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THE IMPACT OF LOSING CHILD DISABILITY BENEFITS ON HEALTH OUTCOMES

Priyanka Anand

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Center for Retirement Research at Boston College
Haley House
140 Commonwealth Avenue
Chestnut Hill, MA 02467
Tel: 617-552-1762 Fax: 617-552-0191
https://crr.bc.edu

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Center for Retirement Research at Boston College
Haley House
140 Commonwealth Avenue
Chestnut Hill, MA 02467
Tel: 617-552-1762 Fax: 617-552-0191
https://crr.bc.edu

Affiliated Institutions:
The Brookings Institution
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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. This paper uses data from the *National Longitudinal Study of Adolescent to Adult Health* (Add Health) to examine the impact of losing child SSI benefits upon turning 18 years old on health outcomes. I compare the physical and mental health outcomes of those who turned 18 just after August 1996 with those who turned 18 just before, given that the 1996 welfare reform increased the strictness of medical reviews for SSI beneficiaries who turned 18 after August 1996.

The paper found that:

- The results show that those who are likely to lose their SSI benefits at age 18 are less likely to be diagnosed with depression, anxiety, and chronic physical health conditions such as hypertension and diabetes.
- The lower diagnoses rates after losing child SSI benefits likely reflects a higher prevalence of untreated conditions due to lack of access to insurance and healthcare.

The policy implications of the findings are:

- It is important to consider the long-term health impacts of losing SSI at age 18 when considering future policy changes to SSI eligibility.
- The health impacts of losing SSI benefits at age 18 may also shed light on the implications of losing access to other safety net programs, such as Medicaid, which many recipients lost in 2023 following the end of the public health emergency.

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. The disability criteria to qualify as an adult 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. The main goal of this paper is to estimate the impact of losing child SSI benefits right after turning 18 on the physical and mental health outcomes.

There is a growing body of research that examines the adult outcomes of child SSI beneficiaries, but most of this work focuses on adult employment and income as an outcome. Levere (2021) finds that for individuals with mental disorders, increased exposure to SSI during childhood results in lower earnings in adulthood. Losing SSI benefits at age 18 seems to result 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 2016a). Together, this body of literature suggests that losing SSI benefits may have a large, negative impact on overall income because higher employment earnings do not typically fully replace the value of the benefits. Most of the research on non-employment outcomes examines the impact of receiving SSI at birth, and the findings are mixed. Ko et al. (2020) find that receiving SSI at birth results in a higher likelihood of moving to a higher-income neighborhood, which has generally been shown to have long-term positive impacts on outcomes such as college attainment, marriage, and fertility outcomes (Chetty et al. 2016; Chetty and Hendren 2018; and Chyn 2018); however, Hawkins et al. (2023) do not find an impact when looking directly at the impact of receiving SSI at birth on educational performance in high school, college attainment, or health outcomes in young adulthood. Finally, there is some limited evidence that disability benefit receipt may have intergenerational effects as well; for

example, Dahl et al. (2014) find that, in Norway, receipt of disability benefits increases the likelihood of their adult children receiving disability benefits.

This paper explores the impact of losing SSI after age 18 on physical and mental health outcomes. Comparing the outcomes of child SSI beneficiaries who lost their benefits after turning 18 to those who did not lose their benefits may suffer from bias, given that those who lose their benefits could be different in terms of their observed and unobserved characteristics. As a result, I exploit exogenous variation in the likelihood of losing child SSI benefits generated by the Personal Responsibility and Work Opportunity Reconciliation Act (PRWORA, also known as the 1996 welfare reform). Starting in 1996, PRWORA 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) show 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 a 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. I use this variation to estimate regression discontinuity and difference-in-differences models that compare 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). Additionally, I use neighboring cohorts of child SSI beneficiaries as a comparison group in the difference-in-differences model. Finally, I use these same methods to explore where there are intergenerational impacts from losing these benefits on the children of affected SSI recipients. The results show that those who were more likely to lose their childhood SSI benefits at age 18 have a lower likelihood of being diagnosed with depression, anxiety, and chronic physical health conditions such as hypertension and diabetes. This is likely due to a higher prevalence of untreated conditions among those who lose their SSI benefits at age 18 as a result of lack of access to care and insurance. The results regarding the intergenerational effects of losing SSI benefits at age 18 are inconclusive due to small sample sizes and potential bias in family structure among those who lost their benefits.

The organization of this paper is as follows. The second section provides background on the SSI program and the 1996 welfare reform, which provides the exogenous variation used for the identification strategy. The third section presents the conceptual framework for the analyses. The fourth describes the data used for the empirical work, which is described in the fifth section. The results of the empirical work are presented in the sixth section, and the seventh section 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. 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 are 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.

SSI is one of the main government programs that provide 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 the child population grew just 15 percent over this 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.

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

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

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. These beneficiaries still had to go through adult medical reviews, but they were much less strict than the age 18 redetermination because the disability examiner had to demonstrate medical improvement since the last decision; furthermore, while adult medical reviews were supposed to happen every three years, in practice, the frequency of the reviews were based on funding (Deshpande 2016a). Furthermore, the disability criteria to qualify for SSI differ 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.

As a result of the 1996 welfare reform, child SSI beneficiaries – especially those with mental disorders (Hemmeter et al. 2009) – 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 (2016a) uses 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

This paper examines whether there is a relationship between losing SSI benefits at age 18 and health outcomes. There are several mechanisms by which this relationship may exist. One reason 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. For example, there is strong evidence that Medicaid disenrollment leads to substantial reductions in psychiatric hospitalizations and

[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.

outpatient visits for mental health disorders (Maclean et al. 2023 and Ji et al. 2019), given the critical role Medicaid plays in enhancing access to mental health treatment and reducing perceived unmet needs (Walker et al. 2015). Losing Medicaid decreases access to medical providers, including mental health professionals such as psychiatrists, psychologists, psychiatric nurses, and clinical social workers (Mojtabai 2019). While there has been limited research on the impacts of losing Medicaid coverage on physical health outcomes, Cole et al. (2021) find that the ACA Medicaid expansions are associated with an increase in hypertension and diabetes diagnoses and 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 from 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, therefore, poor diagnoses and management of these chronic conditions. Leaving chronic conditions untreated can lead to additional health problems; for example, untreated diabetes can lead to heart disease, kidney disease, or stroke.

Another mechanism for why losing SSI benefits at age 18 may have a negative impact on health is that Deshpande (2016a) provides compelling evidence that losing child SSI benefits at age 18 decreases overall income, and lower income can be correlated with lower health outcomes. For example, it has been well documented that hypertension (Kaplan et al. 2010; and Mensah et al. 2005), diabetes (Beckles and Chou 2016 and Chen et al. 2023), high cholesterol (Beckman et al. 2017), and obesity (Kim and von dem Knesebeck 2018) 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. Moreover, individuals with lower incomes frequently experience higher rates of depression and other mental health issues (Thomson et al. 2022). Financial stress is associated with higher levels of depression, particularly for low-income populations (Guan et al. 2022), and households with lower income in the U.S. are more likely to have several lifetime mental disorders, suicide attempts, and a higher risk of incident mental disorders (Sareen et al. 2011). This correlation often reflects a U-shaped relationship, where mental health costs increase beyond middle-income levels, suggesting a complex, nonlinear interaction between income and mental health (Li et al. 2022). Ridley et al. (2020) note that health insurance and other financial supports can mitigate the negative mental health impacts of poverty and economic shocks.

There is also a mechanism by which losing SSI benefits could have a positive impact on health due to its positive impact on employment. Van der Noordt et al. (2014) conducted a systematic review of the literature on the health effects of employment and found strong evidence of a protective effect of employment on depression and general mental health. This can be explained by having social support, a structured day, meaningful life goals, and a sense of personal achievement. The systematic review was unable to conclude the impact of employment on physical health due to a lack of studies and inconsistent findings. Of the four papers the authors identified, one found a negative effect of employment on general health, one found a positive effect, and two found no effects. The negative effect on physical health can be explained by heavy physical work and stressors, while the positive effect could be due to better living standards and healthy behaviors that are associated with employment. Despite the lack of empirical evidence on the direction of this relationship, there is a theoretical pathway in which losing SSI benefits has positive health benefits (both mental and physical) due to increasing employment.

There also may be intergenerational health impacts of losing SSI benefits. Deshpande (2016a) shows that losing SSI at age 18 causes lower overall 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 report that children from lower-income households are more likely to have a developmental delay (Assari and Caldwell 2019), obesity (Babey et al. 2010 and Singh et al. 2010), diabetes (Odutayo et al. 2017), or asthma (Zahran et al. 2018). Furthermore, lower income likely means living in a worse neighborhood, which may negatively impact children's health. Ludwig et al. (2011 and 2012) provide evidence that moving from a neighborhood with a 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. On the other hand, if losing SSI at age 18 improves the mental and physical health of the parent (as discussed earlier), this would likely have a positive impact on the health of their children.

To summarize the conceptual model, the sign of the relationship between losing SSI benefits and health outcomes is ambiguous, with theoretical mechanisms that could produce either a positive or negative relationship. The remainder of this paper will use survey data to test the sign of the relationship empirically. Specifically, I will test whether losing SSI benefits at

age 18 increases or decreases the likelihood of diagnosing and managing chronic conditions and mental health, along with the role of access to care and insurance in these relationships. I will also test the impact of losing SSI benefits at age 18 on the health outcomes for the beneficiaries' children in terms of their overall health status and having a developmental delay, obesity, diabetes, or asthma.

