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THE IMPACT OF LOSING CHILDHOOD SUPPLEMENTAL SECURITY INCOME BENEFITS ON LONG-TERM EDUCATION AND HEALTH OUTCOMES

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Abstract

Many youth with disabilities rely on Supplemental Security Income (SSI) as an important source of income for their families, but they must go through a redetermination process at age 18 if they are to continue receiving those benefits into adulthood. Our project uses data from the National Longitudinal Study of Adolescent to Adult Health (Add Health) to examine the long-term impact of losing child SSI upon turning 18, due to the 1996 welfare reform, on education and health outcomes. We compare the long-term outcomes of those who turned 18 just after August 1996 with those who turned 18 just before, given that the reform increased the strictness of medical reviews for 18-year-old beneficiaries. Because the respondents are in their 30s and 40s in the later waves of the survey, we also examine the health outcomes of their children.

The paper found that:

- Those who were likely to lose SSI at age 18 have fewer years of education and are less likely to attend college than those who were less likely to lose their benefits.
- There is suggestive evidence of worse health outcomes for the children of those who were likely to lose their SSI benefits at age 18.

The policy implications of the findings are:

- Discontinuing benefits at age 18 has a negative impact on the human capital attainment of child SSI beneficiaries, which may explain their lower long-term earnings relative to other disadvantaged populations.
- The negative impacts of discontinuing child SSI benefits may continue into the next generation.
- Moderate amounts of cash transfers to children of vulnerable families may lead to lasting positive impacts.

Introduction

Supplemental Security Income (SSI) is an important source of income for many low-income youth with disabilities. In November 2021, 1.1 million SSI recipients were under age 18, which is 13.6 percent of all SSI recipients (SSA 2021), and child SSI enrollment was found to be associated with an 11 percentage points decrease in the probability that children live in poverty (Duggan and Kearney, 2007). To qualify for SSI, a child must have a medically determinable physical or mental impairment (including an emotional or learning problem) which results in marked and severe functional limitations that have lasted or can be expected to last for a continuous period of at least 12 months or be expected to result in death. For adults, the disability criteria are the same except that their medically determinable physical or mental impairment must also result in the inability to do any substantial gainful activity. Beneficiaries must also meet income and asset criteria to be eligible for SSI.

Starting in 1996, the Personal Responsibility and Work Opportunity Reconciliation Act (PRWORA, also known as the 1996 welfare reform) stated that child SSI beneficiaries must go through a redetermination process when they turn 18 in order to evaluate their impairments based on the adult definition of disability. As a result, those with conditions that result in marked or severe functional limitations but do not preclude engaging in substantial gainful activity were likely to lose their benefits during age-18 redetermination. Hemmeter et al (2017) shows that the rates of SSI cessation after age 18 redetermination range from 20 to 47 percent depending on the state, with state differences being attributed to variation in procedures and staffing of the state Disability Determination Service (DDS) agencies, economic, policy and program environments, the prevalence of disabilities across states, and optional state SSI supplements. The goal of our paper is to estimate the impact of losing child SSI benefits after turning 18 on long-term education and health outcomes; we also explore if there are intergenerational impacts from losing these benefits on the children of affected SSI recipients.

There is a growing body of research that examines the relationship between child SSI and long-term outcomes, but most of this work focuses on adult employment and income as an outcome. The consensus is that losing SSI at age-18 redetermination results in higher employment and earnings (Hemmeter et al. 2017), but there is higher income volatility, and the higher earnings only replace approximately one-third of the value of the lost benefits (Deshpande 2016). Consistent with these findings, Levere (2021) finds that for individuals with mental

disorders, increased exposure to SSI during childhood results in lower earnings in adulthood. Together, this body of literature suggests that while receiving SSI may lower adult employment, losing SSI benefits has a large, negative impact on overall income because the higher employment earnings does not fully replace the value of the benefits. There is also evidence that receiving SSI at birth results in other positive non-employment outcomes, including a higher likelihood of moving to a higher income neighborhood (Ko et al 2020), which has generally been shown to have long-term positive impacts on outcomes such as college attainment, marriage, and fertility outcomes (Chetty, Hendren, and Katz 2016; Chetty and Hendren 2018; Chyn 2018). Though evidence is limited, disability benefit receipt may have intergenerational effects as well; for example, Dahl, Kostol and Mogstad (2014) find that, in Norway, receipt of disability benefits increases the likelihood of receiving disability benefits of their adult children.

Our paper explores the impact of losing SSI at age-18 redetermination on education and health outcomes and whether these impacts have intergenerational effects. Exploiting exogenous variation generated by the 1996 welfare reform, we identify this relationship using a regression discontinuity method that compares the long-term outcomes of child SSI beneficiaries who turn 18 after August 1996 (and have to go through a redetermination process to determine whether they will keep their benefits) to child SSI beneficiaries who turned 18 before August 1996 (and do not have to go through the redetermination process). We find that losing SSI benefits at age 18 results in a decrease in educational attainment; specifically, those who were likely to lose SSI are less likely to attend college and have fewer years of education than those who were less likely to lose their benefits. We also find suggestive evidence of worse health outcomes for the children of those who were likely to lose their SSI benefits. Their children are less likely to report being in good health and more likely to report having obesity or asthma, although these relationships are not always statistically significant.

The organization of this paper is as follows. Section II provides background on the SSI program and the 1996 welfare reform, which provides the exogenous variation we use for our identification strategy. Section II presents the conceptual framework for our analyses. Section IV describes the data we use for our empirical work, which is described in Section V. The results of our empirical work are presented in section VI, and section VII concludes.

Background on SSI and the 1996 Welfare Reform

SSI is a means-tested program that provides monthly cash benefits to children and adults with disabilities. The maximum federal benefit amount in 2023 was $914 for an eligible individual and $1,371 for an eligible individual with an eligible spouse, but this amount may be reduced depending on whether there is other household income.[1] Specifically, after excluding the first $20 of any income and an additional $65 of earned income, the monthly benefit amount is reduced by $1 for every $1 of unearned income and $1 for every $2 of earned income. However, these exclusions are more generous for SSI beneficiaries who are students; all grants, scholarships, and fellowships used to pay tuition and fees at an educational institution are excluded from income (SSA 2022), and the Student Earned Income Exclusion allows SSI beneficiaries who under age 22 and regularly attending school to disregard the first $2,220 of monthly earnings, up to an annual amount of $8,950. Most states provide supplemental payments and Medicaid eligibility to SSI recipients, and SSI recipients are eligible to receive services and support from state vocational rehabilitation agencies to help them prepare for, obtain or retain employment. For students, vocational rehabilitation support may include payments for tuition, books, and supplies. For example, the scope of vocational rehabilitation services in Virginia includes tuition for college and university training in an amount not in excess of the highest amount charged for tuition by a state-supported institution and financial assistance for required textbooks and supplies that shall not exceed the amount determined by the institution for books and supplies in the student's school budget (Virginia Administrative Code 2023).

SSI is one of the main government programs that provides support for children with disabilities, with SSA spending $9 billion on just over one million child SSI beneficiaries in 2021 (SSA 2022). There has been dramatic growth in the child SSI program over the years, with caseloads more than quadrupling between 1990 and 2018, even though child population grew just 15 percent over this time period (Sevak and Bruns 2018). Much of this growth occurred between 1991 and 1996 due to the Sullivan and Zebley court case that added many conditions such as attention-deficit/hyperactivity disorder (ADHD) to the list of qualifying conditions for children.

[1] For children, the income and assets of the parents are used to determine the benefit amount and financial eligibility.

The 1996 welfare reform included an attempt to reduce the drastic growth in the SSI program by requiring SSA to redetermine SSI eligibility at 18 years old and required the medical review to use the adult standards of disability rather than the child ones. Prior to this, almost no child SSI beneficiaries went through a medical review at age 18, and those who did continued on SSI as long as they did not demonstrate medical improvement (Deshpande 2016). The disability criteria to qualify for SSI differs for children and adults. A child is considered disabled if they have a medically determinable physical or mental impairment that results in marked and severe functional limitations, but for an adult, the impairment must result in the inability to do any substantial gainful activity.[2] After the 1996 welfare reform, child SSI beneficiaries whose limitations are marked and severe, but do not limit their ability to do substantial gainful activity, would no longer qualify for adult SSI. The result of this change is that child SSI beneficiaries – especially those with mental disorders (Levere 2021) – who turned 18 after August 22, 1996 were substantially more likely to lose their SSI benefits than those who turned 18 before August 22, 1996. Deshpande (2016) used SSA administrative data to show that child SSI beneficiaries who have an 18th birthday after the August 22, 1996 cutoff are 39 percentage points more likely to have an unfavorable age 18 review relative to those with 18th birthdays before the cutoff, and are 24 percentage points less likely to be enrolled in SSI four years after turning age 18. However, this gap in adult SSI enrollment shrinks to 5 percentage points about 12 years after turning 18 because adult SSI beneficiaries leave the program due to adult medical review, income and asset violations, incarceration or death.

