a group that has low labor force participation rates.

One difference between the model employed by Connely and Kimmel and the model I will use is the inclusion of a variable for the Earned Income Tax Credit (EITC). Connely and Kimmel found that a child care subsidy reduces the dependency of mothers on welfare. This is important, because inclusion of other welfare measures may cause problems of multicollinearity that result in high standard errors and low t-values. Also, this would ruin my model because to receive EITC one must be in the labor force, so the independent variable (EITC) would be highly correlated with the dependent variable (Labor Force Participation).

The research by Danziger, Ananat, and Browning (2004) addresses how child care subsidies help in the transition from welfare-to-work relative to other factors. Specifically, they analyzed the effect of child care subsidy on employment status and found it to be significant. Another study found similar results and stated, “all else being equal, mothers with lower child care costs were more likely to be employed, particularly low-income or single mothers” (Meyers, Han, Waldfogel, & Garfinkel, 2001). These statements further justify my personal hypothesis that child care subsidies are effective in increasing the probability of labor force participation among low-income mothers. In addition to analyzing the effect of child care subsidy on employment, Danziger, Ananat, and Browning examined the effects of access to transportation

and health on employment status. They found that access to transportation, physical health and mental health are other factors important for helping or hindering the success of low-income single mothers in the labor market (Danziger, Sandra K. et al., 2004). This research is unique because it studies the effects of access to a car or driver's license and finds it a significant barrier to work. Other research supports the results by finding, "analyses of women showed reduced work outcomes, especially in those that lacked access to a car or driver's license" (Corcoran et al., 2000).

The research by Lee, George and Reidy (2004) looks at the employment outcomes of subsidy use as well as the types of care mothers are using for their young children when they use the subsidy. The main finding of the report is that subsidy take up within six months of eligibility reduces the hazard of ending an employment spell by 23% (Lee et al., 2004). This is interesting because the individuals used in this database were already employed, and the study focused on the effectiveness of subsidies on keeping people in the labor force. This is the other side of the same coin that was discussed earlier with employment outcomes after being out of the labor force. This research does not account for people completely dropping out of the labor force vs. only becoming unemployed. There could be other reasons that people decide to drop out of the labor force besides lack of subsidy such as health issues, age, and relationship dynamics with a spouse or significant other (Lee et al., 2004).

The results from this research show the same effects as previous research because the authors found child care subsidies to be effective in positively impacting employment outcomes. There are gaps regarding the study of non-monetary factors involved in labor force participation decisions. Also, this study was only conducted in a three-state area (Illinois, Maryland, Massachusetts).

Another study conducted by Anderson and Levine (2019) addresses how various costs affect the labor force participation decisions of low-income women across skill levels. The research uses various models to control for sample selection problems. Once the final models were simplified, the authors were able to measure the elasticity of child care costs, and thereby measure how effective a subsidized price of child care would be for the same individuals. The results of this research found increased child care costs to have a negative effect on labor force participation. Also, the authors found increased age to have a positive effect on the probability of labor force participation. Lastly, the presence of more children or a disability were both found to have a negative effect on the probability of labor force participation (Anderson and Levine, 2019).

