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DISCUSSION PAPER SERIES

IZA DP No. 12417

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ABSTRACT

The Long-Term Effects of Childhood Exposure to the Earned Income Tax Credit on Health Outcomes[1]

The Earned Income Tax Credit (EITC) is a central component of the U.S. safety net, benefiting about 27 million families. Using variation in the federal and state EITC, this paper evaluates the long-term impact of EITC exposure during childhood on the health of young adults. We find that an additional $100 in the average annual EITC exposure between ages 0 and 18 increases the likelihood of reporting very good or excellent health by 2.7 percentage points and decreases the likelihood of being obese by 1.0 percentage point between ages 22 and 27. Direct program transfers, increases in pre-tax family earnings, and increases in health insurance coverage are channels through which the EITC improves health.

JEL Classification: H24, I12, I14

Keywords: EITC, health outcomes, children

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1. Introduction

The Earned Income Tax Credit (EITC) is one of the largest safety net programs in the United States. In 2017, the EITC reached 27 million tax filers at a total cost of $65 billion (IRS 2018). The primary goals of the program are to provide extra resources to low- and moderate-income workers through tax refunds and to encourage labor force participation through the program's structure. By incentivizing work and providing eligible working families with refundable tax credits, the EITC substantially increases family income, which in turn can affect the long-term well-being of recipients and their families. While previous research has shown that EITC is effective at reducing poverty (Hoynes and Patel 2015), improving education outcomes of participant families (Dahl and Lochner 2012, Manoli and Turner 2018, Bastian and Michelmore 2018), increasing labor force participation of mothers (Meyer and Rosenbaum 2001, Bastian 2017), improving maternal and infant health (Evans and Garthwaite 2014, Hoynes, Miller, and Simon 2015, Gangopadhyaya et al. 2019), and promoting asset building (Jones and Michelmore 2018), to our knowledge, this is the first study to investigate the long-term health benefits of EITC.

We estimate the effects of EITC exposure in childhood on health outcomes in early adulthood and assess three mechanisms through which EITC can affect long-term health outcomes. First, the EITC provides additional resources to low- and moderate-income households through the direct transfer and potential increases in pre-tax family earnings. The strong relationship between socioeconomic status and current and future health outcomes over the life course is well documented (Case, Lubotsky, and Paxson 2002; Currie 2009; Smith 2007). Second, mothers, especially those who are single, increase their labor supply in response to more generous EITC policies and consequently spend more time working and less time with their children at home. There is some evidence of reduction in breastfeeding and immunization and an increase in adverse child health outcomes when mothers work and are absent from the household (Berger, Hill, and Waldogel 2005, Rossin 2011).

There is also evidence that childhood obesity is associated with working mothers spending less time with their children (Cawley and Liu 2012). Finally, the EITC program may have long-term effects on health through the program's impact on health insurance coverage (Baughman 2005; Hoynes, Miller, and Simon. 2015, Baughman and Duchovny 2016). The effect of the EITC on health insurance coverage is ambiguous; EITC families may obtain employer-sponsored insurance (ESI) by gaining parental employment but could also lose Medicaid eligibility if their earnings rise above program eligibility thresholds specified in their state of residence. Consequently, EITC expansions could increase insurance coverage of children, if those who were previously uninsured gain ESI coverage, or decrease coverage, if low-income individuals gain employment at firms that do not offer ESI and lose Medicaid eligibility due to increased earnings. Considering all three potential mechanisms, the overall effect of the EITC on children's long-term health is theoretically ambiguous.

Using data from the 1968 to 2015 waves of the Panel Study of Income Dynamics (PSID), we estimate the causal effect of exposure to EITC on later-life health outcomes, including self-reported health status, obesity, emotional problems, functional limitations, and high blood pressure. We define "EITC exposure" in childhood as the maximum federal and state EITC benefits that a child's family could potentially receive (Bastian and Michelmore 2018), averaged each year from the child's birth to age 18. Variation in EITC exposure comes from three sources: the year the individual was born, the state of residence the individual lives in each childhood year, and the number of children in the household in each year.

We estimate that EITC exposure during childhood is associated with better self-reported health status and a lower likelihood of obesity in early adulthood. An additional $100 in the average EITC exposure between ages 0 to 18 increases the likelihood of reporting good or excellent health by 2.7 percentage points (4.1 percent) and decreases the likelihood of being obese by 1.0 percentage points (5.1 percent) between ages 22 and 27. We also estimate that EITC exposure is associated with a lower

likelihood of having a functional limitation at later ages, although this finding is only marginally significant. We find no significant association between EITC exposure in childhood and emotional problems or high blood pressure at later ages, although the direction of our estimates is consistent with the EITC improving these outcomes.

We also investigate which children benefit the most from EITC exposure. Children who grew up in single-parent households are those most affected by EITC exposure; among this group, an additional $100 in average EITC exposure during ages 0 to 18 increases the likelihood of reporting good or excellent health by 4.8 percent points and decreases the likelihood of being obese by 1.8 percent at ages 22 to 27. Similarly, we find stronger effects of EITC exposure on children of less-educated parents, as those families are more likely to receive the tax credit, and no effects on children of more-educated parents.

To investigate the potential mechanisms driving the better health outcomes of children exposed to the EITC, we look at the effect of EITC exposure at different intermediate outcomes during the childhood years of the individuals in our sample. EITC exposure is associated with increases in direct EITC transfers, pre-tax family earnings, and children's health insurance coverage, all of which are likely to improve later life health outcomes. We find no significant association between EITC exposure and parental time spent with children, although the direction of these estimates is consistent with EITC reducing parental time.

Overall, our study provides important findings for evaluating the long-terms benefits of the EITC as well as the more general question on the effects of exposure to safety-net programs during childhood on long-term health outcomes.

2. Literature Review and Contribution

A large and growing literature has shown that access to safety net programs in the prenatal period and in childhood could systematically affect health as children enter adulthood. Hoynes,

Schanzenbach, and Almond (2016) find that children gaining access to the food stamps program had lower incidence of diabetes, hypertension, and obesity in adulthood. Boudreaux, Golberstein, and McAlpine (2016) find that exposure to Medicaid in early childhood (ages 0–5) is associated with improvements in adult health (ages 25–54). Miller and Wherry (2018) find that Medicaid expansions to pregnant women and infants resulted in lower rates of chronic illnesses and fewer hospital visits for diabetes and obesity during adulthood among cohorts who gained access to coverage in utero and during the first year of life.

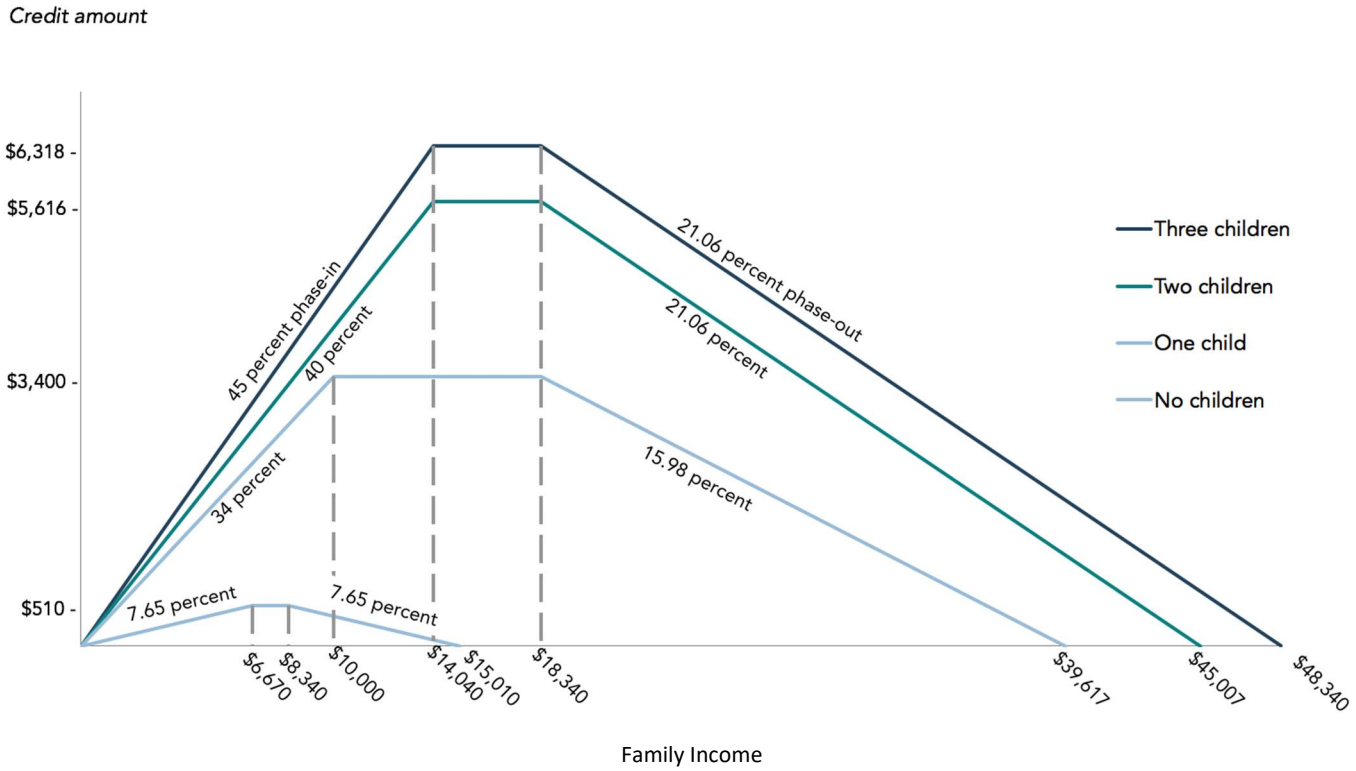
There is also a growing literature investigating the effects of the EITC on health outcomes (summarized in Simon, McInerney, and Goodell 2018). Recent evidence largely supports the hypothesis that health improves after EITC exposure, particularly for children and single mothers. Hoynes, Miller, and Simon (2015) find that the EITC reduced the incidence of low birth weight and increased mean birth weight. Evans and Garthwaite (2014) estimate that higher EITC payments improved self-reported health and reduced the number of poor mental health days reported by mothers. Similarly, Boyd-Swan et al. (2016) and Gangopadhyaya et al. (2019) find that the EITC expansion generated sizeable improvements in mental health. Finally, Dow et al. (2019) find that increases in EITC exposure significantly reduce non-drug suicides. While these papers all find positive contemporaneous effects of the EITC on health outcomes, little is known about the long-run effects of being exposed to the EITC during childhood on health in subsequent years of young adulthood.

