

How Disability Benefits in Early Life Affect Adult Outcomes

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Abstract

We estimate the effect of receiving Supplemental Security Income (SSI) in childhood on adult outcomes using multiple sources of variation. Across quasi-experiments, we find that the program has heterogeneous effects that vary with the parental earnings response to SSI benefits: SSI has positive effects on children when parents do not adjust their labor supply in response to SSI income (meaning household income increases), but zero or negative effects on children when parents offset the transfer by reducing earnings (meaning household income remains constant or falls). These results suggest that, relative to parent non-work time, consumption is crucial in the human capital production of low-income children with disabilities. We estimate a model of maternal labor supply and child human capital formation to quantify the relative importance of these channels. Our findings indicate that 1) the income effects of SSI on children's human capital are substantial, with a limited role for perverse incentive effects from conditioning benefits on disability status, and 2) parental work on net improves children's outcomes by increasing household resources, despite the potential decrease in parental time.

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1 Introduction

The United States spends around \$60 billion annually on cash transfer programs for households with children and hundreds of billions more on in-kind transfers to these households (Lou et al., 2022). While recent research has provided evidence on the long-term effects of these programs on children (e.g., Akee et al., 2010; Dahl and Lochner, 2012; Aizer et al., 2016, 2022; Bastian and Micheltore, 2018; Braga et al., 2020), there is much less evidence on the mechanisms through which these programs affect children’s outcomes (Caucutt et al., 2025; Mullins, 2022). The most obvious mechanism is income effects: transfers make more resources available for the child’s development. But parents decide how to use these resources—for example, increasing child consumption, increasing parent consumption, or decreasing parent work. These choices could have different effects on child development. Many transfer programs also condition on household characteristics like low earnings or disability status, and these restrictions could in turn affect child development through households’ behavioral responses.

We study these questions about the effects of government transfers on children’s outcomes in the context of an important and, at times, controversial transfer program in the United States: Supplemental Security Income (SSI). SSI provides cash transfers and Medicaid eligibility to adults and children who have disabilities and live in households with limited income and assets. In 2022, SSI provided benefits to 1.0 million low-income children with disabilities (Social Security Administration, 2023). Children who receive SSI benefits have poor life outcomes, including low employment rates and high criminal justice involvement (Davies et al., 2009; Deshpande and Mueller-Smith, 2022).

The debate over SSI reflects the broader debate about the effect of transfer programs on young people. On the one hand, the resources provided by SSI could improve children’s outcomes in adulthood. The cash payments of around \$800 per month make up about half of household income for the median household (Deshpande, 2016a). These payments could either increase household consumption or, if parents work less in response to the payments, increase the amount of time that parents can spend with children. But there are potentially countervailing effects from two other forces. First, parents decide how to use SSI income: on more consumption or more non-work time, and across consumption categories. Whether parents spend the SSI income in a way that maximizes the child’s human capital formation depends on the parent’s preferences and constraints (Aizer et al., 2016). Second, critics of SSI argue that the program’s eligibility criteria could create *perverse incentives* that worsen children’s adult outcomes. SSI payments are conditioned on the child meeting certain medical eligibility criteria, enforced through medical reviews at the time of application and periodically thereafter. Especially for children with mental and behavioral conditions,

parents might be concerned that good school performance could lead to an unfavorable medical review and the loss of benefits. Anecdotal stories of SSI discouraging educational achievement have been featured in popular media coverage of SSI (Wen, 2010b; Kristof, 2012), and academic scholars have also highlighted its potential incentive effects (Burkhauser and Daly, 2011).

In this paper, we estimate the effect of receiving SSI in childhood on adult outcomes and identify the channels through which those effects operate. We begin with a conceptual framework illustrating the various channels through which SSI could affect a child’s outcomes. We assume that a child’s human capital production depends on monetary and time investments made by parents during childhood, and that parents choose labor supply and investments in the child taking into account current and future SSI benefits. We show that SSI potentially affects children’s outcomes through two margins. First, SSI receipt may reduce parental labor supply through an income effect, though the magnitude of the decrease depends on the parent’s preferences and constraints. Second, SSI has an ambiguous effect on human capital investment, reflecting countervailing income and perverse incentive effects. On the one hand, SSI provides the household with resources, which can increase human capital investment (income effect). On the other hand, parents take into account future SSI benefits when choosing how much to work and invest in their child, and in particular that those benefits could be reduced or terminated if the child’s human capital exceeds some threshold (perverse incentive effect).

To explore these channels empirically, we use two sources of variation in childhood SSI receipt. We also use a novel data linkage that allows us to identify siblings in Social Security Administration (SSA) data. In addition to increasing our statistical power to identify the overall effect of SSI, siblings help identify channels since siblings are directly affected by the change in household income (income effect) but not by the change in SSI program rules (perverse incentive effect). We estimate the effects of childhood SSI receipt on children’s adult earnings as well as parent earnings, which is a key potential mediator of child outcomes. Since most children in our sample live in households headed by single mothers, parent earnings responses mostly reflect the earnings responses of single mothers.

Our primary source of variation, which identifies the overall effect of SSI, is a 2004 policy that affected how many children received a medical review and were therefore subject to removal from SSI. Deshpande (2016b) examines the impact of this policy on parents’ earnings and household income. In this paper, we study the effect of removal from SSI on the long-term outcomes of the children and their siblings. We find that children who were removed from SSI in childhood have higher earnings in adulthood. From the conceptual framework, these positive effects of SSI removal can be explained by parental decisions about

how money and time are used, including labor supply. In principle, these decisions may be driven by income effects or perverse incentives. We find evidence consistent with income effects: parents respond to the child’s SSI removal by more than replacing the SSI income with earnings, such that household income actually increases as a result of SSI removal (not statistically significant).

In contrast, we find no evidence for the perverse incentives explanation. Two pieces of evidence suggest that perverse incentives are small: the effects of SSI are no larger for the original SSI children relative to their siblings, even though siblings should not be directly affected by perverse incentives; and the effects of SSI are no larger for children with behavioral conditions (which may be more malleable and subject to the perverse incentives concern) compared to children with physical and intellectual conditions.

The second natural experiment provides additional evidence about the channels through which SSI affects outcomes. The source of variation is a 1996 policy change that increased the likelihood that SSI children turning 18 years old would lose their SSI benefits. Deshpande (2016a) examines the impact of this policy on the earnings of the SSI children who are 18 at the time of the reform. Since the 18-year-olds who received SSI generally stay in their childhood household and share income with their family of origin (Social Security Administration, 2012; Deshpande and Dizon-Ross, 2023), this paper uses the same variation to estimate the effect of the 18-year-old’s SSI loss on the long-term outcomes of their *younger siblings*. We find that removing an 18-year-old from SSI reduces the adult earnings of younger siblings in the household. This is the opposite result from the first source of variation. Once again, the evidence points to parent behavior as an explanation: in this context, parents do not make up the lost SSI income with earnings, resulting in a reduction in household income. This reduction in household income could explain adverse effects on younger siblings, much as the increase in household income might explain positive effects on children in the first source of variation.¹

We consider several explanations for why the two sources of variation in childhood SSI receipt give opposite answers about the effect of children’s adult earnings: different “complier” populations, perverse incentives, and parent labor supply responses. The evidence is most consistent with differential parent labor supply responses mediating the effects of childhood SSI. Household income appears to be “sufficient” for child outcomes: When parents respond to an increase in SSI benefits by reducing their earnings from work, SSI has zero or even negative long-term effects on children. But when parents do not adjust their labor supply in response to SSI income, meaning that there is a net increase in household income, SSI improves child outcomes in adulthood. These findings suggest that, on net, parent work

¹We use a third (untargeted) source of variation, a tightening of eligibility criteria for children with behavioral conditions in 1996, for model validation in Section 6.

improves children’s outcomes by increasing household consumption, despite the potential decrease in parental time.

In order to decompose the effect of SSI into channels and quantify their relative importance, we develop a model of parental labor supply and children’s human capital formation. In the model, a single parent, who has one child who potentially qualifies for SSI and another child who does not, decides whether and how much to work, knowing that labor will increase household income but reduce the time she can spend with her children. She faces a trade-off in that higher human capital will increase her child’s consumption in adulthood if the child does not receive SSI, but it could increase the risk of the child being removed from SSI.

We estimate the model’s parameters using causal estimates from the reduced-form variation to generate target moments, in addition to descriptive statistics from other sources. The reduced-form results inform several key features of the model. In particular, we use as moments in the model estimates of the causal effect of SSI on parental labor supply and children’s adult earnings from the two quasi-experiments. We also model, in addition to the SSI child, a second child who is ineligible for SSI to match the reduced-form setting and to help identify income effects separately from perverse incentives. We then use a third quasi-experiment to validate the estimates from the model.

Consistent with the reduced-form evidence, we estimate that consumption plays a key role in child human capital formation for these households, and is difficult to replace: a decrease of \$10 per week in consumption has the same effect on a child’s human capital as a 3-hour per week decrease in parent non-work time. This means that, on the margin, even with a minimum wage job, parental time spent working increases child human capital more than time spent not working.² The high productivity of consumption relative to parental time in the formation of human capital by children likely reflects the limited resources of SSI-eligible households and the high marginal return to consumption. It may also reflect relatively limited human capital transmission between parents and children in this context.

We conduct counterfactual exercises to estimate income effects and perverse incentive effects. We first consider changes in generosity. Eliminating childhood SSI would lead parents to increase their earnings to some extent, but not enough to offset the lost SSI income; children’s human capital would fall as a result. Conversely, doubling the SSI amount in childhood would have a moderate negative effect on maternal labor force participation and a small positive effect on the earnings potential of SSI children and their siblings. However, we find that doubling SSI in both childhood and adulthood would actually reduce children’s

²We cannot measure how mothers use their non-work time. These findings could be consistent with the notion that parental time input in children is highly valuable (Del Boca et al., 2014) as long as mothers preserve their time investment in the child when they increase their labor supply (Bastian and Lochner, 2022).

human capital in adulthood. This is due to two countervailing effects: additional resources in childhood increase human capital investment in children, but higher generosity of adult SSI increases perverse incentives to keep children on SSI in adulthood. Of course, a reduction in child human capital does not necessarily mean a reduction in child welfare.

We next consider proposals to turn the SSI cash benefit into an in-kind benefit. The motivation behind these proposals is generally to reduce parent work disincentives while still providing resources to children with disabilities. The in-kind benefit increases parent labor supply relative to a cash transfer through an income effect. The effect on the SSI child’s human capital depends on how efficient the in-kind transfer is relative to the cash transfer. Non-SSI siblings experience a decrease in human capital as a result of the reform.

In a final counterfactual exercise, we set parents’ expectations of future medical reviews to zero while keeping actual medical review rates fixed. This counterfactual helps us measure the size of the perverse incentives generated by a fear of losing SSI benefits if the child’s human capital exceeds the admissible threshold. We find that perverse incentives are relatively small compared to the benefits of the program highlighted in the previous exercise.

The main contribution of this paper is to provide the first evidence on the long-term effects of childhood SSI using multiple sources of credibly exogenous variation, and to decompose these long-term effects into channels. Using only one of the sources of variation alone would have provided an incomplete or misleading picture of the long-term effects of SSI. In particular, having multiple sources of variation (and a novel sibling data linkage) allows us to identify the role of parent labor supply responses in SSI’s effect on children’s outcomes and the role of perverse incentives created by program rules. Our model of household decision-making and child human capital formation in the presence of SSI is crucially informed by the reduced form evidence, using quasi-experimental variation in SSI receipt in the structural estimation.

Related literature. Previous research has found mixed evidence on the effect of childhood SSI on later outcomes. Coe and Rutledge (2013) and Levere (2021) use variation created by a 1990 Supreme Court decision that allowed mental conditions to qualify children for SSI. Coe and Rutledge (2013) find that SSI increases adult earnings, while Levere (2021) finds that SSI decreases adult earnings after adjusting for changes in the composition of mental conditions before and after the decision. Hawkins et al. (2023) use a regression discontinuity in birth weight to estimate the effect of SSI on the outcomes of children with very low birthweight and find no effect. In their context, higher SSI eligibility increases household income in infancy and young childhood but decreases household income in later childhood due to behavioral responses. The net zero effect of SSI on household resources and the zero effect on children’s outcomes is consistent with our finding that household income response

is a crucial determinant of the child’s adult earnings response.³

We also build on an emerging literature on the mechanisms through which exposure to the safety net in childhood affects adult outcomes. Mullins (2022) estimates a dynamic model of work, welfare participation, and parental investment, using variation in the generosity of the social safety net across states and years in the 1990s to identify the effect of the safety net on parental work and child outcomes. He finds that policies that encourage mothers to work reduce children’s human capital development. In contrast, we find that parental work, on net, improves children’s adult outcomes for low-income children with disabilities. Our results are consistent with findings from Hicks et al. (2023) that reducing welfare access in Canada increased maternal employment and increased family income, with no adverse effect on children’s test scores.⁴

We also contribute to a large literature estimating models of the technology of skill formation from parental investment inputs (Cunha and Heckman, 2007; Cunha et al., 2010; Del Boca et al., 2016, 2014; Bruins, 2017; Agostinelli and Sorrenti, 2021). While we lack data on test scores or other early-life outcomes, an advantage of our setting is that we observe long-term earnings, which is a more direct measure of human capital accumulation. We also use quasi-experimental variation from our regression discontinuity analyses to estimate the parameters of our model. A disadvantage of our setting is that we do not observe parental investments directly, so we must infer these investments from our estimates of the long-term effects of changes in household income and parental earnings.⁵

2 Context: The SSI program

SSI provides monthly cash payments to children (1.0 million) and adults (5.4 million) who have a qualifying disability and limited income and assets (Social Security Administration,

³A key difference between Hawkins et al. (2023) and this paper is that the marginal child in Hawkins et al. (2023), born with very low birthweight, likely has more severe disabilities and lower earnings potential than the marginal child affected by the variation in medical reviews used in this paper. Other research has studied the effects of SSI in young adulthood on later life outcomes (Deshpande, 2016a; Deshpande and Mueller-Smith, 2022), and the effects of childhood SSI on parental labor supply and household income (Duggan and Kearney, 2007; Deshpande, 2016b). In addition, previous research has used a combination of administrative and survey data to provide descriptive evidence on the outcomes of individuals who received SSI in childhood (Rupp et al., 2015; Hemmeter et al., 2009). Recent evidence from other programs shows that providing resources in childhood improves adult outcomes (Akee et al., 2010; Dahl and Lochner, 2012; Aizer et al., 2016, 2022; Bastian and Michelsmore, 2018; Braga et al., 2020).

⁴Duncan et al. (2011) find that the welfare reform experiments of the 1990s increased maternal employment, increased household income, and increased child test scores. Using variation from peers’ work decisions in Norway, Nicoletti et al. (2023) find that mother work on net increases child test scores. Relatedly, Bastian and Lochner (2022) find that increases in maternal work induced by the earned income tax credit do not reduce time spent with children in active learning and development.

⁵The paper also builds on a broad literature studying the effects of welfare programs on labor supply, such as Keane and Wolpin (2010); Blundell et al. (2016); Chan and Moffitt (2018) and Low et al. (2022), among others, and on the literature on the impact on of benefits that affect mothers’ work on children’s outcome (Dustmann and Schönberg, 2012; Carneiro et al., 2015).

2023). The maximum federal benefit amount for an individual is \$914/month (\$10,968/year) in 2023, and most states provide a small supplement. This amount is roughly equivalent to average parent earnings for households of children receiving SSI (Deshpande, 2016a). SSI provides categorical Medicaid eligibility in most states. Duggan et al. (2015) provide a comprehensive review of the SSI program and literature.

We discuss the key features of SSI at each life stage:

Childhood. SSI eligibility for children is based on age-appropriate activity. Children must have “marked and severe functional limitations” that limit their activities, which can include social interaction and school performance. Conditions like ADHD and speech and language delays may qualify a child for SSI because they limit age-appropriate activity.

In 1990, the Supreme Court decision in *Sullivan v Zebley* led to an expansion of the mental and behavioral conditions under which children could qualify for SSI. This reform led to rapid growth in the SSI children’s program in the early 1990s. In 1996, Congress responded to this growth by tightening rules for children qualifying on the basis of mental and behavioral conditions. We use the tightening of these rules as one of our sources of variation in childhood SSI receipt.

Cash payments are made to the parent or guardian of a child receiving SSI benefits. The maximum monthly federal SSI benefit in 2023 was \$914. The amount of the benefit falls as household earnings and unearned income increase, but the majority of children live in households that qualify for the maximum benefit. Many states add a supplemental payment, bringing the annual benefit for the median household to around \$12,000. SSA does not impose conditions on how households use SSI income, nor does it audit households to determine how they are using the income.

SSA conducts periodic medical reviews for child recipients. Most children are scheduled to receive a medical review every 3 years. In practice, however, whether a child gets a medical review as scheduled depends on the SSA administrative budget for conducting medical reviews. We use changes in SSA’s administrative budget for child reviews as another source of variation in childhood SSI receipt.

To remove a child from SSI, SSA must demonstrate medical improvement in the child’s condition since the previous review—it is not sufficient to show that the child does not meet eligibility criteria. Childhood reviews therefore disproportionately affect children with more verifiable conditions, like cancer and asthma. SSA also conducts non-medical reviews for child recipients, in the form of verifying parent income and assets and the child’s living situation.

Age 18. When a child receiving SSI turns 18, they are reevaluated based on the adult criteria. In contrast to the child standard, the adult SSI criteria are based on the ability

to work. SSA determines whether the 18-year-old is capable of earning at “substantial gainful activity” (SGA) levels (\$1,470 for non-blind disabled individuals in 2023). For this reason, age 18 medical reviews disproportionately affect children with mental and behavioral conditions. About 40% of all children receiving SSI, and nearly 70% of children with certain behavioral conditions like ADHD, are removed from SSI at the age of 18 (Hemmeter and Gilby, 2009). If SSA determines that the child does not meet the adult criteria, the child is removed from SSI. The Personal Responsibility and Work Opportunity Act of 1996 (i.e., welfare reform) mandated more and stricter reviews of children reaching age 18. This reform, and in particular its effects on the younger siblings of the affected 18-year-olds, creates a third source of variation in childhood SSI receipt.

Adulthood. For 18-year-olds who pass the age 18 medical review and are allowed onto the adult program, the SSI benefit is generally paid directly to the now-adult recipient (rather than the parent or guardian), even though most young adults receiving SSI continue to live with their family (Social Security Administration, 2012). After a small exclusion, the monthly SSI benefit (\$914 max in 2023) is reduced by \$1 for every \$2 of earned income. The benefit completely phases out at around \$22,716 in earned income. Adult SSI benefits are terminated if recipients consistently work above the SGA level.

Like children, most adults are scheduled to receive periodic medical reviews, and SSA must show medical improvement in the recipient’s condition in order to remove them. Adults also face non-medical reviews of their own income and assets, along with any in-kind support from family.

3 Conceptual Framework

To outline the important channels through which SSI benefits could affect childhood outcomes, we illustrate here a simple conceptual framework and then develop an empirical strategy to identify the key channels. The conceptual framework forms the basis of the structural model described in Section 6.

Child human capital depends on monetary (m) and time (τ) investment inputs made by parents during childhood:

$$k = f(m, \tau).$$

The parent chooses labor supply (h), leisure time (ℓ), consumption (c), and investments in the child (m, τ) taking into account current and future SSI benefits:

$$\begin{aligned}
& \max_{c \geq 0, m \geq \underline{m}, h \geq 0, \tau \geq \tau, \ell \geq 0} u(c, \ell) + \beta \cdot \nu(k, \tilde{s}(k)) \\
& \text{s.t.} \quad c + m \leq wh + s \\
& \quad h + \tau + \ell \leq E
\end{aligned}$$

where s is the maximum SSI benefit and $\tilde{s}(k) = s - \sigma \cdot k$ is the future SSI benefit amount.⁶ The function $\nu(k, \tilde{s}(k))$ represents the continuation utility, where the parent derives positive utility from the child's human capital k and from their future benefits receipt $\tilde{s}(k)$. The parameter σ represents SSI's human capital penalty: future SSI benefits will be reduced as the child's human capital increases. The parameter β is the discount factor, w is the parent's wage, and E is the parent's time endowment. It is important to note that in practice, we do not observe time and monetary investments; they are included in this conceptual framework for the purpose of clarifying how we think about parent decision-making.

Substituting the budget constraint into the utility function and taking first-order conditions, we can highlight that SSI affects child outcomes through multiple margins in interior solutions:

1. *Income effect.* SSI may reduce parent labor supply, but the magnitude of the reduction depends on parent preferences and parent wage:

$$u_c(wh^* + s - m^*, E - h^* - \tau^*) \cdot w = u_\ell(wh^* + s - m^*, E - h^* - \tau^*).$$

Parents might choose to spend the SSI income entirely on consumption (not reducing earnings), entirely on non-work time (reducing earnings by the amount of the SSI income), or something in between.

2. *Human capital investment vs perverse incentive effect.* SSI may have an ambiguous effect on labor supply and human capital investment, reflecting countervailing investment and perverse incentive effects:

$$\begin{aligned}
u_c(wh^* + s - m^*, E - h^* - \tau^*) &= \beta \cdot [\nu_k(k, \tilde{s}) - \nu_{\tilde{s}}(k, \tilde{s}) \cdot \sigma] \cdot f_m(m, \tau) \\
u_\ell(wh^* + s - m^*, E - h^* - \tau^*) &= \beta \cdot [\nu_k(k, \tilde{s}) - \nu_{\tilde{s}}(k, \tilde{s}) \cdot \sigma] \cdot f_\tau(m, \tau).
\end{aligned}$$

⁶In practice, SSI is a targeted transfer program, with two key targeting mechanisms: a means test and a medical review. Here, we have benefits decreasing in human capital, capturing, in a stylized way, the targeting based on medical review. Here, we focus our attention on the implications of medical reviews, which could create potentially perverse incentive effects. In the structural model, we will reintroduce the means test to capture the comprehensive dynamics of the SSI program, including the role of a substitution effect.

SSI increases the resources available to the household, which could increase human capital investment through an income effect, but it also creates a penalty for human capital in the form of a higher marginal tax rate on future human capital σ (perverse incentive effect). How much parents decide to increase monetary versus time investments depends on preferences, wages, and the human capital production function. Perverse dynamic incentives may involve concerns about losing access to SSI during childhood, when the program contributes to the family budget constraint, or concerns about the child losing SSI as an adult, which can affect the decision of an altruistic parent. This formulation may accommodate both depending on the nature of the continuation utility $\nu(\cdot)$: it could represent the continuation value when the child is still young, or the continuation value when they become an adult, given maternal altruism.

The goal of the paper is to measure the overall effect of SSI and to highlight the role of the two channels outlined here, particularly 1) parent decisions about work versus consumption due to the income effect and 2) the role of perverse incentives in shaping investments in children. Our primary source of variation, the Child Removal RD, helps us capture the overall effect of SSI in childhood. It gives us the effect of losing childhood SSI on adult earnings in a context in which both income effects and perverse incentives are present. Our second source of variation, the Age 18 Removal RD, helps us separate the income effect from the perverse incentive effect. It gives us the effect of an 18-year-old losing SSI on the adult earnings of younger siblings, who should be directly affected by the change in household income but who do not experience a change in program incentives. Both sources of variation provide evidence on the parent decision-making channel.

The structural model uses the causal estimates from the Child Removal RD and the Age 18 Removal RD to identify parameters of the utility function and human capital production function. Due to data limitations and to the empirical findings, the model focuses on the role of maternal labor supply as the determinant of resource and time inputs in children’s human capital, influenced by income effects and perverse incentive effects.

4 Data

We use administrative data from the Social Security Administration (SSA). The Supplemental Security Record (SSR) includes demographic information and detailed monthly benefit history information for every individual who has ever received SSI benefits since the program started in 1974. For children, the SSR also includes identifiers for their parents, including Social Security Number (SSN), full name, sex, and date of birth. We use this link between children and parents to link children to their parents’ annual earnings from Master Earnings File.

We use two different sibling samples in this analysis. The first is siblings who themselves receive SSI. We define siblings in the SSR as children who have at least one parent in common (as identified by parent SSN) on their SSR record. Because of the ability to merge on unique identifiers, this sample has the advantage of no or few false sibling matches. The disadvantage of this sample is that it is a specific subset of siblings who also receive SSI during childhood.

In a novel contribution, we develop a new matching procedure in SSA administrative data to construct a sample of siblings who do not receive SSI benefits. Unlike IRS data, SSA administrative data does not provide information on family relationships for individuals who do not receive benefits from SSA, making it much more difficult to identify siblings who do not receive SSI benefits. To the best of our knowledge, no one has successfully created sibling linkages using SSA administrative data.⁷ We develop a new linkage procedure in the Numident by matching siblings on full (first, last, middle) mother and father names.⁸ We eliminate matches with common mother and father names. We use other observables to determine which “potential” siblings are likely to be true matches: e.g., same place of birth, uncommon mother and father names, dates of birth of the potential sibling relative to the original child and relative to the mother of the original child. Appendix A provides the details of our data linkage procedure.

For the Child Removal RD, we keep potential Numident siblings who are born within eight years of the original child, turn 18 years old after the reform (so that there is time to experience effects), and turn 18 years old at least three years before the last year of earnings data (so that we can observe their outcomes). For the Age 18 Removal RD, we keep potential Numident siblings who have a relatively high likelihood of being a correct match, who are at least four years younger than the 18-year-old (so that there is time to experience the effects of the 18-year-old’s removal), and who do not themselves receive SSI benefits as children (since these siblings are in the other sibling sample). See Appendix A for more details on the sibling linkage procedure.

5 Evidence on the effect of SSI on children’s outcomes

5.1 Child Removal RD

Our primary source of variation in childhood SSI receipt comes from a 2004 administrative budget cut that resulted in fewer children receiving medical reviews. Starting October 1, 2004 (the start of FY2005), SSA’s administrative budget for conducting child medical reviews was

⁷Price and Song (2020) use probabilistic Numident matching, including dates of birth and parent names, to link participants in the SIME/DIME experiments to outcomes in SSA data.

⁸Father’s name is almost always populated in the Numident, even if the mother is single.

cut and it remained low for the next decade.⁹ Since most children have a three-year medical review schedule, children entering SSI just before October 1, 2001, were much more likely to receive a medical review three years later than children entering SSI just after this date. Deshpande (2016b) originally used this source of variation to estimate the effect of removing children from SSI on parent labor supply, but not on child outcomes. In this paper, we use this RD design to estimate the effects of removing children from SSI on their own earnings and the earnings of their siblings. This source of variation gives us the overall effect of SSI, which potentially includes income effects, perverse incentive effects, and parental earnings responses.

The original children in the sample were between the ages of 0 and 9 at the time of entry.¹⁰ In 2022, the latest available year of earnings data, they were between the ages of 21 and 30 years old. Since college attendance rates are very low in this population (Social Security Administration, 2012), early- and mid-20s earnings are meaningful measures of earnings potential. As discussed in Section 4, we identify two samples of siblings: siblings who themselves receive SSI as children and siblings who do not receive SSI as children. We include both younger and older siblings, provided that the sibling was less than 18 years old at the time of the reform.

The top two graphs in Figure 1 show the first-stage effects of the budget cut on the likelihood of receiving a child medical review. As shown in the top-left graph, nearly all children who entered SSI just before October 1, 2001, received a medical review three years later, while a much smaller fraction of children who entered SSI just after this date received a review due to the budget cut. As a result, as shown in the top-right graph, children just to the left of the cutoff received less SSI income in childhood relative to children just to the right of the cutoff.