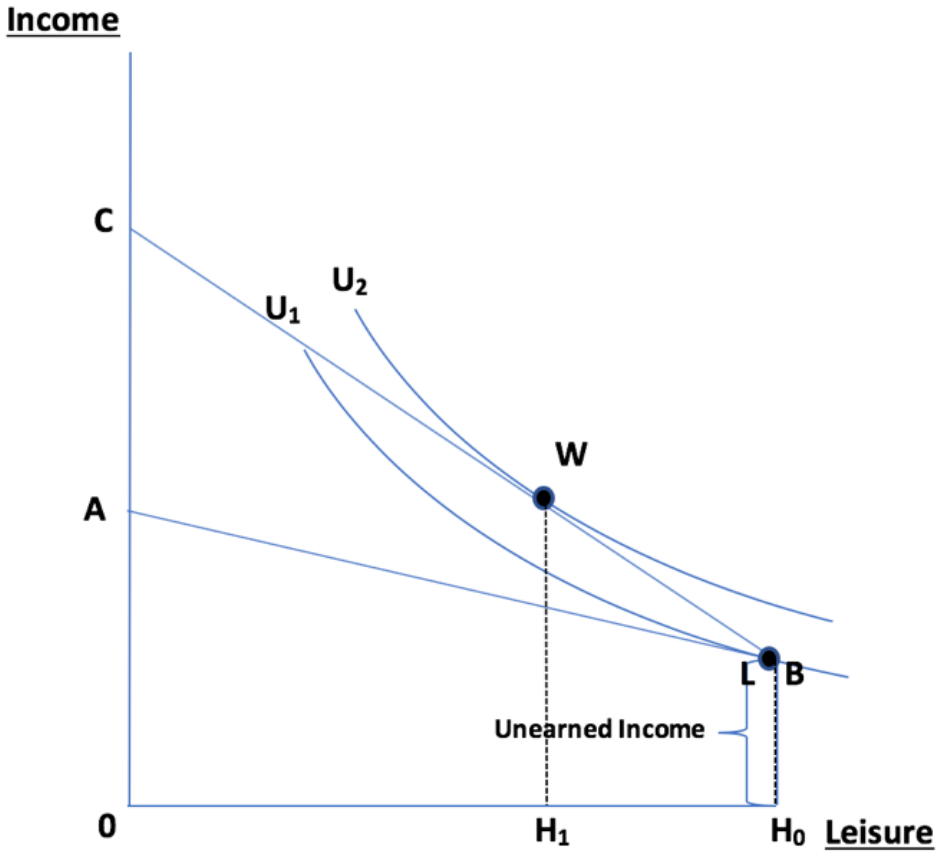
In my own research, I will also investigate the effects of disabilities on labor force participation. Here, a variable will represent if an individual has any significant physical disability (disabilities include problems with: auditory, physical, visual, memory, mobility, and self-care functions). My research will attempt to fill in some gaps from Lee, George and Reidy's research by better understanding the effects of age, marital status and disabilities, and I will look at a larger region which includes Ohio, Illinois, Indiana, Michigan and Wisconsin. In my own model, I will make use of an indicator for how many children in the household are under the age of five. This is important because it addresses how long the mother has had to care intensively for her children. If there is more than one child under five in the home, then the probability a mother has been out of the workforce increases because of the time it takes to raise infants and toddlers. I also will use the idea that age is an important variable to be included because it accounts for two things. First, age captures preferences in types of care, and second, older mothers are less likely to have living parents to take care of the children for free (Anderson and

Levine, 2019). I will also investigate the effect that transportation has on the labor force participation. This will not look only at employment, but rather labor force participation. It is important to note this because someone could be unemployed and still be in the labor force. In my research, the transportation aspect of labor force participation is captured by a variable that represents recipiency of a transportation subsidy.

All of research on this subject find that different variables affect employment and labor force participation. It does not, however, differentiate between how effective predictors of employment outcomes are between individuals above and below to poverty level. Child care subsidy policies are often targeted at families below the poverty level (Layzer and Burstein, 2019), but it is unclear how effective these policies are. I attempt to understand if the policies effectively increase the probability of labor force participation for individuals above the poverty level, below the poverty level or both through regression analysis.

III. THEORY AND FORMATION OF THE MODEL

This research is based on consumer choice theory. Specifically, consumer choice theory in a Labor-Leisure model. In this model, a consumer is choosing between work and leisure, and it is assumed that the choices are subject to a budget constraint. The budget constraint is made up of many costs that affect wage opportunity, which are important because the slope of the budget constraint is the wage or wage opportunity. The main cost I focus on here is the cost of child care. It is assumed that high child care costs may lead to mothers making the rational decision to not participate in the labor force. As stated previously, the cost of child care is a relatively higher percentage of income for low-income mothers than for other mothers. So, changes in child care costs will affect the budget constraint of this group in a major way. Following this logic, a child care subsidy should be significant in increasing the probability of labor force participation.