This paper aims to fill this gap by estimating the long-term health effects associated with childhood exposure to the EITC and providing insight on the mechanisms through which EITC affects long-term health outcomes. In addition, we compare the size of our estimated EITC effects with the long-term effects associated with other safety net programs. Finally, this paper provides insights to the social costs and benefits of the program (e.g., Bastian and Jones 2018), as heathier individuals are more likely to be in the work force and less likely to rely on public assistance programs.

3. Background on EITC program

The EITC program was established in 1975 and has grown to be the primary poverty-reducing, means-tested transfer program in the country. While the benefits of the program have increased substantially since its introduction, the main structure of the program has remained the same. The EITC is a tax credit program targeting low-wage earners. Eligibility is based on family structure, income, and state of residence. The tax credit increases for the lowest section of the wage distribution (referred to as the "phase-in" section), holds steady for a subsequent section of the wage distribution, then decreases for a section of the wage until it reaches zero (a "phase-out" section). This creates a trapezoidal benefit structure along the wage distribution axis (Figure 1). The shape of this trapezoid (i.e., the height and the slopes of the phase-in/phase-out regions) varies by year, marital status, family size, and, in the case of states that augment the federal EITC with their own state program, by state of residence. Since 1975, the size of the credit has generally grown for the working-poor population, although some subgroups experienced greater growth differentials.

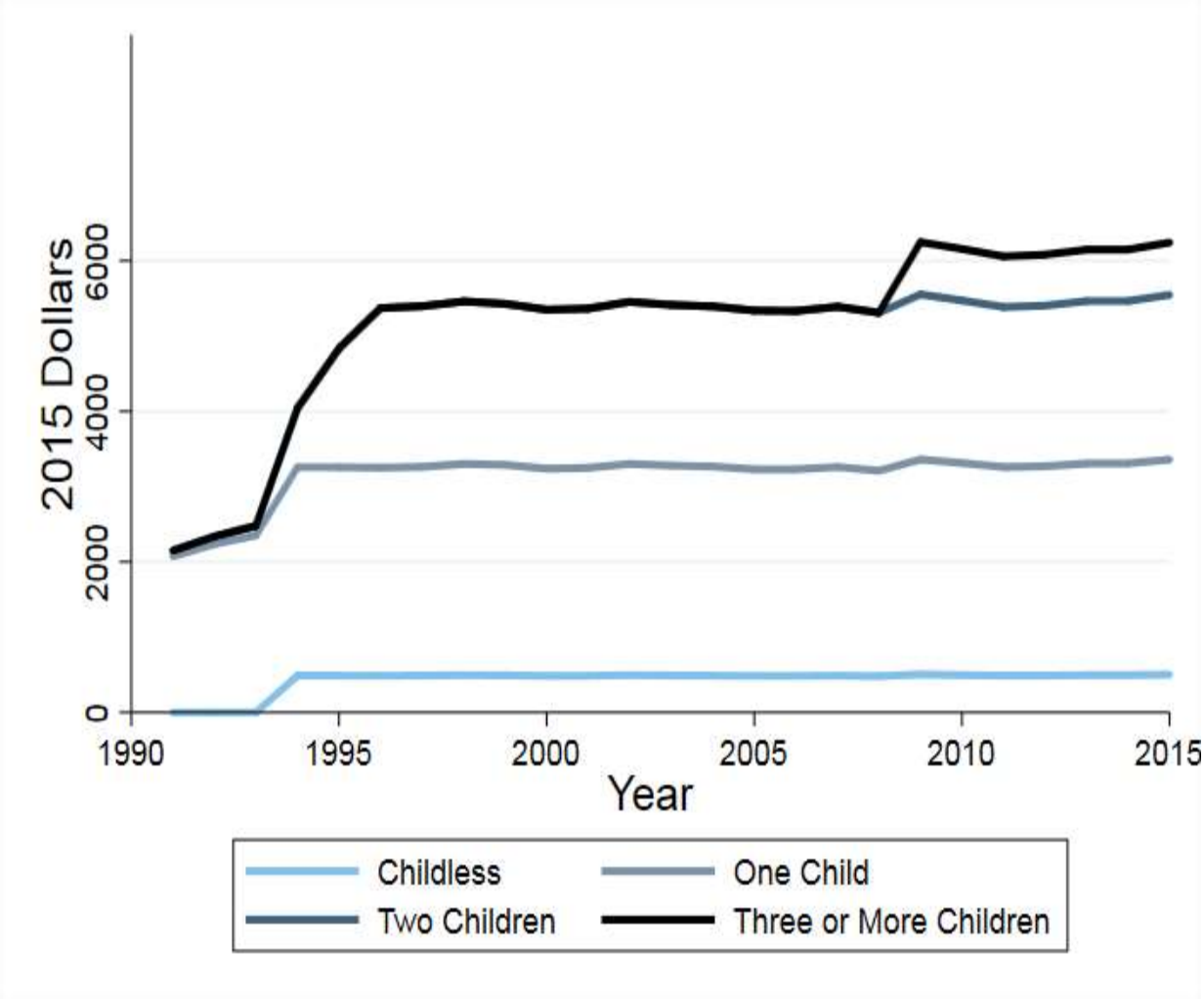
Figure 1. Structure of the EITC, 2017



Source: Urban Institute Tax Policy Center 2017.

The main changes in the program came from federal expansions for larger family sizes and the introduction of some state EITCs. Since 1993, the credit has been significantly more generous for families with two or more children than for those with just one, while a small credit was added for families without children. The program became even more generous for families with three or more children and for married couples in 2009 (Figure 2).