We estimate the following equation:

$$Y_i = \alpha_1 + \beta_1 \text{FY2001}_i + \gamma_1 \text{AwardDate}_i + \delta_1 (\text{FY2001}_i \times \text{AwardDate}_i) + \kappa X_i + \varepsilon_1 \quad (1)$$

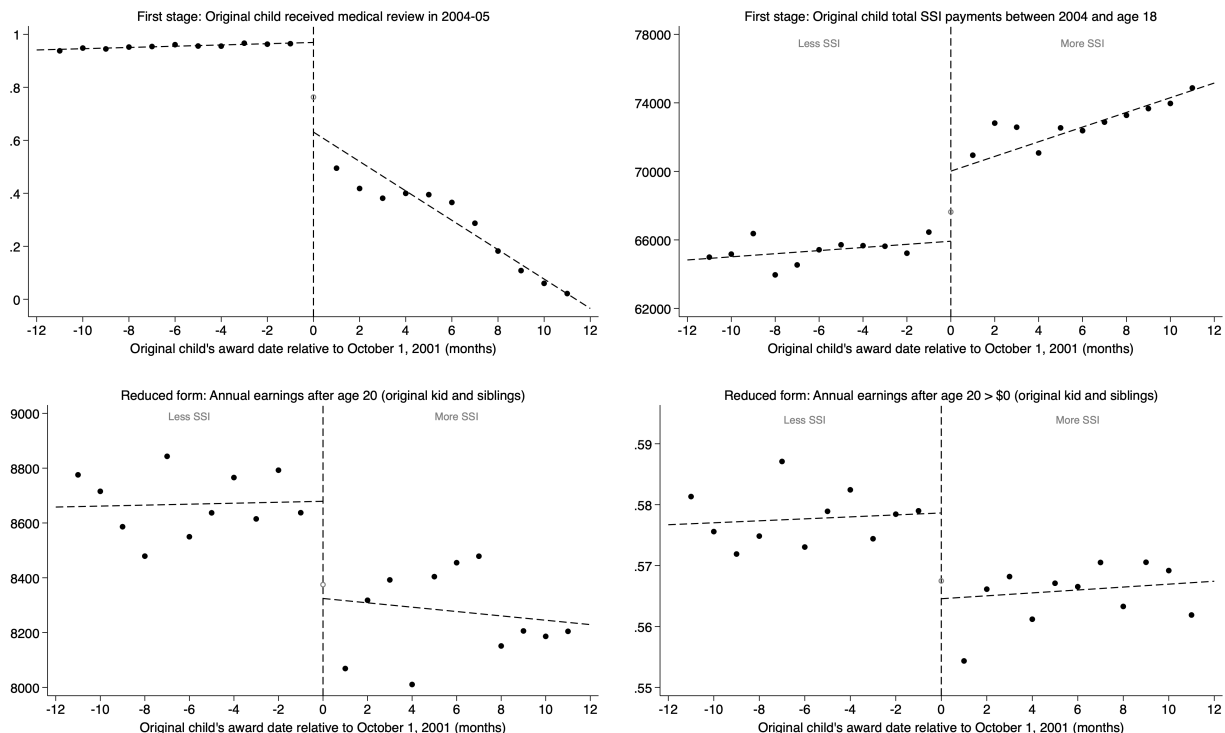
where Y_i is an outcome (e.g., child earnings in adulthood), FY2001_i is an indicator for having an award date before October 1, 2001 (the FY2002 award date cutoff), AwardDate_i is the award date running variable; and X_i are covariates (original child's age at first SSI receipt and original child's year of birth). The coefficient of interest, β_1 , gives the effect of having an award date before the cutoff, which means having a higher likelihood of being removed from SSI. We frame all of our estimates in terms of SSI removal (rather than SSI continuation).

⁹See Table V.D.2 of the 2022 Annual Report of the Supplemental Security Income Program (<https://www.ssa.gov/OACT/ssir/SSI22/ssi2022.pdf>).

¹⁰The upper bound of children's ages is the result of a separate policy that temporarily halted medical reviews for children 13 years and older.

To account for multiple siblings in the same household, we cluster standard errors at the household level. We include original child's age at first SSI receipt and year of birth as covariates in the main specification. Appendix Table D.1 presents results of a covariate balance test, with more details in Deshpande (2016b). The discontinuities in the covariates are small relative to the control mean.

Figure 1: Child Removal RD: children removed from SSI have higher adult earnings



Notes: Figure plots likelihood of the original child receiving a child medical review as scheduled in 2004–05, three years after entering SSI (top left); total SSI payments during the rest of childhood (from 2004 to age 18, top right); average annual earnings after age 20 for the original child and siblings (bottom left); and the annual likelihood of positive earnings after age 20 (bottom right). The earnings outcomes are residualized (and then control mean added back) using the same covariates used in the main specification: original child's age at first SSI receipt and year of birth. Sample for the top two graphs is SSI children who entered SSI within 250 days of October 1, 2001, and who were between the ages of 0 and 9 when they entered SSI; sample for the bottom two graphs also includes their siblings identified through either the Supplemental Security Record (who at one time applied for or received SSI) or the Numident, as described in Section 4. Table 1 reports point estimates and standard errors from estimating equation (1).

The bottom-left graph of Figure 1 shows that children (original children plus siblings) on the left of the discontinuity, who were more likely to experience the loss of SSI benefits, have *higher* earnings in adulthood than children on the right of the discontinuity. Average annual earnings after age 20 are about \$510 higher annually for those on the left than those on the right (see Table 1 for estimates). The bottom-right graph shows a large effect on employment (i.e., positive earnings), about 1.5pp. The intensive margin effects, presented in

Table 1, are also large. Importantly, the earnings result is not driven by contemporaneous SSI receipt: there is no discontinuity in the likelihood of receiving SSI benefits after age 20, likely because the marginal children who did not get a medical review during childhood were removed at age 18 as a result of their age 18 medical review. We conduct several robustness checks: Appendix Table D.9 shows that bias-corrected estimates using Stata’s “rdrobust” package (Calonico et al., 2017) are similar; Appendix Table D.10 shows similar estimates using higher-order polynomial orders; and Appendix Table D.11 shows similar estimates without covariates.

Table 1: Child Removal RD: First stage and reduced form estimates

	Pt Est	Std Err	Cntrl mean	N
First stage				
Original kid receives medical review in 2004-05	0.336	0.006	0.495	48,059
Original kid removed via medical review in 2004-05	0.048	0.005	0.030	48,059
Original kid’s SSI payment from 2004 to age 18	-\$3,633	\$639	\$70,945	48,058
Children’s (original kid + sib) adult earnings response				
Avg ann earnings after age 20	\$524	\$170	\$8,170	80,739
Annual earnings after age 20 > \$0	0.013	0.006	0.559	80,739
Annual earnings after age 20 > \$10K	0.016	0.006	0.297	80,739
Annual earnings after age 20 > \$20K	0.012	0.004	0.151	80,739
Avg ann earnings after age 20 (original kid only)	\$326	\$178	\$5,688	42,392
Avg ann earnings after age 20 (siblings only)	\$547	\$274	\$11,441	38,347
Original child’s avg ann SSI payment after age 20	\$14	\$79	\$3,458	80,739
Parent contemporaneous earnings response				
Mother’s earnings from 2004 to age 18	\$3,941	\$2,055	\$96,772	42,392
Mother ann earnings 2004-11 > \$0	0.006	0.007	0.558	42,392
Mother ann earnings 2004-11 > \$20K	0.005	0.005	0.145	42,392
Father’s earnings from 2004 to age 18	\$7,835	\$6,438	\$201,774	17,497
Parent’s earnings from 2004 to age 18	\$6,285	\$3,989	\$183,474	42,392
Annual HH income (SSI + parent earn) from 2004 to age 18	\$3,239	\$3,818	\$253,623	42,392

Notes: Table presents estimates of β_1 from equation (1); i.e., the effect of having an award date before the October 1, 2001, cutoff, and therefore having a higher likelihood of SSI removal in childhood. First stage sample is the original children: SSI children who entered SSI within 250 days of October 1, 2001, and who were between the ages of 0 and 9 when they entered SSI. The parent earnings sample is the subset of those children who have a parent (or mother or father) listed on their record at the time of the reform. The combined child and sibling sample is the original children plus their siblings identified through either the Supplemental Security Record (who at one time applied for or received SSI) or the Numident, as described in Section 4. “Control mean” indicates the average for those on the right-hand side (i.e., lower likelihood of removal) of the cutoff with running variable within 30 days of the cutoff. Specification controls for original child’s age at first SSI receipt and year of birth.

The conceptual framework from Section 3 offers two potential explanations for the result

that losing SSI has no adverse effect—in fact, a positive effect—on earnings in early adulthood. The first is perverse incentives created by program rules, and the second is parent labor supply responses. We investigate both hypotheses:

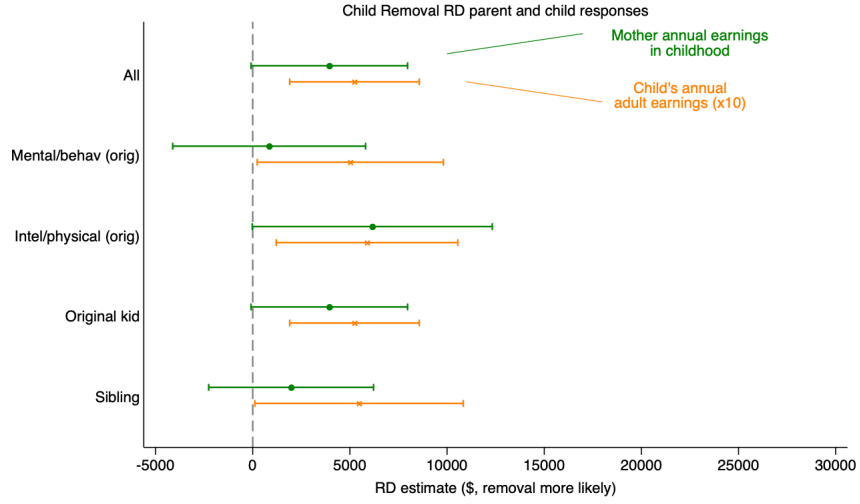
Potential perverse incentives. Could the reversal of perverse incentives—in which the SSI program potentially discourages parents from investing in their child’s human capital—explain the positive effect of SSI removal on children’s adult earnings? We conduct two tests for this hypothesis. The first test is whether the earnings response is larger for behavioral conditions than for physical or intellectual conditions. Under the assumption that behavioral conditions are more malleable than physical or intellectual conditions, estimating a larger earnings response for children with behavioral conditions than physical or intellectual conditions would suggest a role for perverse incentives, since SSI would have suppressed the human capital of the former group more.¹¹ The second test is whether the earnings response is larger for the original child receiving SSI than for that child’s siblings. Under the assumption that perverse incentives operate at the individual child level (rather than the household level), estimating a larger earnings response for original children than siblings would suggest a role for perverse incentives, since siblings are unaffected or less affected by program rules. Figure 2a compares earnings for behavioral versus other conditions, and for original children versus siblings. In both cases, the point estimate comparisons are inconsistent with a perverse incentives story.¹²

¹¹Among physical and intellectual disabilities, by far the most common diagnosis in the Child Removal RD sample is “mental retardation” (56%, now more commonly referred to as intellectual disability) followed by “loss of voice” (11%). Among behavioral conditions, the most common are speech delay (32%), ADHD (30%), and autism (13%). ADHD diagnosis in particular has been shown to be sensitive to a child’s comparison group (Elder, 2010; Evans et al., 2010; Persson et al., 2025) and to vary substantially across providers even conditional on patient observables (Marquardt, 2023), suggesting that it is less objective than a condition like intellectual disability. Similarly, there is evidence that the diagnosis of autism is responsive to symptoms more commonly expressed in boys versus girls and to compensatory behavior (Frazier et al., 2014; Estrin et al., 2020).

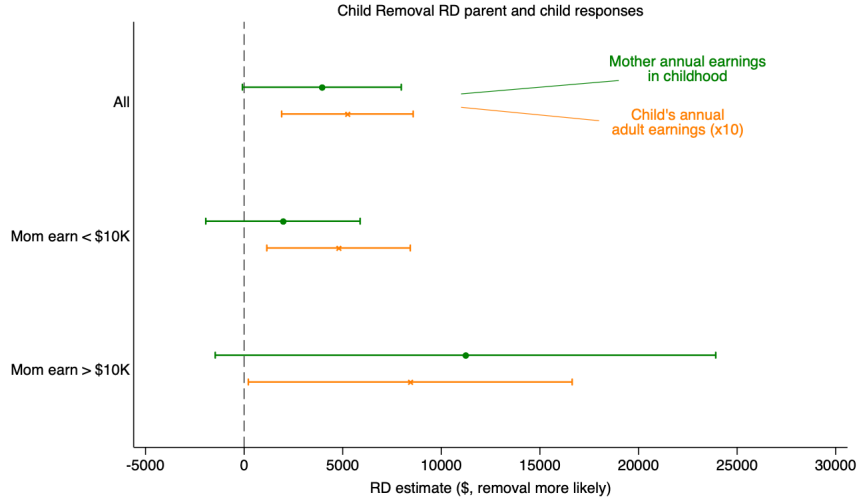
¹²Figure 2a classifies diagnosis based on primary condition listed in the Supplemental Security Record. Appendix Table D.12 presents additional estimates by diagnosis, including classifications using both primary and secondary diagnosis in the SSR. Our findings on the differences between mental/behavioral and physical/intellectual are even stronger using the primary and secondary diagnosis classifications.

Figure 2: Child Removal RD: heterogeneity in parent and child responses

(a) Tests of perverse incentives



(b) Mother's previous labor force attachment

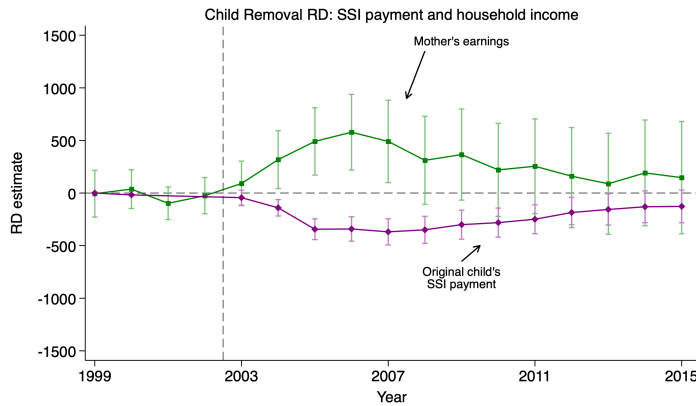


Notes: Figure plots RD estimates for the Child Removal RD (i.e., β_1 from equation (1)) for two outcomes: 1) mother's total earnings between 2004 and the year the child turns 18 years old, and 2) child's adult annual earnings after age 20 (child earning estimates are multiplied by 10 for scaling). The sample for mother's earnings is SSI children who entered SSI within 250 days of October 1, 2001, and who were between the ages of 0 and 9 when they entered SSI (see text for details); the sample for child earnings also includes their siblings identified through either the Supplemental Security Record (who at one time applied for or received SSI) or the Numident, as described in Section 4. "Mental/behav" ("intel/physical") means the original child has a mental or behavioral (intellectual or physical) condition. "Mom earn < \$10K" ("Mom earn > \$10K") means the mother earned less than (greater than or equal to) \$10,000 between 1994 and 2001 (i.e., the years prior to child's SSI entry). Appendix Table D.5 reports point estimates and standard errors. Appendix Figure D.1 graphs estimates for all subgroups.

Parent labor supply responses. Could parent labor supply decisions explain the positive effect of SSI removal on children's adult earnings? Figure 3 shows that mothers respond

to the loss of SSI benefits by increasing their earnings by even more than the SSI loss. Compared to mothers on the right-hand side, mothers of children on the left-hand-side of the cutoff earn \$3,900 more in the labor market between 2004 and the year the child turns 18 years old (see Table 1).¹³ This earnings response by mothers is about the same size as the \$3,600 SSI loss over the same period. As a result of this large earnings response by parents, household income actually *increases* in response to SSI removal. Of course, just because parents increase their earnings does not mean that the parent earnings response causes the increase in the child's adult earnings. However, the parental labor supply response channel is more consistent with the data than the perverse incentives channel. In the next section, we investigate these channels further using a second source of variation.¹⁴

Figure 3: Parent earnings responses for Child Removal RD



Notes: Graphs plot estimates of the effect of the reform on the original child's SSI payment and on mothers' earnings responses by year for the Child Removal RD (i.e., β_1 from equation (1)). The Child Removal RD sample for SSI payment is SSI children who entered SSI within 250 days of October 1, 2001, and who were between the ages of 0 and 9 when they entered SSI.

5.2 Age 18 Removal RD: additional evidence on mechanisms

We turn to a second source of variation to provide additional evidence on mechanisms. This source of variation uses a policy change, created by the 1996 welfare reform law, that increased the number and strictness of age 18 medical reviews. Children receiving SSI who

¹³We focus on mothers because a majority of children receiving SSI live in households headed by single mothers. We present results for fathers for all three sources of variation, but, consistent with other research showing small labor supply elasticities for men, we do not find significant earnings responses by fathers in any source of variation.

¹⁴The findings on parent earnings replicate the findings of Deshpande (2016b). Why is mothers' earnings response so large? One explanation might be that it is difficult to target hours perfectly. Even if mothers wish to make up only a fraction of the lost SSI income, they may not be able to find a position that accommodates these preferences. Another possibility is that the marginal utility of consumption is high, given that these are low-income households with children with disabilities. Third, if families are uncertain about SSI income limits and risk averse about the possibility of losing benefits, then parents of children receiving SSI might reduce their earnings by more than would be expected based on SSI rules alone.

had an 18th birthdate on or after August 22, 1996, the date of welfare reform enactment, were much more likely to receive an age 18 medical review than those with a birthday just before this date.

Deshpande (2016a) originally used this regression discontinuity design to estimate the effects of SSI removal on the 18-year-olds themselves. In this paper, we use this RD design to estimate the effects of the 18-year-old’s removal on the *adult earnings of younger siblings*, using the method to identify siblings outlined in Section 4. Since most young SSI adults still live with their parents and share income with their family of origin (Social Security Administration, 2012; Deshpande and Dizon-Ross, 2023), the younger siblings of 18-year-olds who were removed as a result of the policy change would have grown up with fewer household resources.¹⁵ Estimating the effect of the 18-year-old’s removal on the adult earnings of younger siblings provides another estimate of the effect of childhood SSI receipt on children’s adult outcomes (albeit not the child who actually received SSI in childhood), and thereby complements the Child Removal RD.

The top graphs of Figure 4 show the first stage effects of the age 18 policy change. From the top-left graph, the original 18-year-olds with an 18th birthday just after the date of welfare reform enactment were much more likely to receive an age 18 medical review than those with an 18th birthday just before that date, and therefore more likely to be removed from SSI as a result of the age 18 medical review. As shown in the top-right graph, they were less likely to receive SSI benefits from the ages of 18 to 30 years.

We estimate the following equation:

$$Y_i = \alpha_2 + \beta_2 \text{AfterPRWORA}_i + \gamma_2 \text{DOB}_i + \delta_2 (\text{AfterPRWORA}_i \times \text{DOB}_i) + \kappa_2 X_i + \varepsilon_2 \quad (2)$$

where Y_i is an outcome (e.g., younger sibling earnings in adulthood), AfterPRWORA_i is an indicator for the 18-year-old having their 18th birthday after the date of PRWORA enactment (August 21, 1996), DOB_i is the 18-year-old date of birth running variable, and the X_i are covariates. The coefficient of interest, β_2 , gives the effect of the 18-year-old having a birthdate after the cutoff. To account for multiple siblings in the same household, we cluster standard errors at the household level. We include original 18-year-old’s severity, own sex, own year of birth, and type of sibling (SSR or Numident) as covariates in the main specification. Appendix Table D.2 presents results of a covariate balance test. As discussed in Deshpande (2016a), although some discontinuities are significant, they are small as a percentage of the control mean, and the results do not change when we include them as

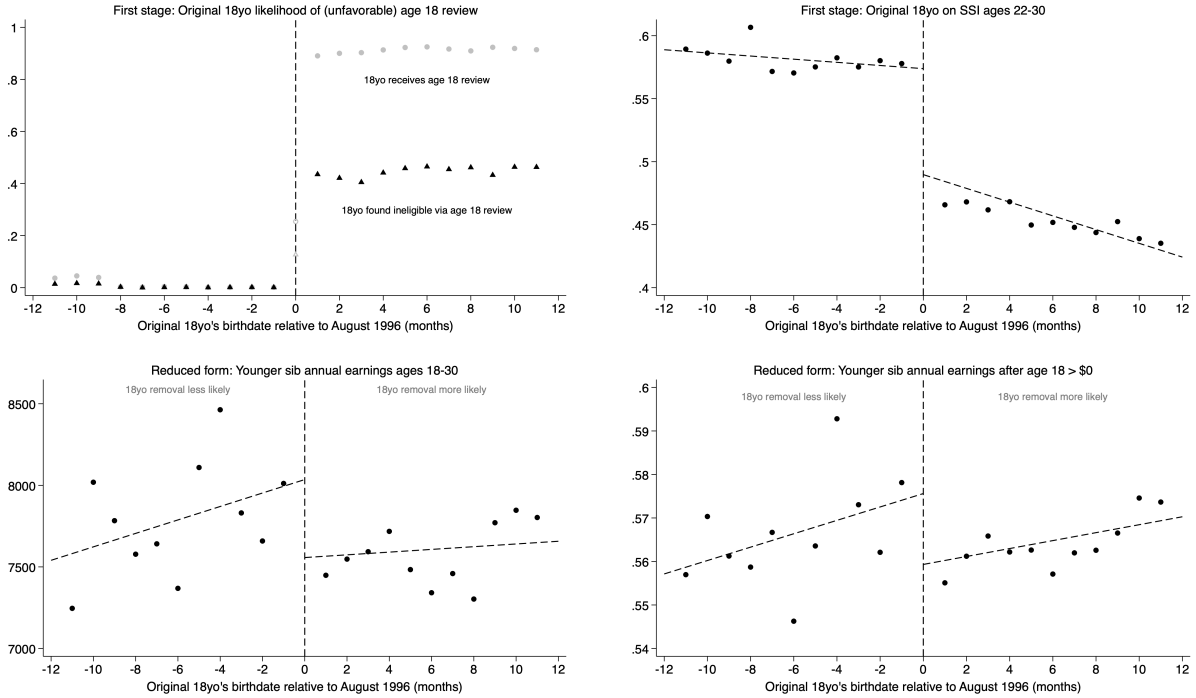
¹⁵DeCesaro and Hemmeter (2009) find that when asked how they would adjust to a \$100 increase or decrease in income, parents of children receiving SSI benefits said that they would adjust food and other household goods, rather than consumption specific to the child with the disability. This suggests that siblings would be affected by the loss of SSI income.

controls.

Deshpande (2016a) shows that 18-year-olds who were removed from SSI have (modestly) higher earnings in adulthood, consistent with theoretical income and substitution effects. We replicate the 18-year-old results for the sibling-only sample in Table 2. The bottom two graphs of Figure 4 show the new result of this paper: in contrast to the 18-year-olds, who earn *more* in adulthood as a result of their removal from SSI, younger siblings earn *less* in adulthood as a result of the 18-year-old’s removal (bottom left) and are less likely to be employed as adults (bottom right). The RD estimate for younger siblings is a \$515 decrease in annual earnings between the ages of 18 and 30 and a 1.6pp reduction in the annual likelihood of employment over this time, both statistically significant (see Table 2 for estimates).¹⁶ These adverse effects apply to both SSI and non-SSI siblings, suggesting that the mechanism is the loss of household resources rather than something specific to SSI siblings (e.g., expectations about SSI removal).

¹⁶Appendix Table D.9 shows that bias-corrected estimates using Stata’s “rdrobust” package (Calonico et al., 2017) are similar. Appendix Table D.10 shows estimates using higher-order polynomial orders. Appendix Table D.13 presents estimates without covariates.

Figure 4: Age 18 Removal RD: younger siblings of removed 18yos have lower adult earnings



Notes: Figure plots the original 18-year-old's likelihood of receiving an (unfavorable) age 18 medical review (top left); the original 18-year-old's likelihood of receiving SSI at ages 18-30 for the original child (top right); younger siblings' average annual earnings between ages 18 and 30 years (bottom left); and younger siblings' average likelihood of positive earnings over those ages (bottom right). The earnings outcomes are residualized (and then control mean added back) using the same covariates used in the main specification: original 18-year-old's severity, own sex, own year of birth, and type of sibling (SSR or Numident). Sample for the top two graphs is SSI children with an 18th birthday within 250 days of the August 22, 1996, cutoff. Sample for the bottom two graphs is the younger siblings of SSI children with an 18th birthday within 250 days of the August 22, 1996, cutoff, where siblings are identified through either the Supplemental Security Record (who at one time applied for or received SSI) or the Numident, as described in Section 4. Table 2 reports point estimates and standard errors.

The Age 18 Removal RD gives the opposite effect of SSI on child outcomes compared to the Child Removal RD. In the Child Removal RD, children who received less SSI income in childhood have higher earnings in adulthood. In the Age 18 Removal RD, children who received less SSI income in childhood have lower earnings in adulthood. Figures 3 and 5 show a key difference between the two quasi-experiments that could explain the opposite effects on children's outcomes: different parent earnings responses. In the Age 18 Removal RD, mothers do not increase their earnings at all in response to the 18-year-old's removal. Combined with the fact that the 18-year-olds themselves do not earn enough to recover the lost SSI income, this means that younger siblings grow up in households with lower income. In the Age 18 Removal RD, SSI removal leads to lower household income and lower adult earnings among children. In the Child Removal RD, SSI removal leads to higher household income and higher adult earnings among children (see Appendix Figure D.5 for household

Table 2: Age 18 Removal RD: First stage and reduced form estimates

	Pt Est	Std Err	Cntrl mean	N
First stage				
18yo receives age 18 review	0.883	0.006	0.004	36,881
18yo removed via age 18 review	0.434	0.010	0.002	36,881
18yo SSI payment 1997-2002 (avg ann)	-\$1,610	\$88	\$5,858	36,881
Original 18yo adult earnings response				
18yo SSI indicator ages 18-30 (avg ann)	-0.129	0.009	0.669	36,881
18yo SSI payments ages 18-30 (avg ann)	-\$1,034	\$85	\$4,937	36,881
18yo earnings ages 18-30 (avg ann)	\$171	\$189	\$4,327	36,881
Younger sibling adult earnings response				
Avg ann earnings ages 18-30	-\$515	\$200	\$7,844	36,881
Annual earnings ages 18-30 > \$0	-0.016	0.007	0.571	36,881
Annual earnings ages 18-30 > \$10K	-0.015	0.006	0.285	36,881
Annual earnings ages 18-30 > \$20K	-0.009	0.005	0.140	36,881
Avg ann earnings ages 18-30 (SSI sibs only)	-\$509	\$200	\$4,705	19,739
Avg ann earnings ages 18-30 (Non-SSI sibs only)	-\$526	\$357	\$11,760	17,142
Parent contemporaneous earnings response				
Mother earnings from 1997 to age 18	-\$4,122	\$2,268	\$53,284	34,261
Father earnings from 1997 to age 18	-\$9,858	\$5,332	\$102,034	16,613
Parent earnings from 1997 to age 18	-\$11,259	\$3,840	\$102,830	35,100
HH income (SSI + parent earn) from 1997 to age 18	-\$20,359	\$3,848	\$137,940	35,100
HH income (SSI + parent/18yo earn) from 1997 to age 18	-\$17,521	\$4,065	\$160,623	35,100

Notes: Table presents estimates of β_2 from equation (2); i.e., the effect of the original 18-year-old having an 18th birthday after the August 22, 1996, cutoff and therefore having a higher likelihood of SSI removal age 18. The sample is the younger siblings of the original 18-year-olds (SSI children with an 18th birthday within 250 days of the August 22, 1996, cutoff) identified through either the Supplemental Security Record (who at one time applied for or received SSI) or the Numident, as described in Section 4. The parent earnings sample is the subset of those children who have a parent (or mother or father) listed on their record. “Control mean” indicates the average for those on the left-hand side of the cutoff (i.e., lower likelihood of removal) with running variable within 30 days of the cutoff. Specification controls for original 18-year-old’s severity, own sex, own year of birth, and type of sibling (SSR or Numident).

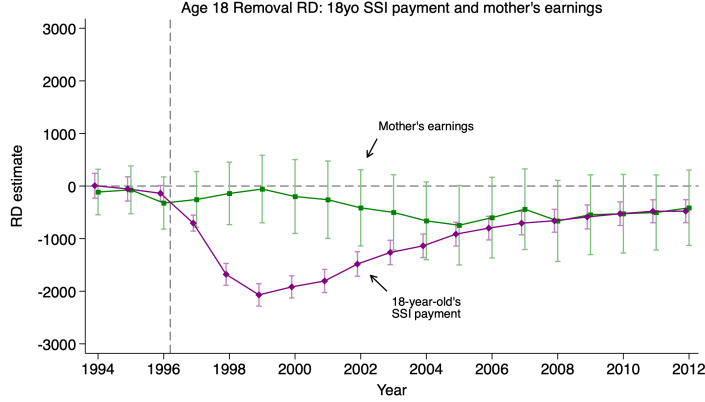
income analog to Figures 3 and 5).

Figure 6 summarizes the effect of SSI removal or denial on SSI income, parent earnings, household income, and children’s adult earnings; i.e., we plot IV estimates from the following equation:

$$Y_i = \alpha + \beta_{IV} \text{SSIRemovalDenial}_i + \kappa X_i + \varepsilon \quad (3)$$

where $\text{SSIRemovalDenial}_i$ is an indicator for being removed from or denied SSI in child-

Figure 5: Parent earnings responses for Age 18 Removal RD



Notes: Graphs plot estimates of the effect of the reform on the original child's SSI payment and on mothers' earnings responses by year for the Age 18 Removal RD (i.e., β_2 from equation (2)). The Age 18 Removal RD sample for SSI payment is the younger siblings of SSI children with an 18th birthday within 250 days of the August 22, 1996, cutoff. The sample for mother earnings is mothers of these children.

