Participation in the Unemployment Insurance Program and Childhood Cognitive Outcomes

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Unemployment Insurance Effect on Childhood Cognitive and Behavioral Outcomes

ABSTRACT

Unemployment spells are associated with substantive, long-lasting negative effects. These also extend to future generations, such that parental job displacement is correlated with children's lower annual earnings, lower educational achievement, grade retention, and high school completion. Despite evidence linking parental unemployment spells and negative child outcomes, there is very little research that explains the role of participation in the Unemployment Insurance Program (UI) in buffering these effects. Using the National Longitudinal Survey of Youth 79 (NLSY79) and Children of the NLSY79 data, we estimate a series of pooled cross-sectional models and fixed effects models to estimate the relationship between UI usage and several behavioral and cognitive child outcomes. The results suggest that UI participation alleviates the harmful effects of unemployment spells, when comparing children whose mothers experience unemployment. Moreover, the program appears to be especially beneficial to the cognitive outcomes of children of color. .

INTRODUCTION

The American economy is undergoing a fundamental restructuring. The unemployment rate, while substantially below the high of 10.1 percent in October 2009, remains above 8.0 percent as of August 2012 (Bureau of Labor Statistics 2012). While the national unemployment rate has improved in the last 12 months, the number of long-term unemployed, defined as those out of the labor market 27 or more weeks, remains at historic highs of 5 million or 40.0 percent of all unemployed. Both the high levels and durations of unemployment mark these economic times as substantially different from prior economic cycles. It is with this policy context in mind that this paper examines the ability of participation in the Unemployment Insurance Program to buffer recipients' children from the effects of unemployment and the accompanying income shock.

Prior research has identified long term negative effects associated with unemployment. These include substantive, long-lasting reductions in future earnings (Jacobsen, Lalonde, & Sullivan, 1993; Stevens, 1997; Page, Stevens, & Lindo, 2009) and negative mental health outcomes (Artazcoz, Benach, Borrell, & Cortez, 2004). The damaging effects of unemployment also extend to future generations. Parental job displacement, especially of fathers, is correlated with children's lower annual earnings (Oreopoulos, Page, & Stevens, 2008) and a host of negative educational outcomes, including lower achievement (Cunha & Heckman, 2007; Rege, Telle, & Votruba, 2007), grade retention (Stevens & Schaller, 2009; Kalil & Ziol-Guest, 2008), and lower high school completion of children from low-income families (Page, Stevens, & Lindo, 2009). This study addresses whether UI is an effective policy lever to mitigate the damaging effects of parental unemployment spells on children. This topic is important and timely, given the current focus and multiple expansions of UI eligibility across the states.

This paper is the first of which we are aware to model the relationship between participation in unemployment insurance and children's outcomes. We use data from the National Longitudinal Survey of Youth 1979 cohort to examine adult participation in UI and the association with children's cognitive outcomes. In the section that follows, we lay out program details of UI and provide a conceptual model linking UI to child outcomes. Then we provide details regarding our data, measures and models employed. Our results suggest that UI program participation is related to child outcomes. Specifically, children whose mothers received UI demonstrate higher cognitive outcomes (PIAT Math and Reading) than otherwise similar children whose unemployed mothers did not participate in UI. We further characterize this relationship by estimating the effects of maternal UI participation on poor, African American, and Latino children. In the final section, we outline the limitations of our study and discuss implications for both research and policy.

UI RECEIPT AND CHILD OUTCOMES: THEORY AND HYPOTHESES

The Unemployment Insurance Program is a joint federal-state program that operates as social insurance for short-term periods of unemployment. In order to qualify, unemployed workers must meet both monetary eligibility guidelines, based on employment and earnings over the prior 20 months, and non-monetary requirements, which are determined by age and reason for work separation. Historically, regular state UI benefits for most recipients last for 26 weeks (6 months). States fund regular unemployment insurance benefits from taxes received from state employers. After exhausting regular benefits, during periods of high unemployment, recipients may be eligible for "extended benefits" as a result of federal and state legislation. Significant state variation exists in the operation of UI with regard to eligibility requirements, benefit amounts, and duration of eligibility.