In the model pictured above, AB is the original budget constraint in which the mother must pay for all child care costs, and point L on utility curve U_1 represents her decision not to work. The kink represents all unpaid income from other sources, which could come from a spouse, investments, other welfare programs or a number of other sources. CB represents the new budget constraint once the mother receives a subsidy for child care. Usually, an increase in wage has two effects, which are substitution and income effects. In this model, it is assumed that the mother begins spending all time on leisure and no work. So, when the budget constraint slope steepens, the mother does not have a choice to consume any more leisure because she is already out of the labor force. Therefore, the only logical conclusion is that a substitution effect takes place and the mother will begin working if only for a few hours a week once receiving the

subsidy because she will have the ability to be at point W on the utility curve U_2 as opposed to point L.

Linear Probability Model / Probit Model

$$Pr(InForce_i) = B_0 + B_1Subsidy + B_2Single_i + B_3Disability_i + B_4Transportation_i + B_5Age_i + B_6MultipleChildren_i + B_7NonNational_i + B_8Unearned_i + B_9Educ99_i + \varepsilon_i$$

The empirical model variables are described in further detail in Table 1. Now I will state the sign expectations for results in the Probit and Linear Probability models. Significant variables are expected to have the same signs in the models because both the Probit model and Linear Probability model predict the probability of participating in the labor force.

In the models, the main independent variable represents recipiency of a subsidy (Subsidy) and is expected to have a positive sign in both models. This is because a subsidy will theoretically increase the expected wage and incentivize an individual to work. The second variable represents the marital status of the individual (Single) and is expected to have a positive sign in both models because single mothers have less unearned income and are more likely to be in the labor force. Additionally, married mothers are classically expected to stay at home and care for young children. The third variable represents an individual as having a disability or not (Disability) and is expected to have a negative sign in the both models because disabilities can be barriers to labor force participation, as shown by previous research (Anderson and Levine, 2019). The fourth variable represents recipiency of a transportation subsidy (Transportation) and is expected to have a negative sign in the Probit model because access to transportation is a barrier to labor force participation, as shown by previous research. The fifth variable represents an individual's age (Age) and is expected to have a positive sign in the probit model because older mothers have less care options. The sixth variable represents the presence of multiple children

under 5 in the household (MultipleChildren) and is expected to have a positive sign because it takes more time to care for more children, and is more costly, so a wage opportunity would need to be relatively higher for someone with more than 1 child to be incentivized enough to work. The seventh variable is an indicator of educational attainment (EDUC99) and serves as a proxy for wage opportunity because as education increases, so does the amount of money one can make (Torpey, 2019). It is expected to have a positive sign in both models because as wage opportunity increases, someone in this Labor-Leisure model would be more likely to choose to work because they can be on a higher indifference curve and receive more utility. The eighth variable is a measure of unearned income (Unearned), which comprised of all other income received by the individual excluding welfare payments. This variable is expected to have a negative sign in both models because an individual would have the opportunity to have a high amount of utility even without working when unearned income is high. Lastly, the ninth variable represents if the individual was born in the United States or elsewhere (NonNational). This variable is expected to have a negative sign because it is likely that non-national individuals do not have the opportunity to receive free child care from their parents because their parents are most likely in their home country.

IV. DATA SOURCES AND DESCRIPTION

The data set I used for this research is from IPUMS's collection of the Current Population Survey for 2008. Initially, the data extract had 12,202 observations, which was reduced to 232 observations after cleaning. The sample includes all women in the North East Central Midwest region of the United States that were eligible for child care subsidies based off their income level for the year 2008. The maximum income allowed to qualify for Child Care Development Fund (CCDF) subsidies is calculated as a percentage of the median income for each state. Percentages

used in this study are based on the 2009 numbers from the Administration for Children and Families (Administration for Children and Families, 2011). For all observations used in this study, the individuals with at least 3 persons in the family have a yearly income at or below the following percentages of the state median income for 2008: Ohio – 52%, Indiana – 45%, Wisconsin – 59%, Illinois – 59%, Michigan – 46% for married people, these are all eligible. For two-person households, eligibility cutoffs are at the following percentages of the state median income for 2008: Ohio – 33%, Indiana – 28%, Wisconsin – 38%, Illinois – 38%, Michigan – 29% (Administration for Children and Families, 2011).