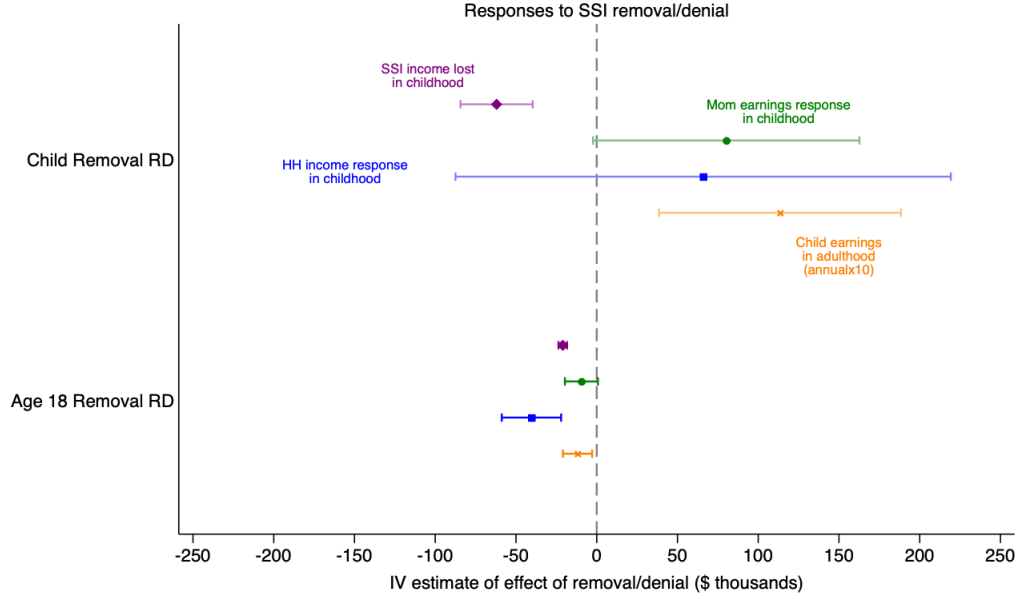
hood and we estimate equation (3) using the instruments in equations (1) and (2). In the Child Removal RD, household income increases (i.e., parents work more in response to removal/denial) and the child's adult earnings increase. In the Age 18 Removal RD, household income decreases (i.e., parents do not increase earnings) and the child's adult earnings decrease.

5.3 Discussion: heterogeneous effects of SSI on adult earnings

We find opposite effects of childhood SSI on adult earnings across the two sources of variation. What explains these opposite effects? We consider several possible explanations and find that the evidence is most consistent with heterogeneity in parent earnings responses:

Differential parent labor supply responses. Figure 6 shows that short-term parent earnings responses and long-term child earnings responses move together. We conduct two additional tests for the hypothesis that heterogeneous household income responses explain heterogeneous adult earnings responses. First, we estimate the reforms on the joint outcomes of household income and child's adult earnings. As shown in Appendix Figure D.3, parent and child earnings responses are highly correlated: the effect of SSI removal is either to increase both household income (determined by SSI and parent earnings) and child's adult earnings, or to decrease both household income and child's adult earnings. There is almost no effect on the joint outcome of increasing household income while decreasing child's adult earnings (or vice versa). Second, we plot the relationship between the household income response and the child's adult earnings response by experiment and subgroup. Appendix Figure D.4 shows that the household income response and the child's adult earnings response

Figure 6: Summary: child's adult earnings response tracks household income response



Notes: Figure plots IV estimates of the effect of SSI removal for the Child Removal RD and Age 18 Removal RD (i.e., β_{IV} from equation (3)). The outcomes include: SSI income lost in childhood, mother's earnings response during childhood, total household income response in childhood, all measured from the year of the reform to the year the child turns 18 years old; and child's annual adult earnings response (multiplied by 10 for scale). The Child Removal RD sample for the first three outcomes is SSI children who entered SSI within 250 days of October 1, 2001, and who were between the ages of 0 and 9 when they entered SSI; for the child's earnings response, the sample includes siblings. The Age 18 Removal RD sample is younger siblings of SSI children with an 18th birthday within 250 days of the August 22, 1996, cutoff. Siblings are identified through either the Supplemental Security Record (who at one time applied for or received SSI) or the Numident, as described in Section 4. Appendix Table D.17 reports point estimates and standard errors.

are highly (positively) correlated across experiments and across subgroups.¹⁷

A natural question is *why* parents have different earnings responses across the two quasi-experiments. The only characteristic that shows evidence of heterogeneous treatment effects in the Child Removal RD is mother's previous labor force attachment (Figure 2b): mothers who were already working at the time of the SSI loss respond by working even more, while mothers who were not working have no earnings response. The Age 18 Removal RD sample has many fewer attached mothers than the Child Removal RD, since the 18-year-olds who are removed in the Age 18 Removal RD have been receiving SSI for much longer on average than the children in the Child Removal RD (who, by the nature of the design, have only been receiving SSI for three years). The weaker attachment of mothers in the Age 18 Removal RD, and the worse outcomes of their children, is consistent with the heterogeneous effects

¹⁷To test this relationship formally, in Appendix Table D.8, we test for equality of the effect of household income in childhood on the child's adult earnings across experiments and across experiment-subgroups, and we fail to reject the null of equality.

by mother’s labor force attachment in the Child Removal RD.¹⁸ We find no heterogeneity in the mother’s earnings response on any other dimension (child sex, age, or condition; or mother marital status or age) in Appendix Figure D.1.

Differential characteristics of marginal population. Perhaps the most obvious alternative explanation for the different effects on child outcomes is different “complier” populations. The two quasi-experiments affected different samples of children and occurred at different times. Appendix Figure D.6 compares the complier populations of the two quasi-experiments. The samples look similar on family background (parent earnings and family structure) and child sex. The samples differ substantially in age structure, with the Child Removal RD sample being younger than the Age 18 Removal RD sample. They also differ in type of condition, with most of the Age 18 Removal RD sample having no condition (since they are non-SSI siblings). It could be that these differences in composition explain the different effects across experiments.

To probe this hypothesis, we test for heterogeneous treatment effects by these characteristics. The results, shown in the bottom graph of Appendix Figure D.6, show little heterogeneity in the child’s adult earnings response on these dimensions. While we cannot rule out different complier characteristics as an explanation for the differential effects, the lack of heterogeneous treatment effects suggests that they are unlikely to explain why the effects have opposite signs.

As a more formal test of whether differences in complier populations can explain the heterogeneous effects, we reweight the main Child Removal RD estimate (child’s adult earnings after age 20) according to the complier shares in the Age 18 Removal RD, as proposed in Angrist and Fernández-Val (2013). We use age at reform and diagnosis as the key complier characteristics since these are the characteristics that differ the most across the quasi-experiments. The results, shown in Appendix Table D.7, indicate that complier differences do not explain the heterogeneous effects. If anything, the Child Removal RD

¹⁸The parent labor supply response could operate through household income or through a “role model” effect—i.e., the increase in parent work in the Child Removal RD improves children’s long-term outcomes by setting a good example of work ethic. Two pieces of evidence point to household income as the main channel. One is that parent earnings responses are mostly on the intensive margin—parents who were already working work more in response to the SSI loss—and it might be reasonable to assume that the role model effect is less important on the intensive margin than on the extensive margin. Another is that, in the Age 18 Removal RD, younger siblings experience strong adverse effects from SSI loss even when there is no parent earnings response. This implies that the adverse effects on those younger siblings must be the result of lower household income, and therefore that household income affects long-term outcomes. Another possibility is a “quality child care” effect—i.e., the increase in parent work means that children spend more time with either formal or informal caregivers who contribute more to the child’s human capital than the parent does. This is possible but is again inconsistent with the adverse effects on younger siblings in the Age 18 Removal RD. Moreover, most of the children in these samples are old enough to attend school, so the scope for child care effects is limited to evenings and weekends.

estimate becomes larger in magnitude when reweighted by Age 18 Removal RD complier shares. If complier differences explained the heterogeneous effects, we would have expected the reweighted estimate to become smaller in magnitude or even flip signs.

Differential magnitude of SSI income change. The loss of SSI income is large in both quasi-experiments, as shown in Appendix Table D.15. In each case, the SSI loss amounts to tens of thousands of dollars in childhood when scaled up by the first stage effect on the likelihood of receiving SSI. Scaling the estimates by the magnitude of the loss does not solve the puzzle. Moreover, this explanation does not account for the opposite signs of the effects.

Perverse incentive or labeling effects of SSI. Another hypothesis for the different effects on children’s adult earnings is that SSI might create perverse incentives that discourage achievement (Wen, 2010a; Kristof, 2012; Burkhauser, 2012). In the Child Removal RD, losing SSI could improve long-term outcomes if SSI discourages educational achievement. In contrast, perverse incentives are not relevant for the younger siblings in the Age 18 Removal RD. Therefore, it could be that the loss of SSI income has an adverse effect on long-term outcomes (which would explain the Age 18 Removal RD sibling effect) but the reversal of perverse incentives has an even larger *positive* effect on outcomes (which would explain the Child Removal RD effect). A similar hypothesis is that children who lose SSI (or are denied SSI) are no longer “labeled” as having a disability and therefore have more opportunities and higher expectations, improving their outcomes.

However, two pieces of evidence, already discussed in Section 5.1 point against the perverse incentive/labeling hypotheses. First, the original child’s SSI loss in the Child Removal RD also improves the outcomes of siblings (see Table 1). Since the SSI payments are not tied directly to the sibling’s human capital, we would not expect the reversal of perverse incentives to have an equally large effect on siblings as on the original child. Similarly, labeling likely only applies to the original child, not the sibling. This suggests that perverse incentives cannot explain why the loss of SSI improves outcomes in the Child Removal RD but worsens outcomes in the Age 18 Removal RD. Second, earnings responses for both the child and parent are actually smaller for children with mental conditions compared to those with physical and intellectual conditions (see Appendix Table D.5). If perverse incentives played a major role in children’s outcomes, we would expect the earnings response to removal to be larger for children with mental conditions since they are more susceptible to potential perverse incentive effects.

Differential contemporaneous effects of adult SSI. To the extent that the “first stage” effect of the policy change on SSI receipt persists into adulthood, adult earnings responses could reflect not only changes in human capital development in childhood, but also income and substitution effects resulting from SSI receipt in adulthood. However, for the

Child Removal RD, the first stage effect on SSI receipt for the Child Removal is virtually zero in adulthood (see Table 1). Given the findings from Deshpande and Dizon-Ross (2023) that the anticipation of adult SSI benefits has no effect on human capital investment in childhood, it is also unlikely that the human capital effect is driven by differential anticipation of adult benefits.

In summary, our two quasi-experiments reveal substantial heterogeneity in the effect of SSI on children’s human capital development. Though we cannot know for sure, this variation appears to be driven by differential parent earnings responses and, ultimately, by household income: SSI increases children’s human capital when parents do not adjust their earnings in response, but has no effect or even reduces child human capital when parents reduce their earnings in response. The reduced form findings suggest that parent work increases children’s adult earnings through increased consumption in childhood, despite reducing the time available for parental care and supervision. The evidence also indicates that perverse incentives have little effect on children’s human capital. In the following section, we develop and estimate a model to formally decompose the effects of SSI into channels and to simulate the effects of counterfactual SSI policies.

6 Model

To examine the broader implications of our empirical estimates, we develop a quantitative model that accounts for the potential channels through which the SSI program can affect children’s human capital through family inputs. We focus on the effect of SSI on maternal labor supply choices, household income, and children’s human capital. The goal of the model is to quantify the role of different forces and to estimate the effects of counterfactual SSI policies.

6.1 Model setup

A household comprises a mother and up to two dependent children, S and N . The number of children in period t is denoted by $n_t \in \{0, 1, 2\}$. Children are dependent for a fixed number of years after birth. We follow a household whose older child (S) is potentially eligible for SSI due to a condition and who also has a younger child (N) who is not eligible for SSI. Child S is g years older than Child N . Each child’s human capital affects their adult earnings and is the result of the circumstances experienced during childhood.

Mothers and adult children choose hours of work h_t given hourly wages w_t . They enjoy non-work time $E - h_t$ (where E is their endowment of time) and consumption c_t . We denote the variables in the mother’s problem with a subscript j and variables in the adult child’s problem with a subscript i .

Adult-equivalent consumption c_t and maternal non-work time $E - h_t$ are inputs in the human capital production function of children, proxying for direct time and income inputs in the children. This assumption is due to data limitations, since we cannot directly observe time and monetary inputs into each child. It is also justified by the empirical observation from Section 5 that the effects of SSI on non-SSI siblings is similar to its effects on SSI children, suggesting that focusing on how parents affect the environment in which the children grow up may be a useful way to characterize investments in children when targeted time and money investments cannot be observed. In this model, perverse incentives may influence the family through the maternal labor supply.

6.1.1 Eligibility for Childhood SSI

The oldest Child S may be eligible for SSI due to a disability. The state variable $s_{t-1} \in \{0, 1\}$ is a dummy variable that keeps track of whether Child S received SSI in the prior period, with $s_0 = 0$.¹⁹ Future eligibility for SSI is determined by two factors:

1. Medical Review: If the child is not already on SSI ($s_{t-1} = 0$), they will receive a medical review with probability ϱ , except for newborns who receive a medical review with probability 1, and if they don't receive a medical review, they remain off of SSI.²⁰ If the child is already on SSI ($s_{t-1} = 1$), they will receive a medical review with probability π_t , and if they don't receive a medical review, they remain on SSI. When the child receives a medical review, their human capital, k_t^S , needs to fall below a stochastic threshold $\bar{k}_t$ to be eligible for SSI, drawn from a known distribution at the time of the test.
2. Means-Test: Every period, maternal earnings $w \cdot h$ cannot exceed a means-test threshold that is set by SSA. We let $SSI(w \cdot h, n)$ denote the potential SSI that a mother with n kids and earnings $w \cdot h$ is eligible for according to the SSA means test. We say that a household is eligible for SSI on the basis of the means-test if they have the potential to receive a positive amount of SSI, i.e., when $SSI(w \cdot h, n) > 0$.

Hence, upon receiving a medical review (which occurs with probability $\pi_t s_{t-1} + \varrho(1 - s_{t-1})$), SSI eligibility, s_t , is given by

$$s_t = \mathbf{1}[k_t^S < \bar{k}_t] \cdot \mathbf{1}[SSI(w_t h_t, n_t) > 0],$$

¹⁹We suppress the j subscript in this subsection for readability.

²⁰We lack the variation to estimate ϱ , so instead we calibrate ϱ so that the annual probability of re-entry to SSI given the initial distribution of human capital is equal to 0.013. This number is based on our calculations of the re-entry probability for our sample and is consistent with the re-entry likelihoods in Hemmeter and Bailey (2015). Note, $\varrho = \mathbb{P}(\text{Apply for SSI})$ and $\mathbb{P}(\text{Pass Medical Review} | \text{Previously Failed Medical Review}) \mathbb{P}(\text{Apply for SSI}) = \mathbb{P}(\text{Reentry Rate})$. This allows us calibrate the application rate, ϱ , by setting it equal to $0.013 / \mathbb{P}(\text{Pass Medical Review} | \text{Previously Failed Medical Review})$, where the denominator is based on the initial distribution of human capital.

and otherwise it is given simply by

$$s_t = \mathbf{1}[SSI(w_t h_t, n_t) > 0] \cdot s_{t-1}.$$

Note that SSI provides income that can increase the children's human capital (an income effect), but by requiring that the child pass the medical review, SSI could also induce a behavioral responses that decreases human capital (a perverse incentive effect), which operates through the mother's choice of hours of work, since we cannot observe direct inputs of money and time. Siblings, hence, receive the same investments, which is consistent with our findings that they respond similarly to the loss of SSI benefits in the family.

6.1.2 The mother's optimization problem

Let T^χ denote the last period when child $\chi \in \{S, N\}$ is a dependent, which corresponds to their 21st birthday. Then, for every period from when Child S is a newborn ($t = 1$) until Child N becomes an adult ($t = T^N$), we specify the following household dynamic problem, in which the (altruistic) mother is the decision maker:

$$\begin{aligned} V_t(\mathbf{\Omega}_{j,t}) &= \max_{c_{j,t}, h_{j,t}} u(c_{j,t}, h_{j,t}; n_{j,t}) + \beta E_t[V_{t+1}(\mathbf{\Omega}_{j,t+1})] + \psi \sum_{\chi \in \{S, N\}} \mathbf{1}[t = T^\chi] E_t[W_1^\chi(s_{j,t}, w_{i,t}^\chi) | k_t^\chi] \\ \text{s.t. } c_{j,t} &= w_{j,t} h_{j,t} + s_{j,t} SSI(w_{j,t} h_{j,t}, n_{j,t}) + G(w_{j,t} h_{j,t}, n_{j,t}, s_{j,t}) \\ k_{t+1}^\chi &= f(k_t^\chi, c_{j,t}, h_{j,t}; n_{j,t}) \quad \text{for } \chi = S, N \end{aligned}$$

The vector $\mathbf{\Omega}_{j,t}$ contains the state variables of the parent's problem: the number of children n , the human capital of each child $\{k_t^S, k_t^N\}$, Child S 's prior eligibility for SSI $s_{j,t-1}$, and the realization of the mother's stochastic productivity $w_{j,t}$. The variable $G(w_{j,t} h_{j,t}, n_{j,t}, s_{j,t})$ represents other benefits that the household is entitled to as a function of its earnings, size and SSI eligibility (i.e., SNAP and EITC in this case). The parameter β is a fixed discount factor and the parameter ψ captures the mother's altruism (i.e., how much weight she puts on her children's adult welfare, W_1^χ), net of discounting. As long as the children live with their mother, all of their SSI payments and other benefits enter the mother's budget. As we will see in the adult child's problem, their well being depends on their human capital through its impact on their adult wages, $w_{i,t}^\chi$, and SSI eligibility status for Child S , s_{j,T^S} .

In other words, the mother's objective is to maximize her household's current and future utility as well as the adult utilities of her two children. Her children's utilities in adulthood depend on their human capital going into adulthood and, for Child S , on their SSI eligibility prior to entering adulthood. The mother faces a fundamental trade-off in deciding how much to work, and hence invest in Child S 's human capital: higher human capital for Child S

increases Child S 's earnings potential in adulthood but also increases the risk that Child S is removed from SSI. Her labor supply decisions affect her children's human capital development in childhood: both directly through the earnings she brings in and indirectly through the effect of her earnings on the family's eligibility for SSI and other benefits.²¹ These decisions also have spillovers to Child N 's human capital development, and thus their adult utility.

6.1.3 The adult child's optimization problem

Upon adulthood, each child solves a labor supply life cycle problem, given offer wages that depend on their human capital level and on permanent productivity shocks. Child S is eligible for SSI provided that they qualified at the beginning of adulthood and satisfy means tests. We describe this problem in greater detail in Appendix D.

6.1.4 Evolution of wages

Agents draw their initial wages at the beginning of their adult life from a given distribution. Afterward, wages evolve according to a lognormal random walk and suffer a wage penalty for being out of the workforce in the prior year captured by the parameter δ (skill depreciation). This feature allows us to capture the possibility that, after being out of the labor force for longer periods of time, mothers of adult SSI children may face worse labor market prospects than mothers of younger children.

The average log wage of an adult child corresponds to their log human capital, giving us a natural way to interpret the scale of our human capital measure k . Mothers' initial wage draw is correlated with her children's initial human capital with correlation coefficient ω . We describe these processes in greater detail in Appendix D.

6.1.5 Parameterization

We make the following parametric assumptions to estimate the model.

Childhood human capital production For each child ($\chi \in \{S, N\}$), the law of motion of human capital takes a Constant Elasticity of Substitution (CES) form:²²

$$k_{t+1}^{\chi} = [\alpha_1 c_t^{\rho} + \alpha_2 (E - h_t)^{\rho} + (1 - \alpha_1 - \alpha_2) (k_t^{\chi})^{\rho}]^{\frac{1}{\rho}} \quad (4)$$

Parents are aware of the human-capital returns to consumption and maternal time, and make labor supply decisions based on them.²³ Consumption is measured in adult-equivalent

²¹Unlike in the conceptual framework from Section 3, we do not observe actual time and monetary investments in children in the data. DeCesaro and Hemmeter (2009) find that when asked how they would adjust to a \$100 increase or decrease in income, parents of children receiving SSI benefits said that they would adjust food and other household goods, rather than consumption specific to the child with the disability. This suggests that the loss of SSI income would be equally shared across family members.

²²We suppress the j subscript in this subsection for readability.

²³While exploring the role of parental beliefs may be a fruitful avenue, additional data would be required to identify them in our setting (Boneva and Rauh, 2018; Attanasio et al., 2019).

terms based on the OECD scale.²⁴ The children's human capital continues to develop until they turn 18, after which their human capital is fixed.

The utility function The mother and her adult children have additive CRRA preferences in consumption c and labor h (MaCurdy, 1981):

$$u(c, h) = \frac{c^{1-\gamma}}{1-\gamma} + \phi \frac{(E-h)^{1-\zeta}}{1-\zeta} - \eta \mathbf{1}[h > 0]$$

with $\gamma = 1.5$, a value commonly used in the literature (see, for example, Attanasio et al. (2008)) and discount factor $\beta = 0.98$. Agents also face a fixed cost of work, η , which is an estimated parameter. We allow Child S to have different preferences than mothers and Child N due to their health condition. Formally, let ζ^S, ϕ^S, η^S denote the preference parameters of Child S , while ζ, ϕ, η denote the preference parameters of the mother and Child N .

SSI eligibility threshold In the years before the age T^S medical review, the threshold for SSI eligibility is distributed according to a gamma distribution, i.e., $\bar{k}_t \sim \Gamma(\mu_{\bar{k}}, \sigma_{\bar{k}})$. Here, we deviate from convention to parameterize the gamma distribution in terms of its mean $\mu_{\bar{k}}$ and standard deviation $\sigma_{\bar{k}}$, in an effort to make the parameter values more immediately interpretable. Similarly, the threshold for SSI eligibility in the age-18 medical review also follows a gamma distribution but with a distinct mean $\bar{k}_{18} \sim \Gamma(\mu_{\bar{k},18}, \sigma_{\bar{k}})$.

6.2 Estimation

We estimate the parameters of the model by the Method of Simulated Moments (McFadden, 1989). There are 25 parameters to estimate:

- 7 parameters in the utility function governing preferences for leisure and the mother's altruism ($\zeta, \phi, \eta, \zeta^S, \phi^S, \eta^S, \psi$);
- 3 parameters in the human capital production function governing the HK productivity of time and consumption (α_1 and α_2) in addition to the substitution in parameter ρ ;
- 8 parameters governing the initial (joint) distribution of the mother's wages and her children's initial human capital ($m^{\text{childRD}}, m^{\text{age18RD}}, \mu^S, \mu^N, \sigma_0, \sigma_k^S, \sigma_k^N, \omega$);
- 4 parameters governing the law of motion of wages ($\sigma, \sigma^S, \sigma^N, \delta$); and
- 3 parameters governing the distribution of SSI eligibility thresholds ($\mu_{\bar{k}}, \sigma_{\bar{k}}, \mu_{\bar{k},18}$).

In the Child Removal RD, we target the following outcome variables for RD moments: i) change in unfavorable reviews; ii-iii) change in the percent of Children S on SSI as children

²⁴The first adult in the household counts as 1 adult equivalent. Each additional adult adds 0.7 adult equivalents, whereas each child adds 0.5. To put each input on similar scales, we further normalize consumption by 500 and hours by 10.

and as adults; iv-vi) change in average adult children’s earnings, Children S earnings, mothers’ earnings; vii) change in household income; viii-x) change in the percent adult children, adult Children S , and mothers with strictly positive earnings.

In the Age-18 Removal RD, we target the following RD moments: i) change in percent unfavorable Age-18 review; ii) change in percent Children S on SSI as adults; iii-vi) change in average adult Children S earnings, Children N (ages 21-30 and 25-30) earnings, mother’s earnings; vii-ix) change in percent of adult Children S , Children N (ages 25-30) and mothers earning more than \$0; x) change in percent of adult Children N earning more than \$20K (ages 25-30); xi) change in household income (mother’s earnings and child SSI).

In both samples, we consider these RD moments estimated in the overall sample and in subsamples based on the mother’s past employment and on the child’s age. In addition, we target the means of the dependent variable on the left-hand side of each discontinuity, the standard deviations of residual earnings and residual earnings growth for mothers and SSI adults, and the means of maternal earnings immediately following the birth of their first child. In the Age-18 Removal RD, we also target the correlation between siblings’ adult earnings and between the mother’s and SSI child’s adult earnings.

We also use SIPP data to target labor supply-related information often not available in administrative data: i) average wages, employment rates and weekly hours for mothers currently on SSI, not currently on SSI, ever seen on SSI in the SIPP, and by employment status in the previous year; ii) standard deviations of wages and wage growth residuals for women on SSI, off SSI, ever seen on SSI in the SIPP; iii) moments of the distribution of hours worked (percent working at least 10, 20, 30 and 40 hours per week); iv) average hours worked for women in four different hourly wage bins. We provide a comprehensive list of the moments used in estimation in Appendix F.

In a non-linear dynamic model like ours, non-parametric identification cannot be typically proven. However, it is often possible to provide economic arguments for how the moments targeted in the estimation can inform the estimation of specific parameters.

The quasi-experimental data provide crucial information to identify preferences for leisure and maternal altruism parameters ($\zeta, \phi, \eta, \zeta^S, \phi^S, \eta^S, \psi$), as we can observe intensive and extensive margin earnings responses of mothers and adult SSI children to being removed from the program as a child (in the Child Removal RD) and as an adult (in the Age-18 Removal RD). Mothers’ labor supply responses depend on their preferences for leisure and their desire to invest in the child, given their expectations about the returns to such investments. Because the medical review policy variation does not affect adult offer wages, and because we have fixed the degree of relative risk aversion, these RD moments provide variation to identify the preference parameters. We also target moments of employment rate and of the empirical

distribution of hours for further restrictions.

Given the different maternal earnings response across quasi-experiments, the children’s preferences for leisure, and the systematic differences in pre-existing human capital between Child S and Child N and between older and younger children, the moments that capture the changes in each child’s long-term earnings due to the policies help identify the roles of consumption, the role of maternal time, and their degree of complementarity with past human capital levels in the production of adult human capital $(\alpha_1, \alpha_2, \rho)$.

Given the investments over the life cycle and the distributional assumptions, the level and the distribution of adult earnings, hours worked, wages, and the correlation between siblings provide information to identify the distribution of the children’s initial human capital, of the mothers’ offer wages, and their correlation $(m^{\text{childRD}}, m^{\text{age18RD}}, \mu^S, \mu^N, \sigma_0, \sigma_k^S, \sigma_k^N, \omega)$. Similarly, standard deviations of wages and wage growth, and differences in earnings across groups of women who did and did not work in the previous year allow us to identify the parameters that govern the offer wage dynamics $(\sigma, \sigma^S, \sigma^N, \delta)$.

Finally, given our distributional assumption, the effect of the policies on the probability of removal conditional on medical review and the overall removal rate provide identifying information to pin down the strictness of the childhood and adult SSI reviews $(\mu_{\bar{k}}, \mu_{\bar{k},18}, \sigma_{\bar{k}})$.

We employ a weighting matrix that give extra emphasis to moments that are particularly important for our analysis. We begin with a diagonal matrix whose entries are the inverses of the estimated moments’ corresponding variances (Altonji and Segal, 1996). Then, we increase the weight assigned to the RD estimates, as they are especially policy-relevant, scaling their standard errors by one-tenth. We placed additional weight on the first-stage RD estimates by scaling their standard errors down by a further factor of two-fifth. We calibrate how much to inflate the weights so that the RD estimates are about an order of magnitude more precise than their levels.

6.2.1 Parameter Estimates

Table 3 reports the results of the parameter estimation. The human capital production function exhibits interesting properties. The elasticity of substitution between inputs is 0.460 (given $\rho = -1.1765$), suggesting a high degree of complementarity between inputs (Caucutt et al., 2025). It is relatively hard to substitute for a loss in consumption by decreasing maternal work time: a 1% reduction in consumption requires a 9.7% increase in maternal non-work time to keep a young child at the same human capital level next period. In levels, a loss of \$10 per week in consumption has an impact on their children’s human capital equivalent to spending an additional 3 hours a week away from their kids. The persistence (self-productivity) of human capital is 0.807.

Initially, mothers’ median offer wages are about \$9.25 per hour in the Child Removal RD

and \$12.35 in the Age 18 Removal RD, with very high dispersion. The parental altruism is well-behaved, between 0 and 1, and equal to 0.86.

In line with the design of SSI medical reviews, the distribution of eligibility thresholds for the age-18 review is stricter than the one in childhood.

Finally, we find a small but positive correlation between a mother’s initial wage levels and her children’s initial human capital.

Table 3: Parameter estimates

ϕ	Preferences for leisure (Mother/Child N)	2.1340 (0.1291)
ζ	Preferences for leisure (Mother/Child N)	1.8830 (0.0137)
ϕ^S	Preferences for leisure (Child S)	0.9638 (0.0328)
ζ^S	Preferences for leisure (Child S)	1.9469 (0.0058)
ψ	Parental altruism	0.8599 (0.1803)
η	Fixed cost of work (Mother/Child N)	0.0015 (0.00029)
η^S	Fixed cost of work (Child S)	0.0032 (0.00014)
ρ	CES substitution in HK production	-1.1765 (0.2334)
α_1	HK productivity of consumption	0.1292 (0.0173)
α_2	HK productivity of non-work time	0.0638 (0.0120)
$\mu_{\bar{k}}$	Mean of medical review strictness in childhood	12.5198 (0.2593)
$\mu_{\bar{k},18}$	Mean of medical review strictness in adulthood	11.6837 (0.1357)
$\sigma_{\bar{k}}$	Std. dev. of medical review strictness	0.8427 (0.1631)
μ^S	Mean of distribution of k_1^S	2.5652 (0.2670)
ς^S	Standard deviation of distribution of k_1^S	0.9334 (0.2456)
μ^N	Mean of distribution of k_1^N	2.2568 (1.5214)
ς^N	Standard deviation of distribution of k_1^N	0.4121 (1.1000)
m^{childRD}	Mother’s median hourly log-wage in Child Removal RD	2.2245 (0.0519)
m^{age18RD}	Mother’s median hourly log-wage in Age 18 Removal RD	2.5140 (0.0720)
σ_0	Standard deviation of the initial wage draw	0.5041 (0.0727)
σ	Standard deviation of wage innovations	0.1882 (0.0097)
σ^S	Standard deviation of wage innovations for Child S	0.0297 (0.0010)
σ^N	Standard deviation of wage innovations for Child N	0.1896 (0.0183)
δ	Wage depreciation	0.0500 (0.0039)
ω	Correlation between the mother and children HK	0.0201 (0.0641)

Notes: Table presents parameter estimates, estimated by the Method of Simulated Moments (McFadden, 1989). See text for details.