Data

I 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 in wave 1) to adulthood (ages 33 to 43 in wave 5). The in-home survey of the first wave was administered to more than 20,000 children in 1994-1995, which was before the 1996 welfare reform. The Add Health survey followed up with the respondents four more times in 1996, 2001-2002, 2008-2009, and 2016-2018. Appendix Table A1 summarizes the ages of all Add Health respondents in each wave. There were more than 12,000 respondents who remained in the survey in the fifth wave, and at that time, the respondents were in their 30s and early 40s, and their 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. The Add Health data are unique compared to other longitudinal datasets that follow children over time, such as the *Survey of Income and Program Participation* or *National Longitudinal Survey of Youth,* because the dataset includes children who turned 18 right around August 1996 and collects detailed information on many aspects of their lives for over 20 years. I examine outcomes in waves 3, 4 and 5 of the Add Health survey, when the age of most respondents ranges from their 20s to early 40s.

This study focuses on child SSI recipients, but unfortunately, SSI receipts are 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 the household 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 et al. (2024) for identifying child SSI beneficiaries in their paper on the impacts of receiving SSI at birth on child outcomes. As shown in Table 1 (which will be described in greater detail later in this section), the final Add Health analysis sample that uses

this household measure of SSI receipt shares similar characteristics as samples in other papers that use data that directly identify child SSI recipients. I further limit the sample to respondents whose parents do not report a disability themselves and whose household income was below the national median household income in 1994.[3] The additional sample restrictions attempt to remove households who receive SSI through the parent, particularly given the large increase in SSI participation among single mothers due to welfare reforms in the early 1990s (Schmidt and Sevak 2004) or mistakenly report SSI receipt even though their household income is too high. In wave 3, when respondents are 18 to 26 years old, they are asked whether they receive SSI, Social Security Disability Insurance, Worker's Compensation, or unemployment insurance (together in one yes or no question). I use this question as a proxy for SSI receipt in wave 3, even though it overestimates SSI receipt by including people who receive the other benefits and not SSI.

After identifying the sample of Add Health respondents who were likely to have received child SSI, the next step for the regression discontinuity and difference-in-differences models 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 respondents, which reveals when they turned 18 years old and would have to go through the SSI redetermination process. The window I use is 12 months before and after August 1996, which is larger than the 37 weeks (approximately 8.5 months) used by Deshpande 2016a, but the sample sizes are not large enough to support limiting the sample to 8.5 months before and after August 1996.

Table 2 shows the summary statistics for the entire sample of child SSI recipients and a covariate balance test by the date when they turned 18. The sample includes one observation for each wave that the respondent participated in after wave 3. Approximately half the sample is female, one-third is Black, and the average annual household income in wave 1 was approximately $15,000. As to be expected, those who turned 18 in the 12 months before August 1996 are slightly older than those who turned 18 in the 12 months after, which may also explain why they are slightly more likely to report feeling depressed a lot or most of the time. They are also less likely to be White, more likely to be Asian or Hispanic, have a slightly lower household income, and are more likely to be female and living with a single mom. It is not clear why the sample who turned 18 just before the cutoff have these slightly differing characteristics than those who turned 18 just after, but I control for gender, race, and wave 1 household income in

[3] The median household income in the United States in 1994 was $32,264, which I rounded down to $32,000.

my regression analyses to ensure that they are not driving the results. I also compare the age at high school graduation, given that August 1996 is near the birthday threshold for entering kindergarten, and do not find differences. Finally, I do not see evidence of differential attrition from the sample by waves 4 or 5 (Appendix Table A2).

To assess whether the proxy sample of child SSI beneficiaries is representative of the entire population of child SSI beneficiaries, I compare the wave 1 characteristics of the Add Health sample to published statistics on the available characteristics of child SSI beneficiaries in SSA administrative data (from Deshpande 2016a) and four nationally representative surveys that are summarized in Ireys et al. (2004).[4] The four surveys are the Na*tional Survey of SSI Children and Families* (NSCF), the *National Survey of Children with Special Health Care Needs* (CSHCN), the *Survey of Income and Program Participation* (SIPP), and the *National Health Interview Survey* (NHIS). The summary statistics for these four surveys are for SSI beneficiaries ages 0 to 17, which is a wider range than the Add Health sample of child SSI beneficiaries between 15 and 17 years old in wave 1. I also present summary statistics for SSI beneficiaries ages 13 to 17 in the NSCF, as presented in Rupp et al. (2005), which is closer to the Add Health sample's age range. Table 1 shows that the weighted means of the sample appear to be similar to the weighted means from the four nationally representative surveys, although there are some differences. The Add Health samples have a higher percentage of child SSI beneficiaries who are female and Hispanic and a lower percentage of beneficiaries who are living with a single mother or are Black than the other surveys. The average household income of the Add Health sample is lower than the NSCF sample of 13-17 year olds, but both datasets have a higher reported income than the SSI administrative data; this difference is likely because the Add Health and NSCF report all sources of household income (including income from benefits and other sources) while the administrative data only reports employment earnings. Despite these differences, the Add Health sample of presumed child SSI beneficiaries is similar enough to the entire population of child SSI beneficiaries for the results to be generalizable.

Regarding long-term outcome measures, the Add Health data has a wide variety of survey questions regarding well-being in waves 4 and 5. First, I create employment and crime

[4] I do not include the summary statistics from Deshpande and Mueller-Smith (2022) because they are the same as those presented in Deshpande (2016a) but split into those that were matched to the Criminal Justice Administrative Records System (CJARS) and those that were not. This distinction (CJARS versus non-CJARS) is not relevant to this study.

measures to replicate the findings in the existing literature. For the employment measures, I 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 to replicate the results in Deshpande (2016a). For the crime measures, I create indicators for whether the respondent has ever been arrested, charged with a crime, or incarcerated. These crime outcomes were selected to replicate the results in Deshpande and Muller-Smith (2022).

I then create the main measures of interest, which are physical and mental health outcomes for the respondents and their children. The measures of physical health are dummy variables for whether the respondent has ever been diagnosed with hypertension, diabetes, high cholesterol, or obesity. These conditions were selected because they all contribute to "metabolic syndrome," which is a cluster of conditions that occur together and increase the risk of heart disease, stroke, and type 2 diabetes (Mayo Clinic 2024; McInerney et al. 2020; and Hoynes et al. 2016). One concern may be that these measures are picking up on diagnoses before the respondent turned 18; however, as shown in Table 2, the difference between those who turned 18 before versus after August 1996 in reported obesity and diabetes in wave 1 of the survey is extremely small. My measures of mental health are whether the respondent has ever been diagnosed with depression or anxiety (waves 4 and 5 only) and a modified Patient Health Questionnaire-9 (PHQ-9) score that is often used to screen for, diagnose and monitor depression. The PHQ-9 score ranges from 0 to 27 and is based on a series of nine questions about the extent to which the respondent has experienced various symptoms of depression over the past two weeks. Using the Add Health data, I create a modified PHQ score that ranges from 0 to 12 based on four questions: the extent to which the respondent has experienced depression, sadness, or lack of sleep in the past week or suicidal thoughts in the past 12 months.

To reduce the number of outcome measures of physical health diagnoses, I create a summary index measure. Anderson (2008) highlights three advantages of using a summary index measure instead of individual tests. First, using an index measure avoids the problem of overtesting because each index is a single test. Second, an index measure allows the researcher to test whether the treatment has a general effect on a set of outcomes. Finally, an index measure may have more statistical power than individual tests because multiple outcomes approaching marginal significance may aggregate into a single index that is significant.

The physical health diagnoses index measures follow the method used by Kling et al. (2007): I create an equally weighted mean of the outcome measures within the given category, which is then converted into a z-score by subtracting the control group mean and dividing by the control group standard deviation. As a result, each index has a mean of zero and a standard deviation of one for the control group. As a robustness check, I create an alternative index 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 components of the health diagnoses index are whether the respondent has ever been diagnosed with hypertension, diabetes, or high cholesterol; I do not include obesity because many people may self-diagnose being obese without visiting a health care provider. For the health diagnoses index, negative estimates indicate a lower likelihood of being diagnosed with a chronic medical condition, which likely reflects a higher prevalence of untreated conditions.

Finally, the Add Health data contains information on the physical health outcomes of the children of the respondents, who tend to be between 7 and 11 years old during the fifth wave of the survey. I created a physical condition index for the respondents' children that includes dummy variables for whether the respondent reports in wave 5 that their child is in fair or poor health, or has had a developmental delay, obesity, diabetes, or asthma. All of these outcomes were selected because past literature and this paper's conceptual model indicate that they may be affected by childhood receipt of SSI benefits. Positive estimates indicate a higher likelihood of the SSI beneficiaries' children having a physical health condition.