Figure 2. Federal EITC Maximum Credit by Number of Children over Time

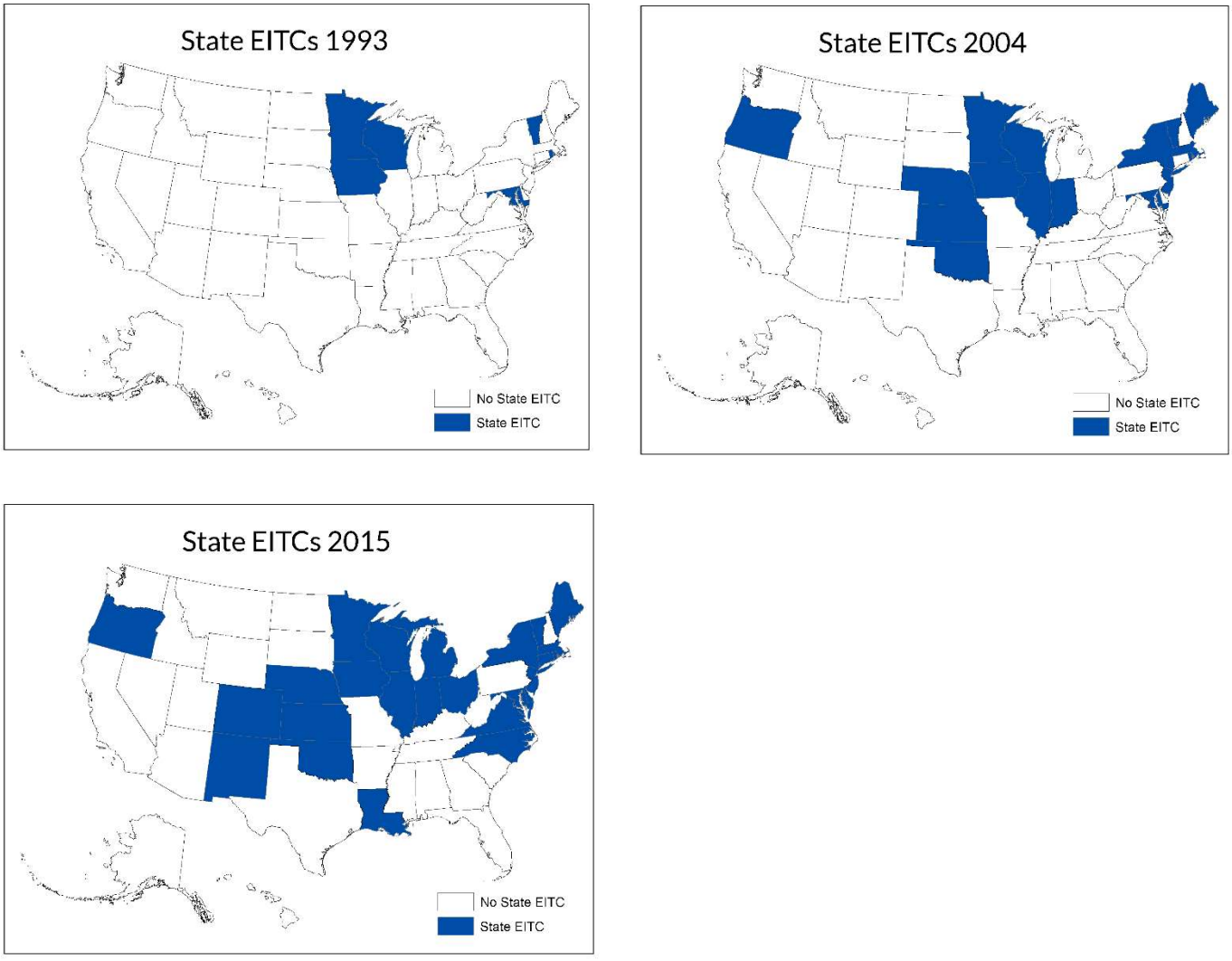


Source: University of Kentucky Center for Poverty Research. 2016. "UKCPR National Welfare Data, 1980–2015." Gatton College of Business and Economics, University of Kentucky, Lexington, KY. http://www.ukcpr.org/data (accessed March 2017).

In addition to the federal EITC program, half of states plus the District of Columbia have established their own state EITC supplements. State-specific EITCs began in 1986, as Rhode Island established their own nonrefundable EITC equal to a percentage of the federal credit. As of 2015, 25 states and the District of Columbia had state EITC programs, compared with 16 states and DC in 2004 and 6 states in 1993 (Figure 3). Most states structure their programs to mirror the federal EITC by simply matching a percentage of the federal credit. There is substantial variation

on state EITCs' matching percentages across states and time. For instance, while Tennessee never established a state EITC supplement, Iowa created its program in 1990 and doubled it in 2013, from 7 to 14 percent of the federal EITC. In a few states, the EITC is non-refundable, making it a less effective incentive for very low–income workers. Even states without state income taxes can offer a state EITC.

Figure 3. State EITC Programs by Year



Source: University of Kentucky Center for Poverty Research. 2016. "UKCPR National Welfare Data, 1980–2015." Gatton College of Business and Economics, University of Kentucky, Lexington, KY. http://www.ukcpr.org/data (accessed March 2017).

4. Data

We use the 1968 to 2015 waves of the Panel Study of Income Dynamics. The PSID is a nationally representative household survey that has followed households and their offspring since 1968. The PSID has been collecting information on self-reported general health status (the standard five-point scale from excellent to poor) and functional limitation status since 1984. Starting in 1999 and for all subsequent waves, the PSID has collected information on self-reported height, weight, and the prevalence and incidence of a list of chronic conditions for the head of the household and spouses. We look at the following five main health outcomes between ages 22 and 27[2]: an indicator for whether the individual reports excellent or very good health at the time of the survey; an indicator for obesity at the time of the survey, where obese individuals have a body mass index greater than 30 based on self-reported weight and height; an indicator for whether the individual has any physical or nervous condition that limits the type or amount of work that he or she can do (functional limitations); an indicator for whether the respondent has ever been diagnosed with problems with anxiety, depression, or bad nerves (emotional problems); and an indicator for whether the respondent has ever been diagnosed with high blood pressure or circulation problems (high blood pressure).

The measure of EITC exposure during childhood is defined as the average of the maximum potential federal and state credit a child's family could receive given their state of residence, family size, and tax year (Bastian and Michelmore 2018). Therefore, EITC exposure variation comes from the generosity of the federal credit in a given year, the child's state of residence, and the number of children in the household. The EITC exposure variable is independent of own family income,

[2] This is also the same age range that Bastian and Michelmore (2018) used for their employment and earnings outcomes.

as those could be endogenously determined by the program. We take the average of EITC exposure during ages 0 to 18, using each observation of the child in the data within the age range.

We limit the sample to individuals we can observe at least once between ages 22 and 27. Since the EITC was not implemented until 1975, we drop individuals born prior to 1967 because these individuals were not exposed to the EITC as a young child. The sample is also restricted to individuals who are observed in at least one year between each of the age intervals: 0 to 5, 6 to 12, and 13 to 18. Finally, we limit the sample to individuals who were heads of households or spouses between because most of the health questions are only asked for this group.[3] We also present robustness checks where we look at outcomes at age 28–32 and without any age restrictions.

In the construction of our main analytical sample, we do not make restrictions based on family income because family earnings could be endogenously determined by the program. However, we present robustness checks where we show effects of the EITC on long-term health outcomes where we restrict the sample to low- and middle-income families only. Finally, we also present a subgroup analysis where we restrict the data to children of lower-educated parents, who are more likely to participate in the program.

Table 1 includes descriptive statistics for our sample of 2,147 individuals included in the self-reported health and functional limitations regression sample.[4] The average annual EITC exposure between ages 0 and 18 was $3,553, with exposure ranging from $2,257 from ages 0 to 5, to $4,850 from ages 13 to 18. EITC exposure between ages 0 and 5 is lower than exposure at older ages because the most significant EITC expansions occurred over past 2 decades, when much of the sample was older than 5.

[3] About 83 percent of our sample are either head of household or spouse of the household head by age 27.
[4] The sample size (1,867 individuals) for the obesity, emotional problems, and high blood pressure regression sample is smaller because the PSID began collecting information on these health outcomes in 1999, compared with 1984 for the other two outcomes.

Average annual family income was $41,113. Just over half of the sample was female (54.7 percent) and 15.8 percent were black, non-Hispanic. Individuals in our sample had an average of 2.2 siblings at age 18. Most individuals in our sample had married parents during their childhood (70.5 percent), a mom that finished high school (95.7 percent), a mom that attended some college (72.7 percent), a dad that finished high school (91.2 percent), and a dad that attended some college (62.6 percent).

Table 1: Descriptive Statistics of Main Sample

Variable	Mean	Standard Deviation
Average EITC Exposure from Age 0 to 18	$3,553	$812
Average EITC Exposure from Age 0 to 5	$2,257	$974
Average EITC Exposure from Age 6 to 12	$4,198	$1,287
Average EITC Exposure from Age 13 to 18	$4,850	$1,062
Average Family Income from Age 0 to 18	$41,113	$38,587
Female	54.7%	49.8%
Black, Non-Hispanic	15.8%	36.5%
Hispanic	1.8%	13.4%
Siblings at Age 18	2.2	1.2
Average Characteristic from Age 0 to 18		
Married Parents	70.5%	37.2%
Mom Finished High School	95.7%	20.4%
Mom Attended Some College	72.7%	44.6%
Dad Finished High School	91.2%	28.4%
Dad Attended Some College	62.6%	48.4%
Number of Observations	2,147	

Source: 1968–2015 waves of the Panel Study of Income Dynamics (PSID). Note: All monetary variables are in 2015 dollars. All results are weighted by average childhood PSID weights.

5. Empirical Method

Our econometric models exploit state, time, and family size variation in the maximum tax credit for the EITC program. We use a difference-in-differences specification with a continuous treatment measure—the average maximum tax credit an individual was exposed to during his or her childhood. We model the impact of EITC exposure on children's long-term health as follows:

$$Y_{i(22-2\ )} = \beta_1 EITC_{i(0-18)} + \Phi X_{i(0-18)} + \mu V_{s,(0-18)} + Z_s + W_t + g_s(t) + \varepsilon_i \quad (1)$$

where $Y_{i(22-27)}$ is the average health outcome for individual i between ages 22 and 27. $EITC_{i(0-18)}$ is the average annual exposure to EITC between ages 0 and 18 described in section 4.[5] $X_{i(0-18)}$ represents a vector of personal characteristics that includes year of birth fixed effects and indicators for black, Hispanic, and female. In addition, to account for state demographic changes over time, we interact black, Hispanic, and female indicators with state and birth year. $X_{i(0-1\ )}$ also includes average individual characteristics between ages 0–18: whether the child's mother and father finished high school or at least some college and whether the parents were married. Finally, $X_{i(0-18)}$ also includes siblings fixed effects measured at age 18. The inclusion of siblings fixed effects to the model is important because EITC exposure varies discontinuously with the number of children in the household.

$V_{s,(0-18)}$ is a vector of state policy and economic contextual variables. We include the state average of the following characteristics between ages 0–18: GDP per capita, unemployment rate, the top marginal income tax rate, the minimum wage, maximum welfare benefits, and tax revenue. $V_{s,(0-18)}$also includes the average state Medicaid income eligibility threshold over the age intervals 0 to 5, 6 to 12, and 13 to 18. These controls are included to address concerns that various state-by-year confounding factors are related to EITC exposure and health in early adulthood. Z_s and W_t are state and year fixed effects, measured at the adult age (last interview within the 22–27 age range). Finally, we also include state-specific quadratic time trends $g_s(t)$ to control for unaccounted policies or conditions that vary by state across time. Standard errors are clustered at

[5] We also present robustness checks in Table A2 using the cumulative maximum tax credit an individual was exposed to during his or her childhood.

the state level. All regressions are weighted with childhood PSID weights averaged across the years from birth to age 18.