Conceptual Framework

Our paper examines whether there is a relationship between losing SSI benefits at age 18 and education and health outcomes. There are several mechanisms by which we think these relationships may exist, which we will describe in this section.

One of the main reasons that losing SSI benefits at age 18 may result in worse education outcomes is that it changes the opportunity cost of completing high school and attending college. While student SSI beneficiaries have more generous earned income exclusions than non-student SSI beneficiaries (as explained in the Background section), they are still limited in their ability to

[2] Substantial gainful activity (SGA) is used by SSA to describe a level of work activity and earnings. In January 2023, the earnings threshold for SGA was set at $1,470 per month.

work. Therefore, completing high school and attending college has a lower opportunity cost for SSI beneficiaries than those who lost their benefits at age 18, for whom the opportunity cost is their foregone earnings with none of the restrictions that SSI beneficiaries have. Another reason why losing SSI may reduce the likelihood of attending college is that the individual no longer receive the same incentives as SSI beneficiaries, such as the postsecondary education supports provided by state vocational rehabilitation agencies. For both of these reasons (higher opportunity cost of attending college and fewer incentives), we would expect those who lost their benefits to be less likely to complete high school, attend college and generally have fewer years of education. Studies have shown that not attending college and having fewer years of education results in lower long-term earnings (Abbott, Gallipoli, Meghir, & Violante, 2019; Autor, 2014; Carnevale, Jayasundera, & Gulish, 2016), which is consistent with the Deshpande (2016) and Levere (2021) findings that while losing SSI benefits at age 18 increases the likelihood of working, the increased employment earnings are not enough to replace the value of the lost benefits.

The existing evidence that losing child SSI benefits at age 18 decreases overall income (Deshpande 2016; Levere 2021) may also provide a mechanism for why losing SSI benefits may affect health outcomes because lower overall income can be correlated with lower health outcomes. For example, it has been well documented that hypertension (Kaplan et al. 2010; Mensah et al., 2005), diabetes (Beckles & Chou, 2016; Chen et al., 2023), and dyslipidemia (Beckman et al., 2017) are highly prevalent in low-income populations. These chronic conditions have all been shown to be important contributors to morbidity and mortality in the U.S.

Another mechanism for why losing SSI benefits at age 18 may have a negative impact on health is the loss of Medicaid eligibility that accompanies the loss of SSI. While there has been limited research on the impacts of losing Medicaid coverage on health outcomes, Cole et al (2021) found that the ACA Medicaid expansions were associated with an increase in hypertension and diabetes diagnoses, but also an improvement in hypertension control and glucose control in the five years after the expansions occurred. While the response to losing Medicaid coverage may be different than the response to gaining coverage, the Cole et al (2021) results suggest that it is plausible that losing health insurance coverage may result in worse access to care and poor diagnoses and management of chronic conditions.

There also may be intergenerational health impacts of losing SSI benefits. Deshpande (2016) and Levere (2021) show that losing SSI at age 18 causes lower income later in life, and lower household income has been shown to result in poorer health for the children in the family (Thomas, 2006). Previous studies reported that children from lower income households are more likely to have a developmental delay (Assari & Caldwell, 2019), have obesity (Babey, Hastert, Wolstein, & Diamant, 2010; Singh, Siahpush, & Kogan, 2010), diabetes (Odutayo et al., 2017), or asthma (Zahran, Bailey, Damon, Garbe, & Breysse, 2018). Furthermore, lower income likely means living in a worse neighborhood, which may have negative impacts on children's health. Ludwig and coauthors (2011 and 2012) provide evidence that moving from a neighborhood with high level of poverty to one with a lower level of poverty was associated with decreases in the prevalence of extreme obesity and diabetes, and leads to long-term (10 to 15 year) improvement in adult physical and mental health.

The remainder of our paper will use survey data to test whether we find empirical evidence of the theoretical relationships we expect to see based on our conceptual framework. Specifically, we will test the hypotheses that losing SSI benefits at age 18 will result in a lower likelihood of completing high school and attending college, and in fewer years of education overall. We also hypothesize that losing SSI benefits at age 18 decreases access to care and therefore reduces the likelihood of diagnosing and managing chronic conditions such as hypertension, diabetes, or dyslipidemia. Finally, we explore whether losing SSI benefits at age 18 results in worse health outcomes for the beneficiaries' children in terms of their overall health status and having a developmental delay, obesity, diabetes, or asthma.

Data

We use data from the National Longitudinal Study of Adolescent to Adult Health (Add Health), which consists of five survey waves that follow respondents from adolescence (grades 7-12, which is approximately ages 12 to 18, in wave 1) to adulthood (ages 31 to 42 in wave 5). The in-home survey of the first wave was administered to more than 20,000 children in 1994-95, which was before the 1996 welfare reform. The Add Health survey followed up with the respondents four more times in 1996, 2001-02, 2008, and the final wave was conducted over twenty years later in 2016-2018. There were more than 12,000 respondents who remained in the survey in the fifth wave, and at that time, the respondents' own children were, on average, 7-11

years old. The focus of the Add Health study is to combine data on respondents' social, economic, psychological and physical well-being with contextual data on the family, neighborhood, community, school, friendships, peer groups, and romantic relationships.

For our study, we focus on the sample of Add Health respondents who received child SSI and turned 18 within a window before and after August 22, 1996. Unfortunately, SSI receipt is measured with some error in the Add Health data. In wave 1 (when most Add Health respondents are between 12 and 18 years old), the parents report whether someone in family receives SSI, but we do not know if the beneficiary is the child or someone else. This is similar to the proxy measure used by Guldi (2018) for identifying child SSI beneficiaries in their paper on the impacts of receiving SSI at birth on child outcomes. We use family SSI receipt as our primary proxy for child SSI receipt, but also create an alternative proxy, which is whether the child has a mental disorder (defined as having a learning disability[3] or having a non-physical disability and are enrolled in special education). We focus on mental disorders because these children are most likely to lose their benefits during age 18 redetermination due to the differences in the adult and child SSI eligibility criteria (Levere 2021). In wave 3, when respondents are 18 to 26 years old, the respondent is asked whether they receive SSI, Social Security Disability Insurance, Worker's Compensation, or unemployment insurance (together in one yes or no question). Because SSI is the only one of these programs that also provides Medicaid in most states, we combine this safety net program question with the question about whether the respondent has Medicaid as a proxy for SSI status in wave 3.

After identifying the sample of Add Health respondents who were likely to have received child SSI, the next step is to limit the sample to those who turned 18 in a window before and after August 22, 1996. The Add Health data contain the month and year of birth of the respondent, which reveals when they turned 18 years old and would have to go through the SSI redetermination process. The optimal window we use is within 24 months of August 1996, following the data-driven bandwidth selection process developed by Calonico et al. (2017). When using family SSI receipt as a proxy, our final sample size is 790 child SSI beneficiaries, with 360 turning 18 within 24 months before August 1996 and 430 turning 18 within 24 months after August 1996. When using having a mental disorder as a proxy, the sample size is 1,561

[3] Parents were asked to answer a question "Does (he/she) have a specific learning disability, such as difficulties with attention, dyslexia, or some other reading, spelling, writing, or math disability?" in Wave 1.

child SSI beneficiaries, with 721 turning 18 within 24 months before August 1996 and 840 turning 18 within 24 months after August 1996. Table 1 shows the characteristics of each group by the date when they turned 18. We find that the groups that turned 18 before and after August 1996 are fairly similar in terms of demographics. When using family receipt of SSI as a proxy, approximately half the sample is female, one third is Black, and the average annual household income in wave 1 was $25,000-$27,000, regardless of when they turned 18. Those who turned 18 before August 1996 are slightly less likely to be white (32.5 versus 41.2 percent) and more likely to be Asian (6.1 versus 3 percent). When using having a mental disorder as a proxy, the sample is only about one-third female, predominately (58 percent) white, and has an average annual household income in wave 1 of approximately $44,000. This reveals that using family receipt of SSI as a proxy identifies a more disadvantaged sample within the Add Health data compared to using having a mental disorder as a proxy; the entire Add Health sample within 24 months before and after August (N=15,019) is 20 percent Black, 26 percent living with a single mom, and living with the annual household income of $46,000 (not shown in table)s.

For our long-term outcome measures, the Add Health data has a wide variety of survey questions regarding well-being in waves 3, 4 and 5. First, we create employment and crime measures to replicate the findings in the existing literature. For the employment measures, we create indicators for whether the individual self-reported any earnings and earnings above $15,000, and create a self-reported measure of their annual income for waves 3, 4, and 5 to replicate the results in Deshpande (2016). For the crime measures, we create indicators for whether the respondent has ever been arrested, ever been incarcerated, or ever been charged with a crime, as reported in wave 5. We selected these crime outcomes to replicate the results in Deshpande and Muller-Smith (2022).