Methodology

The relationship of interest is the impact of losing child SSI benefits at age 18 on long-term physical and mental health outcomes. The most basic method of assessing this relationship is to estimate the following ordinary least squares (OLS) regression on the sample of respondents who received child SSI benefits in wave 1 of the Add Health survey:

$$\mathrm{Y_{iw}} = \beta_0 + \beta_1 NoSSI_{i(3)} + \beta_2 \mathrm{X_{iw}} + \varepsilon_{\mathrm{iw}} \quad (1)$$

where *i* indexes the respondent and *w* indexes the survey wave. $NoSSI_{i(3)}$ is the measure of the child SSI beneficiary not receiving SSI benefits in wave 3, and 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. Because those who lose their SSI benefits are likely to be

in better health than those who do not, I also included self-reported health status as a control. The primary outcome measures, Y_{iw}, are physical and mental health measures for respondent *i* in wave *w*, which include having been diagnosed with hypertension, diabetes, high cholesterol, depression or anxiety, having reported being obese, the modified PHQ score for depression, and the physical health diagnoses index. I also examined employment and crime outcomes in an attempt to replicate the previous findings of Deshpande (2016a) and Deshpande and Mueller-Smith (2022) that used administrative data. I clustered the standard errors at the individual level. The specification in equation (1) provides the overall impact of losing SSI benefits at age 18, but I also estimated a specification where I included wave dummies and interact $NoSSI_i$ with the wave dummies, which allowed me to compare impacts in the short- (wave 3), medium- (wave 4) and long- (wave 5) run.

Our coefficient of interest, β_1, represents the relationship between losing SSI benefits at age 18 and the outcomes of interest. This estimate would be biased if there are unobservable characteristics of child SSI beneficiaries who lose their benefits at age 18 redetermination that are also correlated with their long-term health. I addressed this potential source of bias by controlling for self-reported health in the OLS regression, but also by estimating two additional regressions using the same source of exogenous variation as Deshpande (2016a), which is the lower likelihood of continuing SSI benefit receipt into adulthood after the PRWORA 1996 welfare reform. Specifically, I estimated a regression discontinuity (RD) model and a difference-in-difference (DD) model. The RD model compared the long-term health outcomes of child SSI beneficiaries who turned 18 in the 12-month window before August 1996 to those who turned 18 in the 12-month window after that date. Those who turned 18 before August 1996 were less likely to lose their child SSI benefits upon turning 18 and had medical reviews in adulthood that were less frequent and held to a lower standard compared to those who turned 18 after that date. The estimating RD regression is:

$$Y_{iw} = \alpha_0 + \alpha_1 PostAug96_i + \alpha_2 BirthMonth_i + \alpha_3 (PostAug96_i \; X \; BirthMonth_i) + \alpha_4 X_{iw} + \upsilon_{iw} \quad (2)$$

where $PostAug96_i$ 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 the running variable $BirthMonth_i$ is the difference between the month/year respondent *i* turned 18 and August 1996. The main results use two-month bins for the birth month, but I conducted

robustness checks using monthly and quarterly bins.[5] I also controlled for separate monthly trends ($PostAug96_i \; X \; BirthMonth_i$) in wave 3 SSI receipt before and after the 1996 welfare reform (Almond et al. 2010; Deshpande 2016a). X_{iw} is the same vector of covariates in equation 1, except it does not include a measure of self-reported health status. The primary outcome measures, Y_{iw}, are the same physical and mental health measures that I used in the OLS regression in Equation (1). I also estimated Equation (2) using the sample of children of survey respondents to examine intergeneration effects; that is, I examined whether there is an impact of their parents losing SSI benefits on whether they have certain medical conditions in wave 5. I clustered the standard errors at the birth month-bin level (which 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 I calculated similar standard errors using either method. The coefficient of interest, α_1, represents the impact of being likely to lose SSI at age 18 (due to turning 18 after August 1996) on the outcome of interest. I reported intent-to-treat estimates of the impacts of the 1996 welfare reform. Just as with the OLS model, I estimated an alternative specification that includes wave dummies and interactions with wave dummies to compare the short-, medium-, and long-term impacts.

I provided a visual depiction of the unadjusted RD model by plotting the residualized outcomes by the month/year the respondent turned 18, where I grouped the month/year into two-month bins. To 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, I estimated 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.

Because the sample sizes are relatively small and an RD design often requires large samples to detect statistically significant effects, the second model I estimated is a DD model that includes respondents who turned 18 in a 12-month window around August 1998 as a control group. This follows the methods used by Deshpande (2016b), who also paired RD with DD in a similar context. The DD model has the additional advantage of controlling for any potential

[5] I am unable to examine bins smaller than one month because I do not know the day the respondent was born.

birth-month-invariant differences between the treatment and control groups. The DD model I estimated takes on the following specification:

$$Y_{iw} = \delta_0 + \delta_1 PostAug_i + \delta_2 96Cohort_i + \delta_3 (PostAug_i \; X \; 96Cohort_i) + \delta_4 X_{iw} + \eta_{iw} \quad (3)$$

where $PostAug_i$ is an indicator for turning 18 between August 1996 and the end of the time window for the 96 cohort or between August 1998 and the end of the time window for the 98 cohort. $96Cohort_i$ is an indicator of the 96 cohort, those who turned 18 in a 12-month window around August 1996. The coefficient of interest is δ_3, which represents the difference in outcomes between those who turn 18 before and after August 1996 compared to the difference in outcomes between those who turn 18 before and after August 1998. Just like in the RD model, I calculated robust standard errors that are clustered at the birth month-bin level and estimated an alternative specification that includes wave dummies and interactions with wave dummies in order to compare the short-, medium- and long-term impacts.

The first identifying assumption underlying both the RD and DD models is that there must be a change in the treatment variable for those who turn 18 before and after August 1996. Deshpande (2016a) has already shown that child SSI beneficiaries who turn 18 after August 1996 are less likely to have benefits in adulthood, but I also test this assumption using the Add Health data by estimating the following parametric linear RD and DD models:

$$SSI_{i(3)} = \mu_0 + \mu_1 PostAug96_i + \mu_2 BirthMonth_i + \mu_3 (PostAug96_i \; X \; BirthMonth_i) + \mu_4 X_i + \xi_i \quad (4)$$

$$SSI_{i(3)} = \pi_0 + \pi_1 PostAug_i + \pi_2 96Cohort_i + \pi_3 (PostAug_i \; X \; 96Cohort_i) + \pi_4 X_{iw} + \zeta_{iw} \quad (5)$$

where $SSI_{i(3)}$ is the proxy measure for the child SSI beneficiary i receiving SSI in wave 3. I considered a respondent as receiving SSI receipt in wave 3 if they report receiving SSI, unemployment insurance, worker compensation, or disability insurance. The age of the analysis sample in wave 3 was 21-25 years old, which is an appropriate age range to examine because Deshpande (2016a) finds that the impacts of the 1996 welfare reform on losing SSI are the largest at ages 21 and 22.

Another assumption underlying both the RD and DD models is that no other changes for the treatment group occur at the discontinuity point. It is not possible to test this assumption, but to the best of my knowledge, there were no other policy changes that specifically affected child

SSI beneficiaries who turned 18 after August 1996. The final assumption of the RD model is that there is no manipulation in the running variable, which is highly unlikely in this context, given that parents would have had to anticipate a policy change that occurred 18 years after their child was born. Nonetheless, I estimated the McCrary density test to rule out the possibility of bunching on either side of the discontinuity (McCrary 2008).

After having established the relationship between losing child SSI benefits at age 18 and health outcomes, I turned to exploring the mechanism of these relationships. One question is whether the impact on each of the physical health outcomes is operating through obesity, given that all the metabolic syndrome conditions I measured (hypertension, high cholesterol, and diabetes) are all highly correlated with obesity. To explore this mechanism, I estimated the OLS, RD, and DD models for each physical health outcome, including an interaction between the indicator for turning 18 after August 1996 and being diagnosed with obesity. This will show whether the relationship between losing SSI benefits at age 18 and these physical health measures is only observed for those who are obese or if the impact of losing SSI benefits is independent of an obesity diagnosis.

The next mechanism I examined is the role of insurance and access to care. As discussed in the conceptual framework, one of the channels through which losing SSI benefits may impact health is that it may be accompanied by a loss of insurance and access to healthcare services. To test this, I estimated the OLS, RD, and DD models with the following three dependent variables: insurance status, an indicator for having Medicaid, and an indicator for whether there was any time over the past year when they thought they should get medical care, but they did not.[6] The results provide insight into whether those who were more likely to lose their child SSI benefits at age 18 were less likely to be insured and less likely to have access to healthcare. I then estimated the RD and DD models for each physical and mental health outcome, including an interaction between the indicator for turning 18 after August 1996 and having insurance. This reveals whether the impact of losing SSI benefits at age 18 is larger for those who were not able to replace their lost Medicaid benefits.

[6] In wave 3, the respondent is asked if in the past 12 months, there was a time when they needed to see a doctor or go to the hospital but they did not go because they could not afford it.

Results

The first step of the 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, which is the first assumption underlying the RD and DD models. Deshpande (2016a) has already shown the validity of this assumption based on SSA administrative data, but I seek evidence of this in the Add Health data as well. Table 3 shows that the increase in the likelihood of losing SSI benefits by wave 3 (using a proxy measure) if the respondent turned 18 after August 1996 is small and not statistically significant for the RD sample, but 13 percentage points and statistically significant for the DD sample. The DD estimate is almost exactly halfway between the 24 and 5 percentage point decrease observed by Deshpande (2016a) four and 10 years, respectively, after turning 18. The Add Health analysis sample was between 21 and 25 years old in wave 3, which means they turned 18 anywhere from three to seven years ago. These results suggest that despite having error in the measure of adult SSI receipt, the Add Health data still provides some evidence that turning 18 after August 1996 increases the likelihood of losing SSI benefits at age 18, even if the evidence on the discontinuity is not demonstrated as clearly as it likely would be in SSA administrative data.