To test whether EITC exposure has stronger effects at a specific age range, we also estimate the model where we disaggregate EITC exposure into different age groups:

$$Y_{i(22-27)} = \beta_1 EITC_{i(0-5)} + \beta_2 EITC_{i(6-12)} + \beta_3 EITC_{i(13-18)} + \Phi X_{i(0-18)} + \mu V_{s,(0-18)} + Z_s + W_t + g_s(t) + \varepsilon_i$$

where $EITC_{i(0-5)}$, $EITC_{i(6-12)}$ and $EITC_{i(13-1\ )}$ are the average exposure to EITC between ages 0–5, 6–12, and 13–18 respectively. The coefficients β_1, β_2, and β_3 represent the impact of an additional $100 of average EITC exposure when the child is 0–5, 6–12, and 13–18 years old, respectively, on subsequent health outcomes. To test whether EITC exposure has a stronger effect at a specific age range, we report F-test for the null hypothesis that β_1, β_2, and β_3 are equal to another.

We also present various sensitivity checks of the main findings of the paper. First, we estimate models where we do not control for state-year controls, interactions between demographic characteristics and state and birth year, and state-specific quadratic time trends. Second, we also present results looking at sum of all EITC exposure a child experienced during from ages 0 to 18—consistent with the approach used by Bastian and Michelmore (2018)—as opposed to the average exposure amount.[6]

Third, similar to Hoynes, Schanzenbach, and Almond (2016) and Boudreaux, Golberstein, and McAlpine (2016), we aggregate individual health conditions by creating two health condition index variables. By looking at indices, we gain statistical precision and reduce problems associated

[6] For non-interview years, we impute EITC exposure by averaging EITC exposure from the interview years just before and after the non-interview year.

with multiple hypothesis testing (Andersen 2008). The indices are equally weighted averages across standardized z-score measures of each component. The z-score is calculated by subtracting the mean and dividing by the standard deviation. The "bad health" condition index includes self-reported good and excellent health, obesity, function limitation, emotional problems, and high blood pressure and is constructed such that increasing values indicate worse health. The metabolic syndrome index includes obesity, high blood pressure, and diabetes.

Finally, to further investigate whether our findings are caused by factors not accounted for in the model, we estimate the effect of EITC exposure among children who grew up in a household whose head had at least a bachelor's degree. This model serves as placebo test, as those children are unlikely to be affected by changes in EITC policy.

6. Main Results

Increased exposure to the EITC during childhood is associated with better self-reported health status and lower obesity between ages 22 and 27 (Table 2, Panel A). A $100 increase in the average annual EITC exposure during childhood increases the probability of reporting excellent or very good health by 2.7 percentage points (4.1 percent) and reduces the likelihood of being obese by 1.0 percentage points (5.1 percent).

EITC exposure is also associated with a lower probability of being disabled (0.5 percentage points or 13.7 percent), although this coefficient is estimated with less precision (p-value<0.1). There is no significant association between EITC exposure and the likelihood of reporting emotional problems or high blood pressure, although the direction on these coefficients is consistent with EITC improving these outcomes.

It is unclear whether EITC exposure has a stronger effect at a specific age range of the child (Table 2, Panel B). The estimated EITC effect on self-reported health is statistically

significant for each of the age group variables, but while the effect is largest for exposure between ages 0 and 5, we cannot reject the null that this effect is statistically different from the effects at other age groups (p-value =0.21). In addition, conditional on EITC exposure at younger ages, EITC exposure from ages 13 to 18 decreases the probability of being obese by 0.7 percentage points from ages 22 to 27, but we cannot reject the null that the estimated age coefficients are statistically different from one another (p-value=0.116). Finally, all the age group EITC exposure coefficients for the other three outcomes (functional limitations, emotional problems, and high blood pressure) are statistically insignificant at the 5 percent level.

Table 2: Estimated Effects of EITC Exposure in Childhood on Health Outcomes in Adults Ages 22–27

Dependent Variable	Excellent or Very Good Health	Obese	Functional Limitation	Emotional Problems	High Blood Pressure
Panel A					
Average EITC Exposure from Age 0 to 18 ($100s)	0.027***	-0.010**	-0.005*	-0.003	-0.006
	(0.006)	(0.004)	(0.003)	(0.004)	(0.004)
Panel B					
Average EITC Exposure from Age 0 to 5 ($100s)	0.017**	-0.009	-0.009	0.000	-0.001
	(0.008)	(0.010)	(0.005)	(0.007)	(0.003)
Average EITC Exposure from Age 6 to 12 ($100s)	0.008**	0.001	-0.000	-0.004	-0.004
	(0.004)	(0.003)	(0.002)	(0.003)	(0.003)
Average EITC Exposure from Age 13 to 18 ($100s)	0.006**	-0.007***	-0.001	0.003	0.000
	(0.003)	(0.002)	(0.002)	(0.002)	(0.002)
F-Test, Coefficients are jointly equal (p-value)	0.211	0.116	0.297	0.153	0.515
Observations	2,147	1,837	2,147	1,867	1,867
Mean Dependent Variable	65.5%	19.6%	7.3%	13.4%	6.6%

Source: 1968–2015 waves of the Panel Study of Income Dynamics (PSID).
Notes: All outcomes are measured as averages between age 22 and 27 from 1989 to 2015. EITC exposure is defined as the average of the maximum potential federal and state EITC a household could receive, given the year, state, and number of children (100s of 2015$). Model controls for state, cohort, year fixed effect, demographic controls, state-year policy and economic controls, interaction controls, and state-specific quadratic time trends (see section 5). Robust standard errors clustered at the state level are in parentheses. All results are weighted by average childhood PSID weights. ***p<0.01, ** p<0.05, * p<0.1

Estimates from sensitivity analyses are generally consistent with the overall findings. First, the main model estimates are insensitive to the inclusion or exclusion of groups of control variables, such as state-year controls and state-specific quadratic time trends (Appendix Table A1). The only exception is that we estimate significant effects of EITC exposure on high blood pressure in the models excluding state-specific quadratic time trends and interaction controls. Second, we find consistent results when we use the cumulative EITC exposure measure—a $1,000 increase in cumulative exposure to the EITC between ages 0 and 18 is associated with a 1.3 percentage point

increase in the likelihood of reporting excellent or very good health and a 0.5 percentage point decrease in the likelihood of obesity (Appendix Table A2).

Finally, the effect of EITC exposure in childhood on the "bad health" condition index variable is −0.030 and is statistically significant at the 1 percent level (Appendix Table A3). The magnitude of the coefficient implies that a $100 increase in the average EITC exposure from ages 0 to 18 reduces bad health conditions by 0.03 standard deviations. We also find that EITC exposure during childhood reduces metabolic syndrome, with a $100 increase in the average EITC exposure associated with a 0.02 standard deviation reduction in metabolic syndrome. Once again, for each index variable, we cannot reject the null that the age-specific coefficients are statistically different from one another.

Age Restrictions

While in our main specification we look at outcomes between ages 22 and 27, we also explore the effect of a child's exposure to EITC to on health outcomes at older ages. In Table 3, we estimate the effects of EITC exposure on average outcomes between ages 28 and 32.[7] The effects of EITC exposure on self-reported health and obesity remain statistically significant and similar in magnitude to those in the main model.

We also estimate a model including all adults exposed to EITC during their childhood for whom we observe health outcomes in the PSID (Table A4). The sample consists of individuals born after 1967 from whom the health outcomes are measured from ages 19 to 48.[8] In this unrestricted sample, we also find that EITC exposure during the childhood is associated with

[7] The trade-off of looking at older ages is losing respondents who are not old enough by 2015 to be in the sample. For example, the sample is restricted to those born between 1958 and 1987 when looking at outcomes between ages 28 to 32, eliminating those who would have been exposed to the federal changes in EITC in the early 1990s as infants or young children.

[8] Similar to our main model specification (Table 2), we take the average of outcomes so that there is one observation per person. However, to account for change in health during the life cycle, we also include indicators for the oldest observed age in the sample.

increases in the likelihood of reporting good and excellent health, and decreases in the likelihood of obesity and having some functional limitation. In addition, we find that EITC exposure at early ages (between 0 and 12) have stronger effects on self-reported health than exposure at ages 13 to 18. The results from these two tables suggest that the effects of EITC exposure during childhood do not fade as respondents get older.