We then create our main measures of interest, which are education and health outcomes for the respondents and health outcomes for the respondents' children. For the education outcomes, we create a dummy variable for whether the respondent reported completing high school by wave 5, a dummy variable for attending college by wave 5, and a continuous variable with the reported years of education by wave 3.[4] For the health outcomes for respondents, we create dummy variables for whether the respondent has ever been diagnosed with hypertension, diabetes or dyslipidemia by wave 5. Finally, the Add Health data contains information on the

[4] Respondents are not asked about years of education after wave 3.

outcomes of the children of the respondents, who tend to be between 7 to 11 years old during the fifth wave of the survey. The health outcomes we create for the respondents' children are dummy variables for whether the respondent reports in wave 5 that their child is in good or excellent health, has had a developmental delay, obesity, diabetes or asthma.

Methodology

The relationship we are interested in is the effect of losing child SSI benefits at age 18 on long-term education and health outcomes. A naïve regression of the outcome measures of interest on an indicator for having lost SSI benefits at age 18 would suffer from endogeneity problems; that is, the unobservable characteristics of child SSI beneficiaries who lose their benefits at age 18 redetermination are likely to also be correlated with their long-term education and health outcomes. To overcome this endogeneity problem, we follow the identification strategy used in Deshpande (2016) that uses the PRWORA 1996 welfare reform as a source of exogenous variation in the likelihood of continuing SSI benefit receipt into adulthood.

The first step of our analysis is to examine the first stage relationship between turning 18 after August 1996 and no longer having SSI benefits in wave 3 (which is the first wave after all survey respondents have turned 18) in order to confirm that the 1996 welfare reform reduced the likelihood of child SSI beneficiaries continuing to receive SSI into adulthood. We start by plotting the percent of respondents in our sample that receive SSI in wave 3 by the month/year the respondent turned 18, where we group the month/year into 3-month bins. We consider a respondent as receiving SSI receipt in wave 3 if they report being enrolled in Medicaid and received SSI, unemployment insurance, worker compensation, or disability insurance. Our analysis sample was 21–25 years old in wave 3; Deshpande (2016) reports the impacts of the 1996 welfare reform on losing SSI being the largest at ages 21 and 22. To help determine visually whether there is a shift in wave 3 SSI receipt for those who turned 18 after August 1996 compared to those who turned 18 before, we estimate a non-parametric local linear regression fitted lines using triangular kernel function on each side of the threshold and display the fitted lines together with the raw means.

We then estimate a quantitative measure of this first-stage relationship using the following parametric linear regression discontinuity model:

$$SSI_{i(3)} = \alpha + \beta_1 Post_i + \beta_2 BirthMonth_i + \beta_3 (Post_i \; X \; BirthMonth_i) + \beta_4 X_i + \varepsilon_i \qquad (1)$$

where $SSI_{i(3)}$ is our proxy measure for child SSI beneficiary i receiving SSI in wave 3, $Post_i$ is an indicator that the child SSI beneficiary *i* turned age 18 after August 1996 (and was more likely to go through the age 18 redetermination process), and our running variable $BirthMonth_i$ is the difference between the month/year respondent *i* turned 18 and August 1996. Our main specification uses 3-month bins and 24-months bandwidths chosen following the process developed by Calonico et al. (2017). To check the robustness of our results, we also present estimates using 1-month or 2-month bins. X_i is a vector of covariates that include race/ethnicity, gender, indicators for living with mother/father, household income in Wave 1, and community fixed effects. We also control for separate monthly trends ($Post_i\ X\ BirthMonth_i$) in wave 3 SSI receipt before and after the 1996 welfare reform (Almond et al., 2010; Deshpande, 2016). We cluster the standard errors at the birth month-bin level (that is, the running variable) to address the concern that conventional confidence intervals may be inappropriately centered when using discrete running variables. Recent work by Kolesár and Rothe (2018) suggests that clustering may have worse coverage properties than the traditional robust standard errors, but we calculate very similar standard errors with either method. We hypothesize that, consistent with literature, β_1 will be negative and significantly and meaningfully different from zero, representing a decreased likelihood of having SSI in adulthood if a child SSI beneficiary turns 18 after August1996. We also examine the impact of turning 18 after August 1996 on Medicaid enrollment, given that most people who lose SSI at age 18 will also lose Medicaid eligibility.

After establishing the first-stage relationship that turning 18 after August 1996 reduces the likelihood of receiving SSI in wave 3, we turn to estimating the long-term education and health effects of losing SSI benefits at age 18 using a reduced form regression approach. Specifically, we estimate the following regression discontinuity model for each of our outcomes of interest:

$$Y_{i(w)} = \beta_0 + \beta_1(Post_i\ X\ BirthMonth_i) + \beta_2 X_i + \varepsilon_i \quad (2)$$

where the parameters and subscripts in equation (2) are the same as equation (1). Our primary outcome measures, $Y_{i(w)}$, include the education outcomes (high school completion, college attendance, and years of education,) and the health outcomes (having been diagnosed with hypertension, diabetes, or dyslipidemia) for respondent *i* in wave *w*. We also examine employment and crime outcomes in an attempt to replicate the previous findings of Deshpande (2016) and Deshpande and Mueller-Smith (2022) that used administrative data. Finally, we

specify equation (2) with the children (of survey respondents) sample using health-related indicators for being in good health status, having a developmental delay, obesity, diabetes, or asthma. Our coefficient of interest, β_1, represents the impact of being likely to lose SSI at age 18 (due to turning 18 after August 1996) on the long-term outcome of interest. We report intent-to-treat estimates of the impacts of the 1996 welfare reform.

For the outcomes that equation (2) shows are impacted by losing SSI benefits at age 18, we plot the mean of the outcome for the respondents in our sample by the month/year the respondent turned 18, just as we did in the first-stage analysis. We also estimate a non-parametric local linear regression fitted lines using triangular kernel function on each side of the August 1996 threshold and display the fitted lines together with the raw outcomes. This helps us visually examine the shift in average outcome for those who turned 18 after August 1996 compared to those who turned 18 before. We then report a quantitative measure of the effect as estimated by β_1 in equation (2).

Two challenges of our analysis are that the sample sizes are relatively small in the Add Health data (Table 1), which limits our statistical power, and that we test a large number of outcome measures, which may result in significant coefficients emerging by chance even when there is no true effect. We address this in two ways. First, we conduct a power analysis to see how large of an impact we will be able to detect given the sample sizes in the Add Health data. We present the mean values and the minimum detectable effect (MDE) for the outcomes of interest separately for each child SSI sample. This allows us to compare the magnitude of the impacts we estimate with the minimum impacts that we would be able to detect given our sample sizes.

Second, we create summary index measures to reduce the number of tests, as suggested by Anderson (2008). We create summary index measures, which are weighted means of multiple outcome measures, by performing a principal component analysis at the individual level and taking the first components that capture the highest variation across all included variables (Opuni et al., 2010). The set of interrelated outcome measures we use to create each summary index measure are selected based on literature review and shown in Appendix Table 1. The summary index measures are normalized to have a mean of zero and standard deviation of one, and we ensure when creating them that positive estimates indicate better outcomes. Anderson (2008) highlights three advantages of using a summary index measure instead of individual tests.

First, they avoid the problem of over testing because each index is a single test. Second, they allow the researcher to test whether the treatment has a general effect on a set of outcomes. And finally, they may have more statistical power than individual tests because multiple outcomes approaching marginal significance may aggregate into a single index that is significant.

Results

The first step of our analyses is to confirm empirically that child SSI beneficiaries who turn 18 after August 1996 are more likely to lose their benefits than those who turn 18 before August 1996. Deshpande (2016) already showed that this is true based on SSA administrative data, but we look for evidence of this in the Add Health data as well. Figure 1 shows the share of child SSI recipients (based on our proxy measures) in the Add Health data who received SSI in wave 3 by 3-month birth month bins, along with nonparametric regression fitted lines. For both of our samples, the fitted regression lines before and after August 1996 reveal a discontinuity in the likelihood of receiving SSI during wave 3, with those who turned 18 after the welfare reform being less likely to receive SSI in adulthood compared to those who turned 18 before. We show the magnitude of the discontinuity in Table 2, which shows the estimated β_1 from equation 1. We find a decrease in the likelihood of having SSI in wave 3 if the respondent turned 18 after August 1996 of 2 to 4 percentage points depending on how we define the SSI sample. These estimates are not statistically significant and are smaller than the 24-percentage point decrease observed by Deshpande (2016) four years after turning age 18, but closer to the 5 percentage points observed 10 years after and beyond. Our study population was between 21 and 25 years old in wave 3, which means they turned 18 anywhere from 3 to 7 years ago. We also observe a decrease in Medicaid coverage in wave 3, which is consistent with losing SSI benefits, which in most states translates to a loss of Medicaid eligibility as well. Together, these results suggest that despite having some error in how we selected our sample of child SSI beneficiaries and how we measure receipt of SSI in adulthood, we still observe some evidence that turning 18 after August 1996 increases the likelihood of losing SSI benefits in our sample, even if the evidence is not as robust as we would see in SSA administrative data.