Next, I conducted a McCrary density test to confirm that there is no manipulation of the running variable, which is the second assumption underlying the regression discontinuity model. The McCrary test failed to reject the null hypothesis of any systematic manipulation of the running variable (which is the difference between the month/year the respondent turned 18 and August 1996), with a p-value of 0.7368 when using bimonthly bins.

Having established that the assumptions of the RD and DD models are satisfied, I turned to estimating the OLS, RD, and DD models on the outcomes of interest. First, I confirmed that I observed 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 (2016a) 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 increased likelihood of having ever been arrested, incarcerated, or being charged with a crime. I estimated the impact of losing SSI benefits on earnings outcomes by estimating Equations (1), (2), and (3) using reported personal earnings, having positive earnings, and having earnings over $15,000. The results are presented in Appendix Table A3. The results are mixed for waves 3 and 4, but all three models (except for

positive earnings in the DD model) show that losing SSI benefits at age 18 is associated with higher earnings in wave 5, which is the closest wave to the age at which Deshpande (2106a) examines earnings outcomes. The coefficients are not statistically significant, likely due to lack of statistical power, but it is reassuring that all three models produce point estimates of the long-run impact on employment using the Add Health data that match the sign of the administrative results found in Deshpande (2016a).

I next estimate Equations (1), (2), and (3) using indicators for having ever been arrested, incarcerated, or charged with a crime to compare to Deshpande and Mueller-Smith (2022), which looks at these outcomes between ages 18 and 38 (similar to the ages in waves 3 through 5 of the Add Health data). The results are shown in Appendix Table A4 and show that both the RD and DD models show that losing SSI benefits at age 18 increases the likelihood of being charged with a crime by waves 4 and 5, although the estimates are not statistically significant likely due to lack of statistical power. The results regarding having been arrested or incarcerated are less consistent, with the estimated coefficients being small in magnitude and the signs sometimes differing between the RD and DD models; similarly, the OLS estimates are often in conflict with the RD and DD models. Nonetheless, when the analyses with the Add Health data were able to produce consistent relationships between losing SSI and employment and crime, the sign of the relationships are consistent with what has been established in the existing literature that uses administrative data.

I then turned to looking at long-term health outcomes that have not been examined in the existing literature. The conceptual model has an ambiguous prediction of the relationship between losing SSI benefits at age 18 and health. On the one hand, losing SSI benefits at age 18 could decrease the diagnoses of physical and mental health conditions due to losing health insurance and having lower access to care; on the other hand, it could improve health via the positive externalities of increasing employment.

Table 4 shows the OLS, RD, and DD results for health diagnoses index and obesity. All three models show a positive relationship between losing SSI benefits at age 18 and obesity in waves 4 and 5, but the estimates are not statistically significant. The RD and DD results show fairly consistently that those who are likely to lose SSI benefits at age 18 have a much lower health diagnoses index in almost every wave; these relationships are statistically significant in the DD specification (waves 4 and 5), which is more likely than the RD specification to have

enough power to detect significance. We found the same relationship when using the index created by a principal component analysis (Appendix Table A5). The OLS estimates do not show a consistent relationship between losing SSI benefits and the health diagnoses index, which may mean that there is still some bias in this model even after controlling for self-reported health. Examining the RD and DD estimates for each individual component of the health diagnoses index separately (Table 5) shows a decreased likelihood of being diagnosed with hypertension and diabetes in wave 5 for those who were likely to lose their SSI benefits at age 18, although only hypertension is statistically significant in the DD model. There is a large variation in the magnitude of these effects across models and waves, with the estimated impacts sometimes being implausibly large. The imprecision is likely due to the limited power of the Add Health data; as a result, the strongest conclusions from these analyses can be drawn from the consistent patterns observed in the signs of the estimated impacts rather than the magnitudes.

I showed the differences in health outcomes that appeared to be the most impacted by losing SSI benefits at age 18 in the regression models (health diagnosis index, hypertension, and diabetes) graphically in Figure 1. These graphs show the residualized share of child SSI recipients who report each condition by two-month birth bins, along with nonparametric regression fitted lines. 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 have health diagnoses of a chronic condition (specifically, diabetes and hypertension) compared to those who turned 18 before. These graphs confirm the conclusions from the regression models.

Because these chronic conditions are often a result of obesity, I estimated the RD and DD models, including an interaction for reporting obesity during that wave, in order to see if I only observed these relationships for those who report obesity versus those who do not. The results, shown in Appendix Table A6, do not show statistically significant differences in the impact of losing SSI benefits at age 18 on physical health outcomes between those who report being obese compared to those who did not, except in terms of diabetes diagnoses according to the RD model. This suggests that the decrease in the diagnoses of chronic conditions is largely independent of obesity status.

We next explored the impact of losing SSI benefits at age 18 on mental health outcomes. As shown in Table 6, all three models show that being likely to lose SSI benefits at age 18 tends

to result in a decrease in depression diagnoses and anxiety diagnoses, although the impacts are not always statistically significant. There is a large variation in the magnitude of the estimates, which are sometimes implausibly large, but the pattern in the direction of the relationships are consistent. Figure 2 graphically shows the differences in mental health outcomes between those who are likely and not likely to lose SSI benefits at age 18 using bimonthly bins and confirms the conclusion that those who are likely to lose SSI benefits at age 18 are less likely to be diagnosed with depression or anxiety. I sought to understand whether this relationship reflects a lower likelihood of actually having depression (not just a diagnosis) by examining the impact on the modified PHQ score; I found conflicting results between the models. The DD estimates show an increase in depression, and the OLS and RD estimates are mixed. Based on this evidence, I am not able to conclude whether the decrease in depression and anxiety diagnoses is due to a lower incidence of these conditions.

Given the lack of compelling evidence that the lower diagnoses of mental health conditions are due to fewer cases of depression, I explored the competing theory that the lower diagnoses of both mental and physical health conditions reflect a higher prevalence of untreated conditions due to lack of access to care. One reason why people may have reduced access to care after losing SSI benefits at age 18 is through their loss of health insurance. To this end, I explored whether those who are more likely to lose SSI benefits at age 18 are also less likely to have insurance coverage or Medicaid and more likely to report not receiving medical care when they need it. The results are shown in Table 7. The OLS and DD estimates suggest that, for the most part, those who are likely to lose SSI benefits at age 18 are less likely to be insured and more likely not to receive care when they need it, although the estimates are not statistically significant likely due to a lack of power. The evidence is less clear in the RD model. However, when I look at the impact of losing SSI benefits on health outcomes by insurance status (Table 8), I found a clear pattern in all three models those who are uninsured and likely to lose their SSI benefits at age 18 are less likely to be diagnosed with a physical health condition or depression. The models disagree about whether this relationship exists to the same extent for those who are insured, given the conflicting signs of the interaction in the RD versus DD model. All together, these results provide suggestive evidence that access to care in the form of not having insurance plays an important role in the relationship between losing SSI benefits at age 18 and having lower diagnoses of untreated physical and mental health conditions.

Finally, I examined 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 in terms of who has children based on SSI status. I tested for this probability of selection by examining whether there is a difference in the likelihood of getting married or having children for those who are likely to lose their SSI benefits compared to those who are not. The results are in Appendix Table A8, and the RD and DD estimates reveal a negative, but not statistically significant, relationship between losing SSI at age 18 and the likelihood of getting married and having children by wave 5; the sign is opposite in the OLS model. While the evidence is not completely clear, I cannot rule out the possibility that those who lose their child SSI benefits at age 18 are less likely to have children for reasons that are correlated with the health outcomes of their children; for example, they may choose not to have children due to lower access to health services.

With the potential for selection bias discussed above in mind, I examined the relationship between losing SSI at age 18 and the physical health outcomes of their children in wave 5. The RD and DD results in Appendix Table A9 suggest that losing child SSI benefits at age 18 may increase the prevalence of medical conditions of their children, specifically asthma, although the results are not statistically significant, and the OLS estimates go in the opposite direction. The magnitude of the RD and DD estimated impact on asthma is large, but concluding that there are intergenerational effects of losing SSI at age 18 on medical conditions is merely suggestive given the large standard errors, the differing OLS estimates, and the possibility that those who lose SSI are less likely to have children for reasons that are correlated with their health outcomes.

Conclusions

A growing body of research reveals that losing child SSI at age 18 leads to lower overall income and a higher likelihood of being convicted of a crime (Deshpande 2016a; and Deshpande and Mueller-Smith 2022). However, little is known about the long-term impacts of losing childhood SSI at age 18 on health outcomes. Understanding this relationship is important when considering the potential long-term impacts of future policy changes to SSI eligibility, such as changing the SSI asset limits. It may also shed light on the long-term implications of losing access to other safety net programs, such as Medicaid, which many recipients lost in 2023 following the end of the public health emergency.