UI was designed as a counter-cyclical program: When the economy is strong and unemployment levels are low, participation levels in UI should be low and of a short duration. However, during times of economic hardship, such as during the Great Recession of 2008, UI caseloads are expected to grow substantially and the duration may be expanded. As a result of seven federal legislative actions from June 2008 through April 2010, the UI program was altered to extend the duration of receipt allowable from 26 weeks up to 99 weeks, as well as to provide for a $25 week supplement. However, our study focuses on unemployment during the 1979-2008 period and does not include this recent and unprecedented expansion in UI participation and benefits.

Because UI participation is not means-tested and is a part of the safety net that is considered social insurance (although with other popular programs such as Social Security, Medicare and Disability Insurance), there has generally been little social stigma attached to participation. Nonetheless, participation among eligible populations is far from complete. According to estimates from Currie (2006), participation among those eligible is the range of 72 to 83 percent. While Currie suggests that the transaction costs of applying for benefits might explain the moderately high non-participation rates, Ebenstein and Stange (2010) test this hypothesis using state-level differences in application procedures for UI and find that this is not the case. Shaefer and Wu (2011) report that participation among eligible low-educated single women is lower among women with children than among childless women suggesting that barriers to participation may exist for certain disadvantaged groups of eligible unemployed.

States provide UI to displaced workers to minimize the negative effects of unemployment spells that might be associated with reduced income levels. While much is known about the harmful effects of parental unemployment spells on children (Oreopoulos, Page, & Stevens,

2008; Cunha & Heckman, 2007; Rege, Telle, & Votruba, 2007; Stevens & Schaller, 2009; Kalil & Ziol-Guest, 2008) and the positive relationship between income and child wellbeing (Dahl and Lochner, 2005), very little evidence exists regarding the direct effects of parental UI receipt on children's cognitive or behavioral outcomes. If income is associated with children's outcomes, then all else equal, augmented income due to UI participation should be positively associated with child outcomes, assuming the source of income is unimportant. Theoretically, UI receipt should alleviate many of the harmful effects of unemployment by buffering the household from the income shock associated with the job loss.

In reality, UI benefits are not designed to be perfect substitutes for lost wages: the size of the maximum UI benefit varies by state and provides a partial wage replacement only. Some states provide an extra amount if the UI participant has dependent children. On average, UI replaces about 50 percent of lost wages, up to state maximum benefits amounts. However, because of the state ceilings on benefits, UI tends to replace a higher share of low-wage earnings than high-wage earnings (US Department of Labor, 2009). Because of the positive income effect and the lack of evidence regarding hassles or stigma of participation, there should be an unambiguously positive effect of participation. Therefore, *we hypothesize that child outcomes will be higher in unemployed households that participate in UI relative to unemployed households in which the unemployed mother does not receive UI.*

METHODS, DATA, AND VARIABLES

Methods

The statistical analysis is designed to estimate the relationship between mother's UI participation and children's cognitive and behavioral outcomes. We observe mothers' employment status and participation in UI over time, allowing us to compare unemployed

mothers who receive UI to unemployed mothers who do NOT receive UI. To limit sample selection bias, our estimation strategy compares groups of mothers who were employed at the base time period. Additionally, we exclude from the sample mothers whose employment patterns mimic those of mothers who choose not to participate in the labor force after child-bearing. Specifically, we do not include women in the sample who do not work for the initial two years following a child's birth. Unfortunately, the data do not provide information on the reasons the mother is out of the labor force. This selection strategy is not perfect, but it likely prevents us from comparing mothers who voluntarily stay at home with their child(ren) to mothers who experience unemployment for a reason outside of their control. This approach also allows for an estimate of the effects of UI participation relative to non-participation among a sample of unemployed women who were observed to be working in a prior time period.

The analysis proceeds in three steps. First, we estimate the unadjusted effect of unemployment on the three measures of cognitive development to verify and replicate the negative association described in the literature (Cunha & Heckman, 2007; Rege, Telle, & Votruba, 2007; Stevens & Schaller, 2009; Kalil & Ziol-Guest, 2008; Page, Stevens, & Lindo, 2009). We regress PPVT, PIAT Reading, and PIAT Math on unemployment spells.