Having established that turning 18 after August 1996 increases the likelihood of losing SSI benefits, we next confirm that we observe the same relationships between losing SSI benefits at age 18 using the Add Health data that have been documented in the existing literature.

Specifically, Deshpande (2016) showed that losing SSI benefits results in an increase in earnings, and Deshpande and Mueller-Smith (2022) showed that losing SSI benefits results in an increase in the likelihood of having ever been arrested, incarcerated or being charged with a crime. We estimate the impact of losing SSI benefits on earnings outcomes by estimating equation 2 using reported earnings, having positive earnings and having earnings over $15,000 in waves 3, 4, and 5 (with differences in how the questions are asked and calculated in each wave; see the notes of Appendix Table 2 for more details). The results are in Appendix Table 2. We focus on the wave 5 results because our study population is 36 to 40 years old, which is the closest to the age at which Deshpande (2016) examined the long-run employment of her sample (at 34 years old). The wave 5 results using the Add Health data reveal that losing SSI benefits at age 18 is associated with a higher income from personal earnings, higher likelihood of positive personal income and higher likelihood of personal income over $15,000. Although these results are not statistically significant, the sign of coefficients are consistent with the results of Deshpande (2016). We then estimate equation 2 using indicators for having ever been arrested, incarcerated or charged with a crime in wave 5 and present the results in Appendix Table 3. Just like Deshpande and Mueller-Smith (2022), we find evidence that losing SSI benefits at age 18 increase the likelihood of being arrested, incarcerated, and being charged with a crime by wave 5, although our estimates are not statistically significant.

One reason that our estimates in Appendix Tables 2 and 3 are not statistically significant is that we may lack statistical power to identify a significant effect. To check for this, we conduct a power analysis to see what the minimum detectable effect (MDE) is given our sample sizes. The results in Table 3 show that for all but one of the wave 5 employment and crime outcomes of interest, the MDE is larger than our regression estimates. For example, the MDE for having ever been arrested is 0.08 for both of our samples, while our estimate is only 0.04 for our sample of respondents whose household had SSI and 0.03 for respondents who had a mental disorder. This suggests that while the Add Health data is able to replicate the sign of the relationships between losing SSI and employment or crime that have been established in the past, the Add Health sample size is not large enough for them to be statistically significant.

We now turn to looking at long-term education and health outcomes that have not been examined already in the existing literature. First, we estimate the impact of losing SSI benefits at age 18 on education outcomes by estimating equation 2 using high school completion by wave 5,

college attendance by wave 5, and years of education by wave 3 as the dependent variable. The conceptual model predicted that losing SSI benefits at age 18 would unambiguously decrease educational attainment. The results in Table 3, show that for children with household SSI, losing their benefits at age 18 reduces the years of education completed by wave 5 by between 1 to 1.6 years, reduces the likelihood of completing high school by 2 to 4 percentage points (although this is not statistically significant), and reduces the likelihood of attending college by 14 to 16 percentage points. The baseline rate of college attendance is 74 percent for this sample, which means our estimate is equivalent to a decrease of 19 to 21 percent. For those with a mental disorder (Panel B), the losing SSI also reduces the years of education completed by approximately 1 year and decreases the likelihood of completing high school by 3 to 4 percentage points (which is statistically significant and also equivalent to a 3 to 4 percent increase), but the decrease in college attendance is only 1 to 3 percentage points and not statistically significant.

We display the impact of losing SSI benefits at age 18 graphically for the two outcomes that have the greatest response. Figure 2 shows that for the sample of those whose family has SSI during their childhood, those who turn 18 after August 1996 are much less likely to attend college than those who turn 18 before. Consistent with our main regression results (Table 3), this decrease is observed for the sample that has a mental disorder, but it is smaller in magnitude and not statistically significant. In Figure 3, we see a sharp decrease in the number of years of education for those who likely lost their SSI benefits compared to those who did not. This is observed for both samples of child SSI beneficiaries.

Next, we estimate the impact of losing SSI benefits on health outcomes by estimating equation 2 using ever having been diagnosed with hypertension, diabetes or dyslipidemia by wave 5 as the dependent variable. The contextual model predicted a decrease in the diagnoses of these conditions due to losing health insurance and having lower access to care. The coefficients (reported in Table 5) reveal a decreased likelihood of being diagnosed with diabetes and an increased likelihood of being diagnosed with dyslipidemia, but neither are statistically significant. The sample of respondents who had household SSI as a child were less likely to be diagnosed with hypertension (but this was not statistically significant), while the sample of respondents with a mental health-related disability were more likely to be diagnosed with

hypertension. Overall, our evidence is mixed regarding the relationship between losing SSI benefits at age 18 and the long-term diagnoses of these chronic health conditions.

Our analyses have many null results, and the concern may be that this is due to having limited statistical power from our small sample sizes and also due to multiple inference problems from testing many outcome measures. Indeed, Table 2 shows that most of the outcome measures have MDEs that are much larger than our estimated effects, suggesting that our sample size is too small to pick up on smaller effects of losing SSI benefits. We try to address the problem by following the Anderson (2008) method of creating a summary index, which is robust to over testing and may also have more power if aggregating marginally significant individual tests into a single test produces significant results. The results of our analyses using a summary education index and a summary health index as the dependent variable for equation 2 are shown in Table 6. We find that losing SSI benefits at age 18 causes a negative and sizable impact on the long-term education outcome index (between 18 to 40 percent of the standard deviation), but for the most part, these effects are not statistically significant at the traditional level of significance. In terms of health outcomes, just as before, we find mixed results depending on the sample selected and how the birth month bins are defined. For example, we find a positive relationship between losing SSI benefits and the health index (which is the likelihood of being diagnosed with a chronic health condition) for those whose household received SSI if we use monthly or quarterly bins and for those with a mental disorder using monthly bins, but a negative relationship for those with household SSI if we use bimonthly bins and those with a mental disorder using bimonthly or quarterly bins. Furthermore, none of the relationships are statistically significant. Overall, while using a summary index test is a useful exercise, it did not end up giving us the power we need to feel confident that our null results are evidence of no relationship.

Finally, we examine the impact of losing SSI at age 18 on the health outcomes of the child SSI beneficiary's children. One concern here is that there may be selection bias in terms of who has children based on SSI status; for example, it could be that losing SSI at age 18 reduces the likelihood of getting married and/or having children, so the respondents that do have children are more advantaged. We test for this probability of selection by examining whether there is a difference in the likelihood of getting married or having children for those who turn 18 after August 1996 relative to those who turned 18 before. The results are in Appendix Table 4 and do not reveal a statistically significant relationship between losing SSI at age 18 and the likelihood

of getting married or having children. Having ruled this out as a concern, we examine the results of our estimate of equation 2 using indicators for whether the respondent's child was in good health status, had a developmental delay, had obesity, had diabetes, or had asthma in wave 5 as the dependent variables. The results in Table 7 show some suggestive evidence that for those respondents whose household received SSI, losing SSI at age 18 has a negative impact on the health of their children. Specifically, the children are 12 to 16 percentage points less likely to report being in good health, 3 to 6 percentage points more likely to have experienced obesity, and 13 to 16 percentage points more likely to have asthma. The statistical significance of these estimates depends on the size of the birth month bins that are being used in the model. The results for respondents who had mental disorders also show that their children are 0.020 percentage points more likely to experience obesity and 0.01 to 0.02 percentage points more likely to have asthma, but the relationships are not statistically significant and the coefficient on being in good health is positive. The lack of statistical significance may be due to lack of power; as shown in Table 3, the MDE for having obesity is 0.026 and asthma is 0.061. Overall, we conclude that there may be intergenerational effects of losing SSI at age 18 on health outcomes, but the evidence is suggestive and not conclusive.

Conclusions

Past literature has established that children from low-income families are subject to worse early-life outcomes (Almond and Currie, 2011). A growing body of research also reveals that losing child SSI at age 18 leads to lower overall income and a higher likelihood of being convicted of a crime (Deshpande, 2016; Levere 2021; Deshpande and Mueller-Smith, 2022). However, little has been known about the long-term impacts of losing childhood SSI at age 18 on human capital accumulation. Exploiting exogenous variation in continuous SSI enrollment generated by the 1996 welfare reform, we find that losing SSI benefits at age 18 significantly decreases educational attainment. Specifically, we observe that those who are likely to lose their child SSI benefit are less likely to attend college and have fewer years of education relative to those who are unlikely to lose their child SSI benefits. We also find suggestive evidence of worse health outcomes for the children of those who were likely to lose their SSI benefits at age 18. Our findings suggest that lower educational attainment caused by losing SSI may contribute

to long-term labor market outcomes and that the negative impact of losing SSI benefits may continue into the next generation.

References

Abbott, B., G. Gallipoli, C. Meghir, and G. L. Violante. 2019. "Education Policy and Intergenerational Transfers in Equilibrium." *Journal of Political Economy* 127(6): 2569-2624.

Almond, D., J. J. Doyle Jr., A. E. Kowalski, and H. Williams. 2010. "Estimating Marginal Returns to Medical Care: Evidence from At-Risk Newborns." *Quarterly Journal of Economics* 125: 591-634.