In 2008 the federal poverty line was at $14,000 per two-person household, and $17,600 for a 3-person household. I created three groups based on these guidelines. The first group includes all households in the region eligible to receive a child care subsidy based on family income. The second group is comprised of all households below the national poverty level. This group includes all two-person households with a family income below $14,000 per month, and all households with more than 2 people that have a family income below $17,600 per month. The third group includes all eligible two-person and more than two-person households with family incomes above the national poverty level for 2008. The second and third groups are created to test if the higher percentage of income paid out to child care by the lowest-income mothers make a difference in subsidy effectiveness (ASPE, 2019). It should be noted that to some extent these classifications are likely tied to labor force participation because people with higher incomes are likely to receive some of that income from working, and are therefore in the labor force.

V. MODEL ESTIMATION AND HYPOTHESIS TESTING

The Linear Probability and Probit models produced results that were in line with expectations, which will be explained further. Table 2 contains the results from the Linear Probability and Probit regressions for three groups. The "Combined Eligible" group is first, followed by the "Below Poverty Level" group and "Above Poverty Level" group. It is important to note that although the latter group is above the poverty level, they are still very low-income. The model results are displayed in Table 2 in the appendix.

VI. INTERPRETATION OF RESULTS

A few of the results are statistically significant, and all statistically significant result signs followed expectations. The Linear Probability regression shows very low R-Squared values, which is expected when the dependent variable is binary. The Linear Probability analysis does show some significantly high t-values for some observations. The statistically significant observations from the Linear Probability model are almost always likewise significant in the Probit regression. "Above Poverty Level" was the only group where child care subsidy recipiency was shown to increase the probability of labor force participation at a statistically significant confidence level (95%). This is most likely because of the higher wage opportunities of individuals in this group. On average, individuals above the poverty level had a high school diploma, so subsidies (according to the theoretical model) would give them relatively more incentive to join the labor force than people below the poverty line (below the poverty line on average did not have a high school diploma). Another reason why people below the poverty line did not see effective subsidies could be because of the previously stated problems with navigating the welfare system.

For the results, the marginal effect of the probit model reflects the probability of participating in the labor force. The marginal effect is calculated by using means calculated from each sub-group. When calculating the marginal effects, binary variables received a value of 1 in the model if the sub-group population mean was greater than or equal to .5 and a value of 0 if the sub-group population mean was less than .5. Continuous variables in the model received the sub-group population mean. When calculating marginal effects of binary variables, the z-score was calculated when the variable was equal to one and equal to zero, then marginal probability effects were found in the z-distribution table. When calculating marginal effects of continuous variables, the z-score was calculated when the variable was equal to the population mean and equal to the population mean plus one standard deviation, then marginal probability. Effects were found in the z-distribution table.

Significant results in the "Combined Eligible" group show single mothers to be 9.61 percentage points more likely to be in the labor force than married mothers. Also, mothers with disabilities are 31.99 percentage points less likely to be in the labor force, and those an education level one standard deviation higher than the mean are 7.45 percentage points more likely to be in the labor force.

For the "Below Poverty Level" group, mothers with a disability are 32.32 percentage points less likely to be in the labor force. In the "Above Poverty Level" group, mothers one standard deviation older than the mean (mean = 29.25 years) are 15.17 percentage points less likely to be in the labor force. In this group, mothers of more than one child under five are 27.08 percentage points less likely to be in the labor force, and those with an education level one standard deviation higher than the mean are 14.16 percentage points more likely to participate in the labor force.

The Linear Probability and Probit models find almost all the same variables to be statistically significant. However, the Linear Probability model shows subsidy recipiency to be statistically significant at the 95% confidence level for the "Above Poverty Level" group, while the Probit model shows no significance. Also, the Probit model shows educational attainment to be significant at the 90% confidence level for the "Combined Eligible" group, while the Linear Probability model shows no significance. Age education and number of children are found to have larger marginal effects in the probit model than in the Linear Probability model, and disability and marital status are found to have smaller marginal effects in the Probit model comparatively. My research, much like the research covered in the literature review (Connelly et al., 2003, Lee et al., 2004) finds subsidies to be effective in increasing the probability of labor force participation. However, I found child care subsidies to be significant only for those individuals above the poverty line. Once interesting difference between my results and Danziger's results is the effects of access to transportation as increasing the probability of labor force participation. I found the subsidy for transportation to have no effect on labor force participation. It should be noted that I focused strictly on transportation recipiency while Danzinger focused on access to a car.