(1) $C_{it}=\alpha_{it} + \gamma_1 U_{it} + \mu_i$

Where C_{it} is child i's age-standardized score on the relevant test of cognitive development and U_{it} is a vector of dummy variables indicating that an unemployment spell took place during the calendar year. μ_i is an individual-specific error term of unspecified form.

Next, we begin characterizing the relationship between UI and the measures of cognitive development. Modeling child outcomes as a function of cash transfer programs can be potentially problematic. One concern is that the receipt may not be directly driving the

association between program and development outcomes. Rather it is the other characteristics that are correlated with the program that drive the association and inaccurately attribute an effect to the program. Therefore, we first estimate an unadjusted OLS model to determine the base relationship between the measures of cognitive development and UI receipt. Then we test an adjusted OLS model with a richer set of covariates, but we interpret this model with caution because it is possible that the additional mother, child, and environmental characteristics are endogenous with UI participation. The unadjusted and adjusted OLS models are specified:

(2) $C_t=\alpha_t + \gamma_1 U_t + \mu_i$

(3) $C_t=\alpha_t + \gamma_1 U_t + \gamma_2 M_t + \gamma_3 C_t + \gamma_4 E_t + \mu_i$

Where C is the child's standardized scores on the PPVT, PIAT Math, PIAT Reading, and BPI; U is a vector of variables capturing the connection to UI. C is a vector of child-specific characteristics, such as gender and physical health; M includes mother-specific characteristics, such as household income, demographic information, and marital/partner status. Finally, E is a vector of environmental factors that capture the home environment, such as the level of cognitive stimulation and emotional support in the home, μ_i is an individual-specific error term.

Upon establishing the base association, the analysis focuses on limiting the likely threats of endogeneity bias and selection. In terms of selection, the main concern is that women who participate in UI are different from women who do not participate in UI in ways that might affect their children's outcomes. This is most problematic when unobserved differences, such as the cognitive ability of the mothers or their ability to consistently follow routines, might be correlated both with their ability to qualify for UI and their children's cognitive outcomes. Currie and Cole (1993) note that welfare receipt is correlated with unobserved family characteristics, which bias estimates of welfare receipt. To the extent that UI receipt is also correlated with

unobserved family characteristics, cross sectional models would provide biased estimates of UI on child outcomes.

Fixed effects models are useful to address endogeneity bias due to unobserved, time-invariant characteristics. This paper utilizes three outcomes to estimate the effects of UI on cognitive development. The PIAT outcomes are measured at multiple time points, while the PPVT is only measured once for each child. Because of this, we specify two forms of fixed effects models. The PIAT models are specified using the individual child's own variation.

$$(4)\ C_{2t} - C_{1t} = \beta(U_{2t} - U_{lt}) + \gamma(M_{2t} - M_{lt}) + \delta(C_{2t} - C_{1t}) + \eta(E_{2t} - E_{1t}) + \mu_{2t} - \mu_{1t}$$

Where C is the child's standardized scores on the PIAT Math and PIAT Reading; U captures the connection to UI; C is a vector of child-specific characteristics, such as race and physical health; M includes mother-specific characteristics, such as household income, demographic information, and marital/partner status. E is a vector of environmental factors that capture the home environment, such as the level of cognitive stimulation and emotional support in the home. Fixed effects models convert the data through a differencing transformation. The differencing isolates the unobserved effect and removes the effects of any time-invariant explanatory variables (Wooldridge, 2006). The differenced forms prevent estimation of time-invariant explanatory variables.