Almond, D. and J. Currie. 2011. "Human Capital Development Before Age Five." In *Handbook of Labor Economics Volume 4B,* edited by O. Ashenfelter, D. Card, and R. Layard, 1315-1486. North Holland, The Netherlands: Elsevier.

Anderson, Michael L. 2008. "Multiple Inference and Gender Differences in the Effects of Early Intervention: A Reevaluation of the Abecedarian, Perry Preschool, and Early Training Projects." *Journal of the American Statistical Association* 103(484): 1481-1495.

Assari, S. and C. H. Caldwell. 2019. "Family Income at Birth and Risk of Attention Deficit Hyperactivity Disorder at Age 15: Racial Differences." *Children* 6(1): 10. Available at: https://www.mdpi.com/2227-9067/6/1/10

Autor, D. H. 2014. "Skills, Education, and the Rise of Earnings Inequality among the 'Other 99 Percent.'" *Science* 344(6186): 843-851.

Babey, S. H., T. A. Hastert, J. Wolstein, and A. L. Diamant. 2010. "Income Disparities in Obesity Trends Among California Adolescents." *American Journal of Public Health* 100(11): 2149-2155.

Beckles, G. L. and C.-F. Chou. 2016. "Disparities in the Prevalence of Diagnosed Diabetes—United States, 1999–2002 and 2011–2014." *Morbidity and Mortality Weekly Report* 65(45): 1265-1269.

Beckman, A. L., J. Herrin, K. Nasir, N. R. Desai, and E. S. Spatz. 2017. "Trends in Cardiovascular Health of US Adults by Income, 2005-2014." *JAMA Cardiology* 2(7): 814-816.

Calonico, S., M. D. Cattaneo, M. H. Farrel, and R. Titiunik. 2017. "Rdrobust: Software for Regression Discontinuity Designs." *Stata Journal* 17: 372-404.

Carnevale, A. P., T. Jayasundera, and A. Gulish. 2016. "America's Divided Recovery: College Haves and Have-Nots." Report. Washington, DC: Georgetown University, Center on Education and the Workforce.

Chen, Y., X. Zhou, K. M. Bullard, P. Zhang, G. Imperatore, and D. B. Rolka. 2023. "Income-Related Inequalities in Diagnosed Diabetes Prevalence among US Adults, 2001−2018." *PLOS ONE* 18(4): e0283450.

Chetty, Raj and Nathaniel Hendren. 2018. "The Impacts of Neighborhoods on Intergenerational Mobility I: Childhood Exposure Effects." *The Quarterly Journal of Economics* 133(3): 1107-1162.

Chetty, Raj, Nathaniel Hendren, and Lawrence F. Katz. 2016. "The Effects of Exposure to Better Neighborhoods on Children: New Evidence from the Moving to Opportunity Experiment." *American Economic Review* 106(4): 855-902.

Chyn, Eric. 2018. "Moved to Opportunity: The Long-Run Effects of Public Housing Demolition on Children." *American Economic Review* 108(10): 3028-3056.

Cole, M. B., J.-H. Kim, T. W. Levengood, and A. N. Trivedi. 2021. "Association of Medicaid Expansion with 5-Year Changes in Hypertension and Diabetes Outcomes at Federally Qualified Health Centers." *JAMA Health Forum* 2(9): e212375-e212375.

Commonwealth of Virginia. 2023. "Scope of Vocational Rehabilitation Services for Individuals." Virginia Administrative Code, Agency 30, Chapter 20, Section 120. Available at: https://law.lis.virginia.gov/admincode/title22/agency30/chapter20/section120/

Deshpande, Manasi and Michael Mueller-Smith. 2022. "Does Welfare Prevent Crime? The Criminal Justice Outcomes of Youth Removed from SSI." *The Quarterly Journal of Economics* 137(4): 2263-2307.

Deshpande, Manasi. 2016. "Does Welfare Inhibit Success? The Long-Term Effects of Removing Low-Income Youth from the Disability Rolls." *American Economic Review* 106(11): 3300-3330.

Duggan M. G. and M. S. Kearney. 2007. "The Impact of Child SSI Enrollment on Household Outcomes." *Journal of Policy Analysis and Management* 26: 861-885.

Guldi, Melanie, Amelia Hawkins, Jeffrey Hemmeter, and Lucie Schmidt. 2022. "Supplemental Security Income for Children, Maternal Labor Supply, and Family Well-Being: Evidence from Birth Weight Eligibility Cutoffs." *Journal of Human Resources* 0818-9654R2.

Hemmeter, Jeffrey, David R. Mann, and David C. Wittenburg. 2017. "Supplemental Security Income and the Transition to Adulthood in the United States: State Variations in Outcomes Following the Age-18 Redetermination." *Social Service Review* 91(1): 106-133.

Kaplan, M. S., N. Huguet, D. H. Feeny, and B. H. McFarland. 2010. "Self-reported Hypertension Prevalence and Income among Older Adults in Canada and the United States." *Social Science & Medicine* 70(6): 844-849.

Ko, Hansoo, Renata E. Howland, and Sherry A. Glied. 2020. "The Effects of Income on Children's Health: Evidence from Supplemental Security Income Eligibility under New York State Medicaid." Working Paper w26639. Cambridge, MA: National Bureau of Economic Research.

Kolesár M. and C. Rothe. 2018. "Inference in Regression Discontinuity Designs with a Discrete Running Variable." *American Economic Review* 108(8): 2277-2304.

Levere, Michael. 2021. "The Labor Market Consequences of Receiving Disability Benefits during Childhood." *Journal of Human Resources* 56(3): 850-877.

Ludwig, J., G. J. Duncan, L. A. Gennetian, L. F. Katz, R. C. Kessler, J. R. Kling, and L. Sanbonmatsu. 2012. "Neighborhood Effects on the Long-Term Well-Being of Low-Income Adults." *Science* 337(6101): 1505-1510.

Ludwig, J., L. Sanbonmatsu, L. Gennetian, E. Adam, G. J. Duncan, L. F. Katz, . . . T. W. McDade. 2011. "Neighborhoods, Obesity, and Diabetes—a Randomized Social Experiment." *New England Journal of Medicine* 365(16): 1509-1519.

Mensah, G. A., A. H. Mokdad, E. S. Ford, K. J. Greenlund, and J. B. Croft. 2005. "State of Disparities in Cardiovascular Health in the United States." *Circulation* 111(10): 1233-1241.

Odutayo, A., P. Gill, S. Shepherd, A. Akingbade, S. Hopewell, K. Tennankore, . . . C. A. Emdin. 2017. "Income Disparities in Absolute Cardiovascular Risk and Cardiovascular Risk Factors in the United States, 1999-2014." *JAMA Cardiology* 2(7): 782-790.

Opuni M., A. Peterman, and D. Bishai. 2010. "Inequality in Prime-Age Adult Deaths in a High AIDS Mortality Setting: Does the Measure of Economic Status Matter?" *Health Economics* 20(11): 1298-1311.

Sevak, Purvi and Steven Bruns. 2018. "What Have We Learned About SSI Receipt Among Children?" DRC Brief Number: 2018-06. Washington, DC: Mathematica Policy Research.

Singh, G. K., M. Siahpush, and M. D. Kogan. 2010. "Rising Social Inequalities in US Childhood Obesity, 2003–2007." *Annals of Epidemiology* 20(1): 40-52.

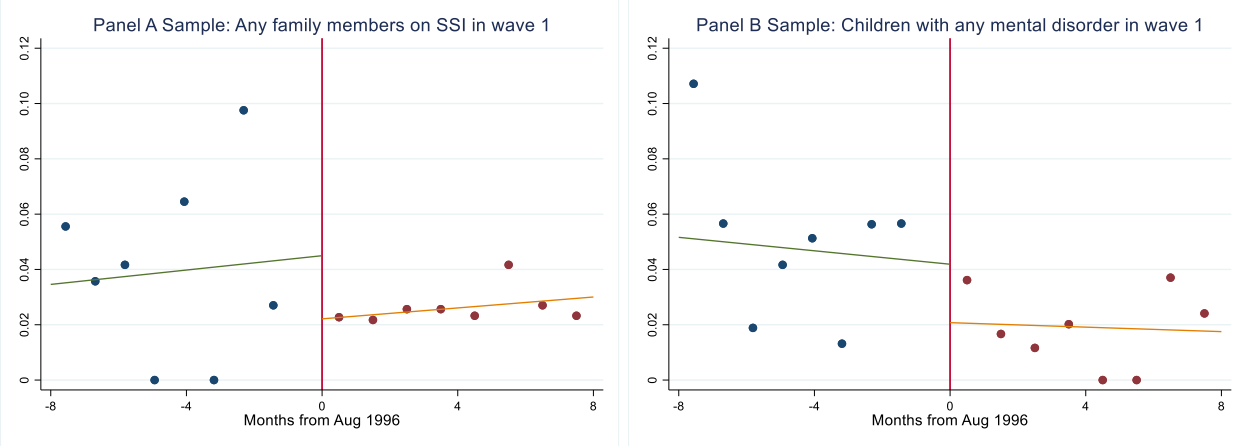
Thomas, E. M. 2006. "Readiness to Learn at School among Five-Year-Old Children in Canada." Statistics Canada. Ottawa, Canada.