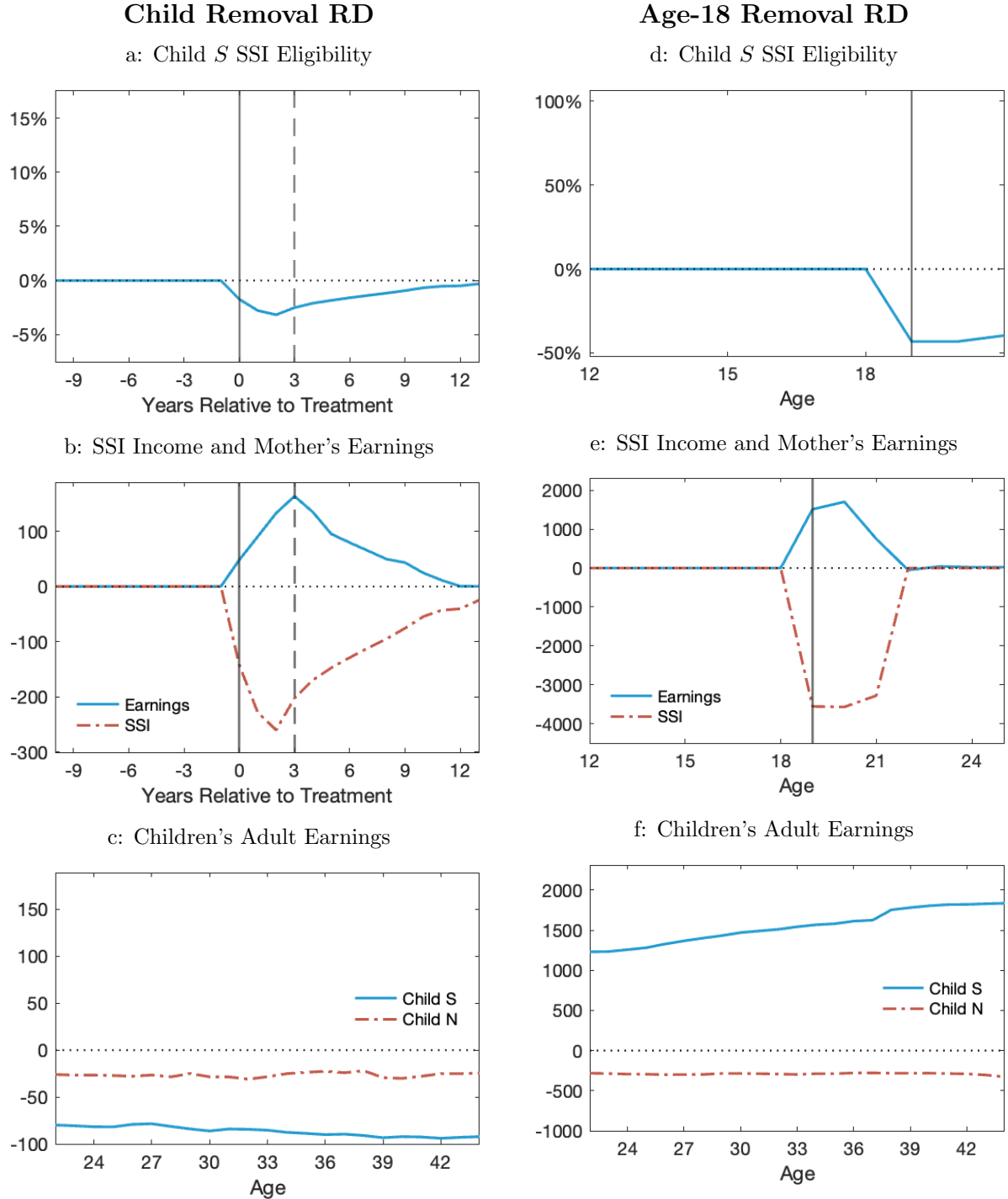
6.2.2 Relationship to the Reduced-form Estimates, Model Fit, and Validation

We now examine the implications of quasi-experimental policy variation on the agents’ outcomes in our model. As a reminder, we have used the reduced-form estimates from the Child Removal RD and the Age-18 Removal RD presented in Section 5 as target moments in the estimation. We use a third sources of variation, the “Child Entry RD-DD” (details presented in Appendix Section C.1), for post-estimation validation.

In the Child Removal RD, the simulated mothers expect their child to be reviewed about once every three years, but to their surprise, the probability of receiving a review drops by about 10 percentage points annually for 3 years. To replicate both sides of the Child Removal RD, we simulate a sample of families twice: once when the likelihood of a medical review every three years is near 100%, consistent with their expectations (the left side of the discontinuity), and once when—to their surprise—this likelihood falls by 30 percentage points (the right side of the discontinuity). Annually, this amounts to a 10 percentage point decline in the likelihood of review. After three years, mothers on both sides of the discontinuity are surprised to see the likelihood of a medical review further decrease to about 0. We include this to match the fact that, in reality, almost no children on either side of the discontinuity received a review in the decade after the discontinuity (see footnote 9 for details).

Comparing the left side of the discontinuity to the right one, to ease the comparison with the Age-18 RD, we see that families that experience a higher probability of a medical review rates have a higher probability that Child *S* drops out of SSI by an average of 1.8 percentage points for the rest of their childhood (Figure 7a), which is close to the 3.3pp we estimate in the data. In response to this lower likelihood of SSI eligibility, mothers' annual earnings increase by nearly \$101 per year (Figure 7b), mostly compensating for the decrease in SSI income such that household income only decreases modestly. These changes have a small negative effect on the human capital of both children. This, in turn, leads to a small decrease in long-term earnings of both Child *S* and Child *N* (Figure 7c). Again, these results are qualitatively consistent with the reduced form results in Figure 1, but we do not replicate the *increase* in the earnings of Child *S* and Child *N* that follow removal from SSI. As expected, the small decline in income during childhood leads to a very small decline in human capital. This means that our model, at most, implies that a loss in childhood benefit has no effect on childhood income and future earnings, not that it leads to an increase both as seen empirically, although, as shown in Figure 8 panel c, the responses of maternal and child earnings to the loss of benefits lie in the 95% confidence intervals of the empirical effects.

Figure 7: Effects on Outcomes in the Simulated RDs



Notes: Graphs depict changes in the simulated agents' average outcomes due to a lower likelihood of medical review. The left column corresponds to the Child Removal RD, while the right column corresponds to the Age-18 Removal RD. The solid vertical line indicates the year in which the treatment (discontinuity) occurred. In the Child Removal RD, we additionally plot a dashed vertical line 3 years later indicating when both sides of the discontinuity return to the same likelihood of review. Graphs (a & d) show the likelihood of receiving SSI benefits. Graph (b & e) shows SSI income and mother's earnings. Graphs (c & f) show average adult earnings for each child.

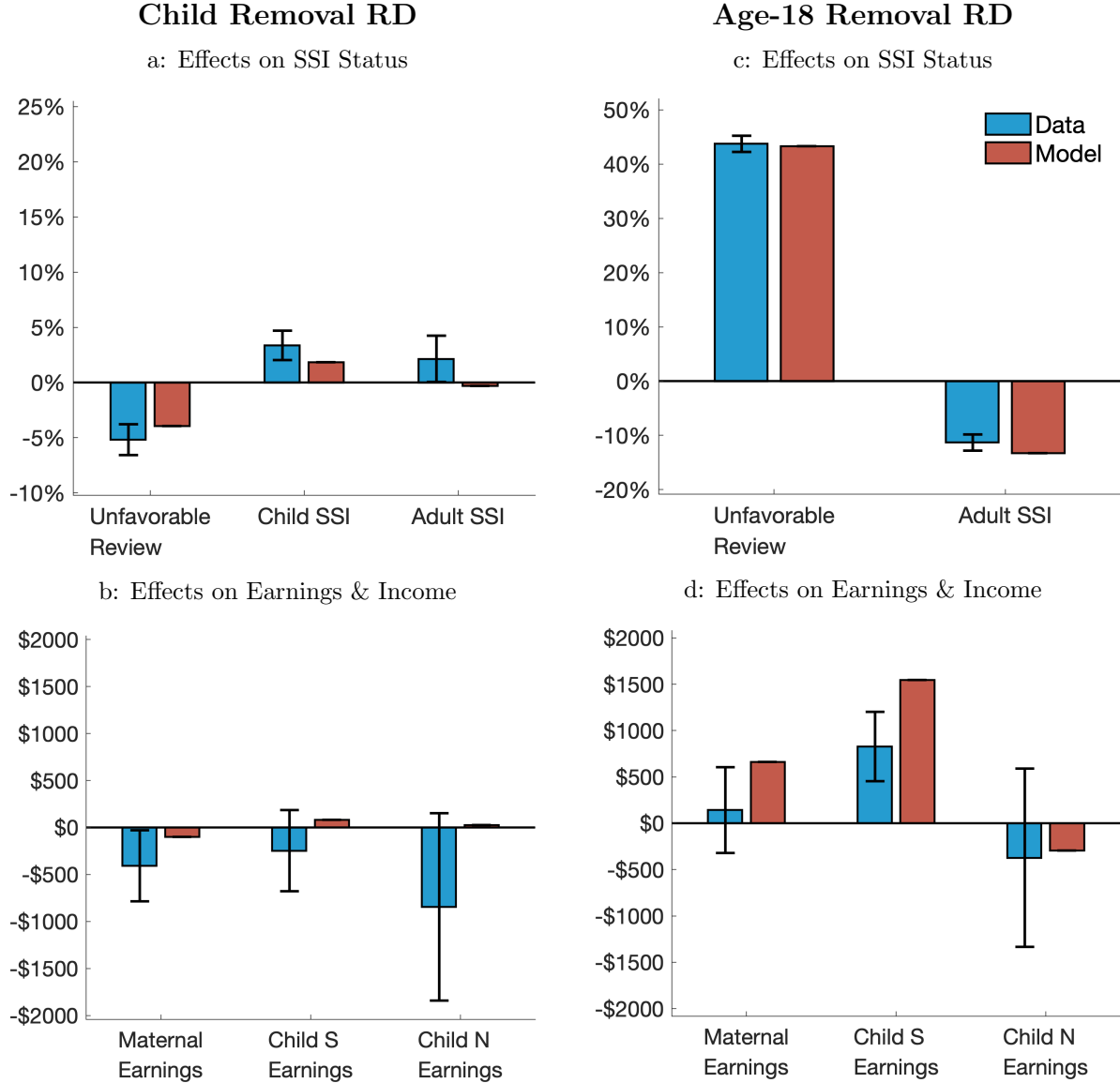
Next, we examine the Age 18 Removal RD, in which the simulated families do not expect the child to receive the age-18 review but, to their surprise, receive a review. To mimic both sides of the RD, we again simulate families twice: once when there is indeed no age-18 review (the left side of the discontinuity), and once when the mothers are surprised to be reviewed with almost 90% certainty (the right side of the discontinuity).

The unexpected increase in the age 18 review leads to an immediate, large drop in SSI participation rate of about 43% relative to the control group, followed by some attenuation as the control group receives medical reviews later in adulthood (Figure 7d). Mother’s earnings increase only modestly in response, and not enough to fully offset the lost SSI benefits, leading to a large drop in household income (Figure 7e). Figure 7f shows the most important results of the simulations: Child *S* experiences a substantial increase in their adult earnings, as they work more to replace their lost SSI (i.e., the reversal of SSI’s income and substitution effects), while Child *N*’s earnings actually decline in adulthood, reflecting Child *N*’s lower human capital due to the loss in household income in childhood. These simulation results follow the reduced-form results in Figure 4, as also documented in Figure 8, panels b and d. The difference in the maternal labor supply responses across quasi-experiments in the model is not as large as observed in the data. Yet, as in the data, a substantial portion of the decline in SSI benefits, especially in the Child RD Removal quasi-experiment simulation, is absorbed by the mother’s earnings response.

Finally, we use a third source of variation, which we call the “Child Entry RD-DD” as a validation exercise for our estimated model. For this exercise, which uses untargeted variation, we exploit a 1996 policy change that tightened eligibility criteria for SSI, primarily affecting a subset of applicants. Appendix Section C.1 presents the institutional details of this source of variation, as well as first-stage and reduced-form estimates of its effects. The policy led to a substantial drop in SSI entry, with no long-term consequences for the child’s adult earnings (Appendix Figure B.1).

To replicate both sides of the Child Entry RD-DD, we again simulate families twice. In the first year after the discontinuity, the families in each simulation face medical reviews of differing strictness: one faces the regular medical review (the left side of the discontinuity), while the other, to their surprise, faces a marginally stricter medical review (the right side of the discontinuity). In the second year onwards, families in both sets of simulations face medical reviews according to the new strictness. To mimic the Child Entry RD-DD, we restrict our sample to those who were applying to SSI at the time of the discontinuity and calibrate the change in medical review strictness to match the instantaneous change in SSI entry rates (-5.2pp). As with the other RDs, the simulated families do not anticipate any changes before they occur.

Figure 8: Target Moments in the Data and in the Simulations

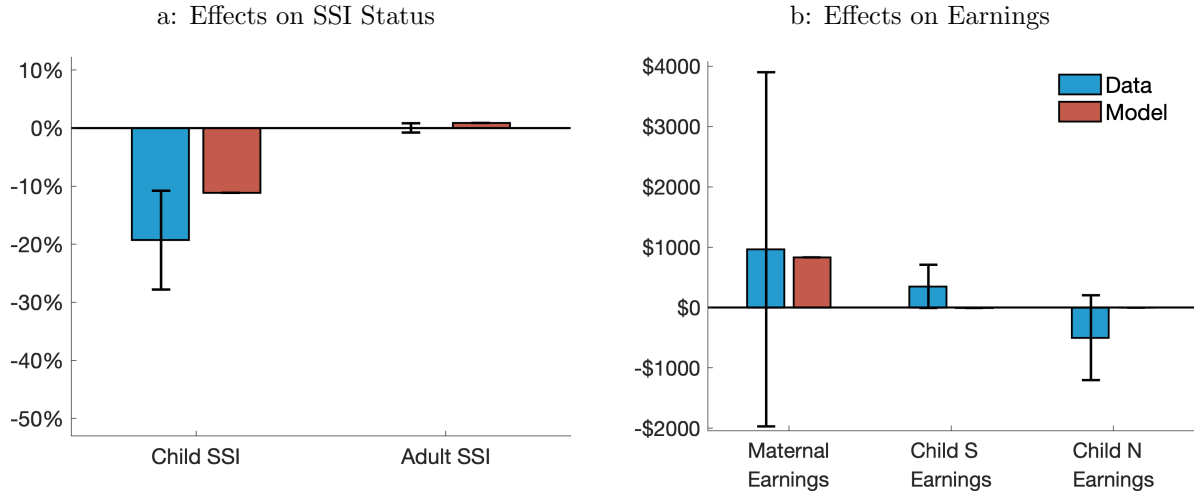


Notes: Graphs compare empirical moments (RD estimates) of a few key target moments to their model implied counterpart: differences between simulated agents' average outcomes after falling on the right hand side relative to the counterfactual, where they're on the left-hand side. In each category, the left (blue) bar corresponds to the empirical moment, while the right (red) bar corresponds to the model implied moment. Capped bars depict 95% confidence intervals.

In Figure 9, we compare the RD estimates from the data to their simulated counterparts as a validation exercise. We see that the unexpected increase in strictness leads to a large, sustained drop in SSI status in childhood. Mothers, in turn, increase their earnings, enough to mitigate the effects on their children's later in life outcomes. In adulthood, we see almost no difference between the two sides of the simulated RD. Hence, our model is able to partly replicate untargeted quasi-experimental effects: following a reduction in SSI benefits, we

observe a sharp rise in maternal earnings, with no systematic change in children’s long-term SSI payments and labor market earnings. While the data suggest an imprecise increase in the earnings of the SSI-eligible child (Child S) and an imprecise decrease for the sibling (Child N), the model produces no change for either sibling.

Figure 9: Validation Untargeted Moments from the Child Entry RD-DD



Notes: Graphs compare empirical moments (RD estimates) of the Child Entry RD-DD to their model implied counterpart: differences between simulated agents’ average outcomes when they are on the left-versus right-hand side of the cutoff. In each category, the left (blue) bar corresponds to the empirical moment, while the right (red) bar corresponds to the model implied moment. Capped bars depict 95% confidence intervals. The adult earnings moments are annual, while the others are cumulative. See Appendix Section C.1 for more details on the Child Entry RD-DD.

7 Counterfactual Simulations and Policy Analysis

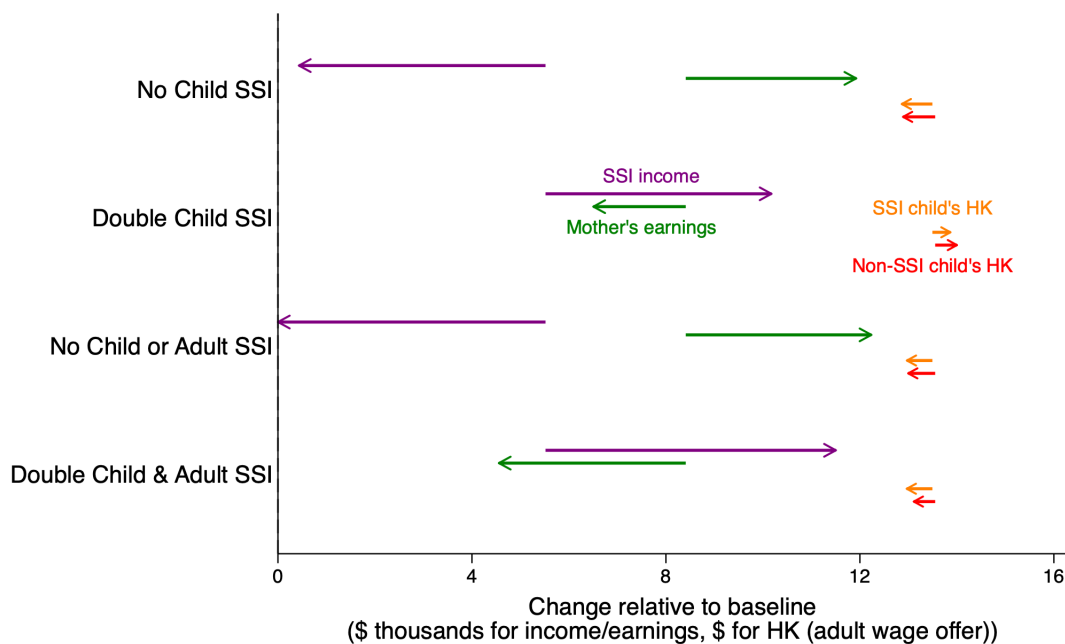
We now exploit the model estimates to assess the effect of the SSI program on parent work and children’s human capital accumulation. We consider three types of counterfactual exercises: varying the generosity of the SSI program, turning the SSI cash benefit into an in-kind transfer, and changing medical reviews and expectations about medical reviews.

7.1 SSI Generosity

We conduct several counterfactual exercises that vary the generosity of SSI, with results shown in Figure 10. We first consider the effect of eliminating child SSI but keeping adult SSI as is. Maternal labor supply increases to partially offset the decline in SSI income, but there is still a decline in household income of 11%. The elimination of child SSI leads to a loss of human capital in both children: human capital (as measured by offer wages) declines by 4.7% for the SSI child and by 4.9% for the non-SSI child. Conversely, doubling the generosity of child SSI increases household income by 20% and increases the human capital of both SSI

and non-SSI children (by 2.8% and 3.3%, respectively). The increase in children’s human capital from doubling child SSI is less than the decrease from eliminating child SSI, due to concavity in consumption of the production function of the children’s human capital.

Figure 10: Simulated Counterfactuals on SSI Generosity



Notes: The graph depicts changes in the simulated agents’ average outcomes in counterfactuals relative to the baseline model. From top to bottom, the simulations are eliminating child SSI, doubling child SSI, eliminating both child and adult SSI, and doubling both child and adult SSI. For each counterfactual, the arrow starts at the current SSI baseline and ends at the new policy counterfactual value. SSI income and mother’s earnings are measured in thousands of dollars. Child human capital is measured in dollars as the child’s initial adult wage offer (hourly).

In the next two exercises, we simultaneously adjust the generosity of both child and adult SSI benefits. Not surprisingly, eliminating both child and adult SSI reduces children’s human capital in adulthood. However, we find that the opposite policy—*doubling* both child and adult SSI—has the same effect of reducing children’s human capital in adulthood. This counterintuitive result is driven by the perverse incentives created by the doubling of adult SSI program. When adult SSI becomes more generous, parents have more incentive to limit SSI children’s human capital and keep them on SSI as adults. (Non-SSI children’s human capital declines as well because household resources are common to both types of children.) This counterfactual exercise highlights the competing forces of income effects and perverse incentive effects: increasing the generosity of *child* SSI increases the resources available to invest in human capital, while increasing the generosity of *adult* SSI raises the return to limiting human capital investment and keeping the child on SSI. In principle, increasing child

SSI could also have encouraged parents to limit human capital so that they and their children could enjoy more consumption in childhood, potentially at the expense of the child’s adult utility. However, in practice, parents appear to limit human capital only when increasing adult SSI, suggesting that they are acting altruistically in response to perverse incentives, i.e., to the extent that it benefits their children’s adult utility.

7.2 SSI as In-Kind Transfer

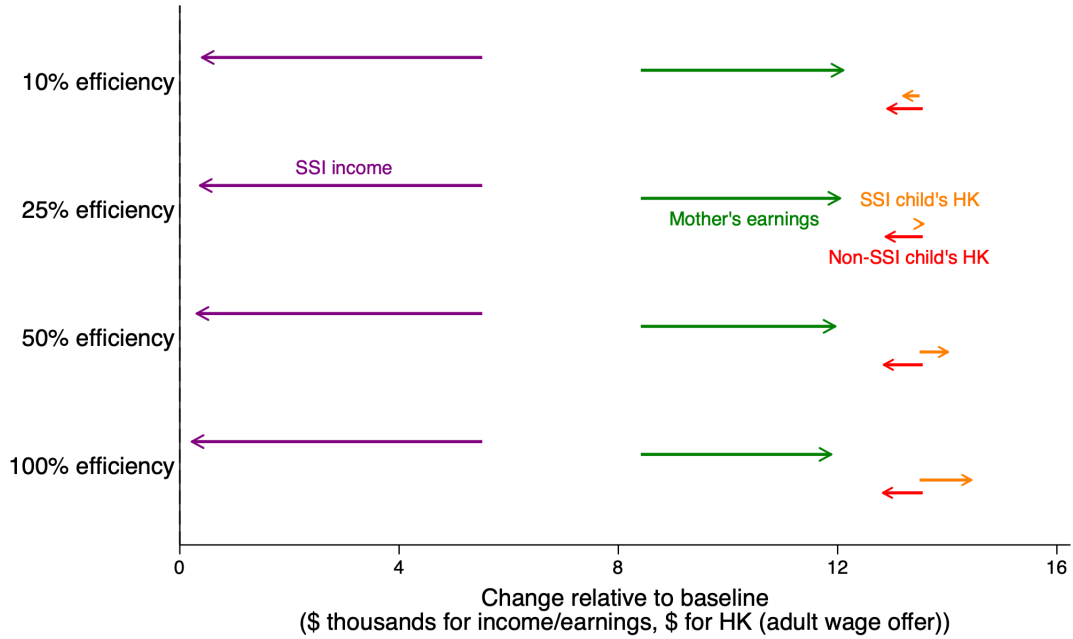
We simulate the potential effect of certain proposals to turn SSI from a cash transfer into an in-kind transfer, e.g., for medical treatment (United States Congress Joint Economic Committee, 2022). The motivation behind these proposals is generally to reduce parent work disincentives created by SSI while still providing benefits to children with disabilities. We model the in-kind reform as an increase only in the input c that enters the SSI child’s human capital production function in equation (4) (leaving the sibling’s input unchanged). This contrasts with the cash baseline, where SSI is modeled as an increase in the household’s budget constraint, which may result in higher total consumption c as well. To reflect the fact that in-kind transfer may be weakly less productive than cash, we vary the efficiency of the in-kind transfer relative to cash. The results are shown in Figure 11. Regardless of the efficiency of the in-kind transfer relative to cash, mothers work more relative to the cash baseline due to an income effect. When the in-kind transfer is very inefficient (e.g., 10%), the SSI child develops less human capital relative to the baseline cash transfer. However, even at just 25% efficiency, the SSI child’s human capital is larger than the cash baseline. However, the non-SSI child’s human capital falls relative to the cash baseline regardless of in-kind efficiency, since the non-SSI child no longer benefits from a general increase in household resources.

7.3 SSI Medical Reviews and Household Expectations

We next examine the effect of counterfactual experiments that manipulate parents’ expectations about future medical reviews for children currently receiving SSI, as well as whether the reviews actually occur. Parents’ expectations of medical reviews generate perverse incentive effects, which in this model operate through the maternal labor supply decision. While this exercise is not meant to capture an actual policy, it allows us to assess how perverse incentives shape human capital accumulation. If perverse incentives play an important role, we would expect the children’s human capital to be substantially higher in a world where the mother does not anticipate future medical reviews and thus has no reason to constrain the growth of the SSI child’s human capital. For comparison, we also consider the effects of removing all medical reviews.

As shown in Figure 12, we find that eliminating expectations of future medical reviews to stay on SSI leads to a small increase (1%) in the children’s human capital through an

Figure 11: Simulated Counterfactuals of In-Kind Reforms



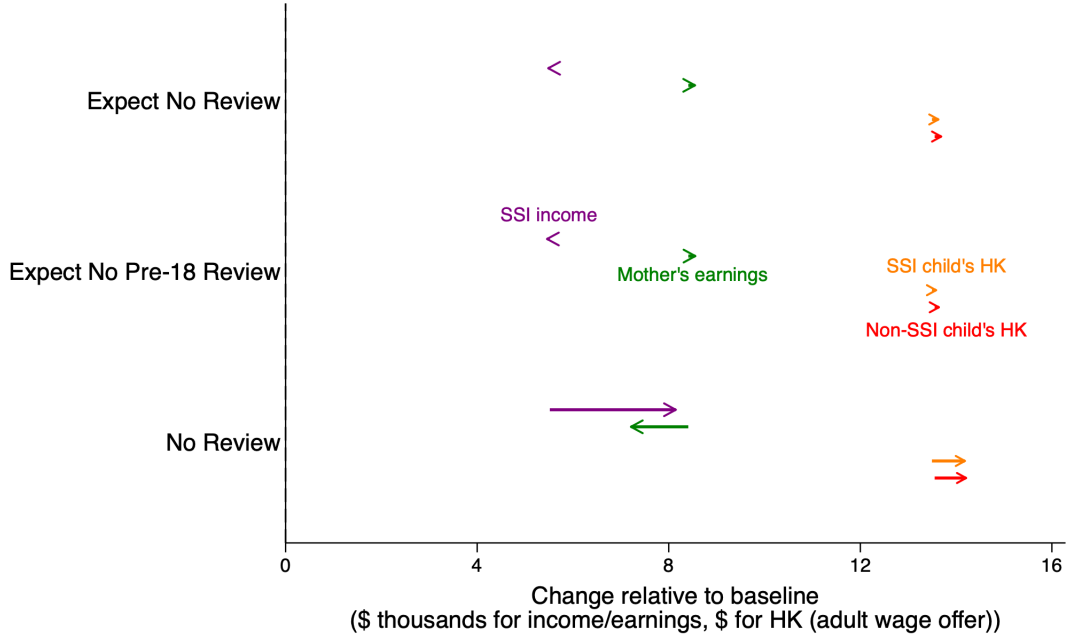
Notes: The graph depicts changes in the simulated agents' average outcomes in counterfactuals relative to the baseline model. The simulations turn child SSI into an in-kind transfer, with varying levels of efficiency. For example, "10% efficiency" assumes that the in-kind transfer is 10% as efficient as cash, while "100% efficiency" assumes that the in-kind transfer is as efficient as cash. For each counterfactual, the arrow starts at the current SSI baseline and ends at the new policy counterfactual value. SSI income and mother's earnings are measured in thousands of dollars. Child human capital is measured in dollars as the child's initial adult wage offer (hourly).

increase (9%) in maternal work hours. Importantly, these perverse incentives are again driven by the adult component of SSI: if we only suppress expectations about childhood medical reviews, the increase in human capital is smaller (0.6%). These findings suggest that perverse incentives embedded in the current SSI system are relatively small.