We cannot use this traditional fixed effects model for the PPVT outcome because each child only took the PPVT at one point in time. Instead, we opt for a family fixed effects model. Siblings share more characteristics than individuals who are paired based on a selected set of variables, such as race, gender, and other observed socioeconomic dimensions. They usually grow up in the same circumstances and attend the same schools. When comparing siblings, many of these unobserved characteristics are automatically controlled (although the models do

not render estimated coefficients for those factors). As such, the estimated effect of mother's UI receipt is less likely to be subject to endogeneity bias. The family fixed effects models are specified as:

$$Y_{2f}- Y_{1f}= \beta(U_{2f}- U_{lf}) + \gamma(M_{2f}- M_{lf}) + \delta(C_{2f} –C_{1f}) + \eta(E_{2f}-E_{1f}) + \varepsilon_{2f}-\varepsilon_{1f}$$

Where Y is the child's age-standardized PPVT score and U, M, C, and E are specified as above. Each child in the family took the PPVT, albeit not concurrently. The family fixed effects models are identified using the time variability in which the siblings took the test. A mother's income and UI participation may be different when sibling A took the PPVT than when sibling B took the PPVT. The family fixed effects model differences the siblings' data, isolates the unobserved effect and removes the effects of any time-invariant explanatory variables. As noted above, time-invariant explanatory and control variables drop out of the equation.

Data

We analyze data from the National Longitudinal Survey of Youth (NLSY79) and Children of the NLSY. The NLSY79 is a panel survey of 12,686 men and women who were 14-21 years old in 1978 and follows them throughout their lives, with the most current data collected in 2010. The survey was conducted every year from 1979-1996, and every other year thereafter. They survey is designed to gather detailed information about employment, education/training, income, fertility, and family characteristics. The data are nationally representative of people living in the United States in 1978. The Children of the NLSY79 is a supplemental survey of all children born to the 6,283 women in the original sample. The supplemental survey provides data on the cognitive development of the children born to these mothers.

Variables

Unemployment Compensation

UI participation is measured in every survey year, starting in 1979. At each follow-up, respondents are asked to report the total amount of UI they (and/or their partner) received in the previous calendar year. Dichotomous variables were created for each calendar year to indicate whether the parent was unemployed and receiving UI. Table one lists summary statistics for the variables used in this study for three subgroups – 1) the full unemployed sample; 2) those who experienced an unemployment spell and received UI; and 3) those who experienced an unemployment spell, but did NOT receive UI. Roughly 67 percent of the mothers who experienced an unemployment spell over the period of interest participation in the UI program.

Home Observation Measurement of the Environment – Short Form (HOME-SF)

The HOME-SF measures the quality of cognitive stimulation and emotional support in a child's family and home environment. NLSY administers a modified version of the original HOME survey, so there is no national norm to be compared. However, internal norms were created by assigning each year of age a standard score mean of 100 and standard deviation of 15 (Bureau of Labor, 2011). The full unemployed sample in this study has average scores that are substantially below the internal norm of the Children of the NLSY sample. Among children of the full unemployed group, the average cognitive stimulation score is 94.905 and the average emotional support score is 95.258. Table one also divides the full unemployed sample into subgroups of participants and non-participants. Columns two and three of table one indicate that children whose mothers participated in UI had more cognitively stimulating and emotionally supportive home environments than those children whose mothers did not participate in UI (at

some point during childhood.) The fourth column of Table one shows that this difference is statistically significant.

NLSY began administering the HOME-SF in 1986 and over 90% of children eligible for a HOME assessment have a valid score (Bureau of Labor, 2011). The HOME-HR is administered one time to the respondent's child and is age-standardized. The size of the child sample deserves explanation. Beginning in 1986, the NLSY program included a battery of child assessments to obtain cognitive, socioemotional, and physiological information on the children of NLSY79 respondents. Only children under the age of 15 are administered this battery of assessments, which includes the HOME-SF, PPVT, and BPI (described below). Each assessment is conducted once for each child. There were 6,622 children under the age of 15 in 1994, and that number has been shrinking steadily since as the children grow up. The child sample and the administration of this battery of assessments are responsible for the relatively small sample sizes reported in this study.

Peabody Picture Vocabulary Test – Revised (PPVT-R)

The PPVT measures a child's hearing vocabulary and estimates verbal capabilities (Dunn and Dunn 1981). Empirical research demonstrates that PPVT scores, which measure receptive language ability, are related to academic achievement (Altepeter and Handal 1985; Bing and Bing 1984; Naglieri and Pfeiffer 1983; Smith, Smith, and Dobbs 1991). Further, early childhood PPVT scores continue to predict academic outcomes for several years after initial assessment (Beitchman et al. 1996).