U.S. Social Security Administration (SSA). 2021. “Annual Statistical Supplement to the Social Security Bulletin, 2021.” SSA Publication No. 13-11700. Washington, DC.

U.S. Social Security Administration (SSA). 2022. “Annual Report of the Supplemental Security Income Program.” Washington, DC.

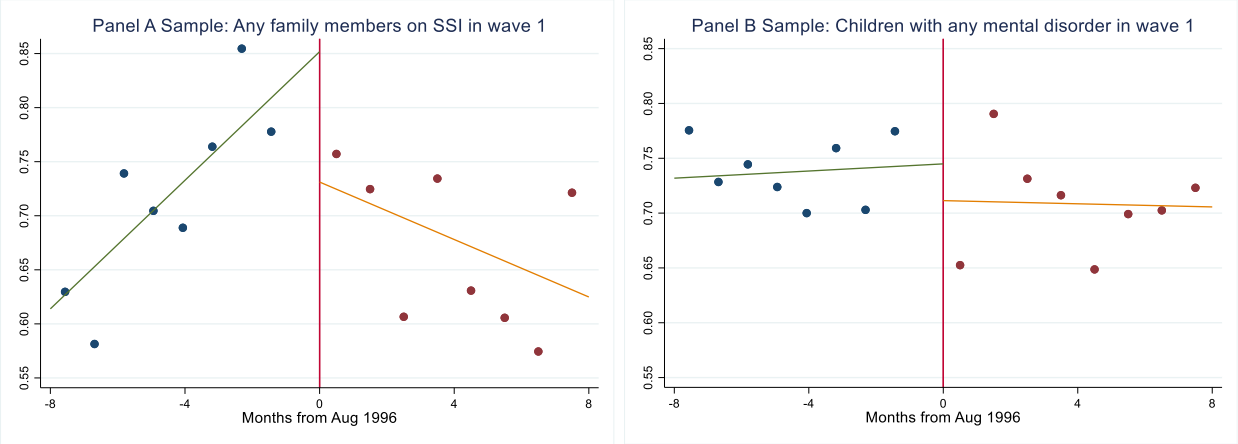
Zahran, H. S., C. M. Bailey, S. A. Damon, P. L. Garbe, and P. N. Breysse. 2018. “Vital Signs: Asthma in Children - United States, 2001-2016.” *Morbidity and Mortality Weekly Report* 67(5): 149-155.

Figure 1. *Percentage of Add Health Respondents Who Likely Received SSI in Wave 3 Based on the Month They Turned Age 18 Relative to August 1996*



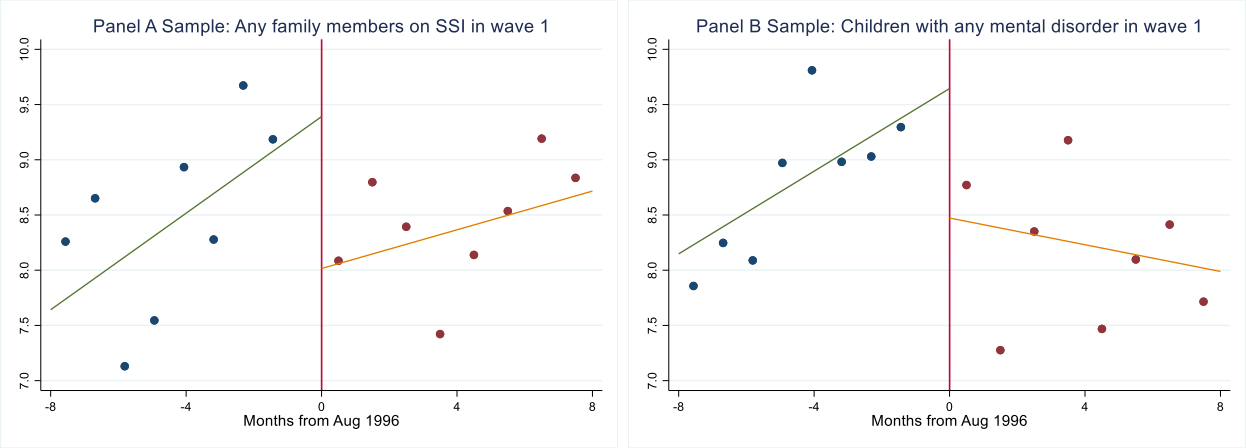
Notes: Sample includes children with an 18th birthday within 24 months of the August 1996 cutoff (N=790 for panel A and N=1,561 for panel B). The x-axis represents the number of months from August 1996 that the respondent turned 18, grouped into three-month bins. Figures plot local linear regression fitted lines using triangular kernel function, estimated separately on each side of the threshold, along with mean values of outcomes for each 3-month bin. The proxy measure used for receiving SSI in wave 3 is that the respondent responded affirmatively to enrolling in Medicaid and also to having received SSI, UI, WC, or DI in wave 3.

Figure 2. *Impact of Turning Age 18 After August 1996 on College Attendance*



Notes: Sample includes children with an 18th birthday within 24 months of the August 1996 cutoff (N=790 for panel A and N=1,561 for panel B). The x-axis represents the number of months from August 1996 that the respondent turned 18, grouped into three-month bins. Figures plot local linear regression fitted lines using triangular kernel function, estimated separately on each side of the threshold, along with mean values of outcomes for each 3-month bin.

Figure 3. *Impact of Turning Age 18 After August 1996 on Years of Education*



Notes: Sample includes children with an 18th birthday within 24 months of the August 1996 cutoff (N=790 for panel A and N=1,561 for panel B). The x-axis represents the number of months from August 1996 that the respondent turned 18, grouped into three-month bins. Figures plot local linear regression fitted lines using triangular kernel function, estimated separately on each side of the threshold, along with mean values of outcomes for each 3-month bin.

Table 1. *Summary Statistics*

Panel A Sample: Any Family Members on SSI in Wave 1

Sample restriction	Turned age 18 before 8/1996	Turned age 18 after 8/1996	P-value of difference
Female	0.489	0.484	0.885
Non-Hispanic White	0.325	0.412	0.012
Non-Hispanic Black	0.333	0.300	0.316
Non-Hispanic Asian	0.061	0.030	0.036
Hispanic	0.225	0.209	0.594
Household income in Wave 1 ($1,000)	27.347 (58.183)	25.540 (48.908)	0.635
Living with a single mom	0.403	0.437	0.330
Living with no parents	0.147	0.107	0.089
Parents have any disabilities	0.222	0.302	0.011
Observations	360	430	

Panel B Sample: Children with Any Mental Disorder in Wave 1

Sample restriction	Turned age 18 before 8/1996	Turned age 18 after 8/1996	P-value of difference
Female	0.338	0.367	0.245
Non-Hispanic White	0.583	0.577	0.838
Non-Hispanic Black	0.179	0.175	0.840
Non-Hispanic Asian	0.021	0.014	0.325
Hispanic	0.153	0.175	0.234
Household income in Wave 1 ($1,000)	44.578 (64.699)	44.194 (65.728)	0.908
Living with a single mom	0.266	0.318	0.026
Living with no parents	0.082	0.044	0.002
Parents have any disabilities	0.085	0.108	0.124
Observations	721	840	

Table 2. *Impact of Turning Age 18 After August 1996 on SSI Receipt during Wave 3 of Add Health Survey*

Panel A Sample: Any Family Members on SSI in Wave 1 (N=790)

	Enrolling in Medicaid + Receiving SSI, UI, WC, or DI	Medicaid coverage (Wave 3)
Monthly bins		
Age 18 after Aug 1996	-0.019 (0.035)	-0.018 (0.045)
Bimonthly bins		
Age 18 after Aug 1996	-0.041 (0.034)	-0.057 (0.055)
Quarterly bins		
Age 18 after Aug 1996	-0.042 (0.042)	-0.055 (0.056)

Panel B Sample: Children with Any Mental Disorder in Wave 1 (N=1,561)

	Enrolling in Medicaid + Receiving SSI, UI, WC, or DI	Medicaid coverage (Wave 3)
Monthly bins		
Age 18 after Aug 1996	-0.015 (0.019)	-0.049* (0.025)
Bimonthly bins		
Age 18 after Aug 1996	-0.021 (0.020)	-0.064** (0.028)
Quarterly bins		
Age 18 after Aug 1996	-0.019 (0.021)	-0.065** (0.029)

Notes: Regressions also include gender, race/ethnicity, and household income in Wave 1. Bandwidths: 24 months before and after Aug 1996. Standard errors, in parentheses, are clustered at the birth month bins. ***, **, *: significant at 0.01, 0.05, 0.1.