VII. CONCLUSIONS AND LIMITATIONS

The first and most important conclusion from this research is that subsidy recipiency, educational attainment, mother's age and the number of children under 5 are all significant predictors of labor force participation in the above-poverty-level group. Having more than one child under the age of five and being older both decrease the probability that a mother will be in the labor force for this group. This could mean that subsidy programs are not accurately accounting for the costs of more children. Also, it could mean subsidy policy does not take into

account the actual cost of care, and when mothers get older, they have less alternative and cheap care options, so they do not enter the labor force because child care costs too much. I would recommend that child care subsidies re-evaluate the sliding scale costs associated with the number of children each household has to better account for actual costs. Also, I would recommend that costs of care be evaluated in each state to better help aging mothers pay for care when they have no alternative cheaper option.

It is interesting to note that none of the significant predictors for the "Above Poverty Level" group are significant for the "Below Poverty Level" group. Subsidy recipiency is likely significant in the "Above Poverty Level" group because these people are able to navigate the system more effectively, and have a higher wage opportunity. Also, people above the poverty level may not be in chronic cycles of poverty and have more energy to spend on getting a job compared to those individuals who do not know where their next meal is coming from. Educational attainment is significant in the "Above Poverty Level' group likely because those with higher educational attainment have a higher wage opportunity, and therefore have more incentive to participate in the labor force according to the utility maximizing assumptions of the aforementioned model. It is interesting to note, that the marginal effects of education are doubled in the "Above Poverty Level" group when compared to the marginal effects of the "Combined Eligible" group.

Child care subsidy recipients are more likely to be in the labor force in the "Above Poverty Level" group. This observation shows that the policy does work for higher-income eligible mothers with the goal of getting them in the labor force, but labor force participation rates are still low among the "Combined Eligible" group. Therefore, I would recommend that organizations such as the Center for Job and Family Services begin marketing campaigns in

communities, on social media and through other platforms to raise awareness that child care subsidies do exist. As mentioned before, low take-up rates among eligible individuals is a problem (Lee et al., 2004).

Eligible individuals with a disability are much less likely to be in the labor force. The most statistically significant predictor of labor force participation in this research was the disability variable. If a person has a disability and is low income, they are not likely to be in the labor force. To solve this problem, I recommend that county agencies that employ disabled people create a policy to specifically target low-income people with disabilities.

Limitations of this research include the fact that some eligible families may not continuously receive subsidies for a number of reasons. This research is not longitudinal, and does not take into account if the individuals have ever received a child care subsidy in the past, or if they recently received a subsidy. Recertification periods are usually short, so a family could receive a subsidy, enter the labor force, and lose the subsidy by the time this data was collected. So, one limitation of this study is the lack of previous knowledge about the individuals that could better picture of the effectiveness of child care subsidies on increasing labor force participation. The average length of subsidy was found to be a mere three to seven months (Blau et al., 2002), and because of application, recertification and continuous reporting standards make it hard for eligible families to keep the subsidy (Snyder, Banghart and Adams, 2006) Barriers to subsidy sustainability are limiting this research because we cannot grasp the full effect of subsidy impact on labor force participation if most eligible families are receiving the subsidy for less than one year.

An additional limitation to this research is the data. The IPUMS CPS team has not collected the variables used in this research since 2008. Data collected over ten years ago may no

longer be useful in the current economic and political climates. Not only does this research use fairly old data, but there is a limited amount of observations as well (232). Difficulties finding states that have very similar child care subsidy policies call for complicated methods when looking at larger sample size to determine which families are eligible to receive the subsidy. Finally, this research is limited because it does not take into account the exact costs of care in the given states. I did focus on one very similar region; however, prices of care vary from state to state and may make subsidies more effective in one state compared to another. It would be advantageous for future studies to find states across the United States that have very similar eligibility rules, or to create a model that efficiently determines the eligibility of each individual across all states to get a larger sample size. Another recommendation for future studies is to take a closer look at state-specific costs of care and the effect on labor force participation. Child care subsidies are important and deserve to be studied in the future with hopes of helping to increase female labor force participation.