Exploiting exogenous variation in continuous SSI enrollment generated by the 1996 welfare reform, the results show that those who are likely to lose their SSI benefits at age 18 appear to have lower physical and mental health outcomes later in life. Specifically, I observed that those who are likely to lose their child SSI benefits are less likely to be diagnosed with depression, anxiety, hypertension, or diabetes, relative to those who are unlikely to lose their child SSI benefits. There is suggestive evidence that these lower diagnoses rates likely reflect a higher prevalence of untreated conditions among this population due to poor access to care and insurance. The relationships I observed are sometimes not statistically significant and/or have inconsistent estimated magnitudes due to a lack of power in the Add Health data, but the patterns are very consistent in the sign of the relationship between losing SSI benefits at age 18 and the measures of physical and mental health outcomes. Overall, the findings suggest that losing SSI at age 18 has wide-reaching impacts on the long-term well-being of the child SSI beneficiaries, specifically in the form of lower diagnoses of depression, anxiety, diabetes, and hypertension, which is likely due to poor access to care and insurance.

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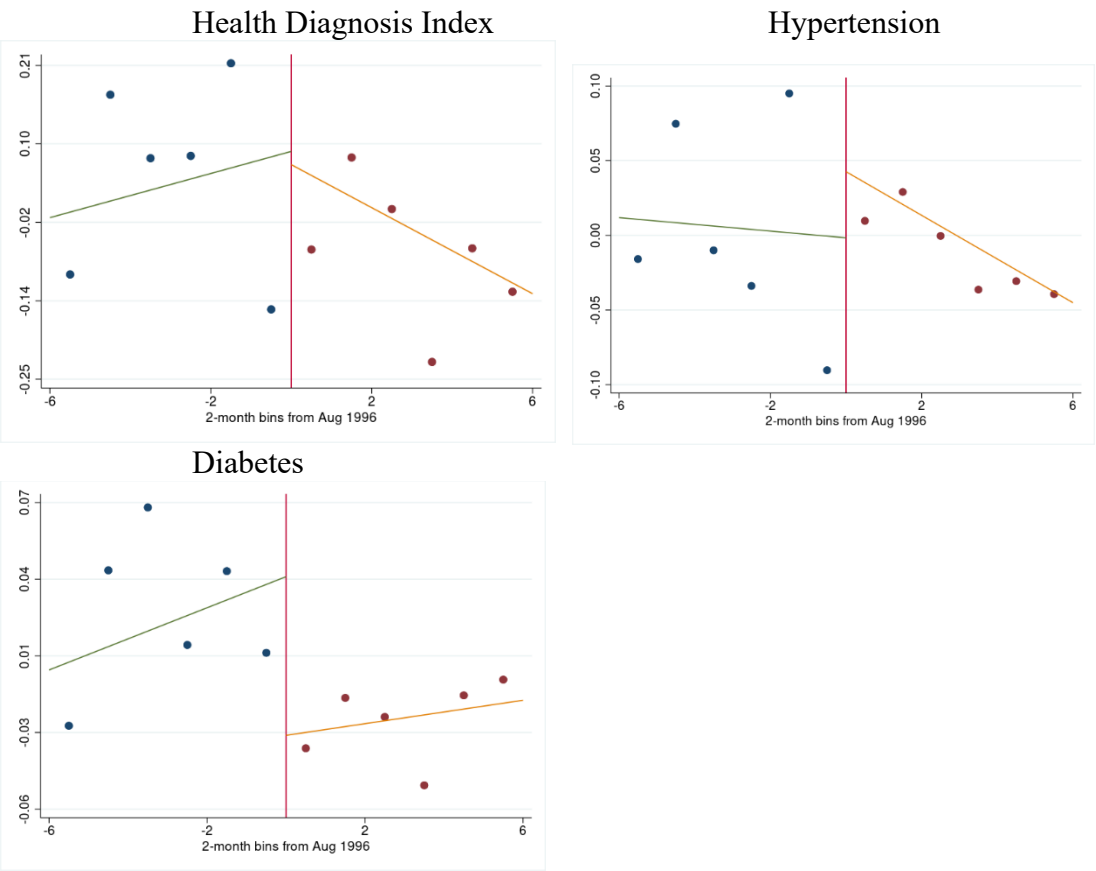
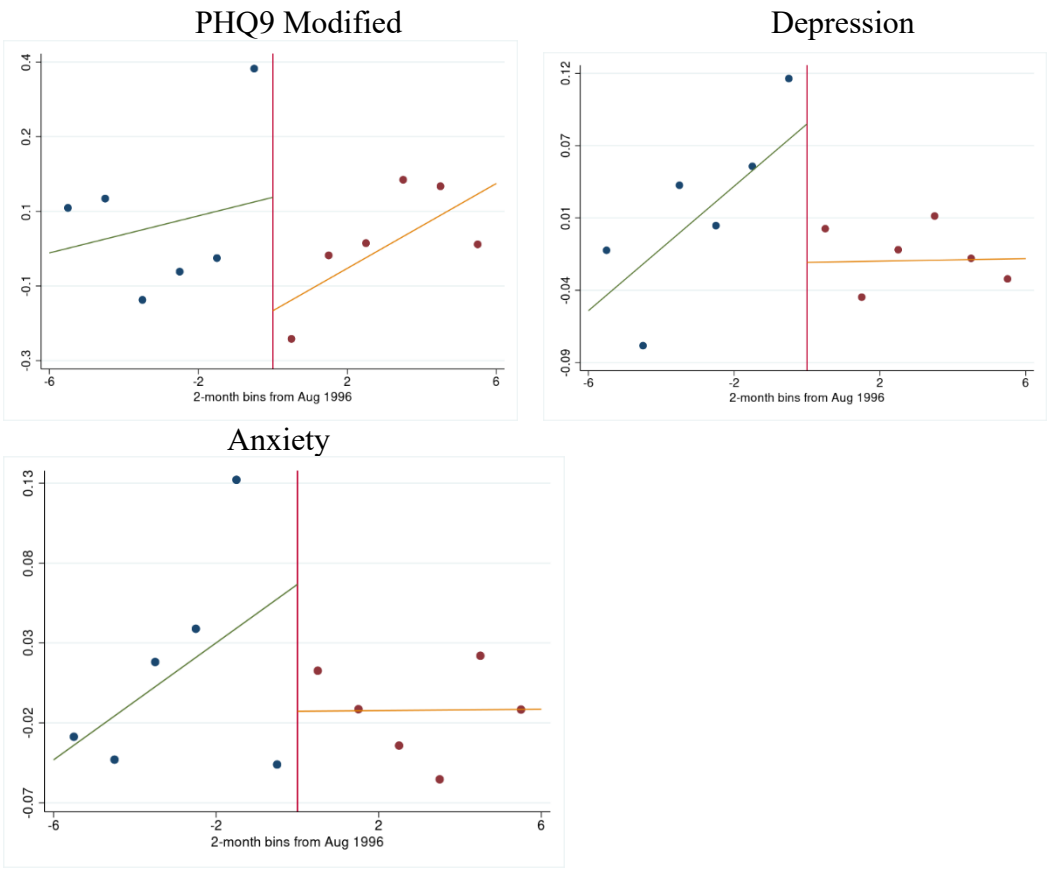
Figure 1. *Physical Health Measures Based on the Month They Turned Age 18 Relative to August 1996*



Notes: The sample includes wave 3, 4, and 5 observations for child SSI recipients with an 18th birthday within 12 months of the August 1996 cutoff (N=430 for health index and diabetes; N=427 for hypertension). The x-axis represents the number of bimonthly bins from August 1996 that the respondent turned 18. 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 bimonthly bin.

Figure 2. *Mental Health Measures Based on the Month They Turned Age 18 Relative to August 1996*



Notes: The sample includes wave 3, 4, and 5 observations for child SSI recipients with an 18th birthday within 12 months of the August 1996 cutoff (N=678 for PHQ, N=565 for depression; N=452 for anxiety (no wave 3)). The x-axis represents the number of bimonthly bins from August 1996 that the respondent turned 18. 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 bimonthly bin.

Table 1. *Sample Characteristics of Child SSI Recipients in the Add Health Data versus Other Datasets with Child SSI Recipients*

	Add Health [a]	Add Health (12-month window)[a]	SSA administrative data[b]	NSCF: Age 13-17[c]	NSCF: Age 0-17[d]	CSHCN: Age 0-17 [d]	SIPP: Age 0-17 [d]	NHIS: Age 0-17 [d]
Female	0.447	0.451	0.37	0.362	0.367	0.405	0.377	0.361
White	0.456	0.444	NA	0.477	0.471	0.589	0.572	0.581
Black	0.286	0.226	NA	0.477	0.458	0.287	0.391	0.356
Asian	0.015	0.020	NA	0.011	NA	NA	NA	NA
Hispanic	0.219	0.271	NA	0.138	0.161	0.149	0.183	0.169
Annual household (HH) income	$14,769	$14,510	$9,881	$21,360	NA	NA	NA	NA
% with annual HH income >$12,000	0.613	0.627	NA	NA	0.732	NA	0.845	NA
Living with a single mother	0.497	0.487	0.51	0.544	0.603	NA	0.507	0.548
Living with no parents	0.122	0.129	0.16	NA	0.110	NA	0.137	0.077
Maternal education								
<High School	0.410	0.452	NA	NA	0.352	0.316	0.385	0.336
High School	0.337	0.270	NA	NA	0.406	0.340	0.259	0.326
Some college	0.159	0.163	NA	NA	0.204	0.246	0.262	0.257
College graduate	0.094	0.115	NA	NA	0.035	0.099	0.094	0.054
Missing	0.019	0.006	NA	NA	NA	NA	NA	NA
Observations (N)	597	226	81,800	NA	3,203	3,042	293	274
Weighted N	624,464	200,375	NA	279,924	813,711	771,177	804,262	640,692

[a] Add Health estimates are weighted using survey sample weights. Ethnicity categories are defined as non-Hispanic. Annual household income is the total income the family received in 1994 and includes income from welfare benefits, dividends, and all other sources. Maternal education is reported for the responding parent, who is typically the mother. The 12-month window limits child SSI recipients to those with an 18th birthday within 12 months of the August 1996 cutoff. N is reported as unique respondents.