Table 3. *Potential Outcome Measures and Minimum Detectable Effect (MDE)*

Panel A Sample: Any Family Members on SSI in Wave 1 (N=790)

Variable	Control group mean	MDE	Our regression estimates
College attendance (Wave 5)	0.739	0.083	-0.159
Years of education (Wave 3)	8.646	0.200	-1.641
High school completion (Wave 5)	0.940	0.039	-0.023
Hypertension (Wave 5)	0.132	0.075	-0.023
Diabetes (Wave 5)	0.060	0.057	-0.027
Dyslipidemia (Wave 5)	0.111	0.071	0.044
Earnings (Wave 3)	12705	21900	11034
Positive earnings (Wave 3)	0.733	0.083	-0.036
Earnings > $15,000 (Wave 3)	0.628	0.094	0.004
Earnings (Wave 4)	24310	5056	-8341
Positive earnings (Wave 4)	0.811	0.072	-0.085
Earnings > $15,000 (Wave 4)	0.700	0.087	0.018
Earnings (Wave 5)	39442	9142	791
Positive earnings (Wave 5)	0.874	0.059	0.032
Earnings > $15,000 (Wave 5)	0.802	0.073	0.043
Ever been arrested (Wave 5)	0.159	0.080	0.039
Ever been incarcerated (Wave 5)	0.093	0.067	0.023
Ever been charged (Wave 5)	0.450	0.100	0.033
Children – Good health status (Wave 5)	0.747	0.087	-0.156
Children – Developmental delay (Wave 5)	0.049	0.058	0.038
Children – Obesity (Wave 5)	0.016	0.041	0.032
Children – Diabetes (Wave 5)	0.004	0.030	-0.001
Children – Asthma (Wave 5)	0.118	0.078	0.127

Panel B Sample: Children with Any Mental Disorder in Wave 1 (N=1,561)

Variable	Control group mean	MDE	Our regression estimates
College attendance (Wave 5)	0.749	0.081	-0.036
Years of education (Wave 3)	8.906	0.200	-1.112
High school completion (Wave 5)	0.963	0.029	-0.043
Hypertension (Wave 5)	0.096	0.067	0.068
Diabetes (Wave 5)	0.043	0.051	-0.010
Dyslipidemia (Wave 5)	0.088	0.065	0.030
Earnings (Wave 3)	14364	10900	6693
Positive earnings (Wave 3)	0.776	0.056	0.039
Earnings > $15,000 (Wave 3)	0.650	0.066	0.038
Earnings (Wave 4)	24310	5922	3107
Positive earnings (Wave 4)	0.781	0.056	-0.036
Earnings > $15,000 (Wave 4)	0.684	0.064	0.040
Earnings (Wave 5)	39442	6378	8362
Positive earnings (Wave 5)	0.888	0.041	-0.036

Earnings > $15,000 (Wave 5)	0.832	0.050	0.010
Ever been arrested (Wave 5)	0.140	0.077	0.031
Ever been incarcerated (Wave 5)	0.063	0.058	0.030
Ever been charged (Wave 5)	0.425	0.100	0.093
Children – Good health status (Wave 5)	0.736	0.075	0.075
Children – Developmental delay (Wave 5)	0.058	0.049	0.013
Children – Obesity (Wave 5)	0.008	0.026	0.020
Children – Diabetes (Wave 5)	0.005	0.023	-0.013
Children – Asthma (Wave 5)	0.103	0.061	0.015

Notes: Control group consists of children turning age 18 before the August 1996 cutoff. MDEs are calculated by two-sample power analyses (alpha=0.05 & power=0.8). Coefficient estimates are from regressions using quarterly bins.

Table 4. *Impact of Turning Age 18 After August 1996 on Education Outcomes*

Panel A Sample: Any Family Members on SSI in Wave 1 (N=790)

	High school completion (Wave 5)	College attendance (Wave 5)	Years of education (Wave 3)
Panel A. Monthly bins			
Age 18 after Aug 1996	-0.024	-0.138**	-1.103
	(0.038)	(0.067)	(0.832)
Panel B. Bimonthly bins			
Age 18 after Aug 1996	-0.019	-0.135*	-1.632*
	(0.045)	(0.072)	(0.880)
Panel C. Quarterly bins			
Age 18 after Aug 1996	-0.023	-0.159**	-1.641
	(0.041)	(0.069)	(1.009)
Control group mean	0.940	0.739	8.646

Panel B Sample: Children with Any Mental Disorder in Wave 1 (N=1,561)

	High school completion (Wave 5)	College attendance (Wave 5)	Years of education (Wave 3)
Panel A. Monthly bins			
Age 18 after Aug 1996	-0.032	-0.015	-1.009*
	(0.022)	(0.043)	(0.558)
Panel B. Bimonthly bins			
Age 18 after Aug 1996	-0.041*	-0.035	-1.076*
	(0.022)	(0.045)	(0.605)
Panel C. Quarterly bins			
Age 18 after Aug 1996	-0.043*	-0.036	-1.112*
	(0.023)	(0.043)	(0.623)
Control group mean	0.963	0.749	8.906

Notes: Regressions also include gender, race/ethnicity, and household income in Wave 1. Bandwidths: 24 months before and after Aug 1996. Standard errors, in parentheses, are clustered at the birth month bins. ***, **, *: significant at 0.01, 0.05, 0.1.

Table 5. *Impact of Turning Age 18 After August 1996 on Health Outcomes*

Panel A Sample: Any Family Members on SSI in Wave 1 (N=790)

	Ever been diagnosed with hypertension (Wave 5)	Ever been diagnosed with diabetes (Wave 5)	Ever been diagnosed with dyslipidemia (Wave 5)
Panel A. Monthly bins			
Age 18 after Aug 1996	-0.050 (0.045)	-0.018 (0.031)	0.031 (0.047)
Panel B. Bimonthly bins			
Age 18 after Aug 1996	-0.029 (0.052)	-0.034 (0.038)	0.027 (0.053)
Panel C. Quarterly bins			
Age 18 after Aug 1996	-0.023 (0.050)	-0.027 (0.038)	0.044 (0.053)
Control group mean	0.132	0.060	0.111

Panel B Sample: Children with Any Mental Disorder in Wave 1 (N=1,561)

	Ever been diagnosed with hypertension (Wave 5)	Ever been diagnosed with diabetes (Wave 5)	Ever been diagnosed with dyslipidemia (Wave 5)
Panel A. Monthly bins			
Age 18 after Aug 1996	0.049 (0.031)	-0.014 (0.017)	0.027 (0.030)
Panel B. Bimonthly bins			
Age 18 after Aug 1996	0.068** (0.030)	-0.014 (0.018)	0.032 (0.031)
Panel C. Quarterly bins			
Age 18 after Aug 1996	0.068** (0.031)	-0.010 (0.019)	0.030 (0.031)
Control group mean	0.096	0.043	0.088

Notes: Regressions also include gender, race/ethnicity, community fixed effects, and household income in Wave 1. Bandwidths: 24 months before and after Aug 1996. Standard errors, in parentheses, are clustered at the birth month bins. ***, **, *: significant at 0.01, 0.05, 0.1.

Table 6. *Impact of Turning Age 18 After August 1996 on Education and Health Index Outcomes*

Panel A Sample: Any Family Members on SSI in Wave 1 (N=790)

	Education index	Health index
Monthly bins		
Age 18 after Aug 1996	-0.359	0.082
	(0.247)	(0.197)
Bimonthly bins		
Age 18 after Aug 1996	-0.336	-0.101
	(0.283)	(0.228)
Quarterly bins		
Age 18 after Aug 1996	-0.395	0.032
	(0.254)	(0.232)

Panel B Sample: Children with Any Mental Disorder in Wave (N=1,561)

	Education index	Health index
Monthly bins		
Age 18 after Aug 1996	-0.183	0.096
	(0.147)	(0.124)
Bimonthly bins		
Age 18 after Aug 1996	-0.260*	-0.152
	(0.150)	(0.123)
Quarterly bins		
Age 18 after Aug 1996	-0.271*	-0.160
	(0.148)	(0.121)

Notes: Index outcomes were taken from principal component analyses using the variables shown in Appendix Table 1, and have means of zero and standard deviation of 1. Regressions also include gender, race/ethnicity, and household income in Wave 1. Standard errors, in parentheses, are clustered at the birth month bins. Bandwidths: 24 months before and after Aug 1996. ***, **, *: significant at 0.01, 0.05, 0.1.