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IX. APPENDIX

Table 1
Descriptive Statistics

	Combined Eligible	Below Poverty Level	Above Poverty Level	
Variable	Mean (Standard Deviation)			Source
Binary variable that represents participation in the labor force. A value of 1 denotes participation. **[InForce]**	0.52 (0.50)	0.47 (0.50)	0.66 (0.48)	[1]
Binary variable that represents recipiency of a childcare subsidy. A value of 1 denotes recipiency. **[Subsidy]**	0.10 (0.31)	0.08 (0.29)	0.15 (0.36)	[1]
Binary variable that represents recipiency of a transportation subsidy. A value of 1 denotes recipiency. **[Transportation]**	0.01 (0.11)	0.01 (0.11)	0.01 (0.12)	[1]
Binary variable that represents if an individual was born in the United States. A value of 1 represents a foreign-born person. **[NonNational]**	0.17 (0.38)	0.13 (0.33)	0.28 (0.45)	[1]
Continuous variable that is a measure of all unearned income excluding income from welfare programs. **[Unearned]**	657.64 (1723.87)	799.61 (1920.04)	296.10 (1003.93)	[1]
Continuous variable that is a measure of the individual's level of educational attainment. A value of 10 indicates a high school graduate. **[Educ99]**	9.70 (2.17)	9.52 (1.92)	10.07 (2.69)	[1]
Binary variable that indicates whether the respondent has any physical or cognitive difficulty, as measured by an affirmative response to at least one of the CPS' six cognitive difficulties. A value of 1 denotes some difficulty. **[Disability]**	0.06 (0.23)	0.07 (0.23)	0.01 (0.12)	[1]
Binary variable represents the number of own children age 5 and under residing with each individual. A value of 0 represents 1 child; a value of 1 represents more than one child in the household. **[MultipleChildren]**	0.34 (0.47)	0.30 (0.46)	0.43 (0.50)	[1]
Binary variable that represents the marital status of an individual. A value of 1 denotes a person is single; a value of 0 denotes a person is married and living with the spouse**. [Single]**	0.81 (0.40)	0.90 (0.29)	0.57 (0.50)	[1]
A continuous variable that represents the age of the individual. **[Age]**	26.85 (5.94)	25.88 (5.49)	29.25 (6.19)	[1]

[1] *Sarah Flood, Miriam King, Renae Rodgers, Steven Ruggles and J. Robert Warren. Integrated Public Use Microdata Series, Current Population Survey: Version 6.0 [dataset]. Minneapolis, MN: IPUMS, 2018. https://doi.org/10.18128/D030.V6.0*

Table 2
Subsidy Effectiveness on Labor Force Participation (Linear Probability and Probit Models)
Probability of Labor Force Participation
(Dependent Variable: InForce)

	Combined Eligible		Below Poverty Level		Above Poverty Level	
	OLS	**Probit**	**OLS**	**Probit**	**OLS**	**Probit**
Intercept	0.086 (0.251) {0.34}	-1.170* 0.083	0.120 (0.341) {0.35}	-1.060 0.236	0.794 (0.340) {2.15 }	1.242 0.356
Subsidy	0.172 (0.108) {1.58}	0.484 0.1123	0.050 (0.141) {0.36}	0.128 0.724	0.230** (0.160) {1.88}	6.114 0.999
Single	0.167** (0.08920) {1.73}	0.460* 0.073 [.0961]	0.200 (0.149) {1.35}	0.554 0.159	0.204 (0.123) {1.57}	0.541 0.231
Disability	-0.379 *** (0.142) {-2.67}	-1.137*** 0.010 [-.3199]	-0.352** (0.153) {-2.30}	-1.022** 0.024 [-.3232]	-0.340 (0.425) {-0.93}	-6.670 1.000
Transportation	0.178 (0.286) {-0.62}	-0.491 0.533	-0.469 (0.363) {-1.27}	-6 .361 0.999	0.137 (0.433) {0.32}	-0.766 1.000
Age	0.002 (0.006) {0.38}	0.006 0.690	0.007 (0.007) {-1.29}	0.020 0.325	-0.019** (0.009) {-1.97}	-0.075* 0.060 [-.1517]
MultipleChildren	-0.097 (0.069). {-1.42}	-0.251 0.169	-0.064 (0.087) {-0.73}	- 0.150 0.501	-0.261** (0.109) {-2.39}	-0.941** 0.030 [-.2708]
Unearned	0.000 (0.000) {0.40}	0.000 0.662	0.000 (0.000) {0.34}	0.000 0.692	0.000 (0.000) {0.51}	0.223 0.999
Educ99	0.028 (0.015) {-1.26}	0.078* 0.059 [.0745]	0.003 (0.021) {0.14}	0.009 0.863	0.035* (0.109) {-1.77}	0.135* 0.020 [.1416]
NonNational	0.002 (0.096) {0.02}	0.0183 0.943	-0.065 (0.129) {-0.50}	-0.169 0.614	0.019 (0.133) {0.14}	-0.047 0.922
R-Squared	0.0932		0.0667		0.3699	
Adjusted R-Squared	0.0565		0.0129		0.2704	
RMSE	0.4867		.46988		.40864	
F-Value	2.54		1.24		3.72	
Number of Observations	232		166		67	