[b] Information comes from Table 1 of Deshpande (2016a). Her sample is a 37-week window around August 22, 1996. Annual household income is calculated as the sum of the mean parent and child pretreatment earnings and does not include income from other sources such as government benefits or dividends.

[c] NSCF is the *National Survey of SSI Children and Families.* Information comes from Table 1 of Rupp et al. (2005), except for annual household income and disability type, which are from Tables 2 and 3, respectively. Annual household income is calculated as the monthly family income multiplied by 12. Income includes earnings, government transfers, and other sources of cash income for all family members. Living with a single mother is measured by living with a single parent.

[d] NSCF is the *National Survey of SSI Children and Families*; CSHCN is the *National Survey of Children with Special Health Care Needs*; SIPP is the *Survey of Income and Program Participation*; and NHIS is the *National Health Interview Survey*. Information comes from Table III.3 of Ireys et al. (2004).

Table 2. *Summary Statistics and Covariate Balance Tests*

	All child SSI beneficiaries	Turned age 18 before August 1996	Turned age 18 after August 1996	P-value of difference
Age	29.128	30.176	29.280	0.134
Age at high school graduation	18.699	18.732	18.615	0.307
Female	0.467	0.470	0.396*	0.055
Non-Hispanic White	0.354	0.261	0.378***	0.001
Non-Hispanic Black	0.342	0.322	0.315	0.858
Non-Hispanic Asian	0.030	0.061	0.018***	0.004
Non-Hispanic Other	0.040	0.052	0.054	0.913
Hispanic	0.233	0.304	0.234**	0.040
Household income in Wave 1 ($1,000)	15.233	14.435	15.739**	0.029
Living with a single mom	0.492	0.522	0.414***	0.005
Living with no parents	0.107	0.130	0.117	0.599
Obesity	0.099	0.088	0.064	0.239
Diabetes	0.008	0.009	0.000*	0.087
Feel depressed a lot or most of the time	0.151	0.209	0.108***	0.000
Observations	1791	345	333	
Unique respondents	597	115	111	

Notes: ***, **, *: difference between those who turned 18 before and after August 1996 is statistically significant at the 1, 5, 10 percent level. Sample includes waves 3, 4, and 5 observations for child SSI recipients with an 18th birthday within 12 months of the August 1996 cutoff.

Table 3. *Impact of Turning Age 18 After August 1996 on Loss of SSI Benefits by Wave 3 of Add Health Survey*

	Regression discontinuity	Difference-in-Differences
Age 18 after Aug 1996	0.013	0.134*
	[0.105]	[0.072]
Observations	159	298
Control group mean	0.889	0.960

Notes: ***, **, *: Difference from zero is statistically significant at the 1, 5, 10 percent levels. The proxy measure used for not receiving SSI in wave 3 is that the respondent responded negatively to having received SSI, UI, WC, or DI in wave 3. Regressions also include gender, race/ethnicity, and household income in wave 1. The RD sample includes wave 3, 4, and 5 observations for child SSI recipients with an 18th birthday within 12 months of the August 1996 cutoff; the DD sample additionally includes child SSI recipients with an 18th birthday within 12 months of the August 1998 cutoff. Standard errors, in parentheses, are clustered at the birth month bins.

Table 4. Impact of Turning Age 18 After August 1996 on Health Diagnoses Index and Obesity

	OLS		Regression Discontinuity		Difference-in-Differences	
	Health diagnoses index	Obesity	Health diagnoses index	Obesity	Health diagnoses index	Obesity
Overall impact						
Age 18 after Aug 1996	-0.089	0.066	-0.061	0.009	-0.389	-0.068
	[0.165]	[0.074]	[0.278]	[0.158]	[0.236]	[0.100]
Impact by wave						
Age 18 after Aug 1996 * Wave 3	-0.207	0.040	0.034	-0.026	-0.008	-0.071
	[0.200]	[0.080]	[0.270]	[0.151]	[0.224]	[0.117]
Age 18 after Aug 1996 * Wave 4	0.107	0.033	-0.120	0.050	-0.478*	0.009
	[0.242]	[0.088]	[0.154]	[0.092]	[0.287]	[0.115]
Age 18 after Aug 1996 * Wave 5	0.386	0.067	-0.238	0.073	-0.775**	0.005
	[0.379]	[0.120]	[0.180]	[0.104]	[0.388]	[0.151]
Observations	1,024	978	430	416	826	798
Control group mean	0.000	0.424	-0.000	0.441	0.000	0.390

Notes: ***, **, *: Difference from zero is statistically significant at the 1, 5, 10 percent levels. Regressions also include gender, race/ethnicity, and household income in wave 1. Standard errors, in parentheses, are clustered at the birth month bins. The OLS sample includes wave 3, 4, and 5 observations for all child SSI recipients; the RD sample is limited to child SSI recipients with an 18th birthday within 12 months of the August 1996 cutoff; the DD sample additionally includes child SSI recipients with an 18th birthday within 12 months of the August 1998 cutoff. Health diagnoses index was created as the z-score of the equally-weighted mean of the health variables shown in Table 5.

Table 5. *Impact of Turning Age 18 After August 1996 on the Components of the Health Diagnoses Index*

	OLS			Regression Discontinuity			Difference-in-Differences		
	Hypertension diagnosis	Diabetes diagnosis	Cholesterol diagnosis	Hypertension diagnosis	Diabetes diagnosis	Cholesterol diagnosis	Hypertension diagnosis	Diabetes diagnosis	Cholesterol diagnosis
Overall impact									
Age 18 after Aug 1996	-0.055	0.009	-0.015	0.068	-0.123**	0.005	-0.129*	-0.078*	-0.017
	[0.066]	[0.026]	[0.045]	[0.129]	[0.055]	[0.080]	[0.068]	[0.043]	[0.053]
Impact by wave									
Age 18 after Aug	-0.074	-0.024	-0.038	0.112	-0.117**	0.026	0.018	-0.044	0.010
1996*W3	[0.079]	[0.030]	[0.058]	[0.128]	[0.053]	[0.081]	[0.077]	[0.038]	[0.056]
Age 18 after Aug	0.009	0.072**	-0.013	-0.047	0.001	-0.038	-0.153	-0.008	-0.082
1996*W4	[0.104]	[0.036]	[0.087]	[0.072]	[0.035]	[0.055]	[0.097]	[0.053]	[0.077]
Age 18 after Aug	0.077	0.035	0.133	-0.124	-0.030	-0.029	-0.343***	-0.121	0.012
1996*W5	[0.121]	[0.089]	[0.106]	[0.080]	[0.060]	[0.087]	[0.125]	[0.085]	[0.109]
Observations	1,019	1,022	1,022	427	430	430	821	824	823
Control group mean	0.145	0.050	0.103	0.198	0.072	0.139	0.106	0.041	0.083

Notes: ***, **, *: Difference from zero is statistically significant at the 1, 5, 10 percent levels. Regressions also include gender, race/ethnicity, community fixed effects, and household income in wave 1. The OLS sample includes wave 3, 4, and 5 observations for all child SSI recipients; the RD sample is limited to child SSI recipients with an 18th birthday within 12 months of the August 1996 cutoff; the DD sample additionally includes child SSI recipients with an 18th birthday within 12 months of the August 1998 cutoff. Standard errors, in parentheses, are clustered at the birth month bins.

Table 6. *Impact of Turning Age 18 After August 1996 on Mental Health*

	OLS			Regression Discontinuity			Difference-in-Differences		
	Modified PHQ	Depression diagnosis	Anxiety diagnosis	Modified PHQ	Depression diagnosis	Anxiety diagnosis	Modified PHQ	Depression diagnosis	Anxiety diagnosis
Overall impact									
Age 18 after Aug 1996	-0.027	-0.171**	-0.236***	-0.404	-0.167**	-0.128	0.199	-0.049	-0.047
	[0.219]	[0.077]	[0.086]	[0.385]	[0.073]	[0.083]	[0.247]	[0.057]	[0.056]
Impact by wave									
Age 18 after Aug 1996 * Wave 3	0.250	-0.159*		-0.402	-0.165**		0.038	0.003	
	[0.259]	[0.083]		[0.385]	[0.075]		[0.253]	[0.066]	
Age 18 after Aug 1996 * Wave 4	-0.372	0.029	-0.224	-0.096	-0.009	-0.151	0.301	-0.029	-0.041
	[0.378]	[0.087]	0.088	[0.221]	[0.047]	0.088	[0.343]	[0.078]	0.062
Age 18 after Aug 1996 * Wave 5	-0.709**	-0.105	-0.031	0.090	0.016	0.046	0.182	-0.184	-0.011
	[0.310]	[0.109]	0.104	[0.234]	[0.081]	0.053	[0.327]	[0.119]	0.073
Observations	1,024	1,024	608	678	565	452	1,245	1,053	830
Control group mean	1.351	0.144	0.099	1.285	0.125	0.117	1.451	0.159	0.118

Notes: ***, **, *: Difference from zero is statistically significant at the 1, 5, 10 percent levels. Regressions also include gender, race/ethnicity, and household income in wave 1. Standard errors, in parentheses, are clustered at the birth month bins. The OLS sample includes wave 3, 4, and 5 observations for all child SSI recipients; the RD sample is limited to child SSI recipients with an 18th birthday within 12 months of the August 1996 cutoff; the DD sample additionally includes child SSI recipients with an 18th birthday within 12 months of the August 1998 cutoff.