Table 3: Estimated Effects of EITC Exposure in Childhood on Health Outcomes in Adults Ages 28–32

Dependent Variable	Excellent or Very Good Health	Obese	Functional Limitation	Emotional Problems	High Blood Pressure
Panel A					
Average EITC Exposure from Age 0 to 18 ($100s)	0.018**	-0.020**	-0.003	-0.001	0.009
	(0.008)	(0.008)	(0.006)	(0.007)	(0.006)
Panel B					
Average EITC Exposure from Age 0 to 5 ($100s)	0.048	-0.031	0.008	0.011	0.021**
	(0.029)	(0.028)	(0.011)	(0.016)	(0.009)
Average EITC Exposure from Age 6 to 12 ($100s)	-0.006	-0.002	0.004	0.000	0.003
	(0.006)	(0.008)	(0.003)	(0.005)	(0.004)
Average EITC Exposure from Age 13 to 18 ($100s)	0.012***	-0.009**	-0.005*	-0.003	0.001
	(0.004)	(0.004)	(0.003)	(0.003)	(0.002)
F-Test, Coefficients are jointly equal (p-value)	0.054	0.687	0.168	0.638	0.070
Observations	1,572	1,508	1,574	1,566	1,567
Mean Dependent Variable	67.5%	23.0%	7.5%	13.5%	8.9%

Source: 1968–2015 waves of the Panel Study of Income Dynamics (PSID).
Notes: All outcomes are measured as averages between age 28 and 32. EITC exposure is defined as the average of the maximum potential federal and state EITC a household could receive, given the year, state, and number of children (100s of 2015$). Model controls for state, cohort, year fixed effect, demographic controls, state-year policy and economic controls, interaction controls, and state-specific quadratic time trends (see section 5). Robust standard errors clustered at the state level are in parentheses. All results are weighted by average childhood PSID weights. ***p<0.01, ** p<0.05, * p<0.1

Family Income Restrictions

While EITC is targeted to low- and middle-income families, we do not make any restriction to family income in our analytical sample because family earnings is endogenously determined by program participation. Nevertheless, in Figure 4 we explore whether the EITC program has a stronger impact on health outcomes when restricting the sample to families below different levels of the income distribution. We estimate treatment effects with different upper bounds to family income among those in our analytical sample, reporting both coefficients and their 95 percent confidence interval.[9] For the purpose of the figure, income is the average family income between ages 0 and 18, as presented in Table 1.

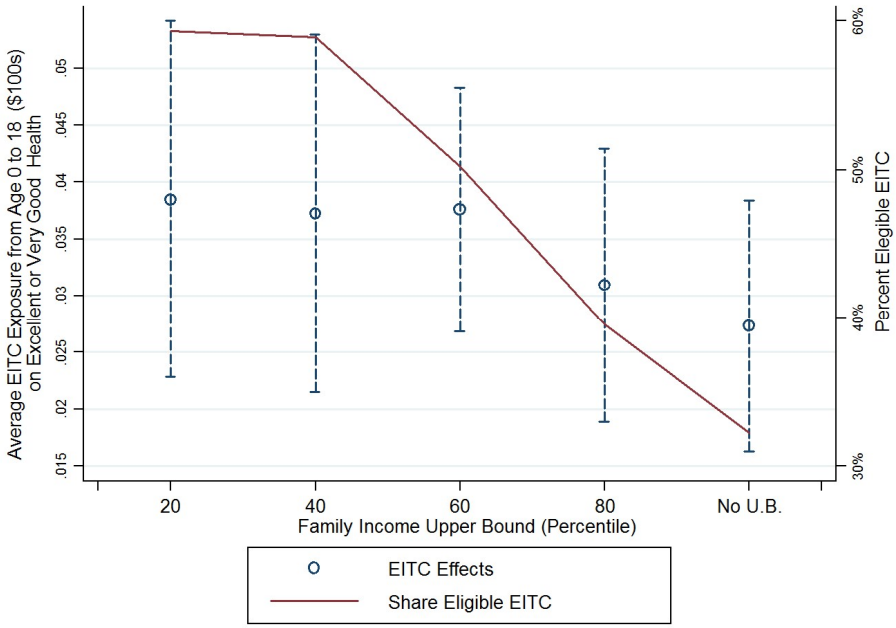
Figure 4 also reports the predicted share of individuals in our sample who were eligible for EITC during their childhood year by family income groups. Actual family EITC benefits are not reported in the PSID, but we can predict eligibility based on federal and state EITC rules, state of residence, number of household children, family income, and parental marital status in the given year. For each individual in our sample, we calculate average eligibility between ages 0 and 18.

Overall, we find larger effects of EITC exposure when restricting the sample to families in the middle and bottom of the income distribution, who are the families most likely to participate in the program. About 59 percent of individuals who grew up in families in the bottom 40 percentile of the income distribution were eligible to receive EITC during their childhood years. For this group, a $100 increase in average EITC exposure during childhood increases the probability of reporting excellent or very good health by 3.7 percentage points and reduces the likelihood of being obese by 2.2 percentage points. Adding higher-income individuals to the sample—who are less likely to be eligible for EITC benefit—reduces the magnitude associated with the program's long-term health effects in both models.

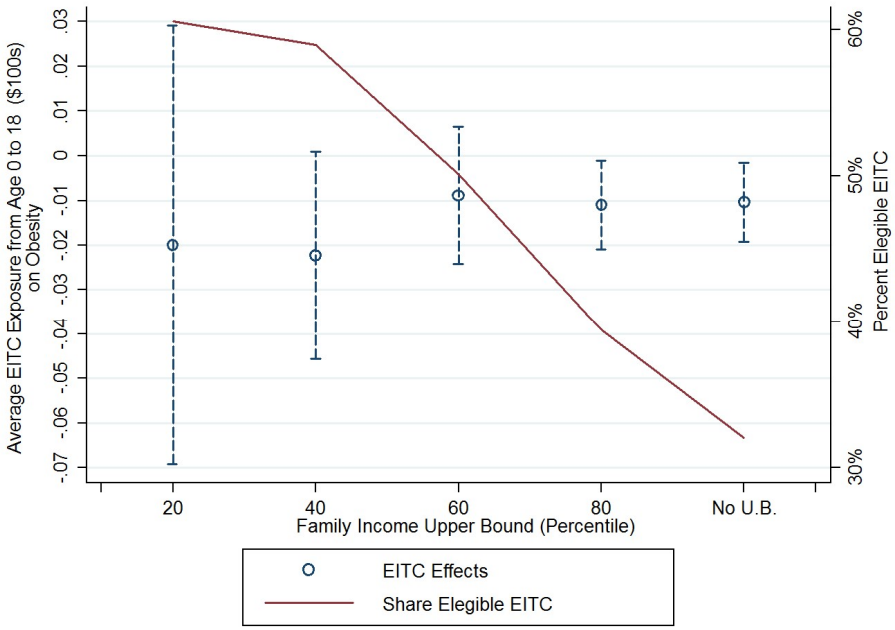
[9] By construction, the upper bound coefficients (No U.B.) correspond to the results presented in Panel A of Table 2.

Figure 4. Estimated Effects of EITC Exposure on Health Outcomes in Adults Ages 22–27, by Family Income Upper Bound

Panel A -Effect of $100 Increase in Average EITC Exposure on Likelihood of Excellent or Very Good Health



Panel B - Effect of $100 Increase in Average EITC Exposure on Obesity



Source: 1968–2015 waves of the Panel Study of Income Dynamics (PSID).

Notes: Coefficients are presented with their 95% confidence interval. All outcomes are measured as averages between ages 22 and 27 from 1989 to 2015. EITC exposure is defined as the average of the maximum potential federal and state EITC a household could receive, given the year, state, and number of children (in 2015$). Models controls for state, cohort, year fixed effect, demographic controls, state-year policy, and economic controls, interaction controls, and state-specific quadratic time trends (see section 4). Robust standard errors clustered at the state level are in parentheses. EITC eligibility is based on federal and state EITC rules, state of residence, number of household children, family income, and parental marital status in the given year. All results are weighted by average childhood PSID weights.

7. Subgroup Analyses and Placebo Test

We now investigate whether EITC exposure during childhood has stronger effects for specific subgroups of the population. We estimate the effect of a $100 increase in average EITC exposure from ages 0 to 18 on the likelihood of reporting excellent or very good health and being obese by different subgroups in Figure 5.[10] Single- or multi-parental household status is measured at age 18. The lower-educated parents group is defined as those whose head of the household had on average 12 years of education or less when the child was between ages 0 and 18. Medium-educated parents are those whose head of the household had on average more than 12 but less than 16 years of education. Higher-educated parents are those whose head of the household had on average 16 years of education or more. The higher-education parents group serves as our placebo group test because children with highly educated parents would likely not be affected by policy EITC expansions during their childhood.

The estimated effects of EITC exposure on self-reported health status (Panel A) are most pronounced among program's targeted population—individuals raised in single-parent households (4.8 percentage points) and those raised by lower-educated parents (4.1 percentage points). However, the estimated EITC effect is also statistically significant in multi-parent household or medium-educated groups. As expected, we find virtually no effect of EITC exposure among

[10] Table A5 in the appendix shows the coefficients of those regressions as well as mean of the outcome of interest within subgroups.

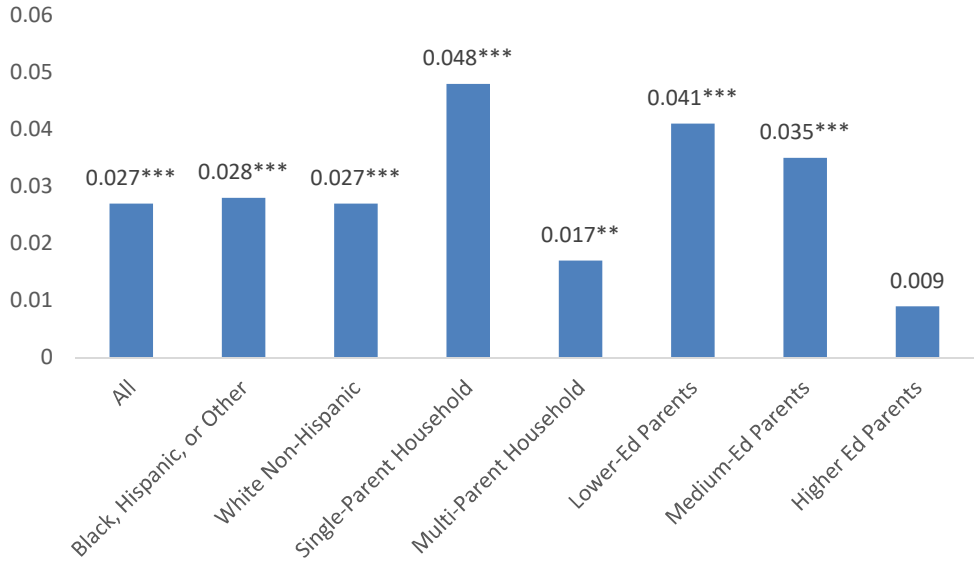
children of highly educated parents because these children are unlikely to be affected by the program. This result reassures that our findings are not caused by factors unaccounted for in the model, as children of highly educated parents are unlikely to be affected by changes in EITC policy.