Finally, we look at the effect of entirely removing all medical reviews to stay on SSI—i.e., allowing children who qualify for SSI initially to stay on the program indefinitely without any conditions on their human capital. The absence of medical reviews means there can be no perverse incentive effects, but also that SSI children remain on SSI for a longer period. We find that SSI disbursements increase sizably (by 48%), maternal labor supply decreases (hours decline by 5%) and the children's human capital increases substantially (5.1% and 4.8% for the SSI child and their sibling, respectively).

Overall, our counterfactual experiments indicate that the perverse incentives generated by the childhood SSI program exist but are small. Eliminating the program would have a clear negative impact on the human capital of SSI children and their siblings. SSI benefits

Figure 12: Simulated Counterfactuals of Medical Review Expectations



Notes: The graph depicts changes in the simulated agents' average outcomes in counterfactuals relative to the baseline model. The simulations are about parents incorrectly expecting no review ever, parents incorrectly expecting no review before age 18, and parents correctly expecting there to be no medical reviews. For each counterfactual, the arrow starts at the current SSI baseline and ends at the new policy counterfactual value. SSI income and mother's earnings are measured in thousands of dollars. Child human capital is measured in dollars as the child's adult wage offer (hourly).

would need to be substantially larger to generate sizable perverse incentives, and such effects appear to primarily involve the adult component of SSI.

8 Conclusion

Our findings address, identify, and quantify the mechanisms through which government transfers, and SSI in particular, affects children's outcomes in adulthood. Using two sources of variation in childhood SSI receipt, we find that the long-term effects of SSI on children appear to depend on the family context. In particular, parents' labor supply responses appear to mediate the effects of SSI on children and ultimately determine whether SSI affects long-term outcomes. When parents respond to SSI income by reducing their earnings enough to offset the transfer, SSI has no effect on children's earnings potential in adulthood. When parents continue working and household income increases, SSI appears to increase children's earnings potential in adulthood.

Our findings also speak more broadly to human capital development and the debate about the relative roles of consumption versus parental time (e.g., Del Boca et al., 2014;

Agostinelli and Sorrenti, 2021). We find that, for this population, more parent work on net improves children’s outcomes. We interpret this finding to mean not that parental time is unproductive in the child’s human capital development—indeed, for a population of children with disabilities, it may be especially productive—but that these households are so resource-constrained that every additional dollar of consumption yields high returns. If this is the case, then there are other ways to increase the human capital development of children beyond parents working and spending time away from home, like increasing the generosity of transfers received by these households.

Finally, these findings highlight that labor supply responses play a crucial role in shaping the incidence of government benefits on the well-being of different family members. When a mother increases her labor supply to keep the consumption of her children constant, a loss in benefits is primarily incident on her utility. In contrast, when a mother’s labor supply does not adjust, the utility loss affects the consumption of all family members and the children’s future productivity. Hence, understanding how resources are allocated within the family, including leisure and investments, is key to capturing the full effect of a change in a welfare program.

References

- Agostinelli, F. and G. Sorrenti (2021). Money vs. Time: Family Income, Maternal Labor Supply, and Child Development. *University of Zurich, Department of Economics, Working Paper* (273).
- Aizer, A., S. Eli, J. Ferrie, and A. Lleras-Muney (2016, April). The Long-Run Impact of Cash Transfers to Poor Families. *American Economic Review* 106(4), 935–71.
- Aizer, A., H. Hoynes, and A. Lleras-Muney (2022, May). Children and the US Social Safety Net: Balancing Disincentives for Adults and Benefits for Children. *Journal of Economic Perspectives* 36(2), 149–74.
- Akee, R. K. Q., W. E. Copeland, G. Keeler, A. Angold, and E. J. Costello (2010, January). Parents’ Incomes and Children’s Outcomes: A Quasi-experiment Using Transfer Payments from Casino Profits. *American Economic Journal: Applied Economics* 2(1), 86–115.
- Altonji, J. G. and L. M. Segal (1996). Small-sample bias in gmm estimation of covariance structures. *Journal of Business & Economic Statistics* 14(3), 353–366.
- Angrist, J. D. and I. Fernández-Val (2013). *ExtrapoLATE-ing: External Validity and Overidentification in the LATE Framework*, pp. 401–434. Econometric Society Monographs. Cambridge University Press.
- Angrist, J. D. and J.-S. Pischke (2009). *Mostly Harmless Econometrics: An Empiricist’s Companion*. Princeton University Press.

- Attanasio, O., F. Cunha, and P. Jervis (2019, November). "Subjective Parental Beliefs. Their Measurement and Role". Working Paper 26516, National Bureau of Economic Research.
- Attanasio, O., H. Low, and V. Sánchez-Marcos (2008, September). Explaining Changes in Female Labor Supply in a Life-Cycle Model. *American Economic Review* 98(4), 1517–52.
- Bastian, J. and L. Lochner (2022). The Earned Income Tax Credit and Maternal Time Use: More Time Working and Less Time with Kids? *Journal of Labor Economics* 40(3), 573–611.
- Bastian, J. and K. Micheltore (2018). The Long-Term Impact of the Earned Income Tax Credit on Children's Education and Employment Outcomes. *Journal of Labor Economics* 36(4), 1127–1163.
- Blundell, R., M. Costa Dias, C. Meghir, and J. Shaw (2016). Female Labor Supply, Human Capital, and Welfare Reform. *Econometrica* 84(5), 1705–1753.
- Boneva, T. and C. Rauh (2018, 03). Parental Beliefs about Returns to Educational Investments—The Later the Better? *Journal of the European Economic Association* 16(6), 1669–1711.
- Braga, B., F. Blavin, and A. Gangopadhyaya (2020). The long-term effects of childhood exposure to the earned income tax credit on health outcomes. *Journal of Public Economics* 190, 104249.
- Bruins, M. (2017). Women's economic opportunities and the intra-household production of child human capital. *Labour Economics* 44, 122–132.
- Burkhauser, R. (2012, Dec). SSI Exemplifies America's Flawed Approach to Social Welfare Policy. *AEI Press*.
- Burkhauser, R. V. and M. Daly (2011). *The Declining Work and Welfare of People with Disabilities: What Went Wrong and a Strategy for Change*. AEI Press.
- Calonico, S., M. D. Cattaneo, M. H. Farrell, and R. Titiunik (2017). Rdrobust: Software for Regression-discontinuity Designs. *The Stata Journal* 17(2), 372–404.
- Carneiro, P., K. V. Løken, and K. G. Salvanes (2015). A flying start? maternity leave benefits and long-run outcomes of children. *Journal of Political Economy* 123(2), 365–412.
- Caucutt, E. M., L. Lochner, J. Mullins, and Y. Park (2025). Child skill production: Accounting for parental and market-based time and goods investments. *Journal of Political Economy* (forthcoming).
- Chan, M. K. and R. Moffitt (2018). Welfare Reform and the Labor Market. *Annual Review of Economics* 10(1), 347–381.
- Coe, N. B. and M. S. Rutledge (2013). What is the long-term impact of welfare on adult and child outcomes?

- Cunha, F. and J. Heckman (2007, May). The Technology of Skill Formation. *American Economic Review* 97(2).
- Cunha, F., J. J. Heckman, and S. M. Schennach (2010). Estimating the technology of cognitive and noncognitive skill formation. *Econometrica* 78(3), 883–931.
- Dahl, G. B. and L. Lochner (2012, May). The impact of family income on child achievement: Evidence from the earned income tax credit. *American Economic Review* 102(5), 1927–56.
- Davies, P. S., K. Rupp, and D. Wittenburg (2009). A Life-Cycle Perspective on the Transition to Adulthood among Children Receiving Supplemental Security Income Payments. *Journal of Vocational Rehabilitation* 30(3), 133–151.
- DeCesaro, A. and J. Hemmeter (2009). Unmet health care needs and medical out-of-pocket expenses of SSI children. *Journal of Vocational Rehabilitation* 30(3), 177–199.
- Del Boca, D., C. Flinn, and M. Wiswall (2014). Household choices and child development. *Review of Economic Studies* 81(1), 137–185.
- Del Boca, D., C. Flinn, and M. Wiswall (2016). Transfers to households with children and child development. *The Economic Journal* 126(596), F136–F183.
- Deshpande, M. (2016a). Does Welfare Inhibit Success? The Long-Term Effects of Removing Low-Income Youth from the Disability Rolls. *American Economic Review* 106(11), 3300–3330.
- Deshpande, M. (2016b). The Effect of Disability Payments on Household Earnings and Income: Evidence from the SSI Children’s Program. *The Review of Economics and Statistics* 98(4), 638–654.
- Deshpande, M. and R. Dizon-Ross (2023, December). The (lack of) anticipatory effects of the social safety net on human capital investment. *American Economic Review* 113(12), 3129–72.
- Deshpande, M. and M. Mueller-Smith (2022, 06). Does Welfare Prevent Crime? The Criminal Justice Outcomes of Youth Removed from SSI. *The Quarterly Journal of Economics* 137(4), 2263–2307.
- Duggan, M. and M. S. Kearney (2007). The Impact of Child SSI Enrollment on Household Outcomes. *Journal of Policy Analysis and Management* 26(4), 861–885.
- Duggan, M., M. S. Kearney, and S. Rennane (2015). The Supplemental Security Income (SSI) Program. Working Paper 21209, National Bureau of Economic Research.
- Duncan, G. J., P. A. Morris, and C. Rodrigues (2011). Does Money Really Matter? Estimating Impacts of Family Income on Young Children’s Achievement With Data From Random-Assignment Experiments. *Developmental Psychology* 47(5), 1263–1279.

- Dustmann, C. and U. Schönberg (2012). Expansions in maternity leave coverage and children’s long-term outcomes. *American Economic Journal: Applied Economics* 4(3), 190–224.
- Elder, T. (2010). The Importance of Relative Standards in ADHD Diagnoses: Evidence Based on a Child’s Date of Birth. *Journal of Health Economics* 29(5), 641–656.
- Estrin, G. L., V. Milner, D. Spain, F. Happé, and E. Colvert (2020). Barriers to Autism Spectrum Disorder Diagnosis for Young Women and Girls: a Systematic Review. *Review Journal of Autism and Developmental Disorders* 8(4), 329–40.
- Evans, W. N., M. S. Morrill, and S. T. Parente (2010). Measuring Excess Medical Diagnosis and Treatment in Survey Data: The Case of ADHD among School-Age Children. *Journal of Health Economics* 29(5), 657–673.
- Frazier, T. W., S. Georgiades, S. L. Bishop, and A. Y. Hardan (2014). Behavioral and cognitive characteristics of females and males with autism in the Simons Simplex Collection. *J Am Acad Child Adolesc Psychiatry* 53(3), 329–40.
- Hawkins, A. A., C. A. Hollrah, S. Miller, L. R. Wherry, G. Aldana, and M. D. Wong (2023, September). ”The Long-Term Effects of Income for At-Risk Infants: Evidence from Supplemental Security Income”. Working Paper 31746, National Bureau of Economic Research.
- Hemmeter, J. and M. S. Bailey (2015). Childhood Continuing Disability Reviews and Age-18 Redeterminations for Supplemental Security Income Recipients: Outcomes and Subsequent Program Participation. *SSA Research and Statistics Note 2015-03*.
- Hemmeter, J. and E. Gilby (2009). The Age-18 Redetermination and Postredetermination Participation in SSI. *Social Security Bulletin* 69(4).
- Hemmeter, J., J. Kauff, and D. Wittenburg (2009). Changing Circumstances: Experiences of Child SSI Recipients Before and After their Age-18 Redetermination for Adult Benefits. *Journal of Vocational Rehabilitation* 30(3), 201–221.
- Hicks, J., G. Simard-Duplain, D. A. Green, and W. Warburton (2023). The Effect of Reducing Welfare Access on Employment, Health, and Children’s Long-Run Outcomes. *IZA Discussion Paper 16516*.
- Keane, M. P. and K. I. Wolpin (2010). The role of labor and marriage markets, preference heterogeneity, and the welfare system in the life cycle decisions of black, hispanic, and white women. *International Economic Review* 51(3), 851–892.
- Kristof, N. (2012, December). Profiting From a Child’s Illiteracy. *New York Times*.
- Levere, M. (2021). The labor market consequences of receiving disability benefits during childhood. *Journal of Human Resources* 56(3), 850–877.

- Lou, C., H. Hahn, E. Maag, H. Daly, M. Casas, and C. E. Steuerle (2022). Kids' Share 2022: Report on Federal Expenditures on Children through 2021 and Future Projections. Technical report, Urban Institute.
- Low, H., C. Meghir, L. Pistaferri, and A. Voena (2022). Marriage, labor supply and the dynamics of the social safety net. Working Paper 24356, National Bureau of Economic Research.
- MaCurdy, T. E. (1981). An Empirical Model of Labor Supply in a Life-Cycle Setting. *Journal of Political Economy* 89(6), 1059–1085.
- Marquardt, K. (2023). Mis(sed) Diagnosis: Physician Decision Making and ADHD. *Working Paper*.
- McFadden, D. (1989). A Method of Simulated Moments for Estimation of Discrete Response Models Without Numerical Integration. *Econometrica* 57(5), 995–1026.
- Mullins, J. (2022, July). Designing Cash Transfers in the Presence of Children's Human Capital Formation. (2022-019).
- Nicoletti, C., K. G. Salvanes, and E. Tominey (2023). Mothers Working during Preschool Years and Child Skills: Does Income Compensate? *Journal of Labor Economics* 41(2), 389–429.
- Persson, P., X. Qiu, and M. Rossin-Slater (2025). Family Spillover Effects of Marginal Diagnoses: The Case of ADHD. *American Economic Journal: Applied Economics* 17(2), 225–256.
- Price, D. and J. Song (2020). The Long-Term Effects of Cash Assistance. *Working Paper*.
- Rupp, K., J. Hemmeter, and P. S. Davies (2015). Longitudinal Patterns of Disability Program Participation and Mortality across Childhood SSI Award Cohorts. *Soc. Sec. Bull.*, 35.
- Social Security Administration (2012). National Survey of SSI Children and Families (NSCF).
- Social Security Administration (2023). 2023 Annual Report of the Supplemental Security Income Program. *Washington, DC: SSA. <https://www.ssa.gov/OACT/ssir/SSI23/ssi2023.pdf>*.
- United States Congress Joint Economic Committee (2022, Jun). Reforming supplemental security income to better serve children with disabilities.
- Wen, P. (2010a, Dec). A cruel dilemma for those on the cusp of adult life. *The Boston Globe*.
- Wen, P. (2010b, Dec). The Other Welfare. *The Boston Globe*.

Online Appendix for:

How Disability Benefits in Early Life Affect Adult Outcomes

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A Probabilistic sibling matching procedure

This appendix section describes the matching procedure for the construction of the probabilistic sibling samples. We start with the original samples for the three natural experiments: the Age 18 Removal RD, the Child Removal RD, and the Child Entry RD-DD. The SSR includes identifiers for these original children and their parents, even if the child’s application was denied and they never received SSI benefits. The original child identifiers in the SSR include Social Security Number (SSN); first, middle, and last names; and date of birth. The identifiers for the parents of children (below 18 years) in the SSR include parent SSN; parent first, middle, and last names; parent sex; and parent date of birth. Note that for the purposes of the SSR a “parent” could be a biological parent or a guardian. A child’s parents in the SSR can change over time as a result of changes in family structure (e.g., divorce or remarriage). The original children in the three samples can be linked using SSN to their record(s) in the Numident, which includes first, middle, and last names at the time of birth and legal changes thereafter; date of birth; city and state (or country, if outside United States) of birth; citizenship; district office at which the Social Security card was processed; race; and mother’s full name and father’s full name at the time of the child’s birth. Father’s name is almost always populated in the Numident, even if the mother is single.

The goal of the probabilistic matching procedure is to identify siblings of the original children using the Numident. The challenge is that the Numident does not include unique identifiers for parents, only full mother and father name at the time of the child’s birth. Many parents have common names, and parent names can change in between sibling births. We therefore develop a probabilistic matching procedure to identify likely siblings in the

Numident. We start with extracts of the Numident provided by the Office of Data Development (Office of Research, Evaluation, and Statistics) at SSA that includes all records for individuals in the United States with a date of birth between 1976 and 2000 (72 million). We link the original children to all mother and father names associated with that child in either the SSR or the Numident. We then link these mother and father names to mother and father names in the full Numident using exact name matching on first, last, and middle names. We then link the original children to individuals in the Numident that share a parent name. Of course, this parent name matching procedure will include a huge number of false positives due to common parent names.²⁵ To identify true siblings, we take a number of steps (see Appendix Table D.18).

First, we drop potential sibling matches that are obviously problematic:

- Potential Numident sibling’s date of birth is less than 300 days apart or more than 12 years apart from the date of birth of the original child
- Potential Numident sibling’s date of birth is less than 16 years or more than 40 years from the date of birth of the mother of the original child (known from the SSR)

Second, we identify matches that are most likely to be true siblings. We do this in two ways. The first is a probabilistic matching procedure based on known siblings. Recall that a subset of siblings are known from the SSR—these are siblings that also receive SSI benefits during childhood and share a parent SSN with the original child. Using these known sibling matches, we regress an indicator for known sibling match on the following characteristics:

- Siblings connected through one vs. two parents, and through parent first and last names only vs. first, last, and middle names
- Siblings share a city and/or state of birth
- Siblings have same district office listed on record
- Siblings have the same race
- Siblings have the same last name
- Annual earnings of the SSR mother and father of the original child relative to the potential Numident sibling’s year of birth
- Frequency of parent combined first, middle, and last name of potential siblings

We then predict the likelihood of being a sibling based on that regression. We keep the potential sibling matches with the top 1 percent of predicted scores.

²⁵This matching procedure will also exclude many true matches because of changes in parent names. Although this issue is concerning for the precision and representativeness of the sibling sample, it is less concerning from a bias perspective.

Since SSR siblings may not be representative of the broader set of siblings that do not also receive SSI benefits, we also tag and keep matches that are very likely to be true matches:

- Siblings connected by both mother name and father name, at least one of which uses parent middle name/initial
- Siblings connected by at least one parent full name (first, last, middle) or two parent names (first and last) or who have the same last name; and have the same city of birth or district office on their Numident file
- Siblings connected by a rare parent name (fewer than 5 of the first, middle, and last combination in the 1976–2000 Numident records), at least one parent middle name/initial, and same state of birth
- Siblings connected by a rare parent name (same definition as above) and the same city of birth
- Siblings connected by an uncommon parent name (fewer than 10 of the first, middle, and last combination in the 1976–2000 Numident records), same city of birth or same district office on Numident record, same last name, and same race

For SSI siblings, we limit to siblings who first appear in the Numident before the reform date, since the reform could causally affect whether siblings apply for and receive SSI. For all siblings, we require that the original child to whom they are connected has at least one parent (in the SSR) at the time of the reform.

For the Child Removal RD, we drop Numident siblings who are more than eight years older or younger than the original child, who reach 18 years old before the reform in 2004 (since they would not be treated in childhood), who do not reach 18 years old at least three years before the last year of data (since we cannot observe their adult outcomes), or who receive SSI benefits themselves. The original sample for the Child Removal RD comprises 48,059 individuals from the Supplemental Security Record (SSR) who entered SSI within 250 days of October 1, 2001, and who have a medical review schedule of three years (“medical improvement expected”). The combined sample additionally includes 38,347 siblings, composed of 25,543 Numident (non-SSI) siblings and 12,804 SSR (SSI) siblings.

For the Age 18 Removal RD, we drop Numident siblings who are fewer than four years younger than the original 18-year-old (to allow enough time for effects to manifest), who are more than 12 years younger than the 18-year-old, or who receive SSI benefits themselves (since SSI siblings are included in a separate SSI sibling sample). We exclude older siblings because older siblings are at least 19 years old at the time of the reform and therefore would not have been affected in childhood. The original (18-year-old) sample for the Age 18 Removal RD comprises 81,453 individuals from the Supplemental Security Record (SSR)

who received SSI on their 18th birthday and whose 18th birthday was within 37 weeks of August 22, 1996, the date of PRWORA enactment. The sibling-only sample includes 36,881 siblings, composed of 17,142 Numident (non-SSI) siblings and 19,739 SSR (SSI) siblings.

For the Child Entry RD-DD, we drop Numident siblings who are more than eight years older or younger than the original child, who reach 18 years old before the reform in 1996, who do not reach 18 years old at least three years before the last year of data, or who receive SSI benefits themselves. The original sample for the Child Entry RD-DD comprises 127,554 individuals who applied for SSI within 6 months of the state-specific PRWORA cutoff (138,005 for the 1995 placebo cohort) with a diagnosis of ADHD, learning disability, ODD, or conduct disorder. The sample additionally includes 76,343 Numident (non-SSI) siblings (82,593 in 1995 cohort) and 12,063 SSR (SSI) siblings (13,635 in 1995 cohort). There are relatively few SSR siblings for this quasi-experiment because of the requirement that the sibling appear in the SSR before the reform date.

B Alternative explanations for heterogeneous effects

C Model Validation: Child Entry RD-DD

C.1 Child Entry RD-DD: additional evidence on the entry margin

The third source of variation in childhood SSI receipt comes from a 1996 policy change that tightened eligibility criteria for mental and behavioral conditions. These changes primarily affected children applying with four types of conditions: ADHD, learning disability, oppositional defiant disorder, and conduct disorder. The rules applied only to child SSI applications reviewed after the date of PRWORA enactment, creating yet another setting for an RD design.²⁶

This source of variation is new to this paper. As with the Child Removal RD and the Age 18 Removal RD, we link the original children affected by the reform to their siblings (older and younger), both those who receive SSI and others who do not receive SSI. We study the effects of a child being denied SSI in childhood on the adult earnings of the child and their siblings, and the contemporaneous earnings responses of their parents. Like the Child Removal RD, the Child Entry RD-DD identifies a net effect of SSI, including both income effects and perverse incentive effects. Unlike the Child Removal RD, which estimates the effect of losing SSI for children who were already receiving SSI, the Child Entry RD-DD estimates the effect of being denied SSI for children who had applied for but not yet received SSI benefits. This source of variation also gives us additional evidence about the parent decision-making channel.

Figure B.1 shows the first stage effects of the 1996 policy change. For each state, we determine a state-specific application date cutoff based on the state’s application backlog.²⁷ We recenter the running variable for each application based on that state’s application date cutoff and pool all states to create the top graph of Figure B.1. The graph shows a discrete 5pp drop in the allowance rate for behavioral conditions at the cutoff for the 1996 cohort, but no drop for the 1995 (placebo) cohort at the same date exactly one year earlier. This means that children reviewed just to the right of the cutoff, under the stricter standard, are less likely to receive SSI as children. To eliminate the effect of seasonality in applications, we estimate an RD with a second difference (RD-DD), using the discontinuity for the 1995 cohort as the second difference.

²⁶As part of PRWORA, Congress made two major changes to childhood SSI criteria. First, it removed “maladaptive behavior” (e.g., aggression and disruptive behavior) as a limitation that could count toward a child’s eligibility for SSI. Second, Congress discontinued the use of a more lenient function-based standard for children.

²⁷For example, a state with a relatively small backlog might have been reviewing applications that were submitted in June 1996 when PRWORA was passed on August 22, 1996. In contrast, a state with a relatively large backlog might have been reviewing applications that were submitted in January 1996 when PRWORA was passed. We determine each state’s particular cutoff using visual inspection of the drop in allowance rates for the four behavioral conditions affected by the PRWORA change.

We estimate the following equation:

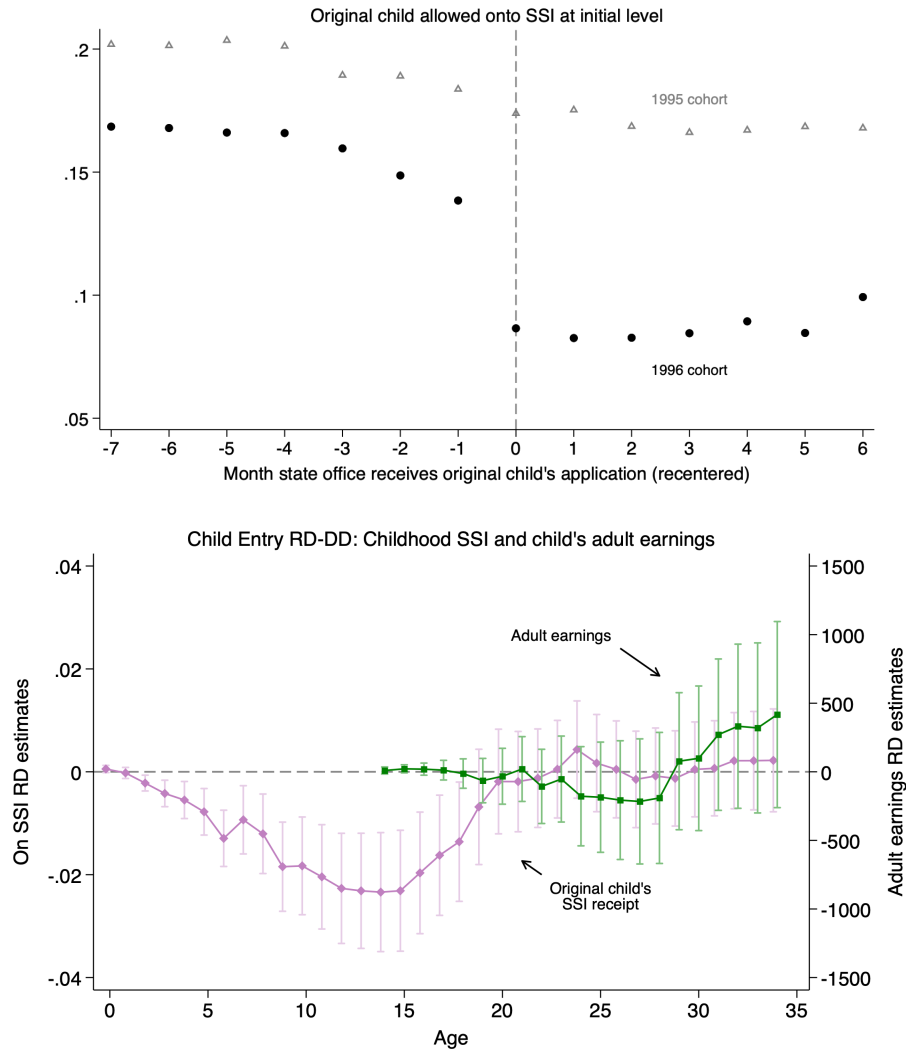
$$\begin{aligned}
Y_i = & \alpha_3 + \beta_3(\text{PostPRWORA}_i \times \text{Coh96}_i) + \gamma_3(\text{AppDate}_i \times \text{Coh96}_i) \\
& + \delta_3(\text{PostPRWORA}_i \times \text{AppDate}_i \times \text{Coh96}_i) \\
& + \beta_0\text{PostPRWORA}_i + \gamma_0\text{AppDate}_i + \delta_0(\text{PostPRWORA}_i \times \text{AppDate}_i) + \kappa_3 X_i + \varepsilon_3
\end{aligned} \tag{5}$$

where Y_i is an outcome (e.g., child earnings in adulthood), Coh96_i is an indicator for the 1996 cohort (versus the 1995 placebo cohort), PostPRWORA_i is an indicator for applying in a month after the PRWORA rules went into effect, AppDate_i is the application date running variable, and the X_i are covariates. The coefficient of interest is the β_3 since it gives the effect of applying in a month after the PRWORA rules went into effect, for the 1996 cohort relative to the 1995 cohort. We include own sex, own year of birth, whether child is original child or sibling, and household earnings as covariates in the main specification. To account for multiple siblings in the same household, we cluster standard errors at the household level.

Since applications are generally reviewed many months after they are submitted, there is little scope for manipulation by applicants. Parents submitting applications several months before PRWORA enactment would not have known that their child's application would be reviewed under a stricter standard, and certainly would not have known the exact date at which the stricter standard would be applied. Appendix Table D.3 shows that the RD-DD design is effective in purging seasonality, with a covariate balance test failing to reject the null hypothesis of no discontinuities at the cutoff. Appendix Figure D.2 presents a histogram for applications around the cutoff. Although applications steadily decline after the PRWORA cutoff, there is no discrete change in applications at the cutoff.

The bottom graph of Figure B.1 plots the RD-DD estimate of the likelihood of being on SSI by age. The policy reform reduces the likelihood of SSI receipt below the age of 18 years, especially between ages 5 and 15 when behavioral conditions are most likely to be diagnosed. The RD-DD estimate attenuates around age 18 because many children who receive SSI based on behavioral conditions are removed from SSI as a result of the age 18 medical review. This is a useful feature of this natural experiment because it means that any effect on adult earnings reflects the effects of SSI (or lack thereof) in childhood, without any contemporaneous effects of adult SSI receipt.