The PPVT-R is given to NLSY79 child respondents aged three to eighteen (Bureau of Labor Statistics, 2011). In 1986 and 1992, all children over three years old were given the PPVT-R. The Bureau of Labor Statistics also periodically audits the respondents to track the PPVT

scores on file. Where missing scores are noted, interviewers administer the PPVT to those respondents' children (Bureau of Labor Statistics, 2011).

Raw PPVT scores correlate to the "mental age" of the test subject (Dunn and Dunn 1981). In order to control for the natural effects of maturation on PPVT scores, we use standardized PPVT scores in the models that take into account the child's actual age at the time of testing. The PPVT is nationally normed with a mean of 100 and standard deviation of 15. Table one indicates that the children in this sample score substantially lower than the national norm. The children in the full unemployment sample and in the non-UI participant sample scored about 88, which is nearly a full standard deviation below the nationally normed mean. Children of mothers who participated in UI scored slightly better (mean=92.361), but this remains substantially lower than the normed mean.

Peabody Individual Achievement Test (PIAT)

The PIAT Math and Reading scores are used to measure academic achievement of children over five years old. PIAT is considered a strong indicator of academic success and is correlated with other cognitive measures (Bureau of Labor, 2011).

The math section of the PIAT contains 84 questions ranging from recognizing numbers to geometry and trigonometry. Over 5,700 children in NLSY79 child dataset have at least four PIAT Math scores on record (Bureau of Labor, 2011).

The reading recognition section of the PIAT consists of 84 multiple choice questions ranging from preschool to high school level difficulties including matching letters and reading words out loud (Bureau of Labor, 2011). The PIAT reading recognition is given to children aged five and older. As in the case of the PIAT Math, children have multiple Reading scores on record (Bureau of Labor, 2011).

Table one lists the average PIAT scores of the sample children. The PIAT Reading scores are all at, or above, the nationally –normed mean. The PIAT Math scores for the overall sample and the non-participating sample are slightly lower than the national norm (~97). The children of the non-UI-participating mothers scored statistically significantly lower on both subject matter tests.

Child Characteristics

PPVT scores and other child cognitive outcomes have been found to vary by child characteristics (Phillips et al. 1998). The models control for the sex of the child using indicator variables. Child's health status is controlled with a dichotomous variable equal to one if the child has a condition that limits his or her usual childhood activities (as reported by the respondent parent.) Half of the child sample is female and nearly four percent of the children have health problems that limit their childhood activities.

Parental Characteristics

The models also include controls for mother's age, annual household income, and whether the parent is married or in a partnership.

RESULTS

Table two reports the unadjusted correlation between a maternal unemployment spell and the three outcomes of interest. Consistent with previous empirical findings (Cunha & Heckman, 2007; Rege, Telle, & Votruba, 2007; Stevens & Schaller, 2009; Kalil & Ziol-Guest, 2008; Page, Stevens, & Lindo, 2009), on average, children whose mothers experience unemployment, have lower scores on PIAT Reading, PIAT Math, and PPVT age-standardized scores than children whose mothers were continually employed.

Table three presents regression estimates of the effects of UI participation on the three cognitive development outcomes. Three models are estimated for each case. Model (1) presents the unadjusted ordinary least squares (OLS) estimates and do not control for any covariates; Model (2) presents the adjusted OLS estimates, which control for mother- and child-specific variables; Model (3) lists the fixed effects estimates, which control for mother- and child-specific variables that vary over time, plus controls for all time-invariant unobserved variables.

Panel A presents the model estimates for the PIAT Reading outcome. The unadjusted model indicates no statistical relationship between UI participation and reading score. However, once important observed and unobserved characteristics are controlled, the relationship does become statistically significant. The coefficients on Models two and three are in opposite directions, underscoring the importance of appropriately controlling for important observed and unobserved characteristics.