The EITC effect on obesity (Panel B) is also largest in magnitude among those raised in single-parent households and those with lower-education parents (1.8 percentage points for both groups). In contrast, the estimated EITC effect on obesity is small and statistically insignificant among these groups' counterparts—including the children of highly educated parents.

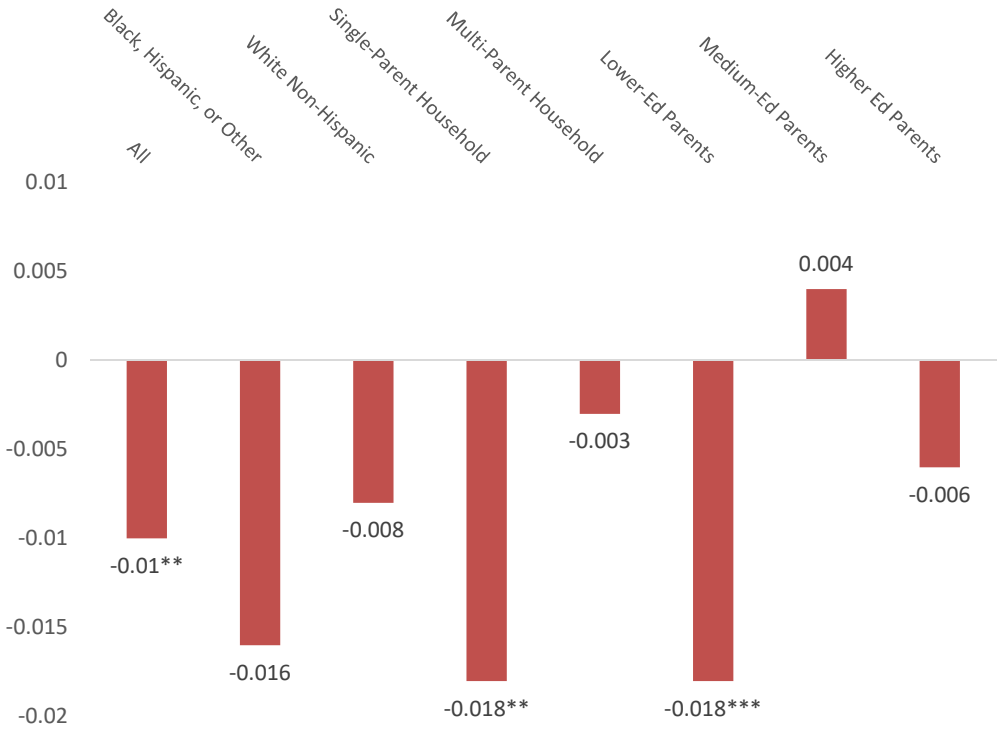
Figure 5 also shows EITC effects by racial and ethnic group. The estimated effect of EITC exposure on self-reported health status is similar among black, Hispanic, and other race children compared with white, non-Hispanic children. EITC exposure is also associated with statistically insignificant declines in obesity among both race and ethnicity groups.

Figure 5. Estimated Effects of EITC Exposure in Childhood on Health Outcomes in Adults Ages 22–27, by Subgroup

Panel A - Effect of $100 Increase in Average EITC Exposure on Likelihood of Excellent or Very Good Health



Panel B - Effect of $100 Increase in Average EITC Exposure on Likelihood of Obesity



Source: 1968–2015 waves of the Panel Study of Income Dynamics (PSID).

Notes: All outcomes are measured as averages between age 22 and 27 from 1989 to 2015. EITC exposure is defined as the average of the maximum potential federal and state EITC a household could receive, given the year, state, and number of children (100s of 2015$). The lower-educated parents group are those whose head of the household had on average 12 years of education or less. Medium-education parents are those whose head of the household had on average more than 12 but less than 16 years of education. Higher-education parents are those whose head of the household had on average 16 years of education or more. Models control for state, cohort, year fixed effect, demographic controls, state-year policy and economic controls, interaction controls, and state-specific quadratic time trends (see section 5). Robust standard errors clustered at the state level are in parentheses. All results are weighted by average childhood PSID weights. ***p<0.01, ** p<0.05, * p<0.1

8. Putting the Effect Size into Context

This section compares our main findings from section 6 with previous studies that investigate the relationship between long-term health and childhood exposure to other safety net or income transfer programs. To put our results in perspective, we project the effect of the most recent EITC program expansion on a 13-year-old living in a three-child household in 2009 using the estimated parameters from our main model. The American Recovery and Reinvestment Act of 2009 increased the annual credit amount for families with three or more children by about $600 in that year (Figure 2). This expansion translates to an increase of $3,600 in total EITC benefits or $200 in the average EITC that a 13-year-old child was exposed to between ages 0 to 18. As we will demonstrate in the next section, the EITC expansion also has multiplicative effect, as this $200 increase in EITC exposure translates to an additional $600 increase in family earnings per year due to labor supply responses to the program. Our model suggests that the 2009 expansion could lead to a 5.4 percentage point (8.2 percent) increase in the probability of reporting excellent or very good health and a 2.0 percentage point (10 percent) decline in the probability of being obese when the 13-year-old becomes a young adult.

These estimated effect sizes are consistent with studies that find significant impacts of increasing family economic resources during childhood, via cash transfers or safety net programs, on later life health outcomes. For example, Hoynes, Schanzenbach, and Almond (2016) estimate that full exposure to food stamps through age 5 leads to a 40 percent standard deviation reduction

in metabolic syndrome (a cluster of conditions including obesity, high blood pressure, heart disease, and diabetes) and about a 30 percentage-point increase in reporting good health at an adult age. Miller and Wherry (2018) find that a 10-percentage point increase in prenatal eligibility for Medicaid is associated with a 3 percent standard deviation decrease in chronic conditions, a 6–8 percent reduction in hospitalizations for chronic conditions, and an 8–10 percent reduction in hospitalizations for diabetes and obesity at ages 19–36. Finally, Ludwig and Miller (2007) find that a 50–100 percent increase in Head Start funding reduces mortality rates of children 5 to 9 years of age from relevant causes by 33–50 percent of the control mean.

Our results are also largely consistent with the evidence on the longer-term effects of EITC exposure in human capital and employment outcomes. Bastian and Michelmore (2018) estimate an additional $167 in the annual maximum EITC when a child is 13–18 years old leads to a 1.3 percent increase in high school graduation, a 4.2 percent increase in college graduation, a 1.0 percent increase in employment, and a 2.2 percent increase in earnings in adulthood.

Overall, policy interventions that improve childhood environments can generate large long-term effects, frequently larger than what we find for EITC exposure. The result is not surprising because increases in economic resources to low-income children can improve contemporaneous health outcomes, which in turn can affect future health (Hoynes, Miller, and Simon 2015). In addition, we find in section 9 that EITC exposure increases health insurance coverage in childhood, which could potentially improve long-term health outcomes through increased access to and utilization of healthcare services and reduced financial risk associated with high out-of-pocket health expenses (Miller and Wherry 2018; Wherry et al. 2018).

9. Mechanisms

The results above suggest that EITC exposure in childhood improves self-reported health status and decreases the likelihood of being obese in young adulthood. In this section, we explore several mechanisms through which the EITC could affect these outcomes. Table 4 shows the estimated effects of EITC exposure on imputed family EITC benefits, pre-tax family earnings, maternal labor supply, likelihood of being uninsured, and daily time parents spend with their children.[11] These outcomes are measured in the same year as EITC exposure and the estimated coefficients should be interpreted as the contemporaneous effect of EITC exposure.

Consistent with Bastian and Michelmore (2018), we find that EITC exposure has a significant impact on family financial resources, primarily through increasing maternal labor supply. A $100 increase in EITC exposure is not only associated with a $16.3 increase in imputed EITC benefits (column 1) but a $314 increase in pre-tax parental earnings as well(column 2).[12] The multiplicative effects of the EITC on pre-tax earnings is consistent with previous studies. For example, Dahl and Lochner (2017) estimate that a $1,000 increase in EITC generosity is associated with an $1,800 increase in family income while Bastian and Michelmore (2018) estimate a $2,200 increase.

A $100 increase in EITC exposure also increases the likelihood of the mother working by 0.3 percentage points (column 3), increases mothers' annual weeks worked by 0.14 weeks (column 4), and increases mothers' annual hours worked by 3.56 hours (column 5). This result is consistent with the past work, which finds that increases in EITC are associated with sizable increases in mothers' employment rates, concentrated among single mothers (summarized in Nichols and Rothstein 2015).