Appendix Figure B.1: Child Entry RD-DD: no effect of SSI denial in childhood on adult earnings

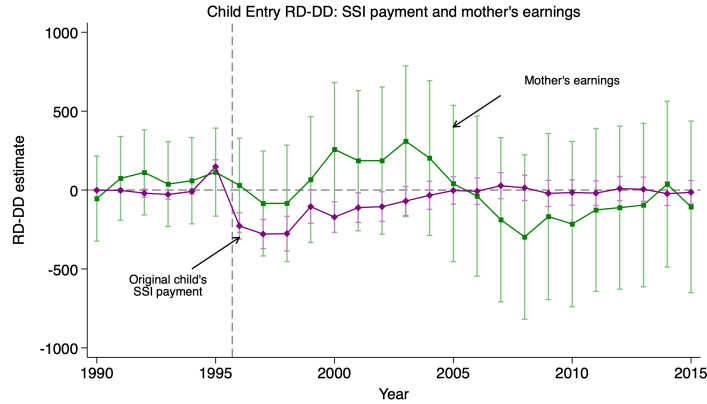


Notes: Top graph plots likelihood of being allowed onto SSI at the initial level, by the date the state disability determination services office receives the child's application, for the 1996 (affected) cohort and the 1995 (placebo) cohort. Bottom graph plots the RD-DD estimate at each age of the effect of being on the right of the cutoff on the likelihood of being on SSI (i.e., β_3 in equation 5) and the effect being on the right of the application-date cutoff on the earnings of the original child plus siblings; specification controls for own sex, own year of birth, whether child is original child or sibling, and household earnings. Sample for the SSI indicator and SSI payment is children who apply for SSI within six months of state-specific PRWORA-induced change in eligibility criteria (and exactly 12 months before that, for the 1995 placebo cohort) and whose primary condition is recorded on their SSI application as ADHD, oppositional defiant disorder, learning disability, or conduct disorder. Sample for child's adult earnings also includes siblings of the original children identified through either the Supplemental Security Record (who at one time applied for or received SSI) or the Numident, as described in Section 4.

The bottom graph of Figure B.1 also plots RD-DD estimates of the effect of SSI denial on the adult earnings of the original children and their siblings. It shows that children on either side of the cutoff have similar earnings in adulthood (see Appendix Table D.4 for a full set of

estimates). Although the estimates are noisy, they suggest that being denied SSI in childhood has no effect on adult earnings. Turning to channels, Figure B.2 shows that mothers roughly offset the loss in SSI income by working more, leaving household income unchanged. Despite heterogeneous effects on children's adult outcomes across the three quasi-experiments, there is one consistent theme across them: children's adult earnings responses track household income responses, which in turn is determined largely by parent earnings responses.

Appendix Figure B.2: Parent earnings responses for Child Entry RD-DD



Notes: Graphs plot estimates of the effect of the reform on the original child's SSI payment and on mothers' earnings responses by year for the Child Entry RD-DD (β_3 from equation (5)). The Child Entry RD-DD sample for SSI payment is children who apply for SSI within six months of state-specific PRWORA-induced change in eligibility criteria (and exactly 12 months before that, for the placebo cohort) and whose primary condition is recorded on their SSI application as ADHD, oppositional defiant disorder, learning disability, or conduct disorder. The sample for mother earnings is mothers of these children.

D Model Details

D.1 The adult child's optimization problem

We characterize each child's continuation value as an adult, W_1^χ , as a function of their human capital, which they accumulate when they are young. Child S 's continuation value also depends on their SSI status when they leave their mother's household. Each adult child $\chi \in \{S, N\}$ faces the following dynamic decision problem:

$$\begin{aligned} W_t^\chi(\Xi_{i,t}^\chi) &= \max_{c_{i,t}^\chi, h_{i,t}^\chi} u(c_{i,t}^\chi, h_{i,t}^\chi) + \beta E_t W_{t+1}^\chi(\Xi_{i,t+1}^\chi) \\ \text{s.t. } c_{i,t}^\chi &= w_{i,t}^\chi h_{i,t}^\chi + \mathbf{1}[\chi = S] s_{i,t}^S SSI^a(w_{i,t}^S h_{i,t}^S) + B(w_{i,t}^\chi h_{i,t}^\chi, s_{i,t}^\chi) \end{aligned}$$

Here, the state variable, $\Xi_{i,t}^\chi$, contains the adult child's wage $w_{i,t}^\chi$ and their prior eligibility for SSI, $s_{i,t-1}^\chi$, where Child N remains ineligible for SSI (i.e., $s_{i,t-1}^N = 0$). Child S enters adulthood with the same SSI status that they ended their childhood with, i.e., $s_{i,1}^S = s_{j,T^S}$. Here, we let $SSI^a(w \cdot h)$ denote the potential SSI that an adult child with earnings $w \cdot h$ is eligible for according to the adult version of the SSA means test. The variable $B(w_{i,t}^\chi h_{i,t}^\chi, s_{i,t}^\chi)$ represents other benefits that the adult child is entitled to as a function of their earnings and SSI status (i.e., SNAP and EITC).

As our focus is on childhood SSI, we simplify adult SSI eligibility so that no individual agent can get back on SSI. Moreover, the only way an agent can be removed from SSI, is if they fail the means test (i.e., they earn too much money). Hence, with probability 1, SSI eligibility s_t is given by

$$s_{i,t}^\chi = \mathbf{1}[SSI^a(w_{i,t}^\chi h_{i,t}^\chi) > 0] \cdot s_{i,t-1}^\chi.$$

D.2 Evolution of wages

Agents draw their initial wages at the beginning of their adult life from a given distribution. Afterward, wages evolve according to a lognormal random walk. In particular, the mother's wages evolve as follows:

$$\begin{aligned} \ln(w_{j,t}) &= \ln(w_{j,t-1}) - \delta \cdot \mathbf{1}(h_{j,t-1} = 0) + \epsilon_{j,t} \\ \epsilon_{j,t} &\sim N(0, \sigma) \end{aligned}$$

where δ captures a wage penalty for being out of the workforce (e.g., this could capture skill deterioration). In much the same way, Child $\chi \in \{S, N\}$'s adult earnings evolve as follows:

$$\begin{aligned}\ln(w_{i,1}^\chi) &= \ln(k_{i,T^\chi}^\chi) + \varepsilon_{i,t}^\chi \\ \ln(w_{i,t}^\chi) &= \ln(w_{i,t-1}^\chi) - \delta \cdot 1(h_{i,t-1}^\chi = 0) + \varepsilon_{i,t}^\chi \quad \text{for } \forall t > 1 \\ \varepsilon_{i,t}^\chi &\sim N(0, \sigma^\chi) \quad \text{for } \forall t > 0\end{aligned}$$

Here, we see that the average log wage of an adult child corresponds to their log human capital, giving us a natural way to interpret the scale of our human capital measure k .

Finally, we note that the mother's initial wage draw is correlated with her children's initial human capital with covariance ω :

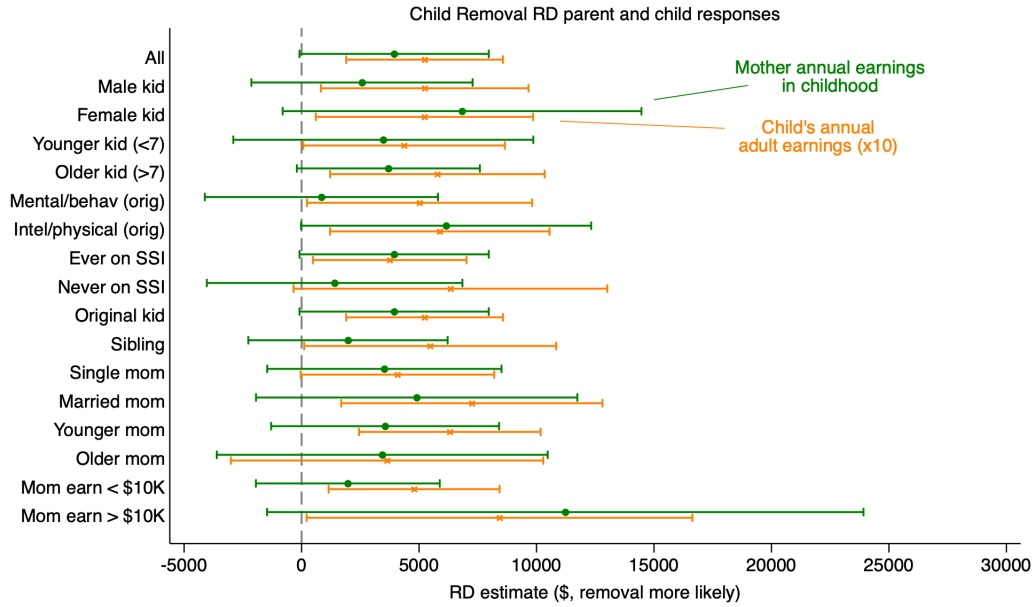
$$\ln \begin{pmatrix} w_1 \\ k_1^S \\ k_1^N \end{pmatrix} \sim N \left(\begin{pmatrix} m^{exp} \\ \mu^S \\ \mu^N \end{pmatrix}, \begin{pmatrix} \sigma_0^2 & \omega\sigma_0\sigma_k^S & \omega\sigma_0\sigma_k^N \\ \omega\sigma_0\sigma_k^S & (\sigma_k^S)^2 & 0 \\ \omega\sigma_0\sigma_k^N & 0 & (\sigma_k^N)^2 \end{pmatrix} \right) \quad \text{for } exp \in \{\text{childRD}, \text{age18RD}\}.$$

Without this correlation structure, all intra-family earnings would be correlated solely due to a mother's endogenous decision-making. However, with it, there is a second, exogenous mechanism for intergenerational transmission.

Note as well that we allow the mother's wage level to vary across the two RDs to accommodate the possibility of different economic environments across the two RDs.

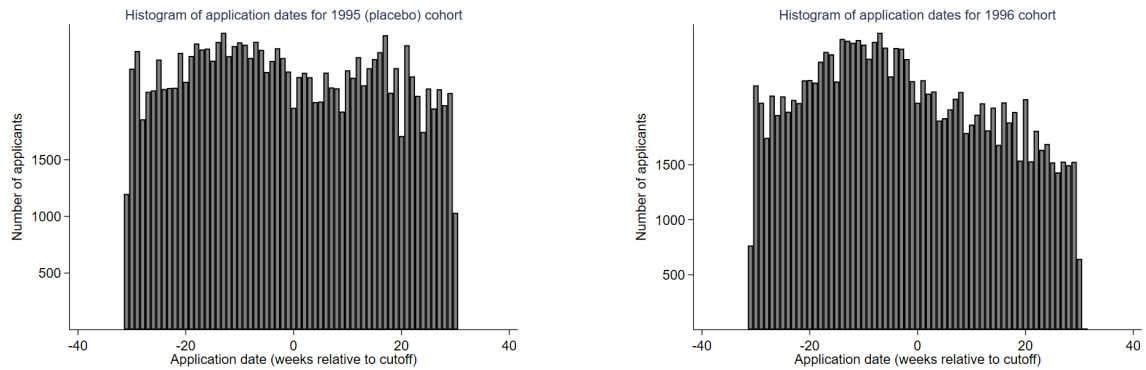
E Key Appendix Figures and Tables

Appendix Figure D.1: Child Removal RD: heterogeneity in parent and child responses



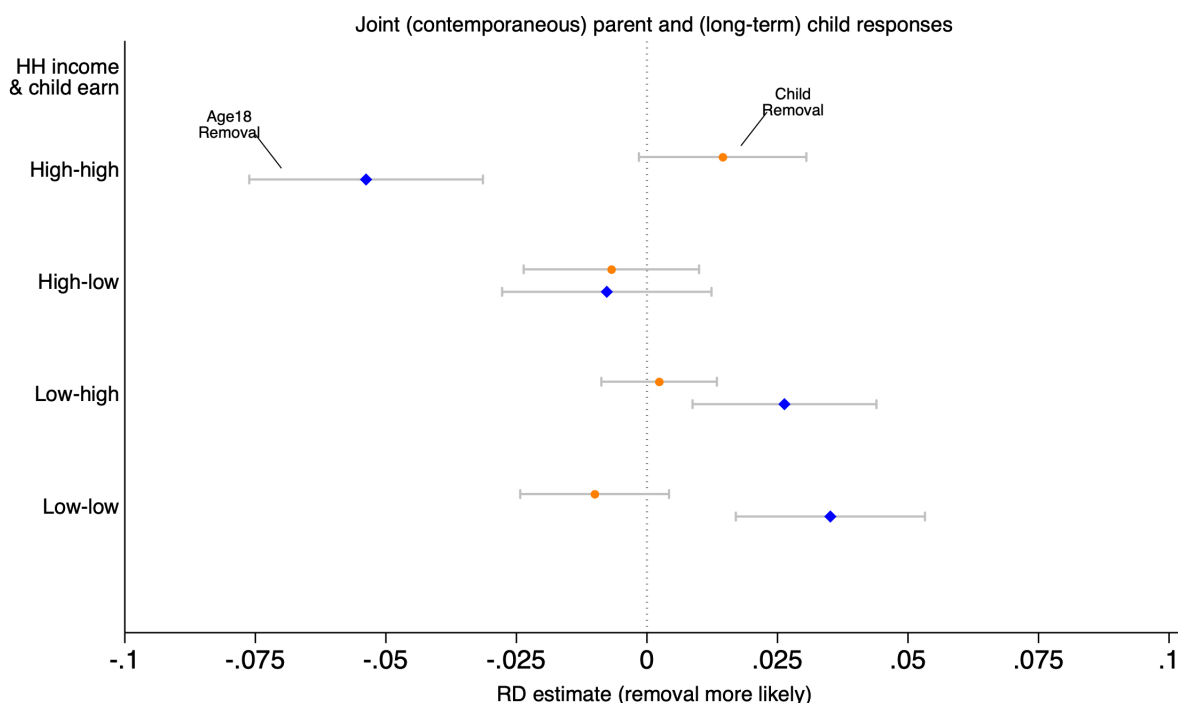
Notes: Figure plots RD estimates for the Child Removal RD (i.e., β_1 from equation (1)) for two outcomes: 1) mother's total earnings between 2004 and the year the child turns 18 years old, and 2) child's adult annual earnings after age 20 (child earning estimates are multiplied by 10 for scaling). The sample for mother's earnings is SSI children who entered SSI within 250 days of October 1, 2001, and who were between the ages of 0 and 9 when they entered SSI (see text for details); the sample for child earnings also includes their siblings identified through either the Supplemental Security Record (who at one time applied for or received SSI) or the Numident, as described in Section 4. "Mental/behav" ("intel/physical") means the original child has a mental or behavioral (intellectual or physical) condition. "Younger mom" ("older") means mother is less than (greater than or equal to) 35 years. "Mom earn < \$10K" ("Mom earn > \$10K") means the mother earned less than (greater than or equal to) \$10,000 between 1994 and 2001 (i.e., the years prior to child's SSI entry). Appendix Table D.5 reports point estimates and standard errors.

Appendix Figure D.2: Child Entry RD-DD: Histogram of applications around cutoff



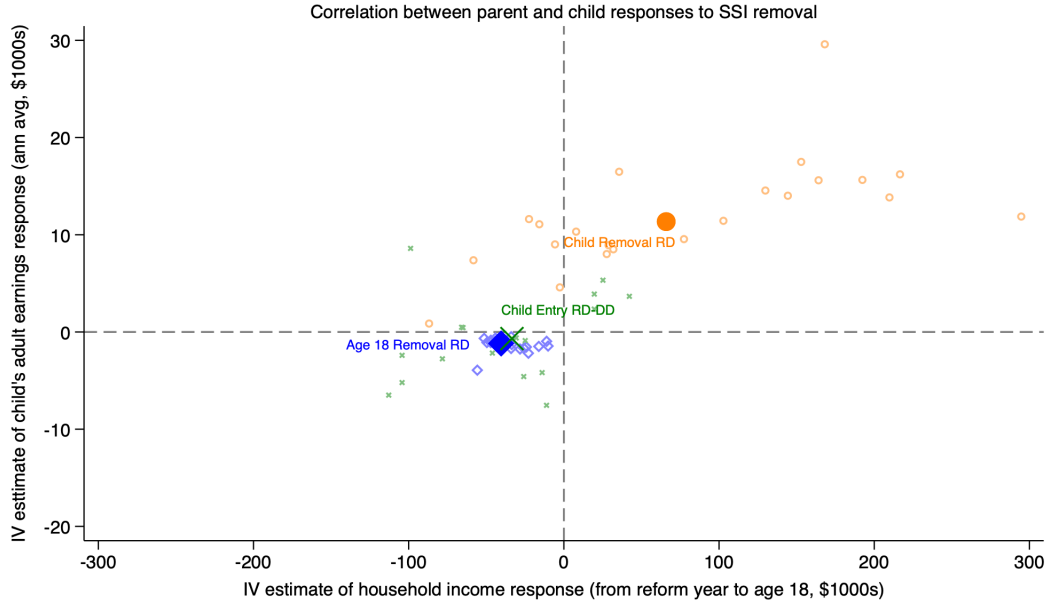
Notes: Figure plots histogram of child applications around the Child Entry RD-DD cutoff for the 1995 (placebo) cohort (left) and the 1996 cohort (right), where the sample is child applicants with a diagnosis of ADHD, learning, ODD, or conduct disorder. See text for description of how the state-specific cutoffs are determined.

Appendix Figure D.3: Joint parent and child responses



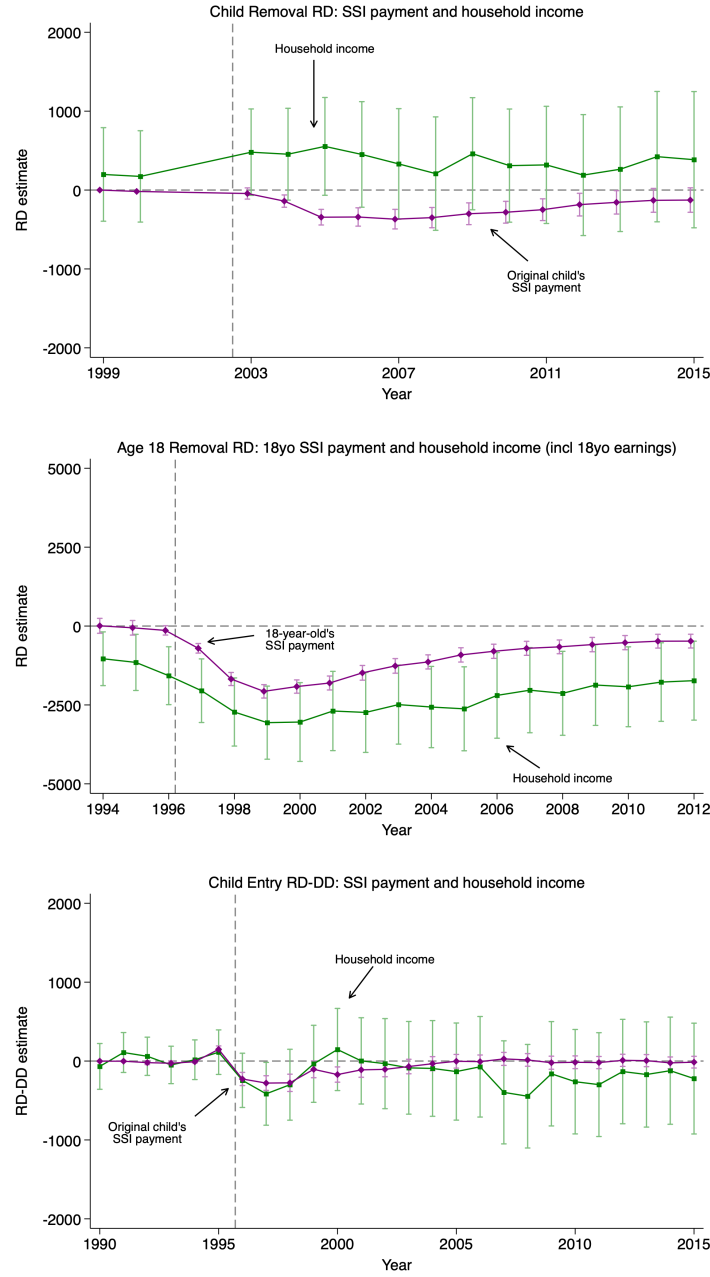
Notes: Figure plots RD estimates of joint child and parent outcomes for the Child Removal RD and the Age 18 Removal RD. The outcomes are four mutually exclusive and collectively exhaustive categories: high household income in childhood ($\geq \$10,000/\text{year}$) and high child earnings in adulthood ($\geq \$3,000/\text{year}$), high household income and low child earnings, low household income and high child earnings, and low household income and low child earnings. For the Child Removal RD, household income is the sum of parent earnings and child's SSI income; and child's adult earnings are average annual earnings from ages 18 to 22. For the Age 18 Removal RD, household income is the sum of parent earnings, 18-year-old earnings, and 18-year-old's SSI income; and child's adult earnings are average annual earnings from ages 22 to 30. The Child Removal RD sample is SSI children who entered SSI within 250 days of October 1, 2001, and who were between the ages of 0 and 9 when they entered SSI; plus their siblings identified in the SSR and Numident. The Age 18 Removal RD sample is the younger siblings (identified in the SSR and Numident) of SSI children with an 18th birthday within 37 weeks of the August 22, 1996, cutoff. Appendix Table D.16 reports point estimates and standard errors for all three quasi-experiments, including the Child Entry RD-DD.

Appendix Figure D.4: Correlation between household income and child earnings responses



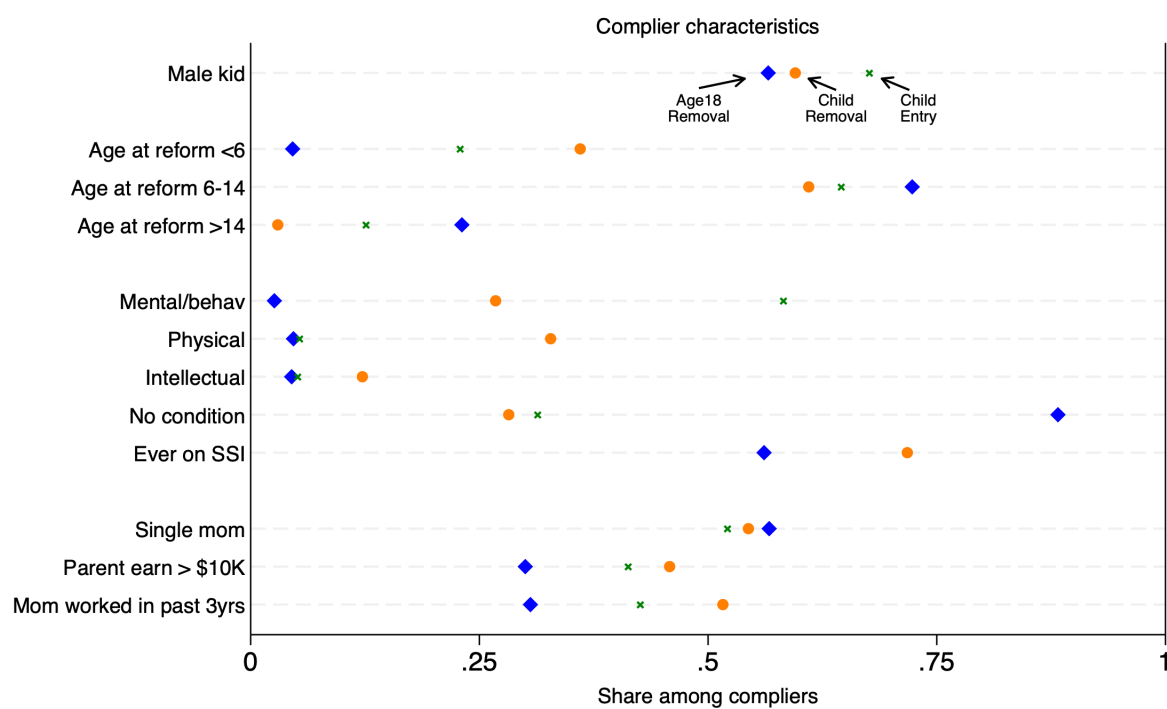
Notes: Figure plots IV estimates of household income response and child's adult earnings response across subgroups for the Child Removal RD, Age 18 Removal RD, and Child Entry RD-DD. The large markers are the estimates for the full samples, while the small markers are the estimates for subgroups within each source of variation, including child's sex (male/female), child age (older/younger), child's exposure to treatment (high/low), original child's disability type (intellectual, other mental, physical), unemployment rate in household's region (high/low), mother's marital status (married/single), mother's age (older/younger), whether mother had any earnings last year or last 3 years (yes/no), and whether mother had substantial earnings ($> \$10,000$) in the year before the reform. The Child Removal RD sample for SSI payment is SSI children who entered SSI within 250 days of October 1, 2001, and who were between the ages of 0 and 9 when they entered SSI (and siblings). The Age 18 Removal RD sample for SSI payment is younger siblings of SSI children with an 18th birthday within 37 weeks of the August 22, 1996, cutoff. The Child Entry RD-DD sample for SSI payment is children who apply for SSI within six months of state-specific PRWORA-induced change in eligibility criteria (and exactly 12 months before that, for the placebo cohort) and whose primary condition is recorded on their SSI application as ADHD, oppositional defiant disorder, learning disability, or conduct disorder (and siblings). Appendix Table D.6 reports point estimates and standard errors for all three quasi-experiments.

Appendix Figure D.5: Household income responses across quasi-experiments



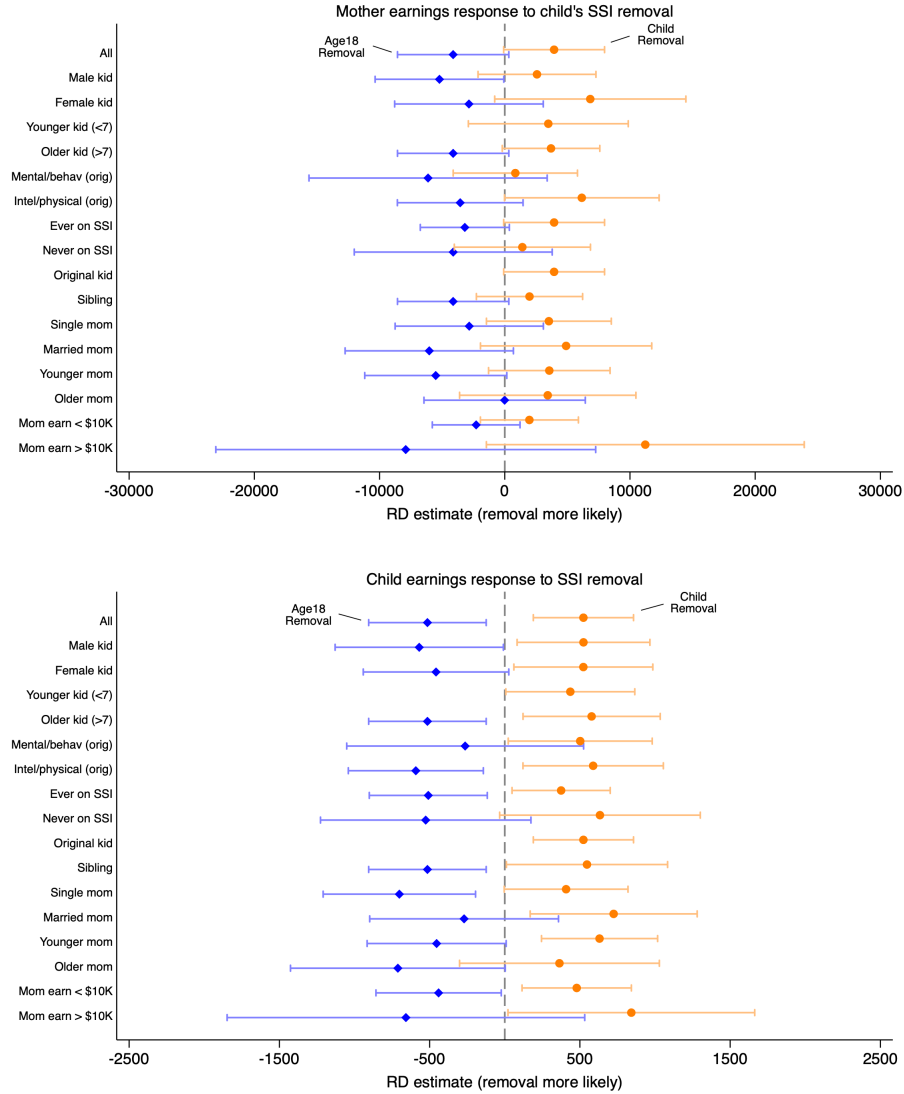
Notes: Graphs plot RD estimates of the effect on the original child's SSI payment and on household income, which equals the sum of parent earnings and child's SSI (and, for the Age 18 Removal RD, the 18-year-old's earnings). For the Child Removal RD, graph plots estimates of β_1 from equation (1) for the specified outcome in each year; this is β_2 from equation (2) for the Age 18 Removal RD, and β_3 from equation (5) for Child Entry RD-DD. The Child Removal RD sample is SSI children who entered SSI within 250 days of October 1, 2001, and who were between the ages of 0 and 9 when they entered SSI. The Age 18 Removal RD sample is younger siblings of SSI children with an 18th birthday within 37 weeks of the August 22, 1996, cutoff. The Child Entry RD-DD sample is children who apply for SSI within six months of state-specific PRWORA-induced change in eligibility criteria (and exactly 12 months before that, for the placebo cohort) and whose primary condition is recorded on their SSI application as ADHD, oppositional defiant disorder, learning disability, or conduct disorder.

Appendix Figure D.6: Differences in complier characteristics across quasi-experiments



Notes: Graph shows characteristics of the complier populations for Child Removal RD, Age 18 Removal RD, and Child Entry RD-DD. Complier characteristics are calculated using the methodology in Angrist and Pischke (2009).