The adjusted OLS model suggests a negative association between reading and UI participation, once observed mother and child characteristics are taken into account. This is an unexpected result. All else equal, participation in UI should stabilize income, thus reducing material and emotional hardships during a potentially distressing time for the family. Further, the negative association is large, just over a third of a standard deviation.

However, once the unobserved, time-invariant characteristics are controlled, the effect of UI participation becomes positive and remains statistically significant. The magnitude of the effect is about a third of a standard deviation, which is substantial given that the fixed effect coefficient estimates the within child effect of UI participation. In concrete terms, a change in mother's UI participation is related to a 3.5 point increase in a child's PIAT Reading score.

Again, these fixed effects models are identified by the changes in the child's (and mother's UI participation) status – each child in the study sample took the PIAT tests more than one time.

A similar pattern presents with the PIAT Math outcome. The UI participation coefficient is negative (albeit not statistically significant) in the OLS Adjusted model. Moving across the table to Model 3, however the coefficient switches sign and statistical significance. The magnitude of the coefficient is again about a third of a standard deviation of the within-child variation in PIAT Math score. The interpretation of this coefficient in the fixed effects model is that a child of a UI-participant mother experiences a 3.2 increase in PIAT Math score.

The PPVT outcome presents somewhat of a different picture. The Unadjusted OLS model presents a positive coefficient, similar in magnitude to what is found for the PIAT outcomes in the fixed effects models. However, once observed and unobserved characteristics of the children are controlled, UI participation does not appear to affect PPVT. It is interesting to note, however, that the sign of the coefficients mimics the pattern found in Models 2 and 3 of the PIAT outcomes.

The consistent pattern of negative effects for the adjusted OLS models and positive effects for the fixed effects models deserves some attention. Table 1 of summary statistics indicates that children of UI participants fare better on nearly every mother, child, and environmental measure. However, once these measures are controlled in the adjusted OLS models, the negative coefficient is an indication that it is the most disadvantaged mothers (possibly in terms of social support or mental health) who choose to participate in UI. Characteristics such as these are unobserved and likely to be cosistent over time. They would impact the likelihood of both an unemployment spell and the child's outcomes. Once these time-

invariant, unobserved characteristics are appropriately controlled, it is apparent that UI participation does have a positive effect on two of the three measures of cognitive development.

These estimates provide evidence that UI has an effect on children's cognitive development. However, these models may mask potentially important differences in groups. For example, as noted in Page, Stevens, and Lindo (2009), the effect of a job loss on financial constraints is larger for low socioeconomic status families. In a similar fashion, the alleviating effect of UI on financial constraints is expected to be larger for these families. To check for heterogeneous treatment effects associated with UI participation, we divide the sample into different subgroups according to race and poverty status. The poverty sample yielded no statistically significant results: the effect of UI participation was uniform across poor and non-poor samples of children. This is a surprising result because children who are poor are characterized as being especially sensitive to the effects of unemployment spells (Page, Huff, & Lindo, 2009). As such, we would expect the income stabilizing effects of their mothers' UI participation to affect their cognitive outcomes. For purposes of brevity, these are not included in the tables, but are available from the authors upon request.

Table four summarizes the UI coefficients for different subgroups of children. Each cell in the table represents a different regression; the columns reflect the race of the child and the rows reflect one of three outcomes of interest.

Research indicates that persistent poverty (and its attenuant qualities) has more detrimental effects on children's outcomes than transient poverty (McLoyd, 1998). Additionally, African American and Latino children spend more time in poverty than white children (McLeod & Shanahan, 1993). Given this reality, we expect that unemployment spells will be especially detrimental to children of color. As noted above, we anticipate that the UI program will be most

beneficial to the cognitive outcomes of children of color. The findings in table three are consistent with these expectations. The UI effect is driven almost entirely by the African American and Latino/a subgroups. UI does not appear to have a statistical relationship with any of the measures of cognitive development in the European American subsample. Latino/a children whose mothers receive UI during an unemployment spell have higher PIAT Reading scores than those Latino/a children whose mothers did not receive UI during an unemployment spell. The size of the UI effect is over half of a standard deviation in reading score, which is substantively large. Among African American children, UI receipt is associated with a 6.6-point higher PIAT Math score and a 10.5-point higher PPVT score than otherwise similar children whose mothers did not receive UI.