[11] Actual family EITC benefits are not reported in the PSID, and we impute EITC benefits based on federal and state EITC rules, state of residence, number of household children, family income, and parental marital status in the given year.
[12] To deal with outliers, family earnings is top codded at the 99th percentile.

Overall, these results imply that most of the increase in family resources generated by the EITC exposure comes from increases in labor supply (and subsequent family earnings) and not the tax credit itself. These extra resources provided by the EITC program are likely to affect long-term health outcomes of the children through the reduction in maternal stress and risky behavior and improvements in the child's nutrition (Simon, McInerney, and Goodell 2018).

EITC exposure could also improve long-term health outcomes through the program's impact on health insurance coverage and consequent medical care utilization of those induced to work and their dependents. The effect of EITC on health insurance coverage is theoretically ambiguous: EITC families may obtain employer-sponsored insurance by gaining parental employment but could also lose Medicaid eligibility if their earnings rise above program eligibility thresholds specified in their state of residence. In fact, past work has found evidence of shifts from public to private insurance coverage for mothers exposed to the EITC (Baughman 2005; Hoynes, Schanzenbach, and Almond 2015; and Baughman and Duchovny 2016). Using the health insurance questions in the PSID from 1999 to 2011, we create an indicator for whether the child was uninsured for at least one month in the interview year (Levy 2007). We estimate that a $100 increase in EITC exposure reduces the likelihood of being uninsured in childhood by 0.2 percentage points (column 6). These findings suggest that for children in our sample, the gains in private insurance coverage—either through employer-sponsored or direct purchase—are greater than the loss of public insurance.

Finally, it is possible that by increasing labor supply, EITC expansion may result in less parental time invested in children, which may affect long-term health. However, findings in Table 4 indicate that this is unlikely to be a strong mechanism for the children in our sample. Using parental time usage information from the 1997, 2002, and 2007 Child Development Survey (CDS),

we find that a $100 increase in EITC exposure is associated with statistically insignificant reductions in the child's daily time spent with his or her mother (column 7), father (column 8), or either parent (column 9).

Table 4: Contemporaneous Effect of Earned Income Tax Credit (EITC) Exposure on Intermediate Outcomes

Dependent Variable	EITC Benefits ($100) (1)	Family Earnings ($100) (2)	Mother Working (3)	Mother's Annual Weeks Worked (4)	Mother's Annual Hours Worked (5)	Uninsured (6)	Daily Minutes Spent with Mother (7)	Daily Minutes Spent with Father (8)	Daily Minutes Spent with Either Parent (9)
Contemporaneous EITC exposure ($100)	0.163***	3.14***	0.003***	0.14***	3.56**	-0.002***	-0.72	-0.80	-1.52
	(0.023)	(0.64)	(0.001)	(0.04)	(1.51)	(0.000)	(0.65)	(0.60)	(1.09)
Observations	42,306	42,306	42,306	42,306	42,306	8,618	2,919	2,919	2,919
Mean Dependent Variable	5.85	608.5	48.0%	23.6	834.1	7.3%	136.6	79.9	216.5

Source: 1968-2015 waves of the Panel Study of Income Dynamics (PSID).
Notes: EITC exposure is in hundreds of 2015 dollars and is defined as the maximum potential federal and state EITC a household could receive, given the year, state, and number of children. All regressions include demographic controls; state-year policy and economic controls; state, cohort, and year fixed effects; and state-specific quadratic time trends (see section 5). EITC benefits are imputed by authors and are a function of year, state, marital status, number of household children, and household earnings. Family earnings are the pre-tax sum of parental earnings top codded at the 99th percentile. Outcomes in columns 1–5 were measured between 1975 and 2011, when individuals in the main sample were between 0 and 18 old; outcome in column 6 (Uninsured) was measured between 1999 and 2011; and outcomes in columns 7–9 come from the 1997, 2002, and 2007 Child Development Survey (CDS). ***p<0.01, ** p<0.05, * p<0.1

10. Conclusion

Using 1968 to 2015 waves of the PSID and variation in federal and state EITC benefits over time, this study finds that EITC exposure in childhood significantly improves self-reported health and lowers the likelihood of being obese in early adulthood. We find that a $100 increase in the average EITC exposure, measured as the maximum credit available based on year, family size, and state of residence from ages 0 to 18, increases the probability of reporting excellent or very good health by 2.7 percentage points (4.1 percent) and reduces the likelihood of being obese by 1 percentage point (5.1 percent) between ages 22 and 27. These findings are robust to several model specifications and are unlikely driven by exposure within a particular age group. We find larger effects among those raised in single-parent households and lower educational attainment households, individuals more likely to participate on the EITC program.

EITC exposure in childhood can improve health outcomes later in life through several mechanisms. EITC generates significant increases in household income through the tax credit itself and increases in earnings via labor supply incentives. A $100 increase in contemporaneous EITC exposure is associated with a $16.3 increase in EITC benefits and a $314 increase in pre-tax family earnings (primarily via an increase in the likelihood of moms working), which translates into over $5,652 over an 18-year period. These results are largely consistent with the evidence that increasing economic resources to low-income children improves their later life health outcomes (e.g, Hoynes, Schanzenbach, and Almond 2016). In addition, contemporaneous EITC exposure increases the likelihood of having health insurance coverage in childhood, which could potentially improve long-term health outcomes through increased access to and utilization of health care services and reduced financial risk associated with high out-of-pocket health expenses (Miller and Wherry 2018; Wherry et al. 2018).

These results are largely consistent with the evidence on the longer-term effects of EITC exposure in human capital and employment outcomes. Bastian and Michelmore (2018) estimate an additional $167 in the annual maximum EITC when a child is 13 to 18 years old leads to a 1.3 percent increase in high school graduation, a 4.2 percent increase in college graduation, and a 1.0 percent increase in employment in adulthood. As discussed in the prior section, these results are also consistent with the literature on the effect of increasing family economic resources during childhood improves later life health outcomes.

Overall, our study suggests nontrivial long-term health impacts of the EITC and provides information on benefits of the program which are not typically taken into account in policy discussions around the program. Our findings should be considered in discussions of the social costs and benefits of the program (e.g., Bastian and Jones 2018), as heathier individuals are more likely to be in the work force and less likely to rely on public assistance programs. More broadly, these findings suggest that programs providing income supports for the poor or near-poor, such as EITC, SNAP, TANF, and unemployment benefits, are likely to generate long-term health benefits for the children of families exposed to the program.

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Appendix

Table A1: Estimated Effects of EITC Exposure in Childhood on Health Outcomes in Adults Ages 22–27 – Robustness Checks

Panel A

Dependent Variable	Excellent or Very Good Health		
Average EITC Exposure from Age 0 to 18 ($100s)	0.023***	0.022***	0.027***
	(0.004)	(0.004)	(0.006)
Observations	2,147	2,147	2,147
R-squared	0.197	0.206	0.325
Controls			
State, Cohort, Year Fixed Effect	X	X	X
Demographic Controls	X	X	X
State-Year Controls		X	X
Interaction Controls			X
State-Specific Quadratic Time Trends			X

Panel B

Dependent Variable	Obese		
Average EITC Exposure from Age 0 to 18 ($100s)	-0.010**	-0.009*	-0.010**
	(0.004)	(0.005)	(0.004)
Observations	1,837	1,837	1,837
R-squared	0.130	0.138	0.245
Controls			
State, Cohort, Year Fixed Effect	X	X	X
Demographic Controls	X	X	X
State-Year Controls		X	X
Interaction Controls			X
State-Specific Quadratic Time Trends			X

Panel C

Dependent Variable	Functional Limitations		
Average EITC Exposure from Age 0 to 18 ($100s)	-0.004**	-0.003	-0.005*
	(0.002)	(0.002)	(0.003)
Observations	2,147	2,147	2,147
R-squared	0.088	0.092	0.182
Controls			
State, Cohort, Year Fixed Effect	X	X	X
Demographic Controls	X	X	X
State-Year Controls		X	X
Interaction Controls			X
State-Specific Quadratic Time Trends			X

Panel D

Dependent Variable	Emotional Problems		
Average EITC Exposure from Age 0 to 18 ($100s)	-0.002	-0.002	-0.003
	(0.003)	(0.003)	(0.004)
Observations	1,867	1,867	1,867
R-squared	0.156	0.165	0.280
Controls			
State, Cohort, Year Fixed Effect	X	X	X
Demographic Controls	X	X	X
State-Year Controls		X	X
Interaction Controls			X
State-Specific Quadratic Time Trends			X

Panel E

Dependent Variable	High Blood Pressure		
Average EITC Exposure from Age 0 to 18 ($100s)	-0.006**	-0.007**	-0.006
	(0.003)	(0.003)	(0.004)
Observations	1,867	1,867	1,867
R-squared	0.079	0.085	0.194
Controls			
State, Cohort, Year Fixed Effect	X	X	X
Demographic Controls	X	X	X
State-Year Controls		X	X
Interaction Controls			X
State-Specific Quadratic Time Trends			X