Appendix Figure D.7: Heterogeneity in mother and child earnings responses



Notes: Figure shows estimates of mother’s contemporaneous earnings response (top) and child’s adult earnings response (bottom) by subgroup for the Age 18 Removal RD and Child Removal RD. Mother’s earnings response is total earnings from year of reform to year child turns 18 years old. Child’s earnings are average annual earnings after age 20 for the Child Removal RD, and average annual earnings between 18 and 30 years for the Age 18 Removal RD. “Mental/behav” (“intel/physical”) means the original child has a mental or behavioral (intellectual or physical) condition. “Mom earn < \$10K” means the mother earned less than \$10,000 on average in the previous three years. “Mom earn > \$10K” means the mother earned at least \$10,000 on average in the previous three years. The Child Removal RD sample for SSI payment is SSI children who entered SSI within 250 days of October 1, 2001, and who were between the ages of 0 and 9 when they entered SSI (and siblings). The Age 18 Removal RD sample for SSI payment is younger siblings of SSI children with an 18th birthday within 37 weeks of the August 22, 1996, cutoff. Appendix Table D.5 reports point estimates and standard errors, including for the Child Entry RD-DD.

Appendix Table D.1: Child Removal RD: Covariate balance test

	Pt Est	Std Err	Cntrl mean	% of mean	N
Male	-0.00580	(0.00870)	0.675	-0.9%	48,059
Age at initial SSI receipt	0.0168	(0.0488)	3.90	0.4%	48,056
Year of birth	-0.0154	(0.0483)	1997.2	0.0%	48,014
Single parent	-0.00616	(0.00921)	0.581	-1.1%	48,059
No parent	0.00285	(0.00540)	0.098	2.9%	48,059
Parent avg ann earnings 1994–2001	-513.0	(265.8)	\$11,690	-4.4%	43,500
Diagnosis: mental	0.00828	(0.00879)	0.670	1.2%	48,059
Diagnosis: nervous	-0.00578	(0.00445)	0.057	-10.2%	48,059
Diagnosis: illness	0.00465	(0.00441)	0.064	7.3%	48,059
Diagnosis: congenital	0.00207	(0.00397)	0.043	4.8%	48,059
Diagnosis: respiratory	-0.0121	(0.00402)	0.046	-26.3%	48,059
Diagnosis: sensory	0.00505	(0.00335)	0.034	15.0%	48,059
Diagnosis: neoplasm	-0.000466	(0.00197)	0.013	-3.6%	48,059
p-value on joint F test	0.0646				

Notes: Table presents estimates of β_1 from equation (1) for characteristics of the Child Removal RD sample, and reports the p-value of the joint F test that all discontinuities are zero. Sample is SSI children who entered SSI within 250 days of October 1, 2001, and who were between the ages of 0 and 9 when they entered SSI.

Appendix Table D.2: Age 18 Removal RD: Covariate balance test

	Pt Est	Std Err	Cntrl mean	% of mean	N
18yo male	0.0187	(0.0141)	0.607	3.1%	36,881
18yo age at initial SSI receipt	-0.132	(0.115)	11.7	-1.1%	36,881
Single parent	0.0305	(0.0145)	0.541	5.6%	36,881
Mother avg ann earnings 1990–95	-98.59	(187.8)	\$3,832	-2.6%	35,985
18yo 18yo diagnosis: mental	-0.0204	(0.0119)	0.772	-2.6%	36,881
18yo diagnosis: nervous	-0.000599	(0.00551)	0.039	-1.5%	36,881
18yo diagnosis: sensory	-0.00570	(0.00472)	0.029	-19.6%	36,881
18yo diagnosis: infectious	0.00149	(0.00598)	0.052	2.8%	36,881
18yo diagnosis: endocrine	0.00999	(0.00540)	0.031	32.2%	36,881
Sibling: SSR	-0.0230	(0.0123)	0.555	-4.1%	36,881
Sibling: Numident	0.0230	(0.0123)	0.445	5.2%	36,881
Sibling: male	-0.00514	(0.0101)	0.543	-0.9%	36,881
Sibling DOB	-33.25	(23.85)	8924	-0.4%	36,881
p-value on joint F test	0.0029				

Notes: Table presents estimates of β_2 from equation (2) for characteristics of the Age 18 Removal RD sample, and reports the p-value of the joint F test that all discontinuities are zero. Specification controls for 18-year-old severity, since RD assignment is conditional on severity. Sample is younger siblings of SSI children with an 18th birthday within 37 weeks of the August 22, 1996, cutoff.

Appendix Table D.3: Child Entry RD-DD: Covariate balance test

	Pt Est	Std Err	Cntrl mean	% of mean	N
Male	0.00492	(0.00683)	0.742	0.7%	264,093
Age at application	-0.0398	(0.0531)	9.45	-0.4%	266,622
Single parent	-0.000985	(0.00741)	0.683	-0.1%	264,093
No parent	-0.00394	(0.00537)	0.140	-2.8%	264,093
White	0.0125	(0.00768)	0.364	3.4%	264,093
Black	-0.0170**	(0.00761)	0.392	-4.3%	264,093
Parent avg ann earnings 1990–95	-16.18	(260.2)	\$11,951	-0.1%	241,939
Diagnosis: ADHD	0.0200***	(0.00768)	0.578	3.5%	266,797
Diagnosis: learning	-0.0114	(0.00720)	0.321	-3.6%	266,797
Diagnosis: ODD	-0.00508	(0.00362)	0.057	-8.9%	266,797
Diagnosis: conduct	-0.00128	(0.00358)	0.058	-2.2%	266,797
p-value on joint F test	0.2534				

Notes: Table presents estimates of β_3 from equation (5) for characteristics of the Child Entry RD-DD sample, and reports the p-value of the joint F test that all discontinuities are zero. Sample is children who apply for SSI within six months of state-specific PRWORA-induced change in eligibility criteria (and exactly 12 months before that, for the placebo cohort) and whose primary condition is recorded on their SSI application as ADHD, oppositional defiant disorder, learning disability, or conduct disorder.

Appendix Table D.4: Child Entry RD-DD: First stage and reduced form estimates

	Pt Est	Std Err	Cntrl mean	N
First stage				
Original kid allowed on SSI	-0.052	0.006	0.139	258,526
Original kid's years on SSI from 1997 to age 18	-0.193	0.043	1.513	258,526
Original kid's total SSI payment from 1997 to age 18	-\$1,256	\$353	\$11,617	258,526
Children's (original kid + sib) adult earnings response				
Avg ann earnings ages 20-35	-\$17	\$192	\$11,700	450,103
Avg ann earnings ages 20-35 > \$0	0.001	0.004	0.672	450,103
Avg ann earnings ages 20-35 > \$10K	0.002	0.005	0.399	450,103
Avg ann earnings ages 20-35 > \$20K	0.001	0.004	0.224	450,103
Parent contemporaneous earnings response				
Mother's earnings from 1997 to age 18	\$965	\$1,498	\$87,842	230,965
Mother ann earnings 1999-2006 > \$0	0.002	0.006	0.676	236,244
Mother ann earnings 1999-2006 > \$20K	0.004	0.006	0.256	236,244
Father's earnings from 1997 to age 18	-\$4,980	\$3,430	\$155,955	89,173
Parent earnings from 1997 to age 18	-\$537	\$1,940	\$141,959	237,133
Annual HH income (SSI + parent earn) from 1997 to age 18	-\$1,813	\$1,927	\$153,573	237,133

Notes: Table presents estimates of β_3 from equation (5); i.e., the effect of having an application date after the state-specific PRWORA cutoff and therefore having a higher likelihood of being denied from SSI. First stage sample is the original children: children who apply for SSI within six months of state-specific PRWORA-induced change in eligibility criteria (and exactly 12 months before that, for the placebo cohort) and whose primary condition is recorded on their SSI application as ADHD, oppositional defiant disorder, learning disability, or conduct disorder. The parent earnings sample is the subset of those children who have a parent (or mother or father) listed on their record. The combined child and sibling sample is the original children plus their siblings identified through the Supplemental Security Record and Numident, as described in Section 4. "Control mean" indicates the average for those on the left-hand side (i.e., lower likelihood of being denied) of the cutoff with running variable within one month of the cutoff. Specification controls for own sex, own year of birth, whether child is original child or sibling, and household earnings. See Appendix Table D.14 for estimates not including covariates.

Appendix Table D.5: RD estimates of SSI income, mother earnings, and child's adult earnings by subgroup

	SSI income	Mom earn	Child Removal RD HH inc	Child adult earn	N (child earn)	SSI income	Mom earn	Age 18 Removal RD HH inc	Child adult earn	N (child earn)	SSI income	Mom earn	Child Entry RD-DD HH inc	Child adult earn	N (child earn)
All	-\$3,633	\$3,941	\$3,239	\$524	80,739	-\$9,100	-\$4,122	-\$17,521	-\$515	36,881	-\$1,256	\$965	-\$1,813	-\$46	448,097
	\$639	\$2,055	\$3,818	\$170		\$634	\$2,268	\$4,065	\$200		\$353	\$1,498	\$1,927	\$249	
Male kid	-\$3,497	\$2,573	\$5,132	\$524	49,093	-\$8,335	-\$5,215	-\$14,856	-\$569	20,505	-\$1,400	\$1,148	-\$1,773	-\$39	289,872
	\$754	\$2,403	\$4,431	\$226		\$737	\$2,623	\$4,710	\$286		\$414	\$1,753	\$2,257	\$295	
Female kid	-\$3,889	\$6,830	-\$775	\$523	31,646	-\$10,034	-\$2,859	-\$20,945	-\$457	16,376	-\$860	\$360	-\$1,789	-\$53	158,225
	\$1,188	\$3,896	\$7,340	\$236		\$831	\$3,028	\$5,366	\$247		\$666	\$2,876	\$3,670	\$340	
Younger kid (<7)	-\$4,005	\$3,477	\$1,601	\$436	34,999						-\$934	\$1,963	-\$2,751	-\$433	131,364
	\$955	\$3,258	\$6,099	\$219							\$1,107	\$4,253	\$5,274	\$463	
Older kid (>7)	-\$2,629	\$3,694	\$4,774	\$578	45,740	-\$9,100	-\$4,122	-\$17,521	-\$515	36,881	-\$1,179	-\$33	-\$1,398	\$164	316,733
	\$653	\$1,987	\$3,732	\$233		\$634	\$2,268	\$4,065	\$200		\$306	\$1,432	\$1,794	\$257	
Mental/behav (orig)	-\$3,309	\$845	\$1,350	\$502	40,723	-\$9,487	-\$6,124	-\$18,361	-\$264	8,309	-\$1,256	\$965	-\$1,813	-\$46	448,097
	\$834	\$2,532	\$4,791	\$244		\$1,274	\$4,852	\$7,789	\$402		\$353	\$1,498	\$1,927	\$249	
Intel/physical (orig)	-\$4,031	\$6,153	\$4,554	\$588	40,016	-\$8,885	-\$3,558	-\$17,389	-\$592	28,572					
	\$950	\$3,151	\$5,815	\$238		\$722	\$2,560	\$4,739	\$229						
Ever on SSI	-\$3,633	\$3,941	\$3,239	\$375	55,196	-\$7,206	-\$3,190	-\$16,191	-\$509	19,739					
	\$639	\$2,055	\$3,818	\$167		\$645	\$1,815	\$3,437	\$200						
Never on SSI	-\$1,170	\$1,407	\$4,503	\$634	25,543	-\$10,910	-\$4,116	-\$17,017	-\$526	17,142					
	\$1,024	\$2,775	\$5,851	\$341		\$1,016	\$4,033	\$7,050	\$357						
Sibling	-\$2,073	\$1,975	\$2,432	\$547	38,347	-\$9,100	-\$4,122	-\$17,521	-\$515	36,881	-\$3,121	\$1,055	-\$10,268	-\$686	182,628
	\$822	\$2,164	\$4,633	\$274		\$634	\$2,268	\$4,065	\$200		\$1,204	\$2,936	\$5,581	\$483	
Single mom	-\$3,660	\$3,523	\$1,483	\$408	47,567	-\$9,384	-\$2,837	-\$10,928	-\$702	19,800	-\$1,301	\$2,508	\$1,191	\$306	234,163
	\$835	\$2,544	\$2,907	\$210		\$857	\$3,021	\$3,621	\$259		\$458	\$1,747	\$1,739	\$274	
Married mom	-\$3,491	\$4,899	\$8,571	\$725	32,803	-\$8,946	-\$6,030	-\$21,145	-\$271	16,016	-\$1,142	-\$1,619	-\$7,339	-\$573	191,014
	\$1,146	\$3,489	\$7,620	\$284		\$980	\$3,429	\$7,322	\$321		\$600	\$2,377	\$3,935	\$468	
Younger mom	-\$3,812	\$3,556	\$457	\$631	57,996	-\$8,787	-\$5,511	-\$20,080	-\$453	23,708	-\$1,805	\$110	-\$1,943	-\$365	283,085
	\$794	\$2,475	\$4,563	\$197		\$795	\$2,895	\$5,215	\$236		\$492	\$1,918	\$2,454	\$326	
Older mom	-\$2,208	\$3,433	\$12,185	\$364	22,077	-\$10,051	-\$11	-\$11,432	-\$711	12,322	-\$298	\$3,182	-\$1,929	\$501	131,600
	\$1,228	\$3,593	\$6,865	\$339		\$1,069	\$3,287	\$6,375	\$365		\$520	\$2,331	\$2,944	\$443	
Mom earn < \$10K	-\$3,332	\$1,968	-\$1,048	\$479	66,941	-\$9,545	-\$2,285	-\$17,752	-\$440	31,368	-\$1,224	-\$227	-\$4,190	-\$200	328,848
	\$739	\$1,997	\$4,070	\$186		\$703	\$1,787	\$4,128	\$213		\$452	\$1,412	\$2,060	\$306	
Mom earn > \$10K	-\$2,437	\$11,225	\$18,086	\$842	13,798	-\$7,345	-\$7,909	-\$10,187	-\$658	4,617	-\$1,575	\$3,248	\$2,852	\$266	85,869
	\$1,503	\$6,476	\$9,947	\$419		\$1,532	\$7,739	\$11,384	\$607		\$530	\$3,747	\$4,587	\$512	
Low unemp rate	-\$2,459	-\$91	-\$3,982	\$41	30,757	-\$8,556	-\$4,174	-\$20,445	-\$369	20,818	-\$1,456	\$1,667	-\$2,855	-\$195	242,780
	\$1,023	\$3,434	\$6,412	\$279		\$808	\$3,031	\$5,613	\$262		\$459	\$2,077	\$2,653	\$299	
High unemp rate	-\$4,368	\$6,428	\$7,866	\$817	49,909	-\$9,753	-\$4,118	-\$14,667	-\$738	15,988	-\$761	-\$1,257	-\$1,068	-\$36	166,838
	\$815	\$2,561	\$4,735	\$215		\$1,003	\$3,403	\$5,801	\$310		\$613	\$2,360	\$3,053	\$466	
Less exposure	-\$2,924	\$4,162	\$7,433	\$506	42,964	-\$2,448	\$470	-\$5,471	-\$456	5,451	-\$1,261	\$689	\$1,031	\$258	259,181
	\$677	\$2,081	\$3,945	\$248		\$383	\$1,172	\$2,062	\$375		\$285	\$1,381	\$1,743	\$287	
More exposure	-\$3,824	\$2,716	\$429	\$587	37,775	-\$9,966	-\$4,629	-\$18,935	-\$524	31,430	-\$1,085	\$478	-\$5,648	-\$384	188,916
	\$851	\$2,866	\$5,359	\$216		\$701	\$2,519	\$4,513	\$225		\$658	\$2,660	\$3,263	\$388	

Notes: Table presents RD estimates by subgroup of the effect of the three reforms: β_1 from equation (1) for the Child Removal RD, β_2 from equation (2) for the Age 18 Removal RD, and β_3 from equation (5) for the Child Entry RD-DD. SSI income, mother's earnings, and household income are all measured as totals from the year of the reform and the year the child turns 18. Child's adult earnings are measured as child's annual earnings after age 20 for Child Removal RD, child's annual earnings between ages 18 and 30 for the Age 18 Removal RD, and child's annual earnings between 25 and 35 years old for the Child Entry RD-DD. The Child Removal RD sample is SSI children who entered SSI within 250 days of October 1, 2001, and who were between the ages of 0 and 9 when they entered SSI; plus their siblings identified in the SSR and Numident. The Age 18 Removal RD sample is the younger siblings (identified in the SSR and Numident) of SSI children with an 18th birthday within 37 weeks of the August 22, 1996, cutoff. The Child Entry RD-DD is children who apply for SSI within six months of state-specific PRWORA-induced change in eligibility criteria (and exactly 12 months before that, for the placebo cohort) and whose primary condition is recorded on their SSI application as ADHD, oppositional defiant disorder, learning disability, or conduct disorder; plus their siblings identified in the SSR and Numident.

Appendix Table D.6: IV estimates of SSI income, mother earnings, and child's adult earnings by subgroup

	SSI income	Mom earn	Child Removal RD HH income	Child adult earn	N (kid earn)	SSI income	Mom earn	Age 18 Removal RD HH income	Child adult earn	N (kid earn)	SSI income	Mom earn	Child Entry RD-DD HH income	Child adult earn	N (kid earn)
All	-\$62.0	\$80.2	\$65.9	\$11.4	80,739	-\$21.0	-\$9.5	-\$40.4	-\$1.2	36,881	-\$24.2	\$17.1	-\$33.6	-\$0.7	448,097
	\$11.4	\$42.1	\$78.2	\$3.8		\$1.4	\$5.2	\$9.4	\$0.5		\$6.0	\$26.6	\$35.6	\$3.6	
Male kid	-\$62.9	\$51.5	\$102.6	\$11.5	49,093	-\$18.9	-\$11.8	-\$33.6	-\$1.3	20,505	-\$25.3	\$19.1	-\$30.9	-\$0.6	289,872
	\$13.4	\$48.0	\$89.7	\$5.0		\$1.5	\$5.9	\$10.6	\$0.6		\$6.6	\$29.1	\$39.2	\$4.5	
Female kid	-\$59.7	\$140.9	-\$16.0	\$11.1	31,646	-\$23.7	-\$6.7	-\$49.6	-\$1.1	16,376	-\$19.7	\$7.8	-\$39.8	-\$0.7	158,225
	\$21.2	\$83.4	\$151.1	\$5.2		\$1.8	\$7.1	\$12.7	\$0.6		\$13.7	\$62.1	\$81.3	\$4.4	
Younger kid	-\$62.8	\$59.6	\$27.5	\$8.0	34,999	-\$25.0	-\$12.2	-\$47.1	-\$1.1	28,306	-\$22.0	\$8.6	-\$104.4	-\$2.4	220,514
	\$15.0	\$55.8	\$104.8	\$4.0		\$1.7	\$6.5	\$11.7	\$0.6		\$12.0	\$47.8	\$61.2	\$4.7	
Older kid	-\$58.2	\$100.3	\$129.7	\$14.6	45,740	-\$7.4	\$0.5	-\$16.2	-\$1.5	8,575	-\$23.5	\$12.3	\$19.4	\$2.4	227,583
	\$16.3	\$56.3	\$104.9	\$6.2		\$0.7	\$2.2	\$4.3	\$0.6		\$4.5	\$24.6	\$33.2	\$4.6	
Less exposure	-\$71.3	\$117.4	\$209.6	\$13.9	42,964	-\$5.0	\$0.9	-\$11.1	-\$1.0	5,451	-\$23.5	\$12.3	\$19.4	\$3.9	259,181
	\$18.8	\$63.2	\$122.1	\$7.2		\$0.8	\$2.4	\$4.2	\$0.8		\$4.5	\$24.6	\$33.2	\$4.3	
More exposure	-\$56.6	\$48.9	\$7.7	\$10.4	37,775	-\$23.4	-\$10.8	-\$44.4	-\$1.2	31,430	-\$22.0	\$8.6	-\$104.4	-\$5.2	188,916
	\$13.9	\$51.5	\$96.4	\$3.8		\$1.5	\$5.9	\$10.6	\$0.5		\$12.0	\$47.8	\$61.2	\$5.2	
Low unemp rate	-\$53.7	-\$2.0	-\$87.0	\$0.9	30,757	-\$19.7	-\$9.6	-\$47.1	-\$0.9	20,818	-\$24.8	\$26.7	-\$46.2	-\$2.1	242,780
	\$20.1	\$75.0	\$140.3	\$6.1		\$1.7	\$6.9	\$13.0	\$0.6		\$7.0	\$33.3	\$42.9	\$3.2	
High unemp rate	-\$66.3	\$124.8	\$152.8	\$17.5	49,909	-\$22.6	-\$9.5	-\$34.0	-\$1.7	15,988	-\$18.7	-\$26.4	-\$25.1	-\$0.9	166,838
	\$13.7	\$51.1	\$94.6	\$5.2		\$2.1	\$7.8	\$13.4	\$0.7		\$13.5	\$50.0	\$71.4	\$11.3	
Physical (orig)	-\$42.0	\$108.1	\$31.7	\$8.5	22,859	-\$25.1	-\$12.9	-\$55.8	-\$3.9	8,721					
	\$15.5	\$59.9	\$109.8	\$3.6		\$3.7	\$14.8	\$27.4	\$1.3						
Mental/behav (orig)	-\$80.5	\$22.2	\$35.5	\$16.5	40,723	-\$17.5	-\$11.3	-\$34.0	-\$0.5	8,309	-\$24.2	\$17.1	-\$33.6	-\$0.7	448,097
	\$20.0	\$66.4	\$126.2	\$8.8		\$2.2	\$8.9	\$14.4	\$0.7		\$6.0	\$26.6	\$35.6	\$3.6	
Intel/physical (orig)	-\$50.0	\$104.3	\$77.2	\$9.6	40,016	-\$22.2	-\$8.8	-\$43.4	-\$1.5	28,572					
	\$14.2	\$54.0	\$99.3	\$4.0		\$1.7	\$6.4	\$11.8	\$0.6						
Intellectual (orig)	-\$78.4	\$37.3	\$216.4	\$16.2	17,058	-\$20.6	-\$8.7	-\$41.7	-\$0.6	19,851					
	\$41.9	\$136.7	\$268.7	\$17.4		\$1.8	\$6.7	\$12.4	\$0.6						
Younger mom	-\$85.8	\$129.1	-\$5.9	\$9.0	34,079	-\$19.5	-\$12.2	-\$44.5	-\$1.0	23,708	-\$29.5	\$8.8	-\$11.3	-\$7.5	203,687
	\$18.3	\$69.2	\$119.9	\$5.2		\$1.6	\$6.4	\$11.6	\$0.5		\$7.5	\$32.3	\$40.7	\$4.6	
Older mom	-\$41.8	\$33.7	\$144.2	\$14.0	45,994	-\$24.8	\$0.0	-\$28.2	-\$1.8	12,322	-\$14.1	\$36.5	-\$98.9	\$8.6	210,998
	\$14.6	\$51.3	\$102.1	\$5.5		\$2.5	\$8.1	\$15.7	\$0.9		\$9.2	\$45.6	\$59.7	\$6.1	
Single mom	-\$60.9	\$68.1	\$28.6	\$9.0	47,567	-\$20.8	-\$6.3	-\$24.2	-\$1.5	19,800	-\$27.3	\$52.6	\$25.0	\$5.4	234,163
	\$12.7	\$49.3	\$56.5	\$4.7		\$1.8	\$6.7	\$8.0	\$0.6		\$8.4	\$37.2	\$37.1	\$4.8	
Married mom	-\$69.3	\$109.9	\$192.2	\$15.7	32,803	-\$21.7	-\$14.6	-\$51.4	-\$0.7	16,016	-\$17.6	-\$22.6	-\$113.0	-\$6.5	191,014
	\$22.5	\$79.5	\$174.8	\$6.6		\$2.2	\$8.3	\$17.8	\$0.8		\$8.4	\$33.4	\$62.2	\$5.5	
Mom no work last year	-\$63.6	\$62.8	\$164.0	\$15.6	53,595	-\$21.6	-\$8.3	-\$44.1	-\$1.0	27,451	-\$20.3	\$12.2	-\$65.1	\$0.5	260,993
	\$16.6	\$49.8	\$118.1	\$6.7		\$1.6	\$3.7	\$9.5	\$0.5		\$10.1	\$32.6	\$50.5	\$4.7	
Mom worked last year	-\$59.7	\$95.7	-\$58.4	\$7.4	27,144	-\$20.5	\$6.3	-\$10.2	-\$1.5	8,534	-\$26.0	-\$1.1	-\$14.2	-\$4.2	153,724
	\$15.1	\$68.2	\$99.5	\$4.2		\$2.7	\$13.6	\$21.3	\$1.1		\$5.9	\$35.9	\$45.0	\$5.6	
Mom no work past 3yrs	-\$49.9	\$5.3	\$167.9	\$29.6	41,595	-\$21.5	-\$6.3	-\$44.1	-\$0.6	25,029	-\$14.2	-\$19.9	-\$66.1	\$0.5	215,010
	\$22.2	\$61.3	\$155.9	\$13.1		\$1.6	\$3.6	\$9.7	\$0.5		\$10.7	\$30.8	\$48.3	\$4.9	
Mom worked in past 3yrs	-\$67.5	\$108.0	-\$2.8	\$4.6	39,144	-\$20.9	-\$6.9	-\$22.8	-\$2.2	10,956	-\$29.4	\$10.3	-\$26.0	-\$4.6	199,707
	\$12.6	\$55.0	\$85.5	\$3.5		\$2.4	\$11.8	\$18.9	\$0.9		\$6.3	\$37.2	\$47.1	\$5.7	
Mom earn $\geq$ \$10K	-\$41.5	\$182.8	\$294.6	\$11.9	13,798	-\$18.6	-\$20.0	-\$25.8	-\$1.7	4,617	-\$23.2	\$47.9	\$42.0	\$3.7	85,869
	\$21.6	\$108.0	\$171.6	\$6.1		\$3.7	\$19.5	\$28.7	\$1.5		\$7.1	\$55.6	\$68.3	\$7.1	
Mom earn $\leq$ \$10K	-\$65.5	\$42.5	-\$22.6	\$11.6	66,941	-\$21.6	-\$5.2	-\$40.2	-\$1.0	31,368	-\$22.9	-\$4.2	-\$78.4	-\$2.7	328,848
	\$13.3	\$43.1	\$87.8	\$4.7		\$1.5	\$4.0	\$9.4	\$0.5		\$7.5	\$26.5	\$38.9	\$4.2	

Notes: Table presents IV estimates by subgroup of the effect of being removed from SSI (for Child Removal RD and Age 18 Removal RD) or being denied from SSI (for the Child Entry RD-DD). All estimates are in thousands of dollars. SSI income, mother's earnings, and household income are all measured as totals from the year of the reform and the year the child turns 18. Child's adult earnings are measured as child's annual earnings after age 20 for Child Removal RD, child's annual earnings between ages 18 and 30 for the Age 18 Removal RD, and child's annual earnings between 25 and 35 years old for the Child Entry RD-DD. The Child Removal RD sample is SSI children who entered SSI within 250 days of October 1, 2001, and who were between the ages of 0 and 9 when they entered SSI; plus their siblings identified in the SSR and Numident. The Age 18 Removal RD sample is the younger siblings (identified in the SSR and Numident) of SSI children with an 18th birthday within 37 weeks of the August 22, 1996, cutoff. The Child Entry RD-DD is children who apply for SSI within six months of state-specific PRWORA-induced change in eligibility criteria (and exactly 12 months before that, for the placebo cohort) and whose primary condition is recorded on their SSI application as ADHD, oppositional defiant disorder, learning disability, or conduct disorder; plus their siblings identified in the SSR and Numident.

Appendix Table D.7: Complier-reweighted estimates

	Original Child Removal RD estimate	Reweighted by complier shares of...		
		Child Removal RD	Age 18 Removal RD	Child Entry RD-DD
Pt Est	\$524	\$457	\$1,103	\$496
Std Err	\$170			
N	80,739			

Notes: Table presents estimates of the main Child Removal RD estimate reweighted by complier shares of the other quasi-experiments, using the strategy proposed in Angrist and Fernández-Val (2013). The Child Removal RD sample is SSI children who entered SSI within 250 days of October 1, 2001, and who were between the ages of 0 and 9 when they entered SSI; plus their siblings identified in the SSR and Numident. The first column shows the Child Removal RD estimate of the effect of the reform on child's adult earnings after age 20 (β_1 from equation (1)). The next three columns shows the same estimate reweighted based on complier shares of each quasi-experiment. We create complier bins using age at reform (less than 6 years, 6-14 years, and above 14 years) and diagnosis (no diagnosis, mental/behavioral, and physical/intellectual), for a total of nine bins. We estimate the effect of the Child Removal RD reform within each of these nine bins, and then reweight according to the complier share in each quasi-experiment.