DISCUSSION

Taken as a whole, the fixed effects models provide some evidence that maternal UI receipt during unemployment can positively affect children's cognitive development. In the general fixed effects models, the coefficients are positive and substantively large. To put the coefficient estimates into context, we construct a hypothetical scenario in which mothers experience unemployment spells in each of three calendar years (with periods of work in-between spells). Those children whose mothers receive UI at any point during those three years will have PIAT Reading scores that are over 9/10ths of a standard deviation higher than the children whose mothers did not receive UI. Four years of UI receipt over the child's observation period leads to a similar increase in PIAT Math score.

The UI effect appears to be stronger for children of color. UI receipt during any two years throughout a Latino/a child's observation period is associated with a full standard deviation increase in reading score. Moreover, it takes less than two UI receipt spells during an African

American child's observation period to see a full standard deviation increase in PPVT score. Those African American children whose mothers receive UI at any point during two years will have PIAT Math scores that are over 9/10ths of a standard deviation higher than similar children whose mothers did not receive UI.

While not directly tested in this paper, this could possibly be attributed to an income effect. It is likely that increased financial resources available to families during a time of financial hardship will alleviate both familial stressors and allow for more cognitively stimulating materials in the home. This is consistent with research that shows a link between income and cognitive development (Smith, Brooks-Gunn, and Klebanov, 1997; Dahl and Lochner, 2005; Gao and Harris, 2000; Blau, 1999; Mayer, 1997).

These data do not contain appropriate measures to allow a comprehensive understanding of the underlying factors to this finding. Heflin and Kukla-Acevedo (2011) show that the TANF program can negatively impact very young children's cognitive development because of the stress that parents experience while participating in TANF. Unfortunately, the NLSY and Children of the NLSY did not consistently collect information on parental mental health and wellbeing. Because of this, there is no reliable means of testing whether the structure of the UI program reduces parental stress during a time of financial crisis. While these results enhance our understanding of the program effects associated participation in the Unemployment Insurance Program, a critical question remains, "Why does UI lead to improved cognitive development outcomes in children?" One possibility is improved mental health for parents during a stressful financial period. Another possibility is the increased visibility of parents in the home during the unemployment spell has positive effects on the children. Understanding the mechanisms that drive the positive UI effect remains a crucial area of future research.

There were several important legislative actions from June 2008 through April 2010, that altered the UI program. These legislative actions considerably extended the duration of allowable receipt and increased the program's generosity. However, the time frame of this study does not incorporate these important changes and so these results do not generalize to the current economic period. However, they may provide a low estimate, indeed the only estimate, of the effect of UI on children. While we consider this a limitation in this version of the study, newly released data will allow for more precise estimates that incorporate the current UI environment.

This study informs public policy in important ways. UI is a cash transfer program that is relatively simple to access, unlike TANF, which forces participants to complete stringent requirements for participation. These stringent requirements lead to unanticipated negative effects on children (Heflin & Kukla-Acevedo, 2011). These results suggest that transitory cash assistance that allows families the flexibility and freedom to spend it leads to positive cognitive outcomes for children. Additionally, the average family in this sample received UI for about two years. Surprisingly, this very short, inexpensive social safety net treatment is enough to positively affect children's cognitive outcomes.

The results of this study suggest that UI as a governmental policy is able to improve children's life chances, especially the life chances of our society's historically marginalized children. While UI has often been criticized for creating disincentives to find work, one very good reason for states to provide UI to displaced workers is to minimize the negative intergenerational effects of unemployment spells. In the absence of UI, unemployment spells would lead to reduced cognitive outcomes that can translate to reduced academic outcomes. Since education level is the primary determinant of individual labor market returns, this also has long-term consequences for states in terms of reduced tax revenue.