Note: *** Indicates a significance level of 99%. ** Indicates a significance level of 95%. * Indicates a significance level of 90%. (Standard Errors) [Marginal Effect] {T-Values}
Second row in Probit results = ChiSq Probabilities.

Note*/ Formatting code downloaded from IPUMS is not included here. All code from this paper is original /*

```
data Two;
set ipums.cps_00012;
if labforce = 1 then InForce = 0;
if labforce = 2 then InForce = 1;
Unearned = incss + incint + incsurv + incdisab + Incdivid + incrent + incchild + incalim +
incother;
if kidcare = 0 then delete;
if kidcare = 1 then Subsidy = 0;
if kidcare =2 then Subsidy =1 ;
if EDUC99 = 00 then delete;
if NCHLT5 = 0 then delete;
if nchlt5 > 1 then MultipleChildren = 1;
if nchlt5 = 1 then MultipleChildren = 0;
if MARST = 9 then delete;
if labforce = 0 then delete;
if DISABWRk = 0 then delete;
if DISABWRK =1 then Disability = 0;
if DISABWRK = 2 then Disability = 1;
if transaid = 0 then delete;
if transaid = 1 then Transportation = 0;
if transaid =2 then Transportation =1;
 IF mbpl > 09900 THEN NonNational = 1;
 IF mbpl = 09900 THEN NonNational = 0;
if Marst > 1 then Single = 1;
if Marst = 1 then Single = 0;
if single = 1 and statefip = 39 and ftotval > 18074 then delete;
if single = 0 and statefip = 39 and ftotval > 28480 then delete;
if single = 1 and statefip = 18 and ftotval > 15328 then delete;
if single = 0 and statefip = 18 and ftotval > 24535 then delete;
if single = 1 and statefip = 17 and ftotval > 24389 then delete;
if single = 0 and statefip = 17 and ftotval > 37867 then delete;
if single = 1 and statefip = 26 and ftotval > 16082 then delete;
if single = 0 and statefip = 26 and ftotval > 25510 then delete;
if single = 1 and statefip = 55 and ftotval > 22593 then delete;
if single = 0 and statefip = 55 and ftotval > 35079 then delete;
run;
proc sort;
by decending InForce;
run;
proc means;
run;
proc freq;
run;
```

```
proc reg;
model InForce = Subsidy Single Disability Transportation Age MultipleChildren Educ99
Unearned NonNational;
run;
proc probit order = data;
class InForce;
model InForce = Subsidy Single Disability Transportation Age MultipleChildren Educ99
Unearned NonNational;
run;



Data Set1;
set ipums.cps_00012;
if labforce = 1 then InForce = 0;
if labforce = 2 then InForce = 1;
Unearned = incss + incint + incsurv + incdisab + Incdivid + incrent + incchild + incalim +
incother;

if kidcare = 1 then Subsidy = 0;
if kidcare =2 then Subsidy =1 ;
if kidcare = 0 then delete;
if DISABWRK =1 then Disability = 0;
if DISABWRK = 2 then Disability = 1;
if transaid = 1 then Transportation = 0;
if transaid =2 then Transportation =1;
if nchlt5 > 1 then MultipleChildren = 1;
if nchlt5 = 1 then MultipleChildren = 0;
if EDUC99 = 00 then delete;
if NCHLT5 = 0 then delete;
if MARST = 9 then delete;
if labforce = 0 then delete;
if DISABWRk = 0 then delete;
if transaid = 0 then delete;
 IF mbpl > 09900 THEN NonNational = 1;
 IF mbpl = 09900 THEN NonNational = 0;
if Marst > 1 then Single = 1;
if Marst = 1 then Single = 0;