Table 7. *Impact of Turning Age 18 After August 1996 on Health Insurance Coverage and Access to Care*

	OLS			Regression Discontinuity			Difference-in-differences		
	Insured	Medicaid	Did not receive needed care	Insured	Medicaid	Did not receive needed care	Insured	Medicaid	Did not receive needed care
Overall impact									
Age 18 after Aug 1996	-0.084	-0.235***	0.075	0.041	0.010	-0.022	-0.049	0.124	0.028
	[0.057]	[0.067]	[0.067]	[0.101]	[0.065]	[0.094]	[0.068]	[0.101]	[0.061]
Impact by wave									
Age 18 after Aug 1996*W3	-0.002	-0.198**		0.013	-0.106		-0.058	0.119	
	[0.094]	[0.095]		[0.111]	[0.093]		[0.104]	[0.114]	
Age 18 after Aug 1996*W4	-0.150	-0.124	0.072	0.020	0.014	-0.034	-0.060	-0.040	0.050
	[0.129]	[0.117]	0.094	[0.109]	[0.113]	0.101	[0.137]	[0.073]	0.084
Age 18 after Aug 1996*W5	-0.146	0.027	0.010	0.120	0.416***	0.025	0.129	0.096	-0.045
	[0.104]	[0.174]	0.156	[0.090]	[0.140]	0.058	[0.135]	[0.094]	0.100
Observations	1,021	1,009	608	494	814	452	939	423	830
Control group mean	0.640	0.207	0.162	0.683	0.214	0.141	0.633	0.188	0.196

Notes: ***, **, *: Difference from zero is statistically significant at the 1, 5, 10 percent levels. Regressions also include gender, race/ethnicity, and household income in wave 1. The OLS sample includes wave 3, 4, and 5 observations for all child SSI recipients; the RD sample is limited to child SSI recipients with an 18th birthday within 12 months of the August 1996 cutoff; the DD sample additionally includes child SSI recipients with an 18th birthday within 12 months of the August 1998 cutoff. Standard errors, in parentheses, are clustered at the birth month bins

Table 8. *Impact of Turning Age 18 After August 1996 on Health Diagnoses Index and Mental Health by Insurance Status*

	OLS			Regression discontinuity			Difference-in-difference		
	Health diagnoses index	Depression diagnosis	Anxiety diagnosis	Health diagnoses index	Depression diagnosis	Anxiety diagnosis	Health diagnoses index	Depression diagnosis	Anxiety diagnosis
Age 18 after Aug 1996	-0.031	-0.048	0.061	-0.482**	-0.099	0.002	-0.422	-0.170*	-0.075
	[0.222]	[0.101]	[0.199]	[0.206]	[0.068]	[0.141]	[0.352]	[0.103]	[0.162]
Age 18 after Aug 1996 * Insured	-0.063	-0.136	-0.290	0.262	-0.151*	-0.251*	-0.074	0.044	-0.044
	[0.204]	[0.107]	[0.194]	[0.292]	[0.085]	[0.142]	[0.353]	[0.085]	[0.140]
Observations	1,021	1,021	605	429	494	268	825	939	524
Control group mean	0.052	0.349	0.212	-0.000	0.125	0.117	0.000	0.159	0.118

Notes: ***, **, *: Difference from zero is statistically significant at the 1, 5, 10 percent levels. Regressions also include gender, race/ethnicity, and household income in wave 1. The OLS sample includes wave 3, 4, and 5 observations for all child SSI recipients; the RD sample is limited to child SSI recipients with an 18th birthday within 12 months of the August 1996 cutoff; the DD sample additionally includes child SSI recipients with an 18th birthday within 12 months of the August 1998 cutoff. Standard errors, in parentheses, are clustered at the birth month bins. Health diagnoses index was created as the z-score of the equally-weighted mean of the health variables shown in Table 5.

Appendix

Appendix Table A1. *Add Health Survey Waves*

	Wave 1	Wave 2	Wave 3	Wave 4	Wave 5
Year	1994-95	1996	2001-02	2008-09	2016-18
Age range	11-21	12-22	18-26	24-32	31-42
Observations	20,745	14,738	15,197	15,701	12,300

Appendix Table A2. *Sample Attrition*

	Turned age 18 before August 1996	Turned age 18 after August 1996	P-value of difference
Wave 2 attrition	0.261	0.207	0.343
Wave 3 attrition	0.270	0.306	0.544
Wave 4 attrition	0.304	0.315	0.859
Wave 5 attrition	0.496	0.505	0.895
Unique Observations	115	111	

Appendix Table A3. *Impact of Turning Age 18 After August 1996 on Long-Term Employment Outcomes*

	OLS			Regression Discontinuity			Difference-in-Differences		
	Personal earnings[a]	Positive personal earnings[a]	Personal earnings> $15,000[a]	Positive personal earnings[a]	Positive personal earnings[a]	Personal earnings> $15,000[a]	Personal earnings[a]	Positive personal earnings[a]	Personal earnings> $15,000[a]
Overall impact									
Age 18 after Aug 1996	9.914***	0.269***	0.201***	-7.724	-0.339**	-0.190	-8.276	-0.069	0.027
	[2.904]	[0.062]	[0.054]	[6.648]	[0.148]	[0.138]	[12.430]	[0.084]	[0.085]
Impact by wave									
Age 18 after Aug 1996*W3	9.231*	0.304***	0.174**	-8.287	-0.310**	-0.234	-24.872	0.148	0.028
	[4.768]	[0.078]	[0.074]	[6.753]	[0.153]	[0.150]	[26.805]	[0.120]	[0.116]
Age 18 after Aug 1996*W4	-4.602	-0.223*	-0.061	-2.817	-0.122	0.048	16.118	-0.525***	-0.096
	[5.112]	[0.121]	[0.117]	[3.308]	[0.100]	[0.099]	[23.456]	[0.153]	[0.146]
Age 18 after Aug 1996*W5	11.026	0.203	0.235*	8.191	0.083	0.131	39.577	-0.082	0.139
	[8.259]	[0.144]	[0.124]	[7.268]	[0.097]	[0.148]	[25.962]	[0.155]	[0.167]
Observations	1,002	1,002	1,002	419	419	419	810	810	810
Control group mean	18.163	0.570	0.412	19.527	0.653	0.463	20.365	0.606	0.481

Notes: ***, **, *: Difference from zero is statistically significant at the 1, 5, 10 percent levels. Regressions also include gender, race/ethnicity, and household income in wave 1. The OLS sample includes wave 3, 4, and 5 observations for all child SSI recipients; the RD sample is limited to child SSI recipients with an 18th birthday within 12 months of the August 1996 cutoff; the DD sample additionally includes child SSI recipients with an 18th birthday within 12 months of the August 1998 cutoff. Standard errors, in parentheses, are clustered at the birth month bins.

[a] Personal earnings in waves 4 and 5 is created from a categorical variable in which the respondent reports their best guess of their personal earnings before taxes, that is, wages or salaries including tips bonuses, and overtime pay, and income from self-employment.

Appendix Table A4. *Impact of Turning Age 18 After August 1996 on Long-Term Crime Outcomes*

	OLS			Regression Discontinuity			Difference-in-Differences		
	Ever been arrested	Ever been incarcerated	Ever been charged[a]	Ever been arrested	Ever been incarcerated	Ever been charged[a]	Ever been arrested	Ever been incarcerated	Ever been charged[a]
Overall impact									
Age 18 after Aug 1996	-0.054	-0.100	0.025	0.009	0.057	0.039	-0.015	-0.067	0.036
	[0.076]	[0.088]	[0.061]	[0.148]	[0.156]	[0.129]	[0.087]	[0.090]	[0.075]
Impact by wave									
Age 18 after Aug 1996* W3	-0.066		0.056	0.025		-0.011	0.004		-0.006
	[0.087]		[0.048]	[0.141]		[0.127]	[0.095]		[0.074]
Age 18 after Aug 1996*W4	0.062	-0.086	-0.002	-0.031	0.046	0.058	-0.013	-0.057	0.038
	[0.101]	0.104	[0.096]	[0.092]	0.162	[0.084]	[0.120]	0.100	[0.118]
Age 18 after Aug 1996*W5	-0.042	-0.040	-0.145	-0.022	0.031	0.133	-0.063	-0.025	0.104
	[0.143]	0.157	[0.126]	[0.103]	0.084	[0.091]	[0.144]	0.115	[0.130]
Observations	1,012	606	1,021	426	268	428	818	522	822
Control group mean	0.295	0.226	0.230	0.284	0.223	0.212	0.318	0.189	0.275

Notes: ***, **, *: Difference from zero is statistically significant at the 1, 5, 10 percent levels. Regressions also include gender, race/ethnicity, and household income in wave 1. The OLS sample includes wave 3, 4, and 5 observations for all child SSI recipients; the RD sample is limited to child SSI recipients with an 18th birthday within 12 months of the August 1996 cutoff; the DD sample additionally includes child SSI recipients with an 18th birthday within 12 months of the August 1998 cutoff. Standard errors, in parentheses, are clustered at the birth month bins.