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Table 1. Selected summary statistics and Tests of Mean Group Difference. (Standard errors in parenthesis)

	All Unemployed	Unemployed UI Participants	Unemployed Non-UI Participants	t-tests
Outcomes of Interest				
PPVT Standardized Score	87.911	92.361	87.545	***
	(16.831)	(17.763)	(17.421)	
PIAT Math Score	97.426	99.960	97.029	***
	(13.749)	(13.104)	(14.443)	
PIAT Reading Score	99.513	103.088	100.160	***
	(14.743)	(13.811)	(15.387)	
UI (=1 if rec'd in calendar year)	0.669	---	---	
	(0.460)			
Mother's Characteristics				
Total Household Income	$30,639	$42,423	$30,740	**
	(74,922)	(81,117)	(88,199)	
African American[a]	41.878	23.201	49.455	***
	(49.399)	(42.250)	(50.088)	
Latino[a]	22.355	26.619	18.181	***
	(41.702)	(44.236)	(38.640)	
European American[a]	35.787	50.180	32.364	***
	(47.998)	(50.044)	(46.872)	
Age	33.830	33.824	34.055	
	(4.017)	(4.279)	(4.006)	
Spouse or Partner	56.345	76.079	54.181	***
	(49.659)	(42.698)	(49.916)	
Child Characteristics				
Health Limitations	3.807	2.698	4.727	
	(19.161)	(16.217)	(21.261)	
Female[a]	52.030	50.899	52.000	
	(50.002)	(50.003)	(50.005)	
Male[a]	47.969	49.101	48.000	
	(50.002)	(50.003)	(50.005)	
Environmental Characteristics				
HOME: Cognitive Stimulation	94.905	97.056	94.229	***
	(14.918)	(14.788)	(15.201)	
HOME: Emotional Support	95.258	99.183	94.545	***
	(15.515)	(15.083)	(15.799)	
N	831	556	275	

[a] Variables not included in fixed effects regressions because they are time-invariant.
Significance levels indicated at ***p<0.01; **p<0.05; *p<0.10

Table 2
Correlation Between Unemployment Spell and Outcomes of Interest

PIAT Reading	PIAT Math	PPVT
-4.195***	-3.963***	-4.929***
(0.453)	(0.432)	(0.756)
Significance levels indicated at ***p<0.01; **p<0.05; *p<0.10		

Table 3
Effect of Participation in Unemployment Insurance on PIAT Reading, PIAT Math, and PPVT

	(1) OLS Unadjusted	(2) OLS Adjusted	(3) Fixed Effects
	A. Dependent Variable: PIAT Reading		
UI Participation	-1.186	-3.160***	3.534**
	(1.047)	(1.080)	(1.571)
F	1.28	20.06	3.25
Sample Size	1114	1045	851
	B. Dependent Variable: PIAT Math		
UI Participation	0.897	-0.245	3.233*
	(0.965)	(1.004)	(1.707)
F	0.86	20.26	2.55
Sample Size	1114	1044	850
	C. Dependent Variable: PPVT		
UI Participation	3.595**	-0.092	2.577
	(1.572)	(1.521)	(4.690)
F	5.23	15.01	2.22
Sample Size	666	701	651

Notes: OLS-adjusted regressions include controls for child's gender and health; mother's race, age, income, educational attainment, cognitive stimulation score; the home environment, including cognitive stimulating materials and emotional support. Fixed effects models include controls for child's health; mother's age, income, educational attainment; the home environment, including cognitive stimulating materials and emotional support.
Significance levels indicated at ***p<0.01; **p<0.05; *p<0.10

Table 4.
Heterogeneous Treatment Effects of UI on Outcomes, by Child's Race (standard errors in parenthesis).

	European American	African American	Latino/a
PIAT Math	1.418	6.606*	3.483
	(3.512)	(4.018)	(3.273)
PIAT Reading	1.789	4.484	7.604**
	(3.619)	(4.136)	(3.437)
PPVT	10.288	10.549*	4.304
	(10.923)	(6.343)	(6.546)

Fixed effects models contain the same set of controls as listed in Table 2 – income, child's health, mother's marital status, mother's age, and scores for the levels of cognitive stimulation and emotional support found in the home environment.
Note: Significance levels indicated at ***p<0.01; **p<0.05; *p<0.10