if single = 1 and statefip = 39 and ftotval > 18074 then delete;
if single = 0 and statefip = 39 and ftotval > 28480 then delete;
if single = 1 and statefip = 18 and ftotval > 15328 then delete;
if single = 0 and statefip = 18 and ftotval > 24535 then delete;
if single = 1 and statefip = 17 and ftotval > 24389 then delete;
if single = 0 and statefip = 17 and ftotval > 37867 then delete;
if single = 1 and statefip = 26 and ftotval > 16082 then delete;
if single = 0 and statefip = 26 and ftotval > 25510 then delete;
```

```
if single = 1 and statefip = 55 and ftotval > 22593 then delete;
if single = 0 and statefip = 55 and ftotval > 35079 then delete;
if single = 1 and ftotval > 14000 then delete;
if single = 0 and ftotval > 17600 then delete;
run;
proc sort;
by decending InForce;
run;
proc means;
run;
proc freq;
run;
proc reg;
model InForce = Subsidy Single Disability Transportation Age MultipleChildren Educ99
Unearned NonNational;
run;
proc probit order = data;
class InForce;
model InForce = Subsidy Single Disability Transportation Age MultipleChildren Educ99
Unearned NonNational;
run;

Data Set2;
set ipums.cps_00012;
if kidcare = 0 then delete;
if labforce = 1 then InForce = 0;
if labforce = 2 then InForce = 1;
Unearned = incss + incint + incsurv + incdisab + Incdivid + incrent + incchild + incalim +
incother;

if kidcare = 1 then Subsidy = 0;
if kidcare =2 then Subsidy =1;
if DISABWRK =1 then Disability = 0;
if DISABWRK = 2 then Disability = 1;
 if transaid = 1 then Transportation = 0;
if transaid =2 then Transportation =1;
if nchlt5 > 1 then MultipleChildren = 1;
if nchlt5 = 1 then MultipleChildren = 0;
if EDUC99 = 00 then delete;
if NCHLT5 = 0 then delete;
if MARST = 9 then delete;
if labforce = 0 then delete;
if DISABWRk = 0 then delete;
if transaid = 0 then delete;
 IF mbpl > 09900 THEN NonNational = 1;
 IF mbpl = 09900 THEN NonNational = 0;
```

```
if Marst > 1 then Single = 1;
if Marst = 1 then Single = 0;
if single = 1 and statefip = 39 and ftotval > 18074 then delete;
if single = 0 and statefip = 39 and ftotval > 28480 then delete;
if single = 1 and statefip = 18 and ftotval > 15328 then delete;
if single = 0 and statefip = 18 and ftotval > 24535 then delete;
if single = 1 and statefip = 17 and ftotval > 24389 then delete;
if single = 0 and statefip = 17 and ftotval > 37867 then delete;
if single = 1 and statefip = 26 and ftotval > 16082 then delete;
if single = 0 and statefip = 26 and ftotval > 25510 then delete;
if single = 1 and statefip = 55 and ftotval > 22593 then delete;
if single = 0 and statefip = 55 and ftotval > 35079 then delete;
if single = 1 and ftotval <14000 then delete;
if single = 0 and ftotval <17600 then delete;
run;
proc sort;
by decending InForce;
run;
proc means;
run;
proc freq;
run;
proc reg;
model InForce = Subsidy Single Disability Transportation Age MultipleChildren Educ99
Unearned NonNational;
run;
proc probit order = data;
class InForce;
model InForce = Subsidy Single Disability Transportation Age MultipleChildren Educ99
Unearned NonNational;
run;
```