[a] Any charges with driving under influence, alcohol-related offenses, marijuana offenses, drug offenses, robbery, theft, forcible rape, manslaughter/murder, simple assault, fraud, civil disobedience, or any other offenses.

Appendix Table A5. *Impact of Turning Age 18 After August 1996 on The Health Diagnoses Index Using a Principal Component Analysis*

	OLS	Regression discontinuity	Difference-in-Differences
Overall impact			
Age 18 after Aug 1996	-0.131	-0.188	-0.481*
	[0.192]	[0.397]	[0.260]
Impact by wave			
Age 18 after Aug 1996 * Wave 3	-0.282	-0.052	-0.093
	[0.236]	[0.386]	[0.242]
Age 18 after Aug 1996 * Wave 4	0.164	-0.147	-0.377
	[0.290]	[0.219]	[0.298]
Age 18 after Aug 1996 * Wave 5	0.452	-0.381	-0.961**
	[0.490]	[0.281]	[0.444]
Observations	1,016	427	817
Control group mean	-0.000	0.189	-0.112

Notes: ***, **, *: Difference from zero is statistically significant at the 1, 5, 10 percent levels. Regressions also include gender, race/ethnicity, and household income in wave 1. Standard errors, in parentheses, are clustered at the birth month bins. The OLS sample includes wave 3, 4, and 5 observations for all child SSI recipients; the RD sample is limited to child SSI recipients with an 18th birthday within 12 months of the August 1996 cutoff; the DD sample additionally includes child SSI recipients with an 18th birthday within 12 months of the August 1998 cutoff. Index outcomes were taken from principal component analyses using the health diagnoses variables shown in Table 5.

Appendix Table A6. *Impact of Turning Age 18 After August 1996 on Physical Health by Obesity Status*

	Regression discontinuity				Difference-in-differences			
	Health diagnoses index	Hypertension diagnosis	Diabetes diagnosis	Cholesterol diagnosis	Health diagnoses index	Hypertension diagnosis	Diabetes diagnosis	Cholesterol diagnosis
Age 18 after Aug 1996	-0.373**	-0.118	-0.118**	-0.045	-0.650*	-0.203	-0.142*	-0.001
	[0.186]	[0.086]	[0.049]	[0.076]	[0.391]	[0.124]	[0.075]	[0.096]
Age 18 after Aug 1996*Obesity	0.053	0.102	-0.076*	0.010	-0.135	-0.040	-0.019	-0.032
	[0.239]	[0.115]	[0.045]	[0.077]	[0.205]	[0.061]	[0.035]	[0.053]
Observations	416	414	416	416	798	794	796	796
Control group mean	-0.000	0.198	0.072	0.139	0.000	0.106	0.041	0.083

Notes: ***, **, *: Difference from zero is statistically significant at the 1, 5, 10 percent levels. Regressions also include gender, race/ethnicity, and household income in wave 1. The RD sample includes wave 3, 4, and 5 observations for child SSI recipients with an 18th birthday within 12 months of the August 1996 cutoff; the DD sample additionally includes child SSI recipients with an 18th birthday within 12 months of the August 1998 cutoff. Standard errors, in parentheses, are clustered at the birth month bins. Health diagnoses index was created as the z-score of the equally-weighted mean of the health variables shown in Table 5.

Appendix Table A7. *Regression Discontinuity Model Results Using Different Sized Bandwidths*

	Health diagnoses index	Hypertension diagnosis	Diabetes diagnosis	Cholesterol diagnosis	Obesity	Modified PHQ	Depression diagnosis	Anxiety diagnosis
Monthly bins								
Age 18 after Aug 1996	-0.029	0.081	-0.117**	0.013	0.016	-0.305	-0.157**	-0.127*
	[0.265]	[0.122]	[0.052]	[0.076]	[0.147]	[0.398]	[0.069]	[0.070]
Bimonthly bins								
Age 18 after Aug 1996	-0.061	0.068	-0.123**	0.005	0.009	-0.404	-0.167**	-0.128
	[0.278]	[0.129]	[0.055]	[0.080]	[0.158]	[0.385]	[0.073]	[0.083]
Q*uarterly bins*								
Age 18 after Aug 1996	0.096	0.108	-0.099*	0.065	0.073	-0.376	-0.174**	-0.117
	[0.250]	[0.110]	[0.054]	[0.073]	[0.124]	[0.412]	[0.083]	[0.085]
Observations	430	427	430	430	416	678	565	452
Control group mean	-0.000	0.198	0.072	0.139	0.441	1.285	0.125	0.117

Notes: ***, **, *: Difference from zero is statistically significant at the 1, 5, 10 percent levels. Regressions also include gender, race/ethnicity, and household income in Wave 1. Standard errors, in parentheses, are clustered at the birth month bins. The OLS sample includes wave 3, 4, and 5 observations for all child SSI recipients; the RD sample is limited to child SSI recipients with an 18th birthday within 12 months of the August 1996 cutoff; the DD sample additionally includes child SSI recipients with an 18th birthday within 12 months of the August 1998 cutoff. Index outcomes were taken from principal component analyses using the health diagnoses variables shown in Table 5.

Appendix Table A8. *Impact of Turning Age 18 After August 1996 on Family Outcomes*

	OLS		Regression Discontinuity		Difference-in-Differences	
	Married	Has children	Married	Has children	Married	Has children
Overall impact						
Age 18 after Aug 1996	0.195**	0.280***	-0.093	0.065	-0.015	-0.048
	[0.085]	[0.054]	[0.124]	[0.101]	[0.086]	[0.080]
Impact by wave						
Age 18 after Aug 1996 * Wave 3		0.214***		0.088		-0.023
		[0.053]		[0.102]		[0.082]
Age 18 after Aug 1996 * Wave 4	0.192	0.126*	-0.085	-0.033	0.036	-0.016
	0.096	[0.072]	0.124	[0.040]	0.090	[0.067]
Age 18 after Aug 1996 * Wave 5	0.010	0.105	-0.028	-0.039	-0.150	-0.059
	0.119	[0.122]	0.089	[0.054]	0.131	[0.079]
Observations	607	1,024	339	678	638	1,245
Control group mean	0.277	0.252	0.312	0.256	0.352	0.291

Notes: ***, **, *: Difference from zero is statistically significant at the 1, 5, 10 percent levels. Regressions also include gender, race/ethnicity, community fixed effects, and household income in wave 1. The OLS sample includes wave 3, 4, and 5 observations for all child SSI recipients; the RD sample is limited to child SSI recipients with an 18th birthday within 12 months of the August 1996 cutoff; the DD sample additionally includes child SSI recipients with an 18th birthday within 12 months of the August 1998 cutoff. Standard errors, in parentheses, are clustered at the birth month bins.

Appendix Table A9. *Impact of Turning Age 18 After August 1996 on Child's Medical Condition*

	Child physical health condition index	Developmental delay	Asthma	Obesity	Fair/poor health status
	(1)	(2)	(3)	(4)	(5)
OLS					
Age 18 after Aug 1996	-1.746**	-0.134	-0.617***	-0.191	-0.013
	[0.749]	[0.182]	[0.189]	[0.156]	[0.020]
Observations	335	335	335	335	400
Control group mean	-0.000	0.050	0.138	0.019	0.020
Regression discontinuity					
Age 18 after Aug 1996	0.581	-0.000	0.238	0.001	-0.063
	[0.598]	[0.001]	[0.245]	[0.002]	[0.069]
Observations	113	113	113	113	139
Control group mean	0.000	0.032	0.111	0.016	0.027
Difference-in-Difference					
Age 18 after Aug 1996	0.457	0.009	0.171	-0.029	0.034
	[0.381]	[0.042]	[0.147]	[0.037]	[0.026]
Observations	280	280	280	280	334
Control group mean	-0.000	0.067	0.089	0.011	0.029

Notes: ***, **, *: Difference from zero is statistically significant at the 1, 5, 10 percent levels. Regressions also include gender, race/ethnicity, community fixed effects, and household income in wave 1. The OLS sample includes wave 3, 4, and 5 observations for all child SSI recipients; the RD sample is limited to child SSI recipients with an 18th birthday within 12 months of the August 1996 cutoff; the DD sample additionally includes child SSI recipients with an 18th birthday within 12 months of the August 1998 cutoff. Standard errors, in parentheses, are clustered at the parents' birth month bins. Child physical health condition index was created as the z-score of the equally-weighted mean of the individual variables shown in columns 2-5 of the table.

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