Table 7. *Impact of Turning Age 18 After August 1996 on Child's Health Outcomes*

Panel A Sample: Any Family Members on SSI in Wave 1 (N=513)

	Good health status (Wave 5)	Developmental delay (Wave 5)	Obesity (Wave 5)	Diabetes (Wave 5)	Asthma (Wave 5)
Panel A. Monthly bins					
Age 18 after Aug 1996	-0.120	0.059	0.058	0.001	0.160*
	(0.102)	(0.052)	(0.0441)	(0.008)	(0.093)
Panel B. Bimonthly bins					
Age 18 after Aug 1996	-0.115	0.027	0.030	-0.001	0.136
	(0.105)	(0.046)	(0.035)	(0.008)	(0.098)
Panel C. Quarterly bins					
Age 18 after Aug 1996	-0.156	0.038	0.032	-0.001	0.127
	(0.114)	(0.049)	(0.037)	(0.009)	(0.101)
Control group mean	0.747	0.049	0.016	0.004	0.118

Panel B Sample: Children with Any Mental Disorder in Wave 1 (N=765)

	Good health status (Wave 5)	Developmental delay (Wave 5)	Obesity (Wave 5)	Diabetes (Wave 5)	Asthma (Wave 5)
Panel A. Monthly bins					
Age 18 after Aug 1996	0.062	0.001	0.020	-0.013	0.014
	(0.071)	(0.033)	(0.017)	(0.008)	(0.048)
Panel B. Bimonthly bins					
Age 18 after Aug 1996	0.079	0.014	0.017	-0.014	0.017
	(0.078)	(0.042)	(0.019)	(0.009)	(0.053)
Panel C. Quarterly bins					
Age 18 after Aug 1996	0.075	0.013	0.020	-0.013	0.015
	(0.079)	(0.040)	(0.018)	(0.009)	(0.055)
Control group mean	0.736	0.058	0.008	0.005	0.103

Notes: Regressions also include gender, race/ethnicity, community fixed effects, and household income in Wave 1. Bandwidths: 24 months before and after Aug 1996. Standard errors, in parentheses, are clustered at the parents' birth month bins. ***, **, *: significant at 0.01, 0.05, 0.1.

Appendix Figures and Tables

Appendix Table 1. *Summary Index Components*

Index	Summary index components
Education	College attendance (Wave 5), Years of education (Wave 3), High school completion (Wave 5)
Health	Ever been diagnosed with hypertension (Wave 5), Ever been diagnosed with diabetes (Wave 5), Ever been diagnosed with dyslipidemia (Wave 5)

Appendix Table 2. *Impact of Turning Age 18 After August 1996 on Long-Term Employment Outcomes*

Panel A Sample: Any Family Members on SSI in Wave 1 (N=790)

	Calculated earnings (Wave 3)[a]	Positive calculated earnings (Wave 3) [a]	Calculated earnings > $15,000 (Wave 3) [a]	Personal earnings (Wave 4)[b]	Positive personal earnings (Wave 4) [b]	Personal earnings> $15,000 (Wave 4) [b]	Income from personal earnings (Wave 5)	Positive income from personal earnings (Wave 5)	Income from personal earnings > $15,000 (Wave 5)
Panel A. Monthly bins									
Age 18 after Aug 1996	12724.669	-0.063	-0.008	-5872.031	-0.071	0.001	3172.361	0.030	0.033
	(16437.43)	(0.064)	(0.067)	(4026.81)	(0.058)	(0.066)	(8958.504)	(0.050)	(0.059)
Panel B. Bimonthly bins									
Age 18 after Aug 1996	10431.885	-0.022	0.014	-8307.399*	-0.083	0.013	950.875	0.039	0.054
	(15744.48)	(0.074)	(0.076)	(4826.263)	(0.065)	(0.073)	(9642.739)	(0.057)	(0.064)
Panel C. Quarterly bins									
Age 18 after Aug 1996	11033.787	-0.036	0.004	-8341.029*	-0.085	0.018	791.339	0.032	0.043
	(16451.21)	(0.081)	(0.083)	(4642.445)	(0.064)	(0.075)	(11263.67)	(0.056)	(0.065)

Panel B Sample: Children with Any Mental Disorder in Wave 1 (N=1,561)

	Calculated earnings (Wave 3)[a]	Positive calculated earnings (Wave 3) [a]	Calculated earnings > $15,000 (Wave 3) [a]	Personal earnings (Wave 4)[b]	Positive personal earnings (Wave 4) [b]	Personal earnings> $15,000 (Wave 4) [b]	Income from personal earnings (Wave 5)	Positive income from personal earnings (Wave 5)	Income from personal earnings > $15,000 (Wave 5)
Panel A. Monthly bins									
Age 18 after Aug 1996	5651.844	0.009	0.009	2778.141	-0.025	0.028	7940.034	-0.031	0.008
	(6250.051)	(0.041)	(0.047)	(3802.805)	(0.039)	(0.045)	(6197.578)	(0.031)	(0.036)
Panel B. Bimonthly bins									
Age 18 after Aug 1996	7832.744	0.035	0.034	3418.678	-0.035	0.029	8960.743	-0.025	0.015
	(7582.643)	(0.043)	(0.048)	(3564.481)	(0.041)	(0.045)	(6609.611)	(0.033)	(0.037)
Panel C. Quarterly bins									
Age 18 after Aug 1996	6692.785	0.039	0.038	3107.011	-0.036	0.040	8362.568	-0.036	0.010
	(6292.73)	(0.044)	(0.050)	(3688.354)	(0.041)	(0.047)	(7190.992)	(0.034)	(0.040)

[a] Calculated earnings in wave 3 is a continuous variable calculated based on reported hourly wages and hours worked.

[b] Personal earnings in wave 4 is created from a categorical variable in which the respondent reports their best guess of their personal earnings before taxes.

[c] Income from personal earnings in wave 5 is created from a categorical variable in which the respondent reports how much income they received from personal earnings.

Notes: Regressions also include gender, race/ethnicity, and household income in Wave 1. Bandwidths: 24 months before and after Aug 1996. Standard errors, in parentheses, are clustered at the birth month bins. ***, **, *: significant at 0.01, 0.05, 0.1.

Appendix Table 3. *Impact of Turning Age 18 After August 1996 on Long-Term Crime Outcomes*

Panel A Sample. Any Family Members on SSI in Wave 1, Bandwidths: 24 Months Before and After Aug 1996 (N=790)

	Ever been arrested (Wave 5)	Ever been incarcerated (Wave 5)	Ever been charged[&] (Wave 5)
Panel A. Monthly bins			
Age 18 after Aug 1996	0.052 (0.055)	0.030 (0.046)	0.041 (0.071)
Panel B. Bimonthly bins			
Age 18 after Aug 1996	0.031 (0.062)	0.012 (0.049)	0.021 (0.074)
Panel C. Quarterly bins			
Age 18 after Aug 1996	0.039 (0.063)	0.023 (0.050)	0.033 (0.076)

Panel B Sample: Children with Any Mental Disorder in Wave 1, Bandwidths: 24 Months Before and After Aug 1996 (N=1,561)

	Ever been arrested (Wave 5)	Ever been incarcerated (Wave 5)	Ever been charged[&] (Wave 5)
Panel A. Monthly bins			
Age 18 after Aug 1996	-0.021 (0.037)	0.030 (0.028)	0.088* (0.049)
Panel B. Bimonthly bins			
Age 18 after Aug 1996	0.032 (0.038)	0.032 (0.029)	0.093* (0.050)
Panel C. Quarterly bins			
Age 18 after Aug 1996	0.031 (0.038)	0.030 (0.030)	0.090* (0.051)

[&] Any charges with driving under the influence, alcohol-related offenses, marijuana offenses, drug offenses, robbery, theft, forcible rape, manslaughter/murder, simple assault, fraud, civil disobedience, or any other offenses.
Notes: Regressions also include gender, race/ethnicity, and household income in Wave 1. Standard errors, in parentheses, are clustered at the birth month bins. ***, **, *: significant at 0.01, 0.05, 0.1.

Appendix Table 4. *Impact of Turning Age 18 After August 1996 on Family Outcomes*

Panel A Sample: Any Family Members on SSI in Wave 1 (N=790)

	Married (Wave 4)	Married (Wave 5)	Having any child (Wave 5)
Panel A. Monthly bins			
Age 18 after Aug 1996	-0.077	-0.059	0.004
	(0.060)	(0.058)	(0.064)
Panel B. Bimonthly bins			
Age 18 after Aug 1996	-0.061	-0.080	-0.046
	(0.064)	(0.067)	(0.072)
Panel C. Quarterly bins			
Age 18 after Aug 1996	-0.062	-0.091	-0.043
	(0.064)	(0.064)	(0.076)

Panel B Sample: Children with Any Mental Disorder in Wave 1 (N=1,561)

	Married (Wave 4)	Married (Wave 5)	Having any child (Wave 5)
Panel A. Monthly bins			
Age 18 after Aug 1996	-0.046	0.017	0.027
	(0.044)	(0.038)	(0.044)
Panel B. Bimonthly bins			
Age 18 after Aug 1996	-0.031	0.022	0.014
	(0.046)	(0.041)	(0.046)
Panel C. Quarterly bins			
Age 18 after Aug 1996	-0.046	0.005	0.012
	(0.048)	(0.040)	(0.047)

Notes: Regressions also include gender, race/ethnicity, community fixed effects, and household income in Wave 1. Bandwidths: 24 months before and after Aug 1996. Standard errors, in parentheses, are clustered at the birth month bins. ***, **, *: significant at 0.01, 0.05, 0.1

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