Source: 1968–2015 waves of the Panel Study of Income Dynamics (PSID).
Notes: All outcomes are measured as averages between age 22 and 27 from 1989 to 2015. EITC exposure is defined as the average of the maximum potential federal and state EITC a household could receive, given the year, state, and number of children (100s of 2015$). See section 5 for definition of Demographic, State-year, and Interaction controls. Robust standard errors clustered at the state level are in parentheses. All results are weighted by average childhood PSID weights. ***p<0.01, ** p<0.05, * p<0.1

Table A2: Estimated Effects of Cumulative EITC Exposure in Childhood on Health Outcomes in Adults Ages 22–27

Dependent Variable	Excellent or Very Good Health	Obese	Functional Limitation	Emotional Problems	High Blood Pressure
Panel A					
Cumulative EITC Exposure from Age 0 to 18 ($1,000s)	0.013***	-0.005**	-0.003**	-0.002	-0.003
	(0.003)	(0.002)	(0.001)	(0.002)	(0.002)
Panel B					
Cumulative EITC Exposure from Age 0 to 5 ($1,000s)	0.027*	-0.012	-0.016*	0.001	-0.000
	(0.013)	(0.016)	(0.009)	(0.012)	(0.006)
Cumulative EITC Exposure from Age 6 to 12 ($1,000s)	0.012**	0.000	0.000	-0.006	-0.006
	(0.006)	(0.004)	(0.003)	(0.004)	(0.004)
Cumulative EITC Exposure from Age 13 to 18 ($1,000s)	0.009	-0.013**	-0.004	0.004	0.003
	(0.006)	(0.005)	(0.004)	(0.005)	(0.004)
F-Test, Coefficients are jointly equal (p-value)	0.000	0.079	0.114	0.561	0.382
Observations	2,147	1,837	2,147	1,867	1,867
Mean Dependent Variable	65.5%	19.6%	7.3%	13.4%	6.6%

Source: 1968–2015 waves of the Panel Study of Income Dynamics (PSID).

Notes: All outcomes are measured as averages between age 22 and 27 from 1989 to 2015. Cumulative EITC Exposure is defined as the cumulative of the maximum potential federal and state EITC a household could receive, given the year, state, and number of children (100s of 2015$). Model controls for state, cohort, year fixed effect, demographic controls, state-year policy and economic controls, interaction controls, and state-specific quadratic time trends (see section 5). Robust standard errors clustered at the state level are in parentheses. All results are weighted by average childhood PSID weights. ***p<0.01, ** p<0.05, * p<0.1

Table A3: Estimated Effects of EITC Exposure in Childhood on Health Outcomes Indexes

Dependent Variable	Bad Health Condition Index	Metabolic Syndrome Index
Panel A		
Average EITC Exposure from Age 0 to 18 ($100s)	-0.030***	-0.017**
	(0.007)	(0.007)
Panel B		
Average EITC Exposure from Age 0 to 5 ($100s)	-0.018	-0.009
	(0.012)	(0.010)
Average EITC Exposure from Age 6 to 12 ($100s)	-0.011**	-0.004
	(0.005)	(0.005)
Average EITC Exposure from Age 13 to 18 ($100s)	-0.005*	-0.006*
	(0.003)	(0.003)
F-Test, Coefficients are jointly equal (p-value)	0.2908	0.9089
Observations	1,837	1,836

Source: 1968–2015 waves of the Panel Study of Income Dynamics (PSID).

Notes: The indexes are constructed as the equally-weighted average across standardized z-score measures of each component. The bad health condition index includes self-reported good and excellent health obesity, function limitation, emotional problems and high blood pressure, and is constructed such that increasing values indicate worse health. The metabolic syndrome index includes obesity, high blood pressure and diabetes. All outcomes are measured between age 22 and 27 from 1989 to 2015. EITC exposure is defined as the average of the maximum potential federal and state EITC a household could receive, given the year, state, and number of children (100s of 2015$). Model controls for state, cohort, year fixed effect, demographic controls, state-year policy and economic controls, interaction controls, and state-specific quadratic time trends (see section 5). Robust standard errors clustered at the state level are in parentheses. All results are weighted by average childhood PSID weights. ***p<0.01, ** p<0.05, * p<0.1

Table A4: Estimated Effects of EITC Exposure in Childhood on Health Outcomes in Adults Ages 19–48, born after 1967

Dependent Variable	Excellent or Very Good Health	Obese	Functional Limitation	Emotional Problems	High Blood Pressure
Panel A					
Average EITC Exposure from Age 0 to 18 ($100s)	0.023***	-0.010**	-0.008**	-0.005	-0.004
	(0.005)	(0.004)	(0.004)	(0.004)	(0.003)
Panel B					
Average EITC Exposure from Age 0 to 5 ($100s)	0.019**	-0.009	-0.012**	0.000	0.001
	(0.007)	(0.007)	(0.005)	(0.006)	(0.003)
Average EITC Exposure from Age 6 to 12 ($100s)	0.007**	0.001	-0.001	-0.005*	-0.004**
	(0.003)	(0.003)	(0.002)	(0.003)	(0.002)
Average EITC Exposure from Age 13 to 18 ($100s)	0.003	-0.007***	-0.001	0.001	0.001
	(0.002)	(0.002)	(0.002)	(0.002)	(0.001)
F-Test, Coefficients are jointly equal (p-value)	0.042	0.189	0.088	0.263	0.071
Observations	2,377	2,334	2,377	2,362	2,363
Mean Dependent Variable	65.9%	19.3%	8.0%	13.4%	6.9%

Notes: All outcomes are measured as averages between age 19 and 48. EITC exposure is defined as the average of the maximum potential federal and state EITC a household could receive, given the year, state, and number of children (100s of 2015$). Model controls for state, cohort, year fixed effect, demographic controls, state-year policy and economic controls, interaction controls, and state-specific quadratic time trends (see section 5). Robust standard errors clustered at the state level are in parentheses. All results are weighted by average childhood PSID weights. ***p<0.01, ** p<0.05, * p<0.1

Table A5: Estimated Effects of EITC Exposure in Childhood on Health Outcomes by Subgroups

Group	Black, Hispanic, or Other	White Non-Hispanic	Single-Parent Household	Multi-Parent Household	Lower-Ed Parents	Medium-Ed Parents	Higher Ed Parents
Panel A							
Dependent Variable	**Excellent or Very Good Health**						
Average EITC Exposure from Age 0 to 18 ($100s)	0.028	0.027	0.048	0.017	0.041	0.035	0.009
	(0.006)***	(0.007)***	(0.008)***	(0.008)**	(0.009)***	(0.009)***	(0.018)
Observations	878	1,269	884	1,263	1,197	650	299
Mean Dependent Variable	58.1%	67.1%	59.3%	68.9%	58.8%	65.6%	79.4%
Panel B							
Dependent Variable	**Obese**						
Average EITC Exposure from Age 0 to 18 ($100s)	-0.016	-0.008	-0.018	-0.003	-0.018	0.004	-0.006
	(0.011)	(0.006)	(0.008)**	(0.005)	(0.009)**	(0.007)	(0.021)
Observations	750	1,087	771	1,066	992	570	274
Mean Dependent Variable	28.0%	17.8%	23.3%	17.5%	23.7%	20.9%	8.9%
Panel C							
Dependent Variable	**Functional Limitation**						
Average EITC Exposure from Age 0 to 18 ($100s)	-0.003	-0.006	0.001	-0.007	-0.002	-0.005	0.001
	(0.003)	(0.003)*	(0.005)	(0.004)	(0.006)	(0.007)	(0.010)
Observations	878	1,269	884	1,263	1,197	650	299
Mean Dependent Variable	5.1%	7.7%	6.7%	7.6%	8.7%	6.7%	5.3%

Group	Black, Hispanic, or Other	White Non-Hispanic	Single-Parent Household	Multi-Parent Household	Lower-Ed Parents	Medium-Ed Parents	Higher Ed Parents
Panel D							
Dependent Variable	**Emotional Problems**						
Average EITC Exposure from Age 0 to 18 ($100s)	-0.008	-0.001	0.010	-0.006	-0.003	-0.004	-0.004
	(0.004)**	(0.005)	(0.006)	(0.005)	(0.008)	(0.010)	(0.012)
Observations	760	1,107	785	1,082	1,009	577	280
Mean Dependent Variable	6.1%	15.0%	12.2%	14.1%	12.2%	15.1%	13.7%
Panel E							
Dependent Variable	**High Blood Pressure**						
Average EITC Exposure from Age 0 to 18 ($100s)	-0.002	-0.007	-0.008	-0.011	-0.015	-0.012	0.007
	(0.004)	(0.005)	(0.004)**	(0.006)*	(0.006)**	(0.008)	(0.006)
Observations	760	1,107	785	1,082	1,009	577	280
Mean Dependent Variable	8.0%	6.3%	7.9%	5.9%	8.2%	7.3%	2.4%

Source: 1968–2015 waves of the Panel Study of Income Dynamics (PSID).
Notes: All outcomes are measured as averages between age 22 and 27 from 1989 to 2015. EITC exposure is defined as the average of the maximum potential federal and state EITC a household could receive, given the year, state, and number of children (100s of 2015$). Lower-educated parents are households where all parents have less than 16 years of education; Higher-educated parents are households where at least one parent has 16 years of education or more. Models controls for state, cohort, year fixed effect, demographic controls, state-year policy and economic controls, interaction controls, and state-specific quadratic time trends (see section 5). Robust standard errors clustered at the state level are in parentheses. All results are weighted by average childhood PSID weights. ***p<0.01, ** p<0.05, * p<0.1