Appendix Table D.8: Testing the role of household income across experiments and subgroups

Outcome: Child's earnings in adulthood

	Cross-experiment		Cross-experiment-subgroup	
	Pt Est	Std Err	Pt Est	Std Err
HH income * Child Removal RD	0.163	0.206		
HH income * Age 18 Removal RD	0.025	0.013		
HH income * Child Entry RD-DD	0.035	0.033		
HH income * Child Removal RD * Subgp1			0.052	0.196
HH income * Child Removal RD * Subgp2			0.182	1.491
HH income * Child Removal RD * Subgp3			0.034	0.245
HH income * Child Removal RD * Subgp4			0.104	0.540
HH income * Child Removal RD * Subgp5			0.212	1.327
HH income * Child Removal RD * Subgp6			0.160	0.690
HH income * Child Removal RD * Subgp7			13.5	209.1
HH income * Child Removal RD * Subgp8			0.626	2.617
HH income * Child Removal RD * Subgp9			-1.058	8.256
HH income * Age 18 Removal RD * Subgp1			-0.023	0.048
HH income * Age 18 Removal RD * Subgp2			0.018	0.053
HH income * Age 18 Removal RD * Subgp3			-0.215	0.687
HH income * Age 18 Removal RD * Subgp4			0.045	0.023
HH income * Age 18 Removal RD * Subgp5			-0.006	0.086
HH income * Age 18 Removal RD * Subgp6			-0.029	0.035
HH income * Age 18 Removal RD * Subgp7			-0.060	0.064
HH income * Age 18 Removal RD * Subgp8			0.069	0.116
HH income * Age 18 Removal RD * Subgp9			-0.005	0.118
HH income * Child Entry RD-DD * Subgp1			0.009	0.033
HH income * Child Entry RD-DD * Subgp2			-0.053	0.139
HH income * Child Entry RD-DD * Subgp3			-0.210	0.424
HH income * Child Entry RD-DD * Subgp4			0.010	0.072
HH income * Child Entry RD-DD * Subgp5			-0.066	0.200
HH income * Child Entry RD-DD * Subgp6			-0.091	0.193
HH income * Child Entry RD-DD * Subgp7			-0.002	0.215
HH income * Child Entry RD-DD * Subgp8			0.149	0.401
HH income * Child Entry RD-DD * Subgp9			-0.054	0.293
N	531,256		531,256	
p-value on joint F test	0.7718		0.9913	

Notes: Table presents IV estimates of the effect of household income during childhood on child's adult earnings. In both specifications, the three quasi-experimental samples (Child Removal RD, Age 18 Removal RD, and Child Entry RD-DD) are stacked into one dataset. In the first specification, the endogenous variables are the quasi-experiment indicator interacted with household income during childhood and the instruments are the quasi-experiment indicator interacted with that quasi-experiment's instrument (i.e., entry date after October 1, 2001, for Child Removal RD; 18-year-old birthdate after August 22, 1996; and application date after PRWORA rule change for the Child Entry RD-DD). In the second specification, the endogenous variables are the quasi-experiment indicator interacted with a subgroup indicator and household income during childhood and the instruments are the quasi-experiment indicator interacted with a subgroup indicator and that quasi-experiment's instrument. Both specifications include the quasi-experiment indicator interacted with that quasi-experiment's running variable (i.e., entry date, 18-year-old birthdate, application date). The subgroups are created by interacting age at reform (less than 6 years, 6-14 years, and above 14 years) and diagnosis (no diagnosis, mental/behavioral, and physical/intellectual), for a total of nine bins. The outcome variable (child's adult earnings) is the main outcome variable for each quasi-experiment: average annual earnings after age 20 for Child Removal RD; average annual earnings from ages 18 to 30 for Age 18 Removal RD; and average annual earnings from ages 25 to 35 for Child Entry RD-DD. "p-value on joint F test" gives the p-value for the test of equality of the income coefficients within each specification.

Appendix Table D.9: Robustness: RD estimates using Stata’s “rdrobust” estimator

Quasi-experiment	Outcome	Standard		Bias-corrected		N
		Pt Est	Std Err	Pt Est	Std Err	
Child Removal RD	Avg ann earnings after age 18	-\$435	\$193	-\$417	\$224	145,213
Child Removal RD	Avg ann earnings after age 20	-\$443	\$230	-\$407	\$268	145,213
Child Removal RD	Avg ann earnings after age 22	-\$461	\$269	-\$436	\$314	140,564
Age 18 Removal RD	Sib avg ann earnings ages 18-30	-\$387	\$238	-\$401	\$277	128,908
Age 18 Removal RD	Sib avg ann earnings ages 22-30	-\$536	\$301	-\$526	\$348	128,908
Age 18 Removal RD	Sib avg ann earnings after age 22	-\$588	\$355	-\$537	\$415	128,908

Notes: Table presents (negative) RD estimates for the Child Removal RD (i.e., $-\beta_1$ from equation (1)) and RD estimates for the Age 18 Removal RD (i.e., β_2 from equation (2)) using Stata’s “rdrobust” estimator (Calonico et al., 2017). “Standard” indicates the non-bias-corrected estimate given by “rdrobust,” and “Bias-corrected” indicates the bias-corrected estimate given by “rdrobust.”

Appendix Table D.10: Robustness: RD estimates using higher-order polynomial orders

Quasi-experiment	Outcome	Linear		Quadratic		Cubic		Quartic		N
		Pt Est	Std Err	Pt Est	Std Err	Pt Est	Std Err	Pt Est	Std Err	
Child Removal RD	Avg ann earnings after age 18	-\$450	\$142	-\$414	\$217	-\$204	\$305	-\$139	\$416	80,739
Child Removal RD	Avg ann earnings after age 20	-\$524	\$170	-\$471	\$259	-\$197	\$365	-\$134	\$498	80,739
Child Removal RD	Avg ann earnings after age 22	-\$612	\$206	-\$592	\$314	-\$200	\$441	-\$269	\$599	77,526
Age 18 Removal RD	Sib avg ann earnings after age 22	-\$749	\$303	-\$925	\$451	-\$1,612	\$607	-\$2,139	\$763	36,881
Age 18 Removal RD	Sib avg ann earnings ages 18-30	-\$515	\$200	-\$575	\$297	-\$879	\$400	-\$1,149	\$502	36,881
Age 18 Removal RD	Sib avg ann earnings ages 22-30	-\$658	\$251	-\$745	\$373	-\$1,171	\$501	-\$1,490	\$629	36,881

Notes: Table presents (negative) RD estimates for the Child Removal RD (i.e., $-\beta_1$ from equation (1)) and RD estimates for the Age 18 Removal RD (i.e., β_2 from equation (2)) using higher-order polynomial orders for the running variable. “Linear” is the baseline specification; it includes only a linear term in the running variable. “Quadratic” includes both a linear and squared term in the running variable, etc.

Appendix Table D.11: Robustness: Child Removal RD estimates (no covariates)

	Pt Est	Std Err	Cntrl mean	N
First stage				
Original kid receives medical review in 2004-05	0.336	0.006	0.495	48,059
Original kid removed via medical review in 2004-05	0.048	0.005	0.030	48,059
Original kid's SSI payment from 2004 to age 18	-\$3,633	\$639	\$70,945	48,058
Children's (original kid + sib) adult earnings response				
Avg ann earnings after age 20	\$480	\$164	\$8,170	87,272
Annual earnings after age 20 > \$0	0.014	0.006	0.559	87,272
Annual earnings after age 20 > \$10K	0.016	0.005	0.297	87,272
Annual earnings after age 20 > \$20K	0.011	0.004	0.151	87,272
Avg ann earnings after age 20 (original kid only)	\$271	\$169	\$5,688	48,059
Avg ann earnings after age 20 (siblings only)	\$559	\$273	\$11,441	39,213
Original child's avg ann SSI payment after age 20	-\$26	\$76	\$3,458	87,272
Parent contemporaneous earnings response				
Mother's earnings from 2004 to age 18	\$7,997	\$2,563	\$96,772	42,434
Mother ann earnings 2004-11 > \$0	0.016	0.008	0.558	42,435
Mother ann earnings 2004-11 > \$20K	0.015	0.006	0.145	42,435
Father's earnings from 2004 to age 18	\$5,235	\$6,527	\$201,774	18,572
Parent's earnings from 2004 to age 18	\$9,453	\$4,334	\$183,474	43,499
Annual HH income (SSI + parent earn) from 2004 to age 18	\$5,952	\$4,230	\$253,623	43,499

Notes: Table replicates Table 1, but with no covariates. Table presents estimates of β_1 from equation (1); i.e., the effect of having an award date before the October 1, 2001, cutoff and therefore having a higher likelihood of SSI removal in childhood. First stage sample is the original children: SSI children who entered SSI within 250 days of October 1, 2001, and who were between the ages of 0 and 9 when they entered SSI. The parent earnings sample is the subset of those children who have a parent (or mother or father) listed on their record. The combined child and sibling sample is the original children plus their siblings identified through either the Supplemental Security Record (who at one time applied for or received SSI) or the Numident, as described in Section 4. "Control mean" indicates the average for those on the right-hand side (i.e., lower likelihood of removal) of the cutoff with running variable within 30 days of the cutoff.

Appendix Table D.12: Child Removal RD estimates using different diagnosis definitions

	Using primary diagnosis only					Using primary and secondary diagnosis				
	SSI	Mom	HH	Child	N	SSI	Mom	HH	Child	N
	income	earn	income	adult earn	(kid earn)	income	earn	income	adult earn	(kid earn)
Mental/behavioral (original child)	-\$3,064 (\$804)	\$845 (\$2,532)	\$1,350 (\$4,791)	\$502 (\$244)	40,723	-\$3,353 (\$713)	\$1,957 (\$2,240)	\$5,495 (\$4,216)	\$428 (\$217)	51,264
Not mental/behavioral (original child)	-\$2,948 (\$932)	\$6,153 (\$3,151)	\$4,554 (\$5,815)	\$588 (\$238)	40,016	-\$2,461 (\$1,116)	\$6,021 (\$3,826)	-\$820 (\$7,063)	\$743 (\$274)	29,475
Physical (original child)	-\$3,170 (\$1,293)	\$8,159 (\$4,468)	\$2,394 (\$8,274)	\$742 (\$315)	22,859	-\$3,192 (\$1,013)	\$4,783 (\$3,445)	\$164 (\$6,414)	\$483 (\$253)	35,435
Intellectual (original child)	-\$2,019 (\$1,158)	\$962 (\$3,539)	\$5,577 (\$6,572)	\$364 (\$352)	17,058	-\$2,550 (\$1,051)	\$416 (\$3,166)	\$6,010 (\$5,904)	\$260 (\$315)	20,617

Notes: Table presents estimates of β_1 from equation (1); i.e., the effect of having an award date before the October 1, 2001, cutoff and therefore having a higher likelihood of SSI removal in childhood. “Using primary diagnosis only” means the diagnosis category is defined based on the primary diagnosis field in the Supplemental Security Record (e.g., “mental/behavioral” indicates a mental/behavioral code in the primary diagnosis field). “Using primary and secondary diagnosis” means the diagnosis category is defined based on both primary and secondary diagnosis fields in the SSR (e.g., “mental/behavioral” indicates a mental/behavioral code in either the primary or secondary diagnosis field, and “not mental/behavioral” indicates that neither the primary nor secondary fields have a mental/behavioral code). SSI income, mother’s earnings, and household income are all measured as totals from the year of the reform and the year the child turns 18. Child’s adult earnings are measured as child’s annual earnings after age 20. The sample is SSI children who entered SSI within 250 days of October 1, 2001, and who were between the ages of 0 and 9 when they entered SSI; plus their siblings identified in the SSR and Numident.

Appendix Table D.13: Robustness: Age 18 Removal RD estimates (no covariates)

	Pt Est	Std Err	Cntrl mean	N
First stage				
18yo receives age 18 review	0.884	0.006	0.004	36,881
18yo removed via age 18 review	0.435	0.010	0.002	36,881
18yo SSI payment 1997-2002	-\$1,614	\$88	\$5,858	36,881
Original 18yo adult earnings response				
18yo SSI indicator ages 18-30 (avg ann)	-0.129	0.009	0.669	36,881
18yo SSI payments ages 18-30 (avg ann)	-\$1,039	\$85	\$4,937	36,881
18yo earnings ages 18-30 (avg ann)	\$176	\$189	\$4,327	36,881
Younger sibling adult earnings response				
Avg ann earnings ages 18-30	-\$530	\$200	\$7,844	36,881
Annual earnings ages 18-30 > \$0	-0.016	0.007	0.571	36,881
Annual earnings ages 18-30 > \$10K	-0.016	0.006	0.285	36,881
Annual earnings ages 18-30 > \$20K	-0.010	0.005	0.140	36,881
Avg ann earnings ages 18-30 (SSI sibs only)	-\$508	\$201	\$4,705	19,739
Avg ann earnings ages 18-30 (Non-SSI sibs only)	-\$559	\$358	\$11,760	17,142
Parent contemporaneous earnings response				
Mother earnings from 1997 to age 18	-\$5,895	\$2,294	\$53,284	34,261
Father earnings from 1997 to age 18	-\$13,163	\$5,403	\$102,034	16,613
Parent earnings from 1997 to age 18	-\$14,617	\$3,891	\$102,830	35,100
HH income (SSI + parent earn) from 1997 to age 18	-\$24,686	\$3,937	\$137,940	35,100
HH income (SSI + parent/18yo earn) from 1997 to age 18	-\$22,963	\$4,203	\$160,623	35,100

Notes: Table replicates Table 2, but with no covariates (except for 18-year-old severity, since RD assignment is conditional on severity, and SSR vs Numident sibling). Table presents estimates of β_2 from equation (2); i.e., the effect of the original 18-year-old having an 18th birthday after the August 22, 1996, cutoff and therefore having a higher likelihood of SSI removal age age 18. The sample is the younger siblings of the original 18-year-olds identified through either the Supplemental Security Record (who at one time applied for or received SSI) or the Numident, as described in Section 4. The parent earnings sample is the subset of those children who have a parent (or mother or father) listed on their record. “Control mean” indicates the average for those on the left-hand side of the cutoff (i.e., lower likelihood of removal) with running variable within 30 days of the cutoff.

Appendix Table D.14: Robustness: Child Entry RD-DD estimates (no covariates)

	Pt Est	Std Err	Cntrl mean	N
First stage				
Original kid allowed on SSI	-0.052	0.006	0.139	258,526
Original kid's years on SSI from 1997 to age 18	-0.197	0.047	1.513	258,526
Original kid's total SSI payment from 1997 to age 18	-\$1,286	\$378	\$11,617	258,526
Children's (original kid + sib) adult earnings response				
Avg ann earnings ages 20-35	-\$189	\$215	\$11,700	450,103
Avg ann earnings ages 20-35 > \$0	-0.003	0.005	0.672	450,103
Avg ann earnings ages 20-35 > \$10K	-0.003	0.005	0.399	450,103
Avg ann earnings ages 20-35 > \$20K	-0.003	0.005	0.224	450,103
Parent contemporaneous earnings response				
Mother's earnings from 1997 to age 18	\$930	\$1,699	\$87,842	230,965
Mother ann earnings 1999-2006 > \$0	0.005	0.006	0.676	236,318
Mother ann earnings 1999-2006 > \$20K	0.006	0.006	0.256	236,318
Father's earnings from 1997 to age 18	-\$4,209	\$4,446	\$155,955	89,173
Parent earnings from 1997 to age 18	-\$1,091	\$2,731	\$141,959	237,133
Annual HH income (SSI + parent earn) from 1997 to age 18	-\$2,409	\$2,744	\$153,573	237,133

Notes: Table replicates Table D.4, but with no covariates. Table presents estimates of β_3 from equation (5); i.e., the effect of having an application date after the state-specific PRWORA cutoff and therefore having a higher likelihood of being denied from SSI. First stage sample is the original children: children who apply for SSI within six months of state-specific PRWORA-induced change in eligibility criteria (and exactly 12 months before that, for the placebo cohort) and whose primary condition is recorded on their SSI application as ADHD, oppositional defiant disorder, learning disability, or conduct disorder. The parent earnings sample is the subset of those children who have a parent (or mother or father) listed on their record. The combined child and sibling sample is the original children plus their siblings identified through the Supplemental Security Record and Numident, as described in Section 4. "Control mean" indicates the average for those on the left-hand side (i.e., lower likelihood of being denied) of the cutoff with running variable within one month of the cutoff.

Appendix Table D.15: Estimates of SSI income loss

	Reduced form estimates			N
	SSI income loss	Change in SSI likelihood	SSI loss among removed	
Child Removal RD	\$3,046	0.049	\$61,993	42,392
	\$622	0.005		
Age 18 Removal RD	\$9,100	0.394	\$23,086	35,100
	\$634	0.005		
Child Entry RD-DD	\$1,256	0.052	\$24,364	258,526
	\$353	0.005		

Notes: Table presents estimates of the effect of the reform on SSI income and on the likelihood of receiving SSI in childhood for each of the three reforms: β_1 from equation (1) for the Child Removal RD, β_2 from equation (2) for the Age 18 Removal RD, and β_3 from equation (5) for the Child Entry RD-DD. The final column divides the SSI income loss by the change in the likelihood of receiving SSI to get the SSI income loss among children who lose SSI. The Child Removal RD sample is SSI children who entered SSI within 250 days of October 1, 2001, and who were between the ages of 0 and 9 when they entered SSI; plus their siblings identified in the SSR and Numident. The Age 18 Removal RD sample is the younger siblings (identified in the SSR and Numident) of SSI children with an 18th birthday within 37 weeks of the August 22, 1996, cutoff. The Child Entry RD-DD is children who apply for SSI within six months of state-specific PRWORA-induced change in eligibility criteria (and exactly 12 months before that, for the placebo cohort) and whose primary condition is recorded on their SSI application as ADHD, oppositional defiant disorder, learning disability, or conduct disorder; plus their siblings identified in the SSR and Numident.

Appendix Table D.16: Joint outcomes household income and child's adult earnings

	Child Removal RD			Age 18 Removal RD			Child Entry RD-DD		
	Pt Est	Std Err	N	Pt Est	Std Err	N	Pt Est	Std Err	N
High HH inc, high kid earn	0.0145	0.0082	77,526	-0.0538	0.0114	36,881	-0.0153	0.0086	425,216
High HH inc, low kid earn	-0.0068	0.0086	77,526	-0.0077	0.0102	36,881	0.0004	0.0055	425,216
Low HH inc, high kid earn	0.0023	0.0056	77,526	0.0263	0.0090	36,881	0.0157	0.0079	425,216
Low HH inc, low kid earn	-0.0100	0.0073	77,526	0.0351	0.0092	36,881	-0.0008	0.0048	425,216

Notes: Table presents RD estimates of the effect of the reform on the joint outcome of household income and child earnings in adulthood. For the Age 18 Removal RD, the household income variable includes parent earnings, 18-year-old SSI income, and 18-year-old earnings; child earnings is measured from ages 22 to 30. For the Child Removal RD and Child Entry RD-DD, the household income variable includes parent earnings and the original child's SSI income. Child earnings is measured from ages 18 to 22 for the Child Removal RD, and from ages 25 to 35 for the Child Entry RD-DD. The estimates are β_1 from equation (1) for the Child Removal RD, β_2 from equation (2) for the Age 18 Removal RD, and β_3 from equation (5) for the Child Entry RD-DD. The Child Removal RD sample is SSI children who entered SSI within 250 days of October 1, 2001, and who were between the ages of 0 and 9 when they entered SSI; plus their siblings identified in the SSR and Numident. The Age 18 Removal RD sample is the younger siblings (identified in the SSR and Numident) of SSI children with an 18th birthday within 37 weeks of the August 22, 1996, cutoff. The Child Entry RD-DD is children who apply for SSI within six months of state-specific PRWORA-induced change in eligibility criteria (and exactly 12 months before that, for the placebo cohort) and whose primary condition is recorded on their SSI application as ADHD, oppositional defiant disorder, learning disability, or conduct disorder; plus their siblings identified in the SSR and Numident.

Appendix Table D.17: IV estimates of the effect of SSI removal or denial on household and child outcomes

	Child Removal RD			Age 18 Removal RD			Child Entry RD-DD		
	Pt Est	Std Err	N	Pt Est	Std Err	N	Pt Est	Std Err	N
Cumulative SSI income btwn treat year and age 18	-\$61,993	\$11,410	42,392	-\$20,998	\$1,354	35,100	-\$24,160	\$6,009	258,526
Cumulative mother earnings btwn treat year and age 18	\$80,212	\$42,083	42,392	-\$9,480	\$5,211	34,261	\$17,115	\$26,567	230,965
Cumulative HH income btwn treat year and age 18	\$65,928	\$78,243	42,392	-\$40,427	\$9,382	35,100	-\$33,611	\$35,613	237,133
Child's annual earnings in adulthood	\$11,351	\$3,819	80,739	-\$1,186	\$460	36,881	-\$654	\$3,569	448,097

Notes: Table presents IV estimates of the effect of SSI removal or denial on outcomes. For the Age 18 Removal RD, the household income variable includes parent earnings, 18-year-old SSI income, and 18-year-old earnings; child earnings is measured from ages 22 to 30. For the Child Removal RD and Child Entry RD-DD, the household income variable includes parent earnings and the original child's SSI income. Child earnings is measured from ages 18 to 22 for the Child Removal RD, and from ages 25 to 35 for the Child Entry RD-DD. The estimates are β_{IV} from equation (3) using instruments from from equation (1) for the Child Removal RD, equation (2) for the Age 18 Removal RD, and equation (5) for the Child Entry RD-DD. The Child Removal RD sample is SSI children who entered SSI within 250 days of October 1, 2001, and who were between the ages of 0 and 9 when they entered SSI; plus their siblings identified in the SSR and Numident. The Age 18 Removal RD sample is the younger siblings (identified in the SSR and Numident) of SSI children with an 18th birthday within 37 weeks of the August 22, 1996, cutoff. The Child Entry RD-DD is children who apply for SSI within six months of state-specific PRWORA-induced change in eligibility criteria (and exactly 12 months before that, for the placebo cohort) and whose primary condition is recorded on their SSI application as ADHD, oppositional defiant disorder, learning disability, or conduct disorder; plus their siblings identified in the SSR and Numident.

Appendix Table D.18: Child Removal RD sibling matching procedure

	Count
Potential matches based on mother name and father name (first/last/middle or first/last)	116,220,147
Drop if sibling DOB within 300 days	-16,993,179
Drop if sibling DOB more than 12 years away	-1,906,454
Drop if mother age less than 16 years or more than 40 years at sibling birth	-3,499,924
Remaining potential matches	93,820,590
Matched using mother name and father name, at least one using middle name	19,077
Matched using parent with uncommon name (<5 parents with same name), parent middle initial, and state of birth	44,942
Matched using parent with uncommon name (<10 parents with same name) and same city of birth	42,527

Notes: Table presents counts of potential matches from Child Removal RD sibling matching procedure. See Appendix A for details.

F List of Moments used For Estimation

Appendix Table F.1: List of Moments

Dataset	Moment Description	Subsamples
SSA Child RD	Change in and pre-policy average of unfavorable review across the discontinuity	
SSA Child RD	Change in and pre-policy average of percent child S on SSI across the discontinuity	Age of child, mother's employment in the previous year
SSA Child RD	Change in and pre-policy average of percent adult child S on SSI across the discontinuity	Age of child, mother's employment in the previous year
SSA Child RD	Change in and pre-policy average of adult children's earnings across the discontinuity	Age of child, mother's employment in the previous year
SSA Child RD	Change in and pre-policy average of adult child S's earnings across the discontinuity	Age of child, mother's employment in the previous year
SSA Child RD	Change in and pre-policy average of mother's earnings across the discontinuity	Age of child, mother's employment in the previous year
SSA Child RD	Change in and pre-policy average of household income across the discontinuity	Mother's employment in the previous year
SSA Child RD	Change in and pre-policy average of percent adult children with >0 earnings across the discontinuity	Age of child, mother's employment in the previous year
SSA Child RD	Change in and pre-policy average of percent adult child S with >0 earnings across the discontinuity	Age of child, mother's employment in the previous year
SSA Child RD	Change in and pre-policy average of percent mothers with >0 earnings across the discontinuity	Age of child, mother's employment in the previous year
SSA Child RD	Average mothers earnings w/ child aged 1-3	Age of child, mother's employment in the previous year
SSA Child RD	Standard deviation of within-person average annual adult children's earnings (after age 20, up to 2019) before the discontinuity	
SSA Child RD	Standard deviation of adult children's earnings at age 22 before the discontinuity	
SSA Child RD	Standard deviation of adult children's earnings at age 23 before the discontinuity	
SSA Child RD	Standard deviation of adult children's earnings at age 24 before the discontinuity	
SSA Child RD	Standard deviation of within-person average annual adult child S's earnings (after age 20, up to 2019) before the discontinuity	
SSA Child RD	Standard deviation of adult child S's earnings at age 22 before the discontinuity	
SSA Child RD	Standard deviation of adult child S's earnings at age 23 before the discontinuity	

SSA Child RD	Standard deviation of adult child S's earnings at age 24 before the discontinuity	
SSA Child RD	Standard deviation of within-person average annual mother earnings (2004-2011) before the discontinuity	
SSA Child RD	Standard deviation of within-person average annual mother earnings w/ child aged 1-3 before the discontinuity	
SSA Child RD	Sum of annual log-wage growth residuals of adult children's earnings before the discontinuity	
SSA Child RD	Sum of annual log-wage growth residuals of adult child S's earnings before the discontinuity	
SSA Child RD	Sum of annual log-wage growth residuals of mothers before the discontinuity	
SSA Child RD	Standard deviation of annual adult children's earnings (after age 20, up to 2019) before discontinuity	
SSA Child RD	Standard deviation of annual adult child S's earnings (after age 20, up to 2019) before discontinuity	
SSA Child RD	Standard deviation of annual mother earnings (2004-2011) before discontinuity	
SSA Age-18 RD	Change in and pre-policy average of percent Unfavorable Age18 Review across the discontinuity	
SSA Age-18 RD	Change in and pre-policy average of percent adult child S on SSI across the discontinuity	Mother's employment in the previous year
SSA Age-18 RD	Change in and pre-policy average of adult child S earnings across the discontinuity	Mother's employment in the previous year
SSA Age-18 RD	Change in and pre-policy average of percent of adult child S earning more than \$0 across the discontinuity	
SSA Age-18 RD	Change in and pre-policy average of adult child N earnings across the discontinuity (25-30)	Mother's employment in the previous year
SSA Age-18 RD	Change in and pre-policy average of percent of adult child N earning more than \$0 across the discontinuity (25-30)	
SSA Age-18 RD	Change in and pre-policy average of percent of adult child N earning more than \$20K across the discontinuity (25-30)	
SSA Age-18 RD	Change in and pre-policy average of adult child N earnings across the discontinuity (21-30)	Mother's employment in the previous year
SSA Age-18 RD	Change in and pre-policy average of mother's earnings across the discontinuity	Mother's employment in the previous year
SSA Age-18 RD	Change in and pre-policy average of percent mothers with >0 earnings across the discontinuity	Mother's employment in the previous year

SSA Age-18 RD	Change in and pre-policy average of household income (mom's earnings + child SSI) across the discontinuity	Mother's employment in the previous year
SSA Age-18 RD	Average mothers earnings w/ child aged 1-3	Mother's employment in the previous year
SSA Age-18 RD	Standard deviation of within-person average of adult child S earnings (1997-2019) before the discontinuity	
SSA Age-18 RD	Standard deviation of adult child S earnings at age 22 before the discontinuity	
SSA Age-18 RD	Standard deviation of average adult child S earnings from ages 23 to 35 before the discontinuity	
SSA Age-18 RD	Standard deviation of within-person average of adult child N earnings (ages 25-30) before the discontinuity	
SSA Age-18 RD	Standard deviation of within-person average of adult child N earnings (ages 21-30) before the discontinuity	
SSA Age-18 RD	Standard deviation of adult child N earnings at age 22 before the discontinuity	
SSA Age-18 RD	Standard deviation of average adult child N earnings from ages 23 to 30	
SSA Age-18 RD	Standard deviation of within-person average of mother's earnings (1997-2002) before the discontinuity	
SSA Age-18 RD	Standard deviation of within-person average annual mother earnings w/ child aged 1-3 before the discontinuity	
SSA Age-18 RD	Correlation between earnings of parent and earnings of adult child S (mom's average annual earnings when child S is below 18, child S average annual earnings ages 23 and above)	
SSA Age-18 RD	Correlation between earnings of parent and earnings of adult child N (mom's average annual earnings when child N is below 18, child N average annual earnings ages 23 and above)	
SSA Age-18 RD	Correlation between earnings of adult child S and adult child N (child S average annual earnings ages 23 and above, child N average annual earnings ages 23 and above)	
SSA Age-18 RD	Sum of annual log-wage growth residuals of adult child S earnings before the discontinuity	
SSA Age-18 RD	Sum of annual log-wage growth residuals of adult child N earnings before the discontinuity	

SSA Age-18 RD	Sum of annual log-wage growth residuals of mother's earnings before the discontinuity	
SSA Age-18 RD	Standard deviation of annual adult S child earnings (1997-2019) before discontinuity	
SSA Age-18 RD	Standard deviation of annual adult N child earnings (ages 25-30) before discontinuity	
SSA Age-18 RD	Standard deviation of annual mother's earnings (1997-2002) before discontinuity	
SIPP mother	Average wage among employed (on SSI, off SSI, ever SSI)	
SIPP mother	Average log wage among employed (on SSI, off SSI, ever SSI)	
SIPP mother	Average weekly hours (on SSI, off SSI, ever SSI)	
SIPP mother	Percent not working mothers in each year (on SSI, off SSI, ever SSI)	Mother's employment in previous year (ever SSI only)
SIPP mother	SD of wage among employed (on SSI, off SSI, ever SSI)	
SIPP mother	SD of log wage among employed (on SSI, off SSI, ever SSI)	
SIPP mother	Sum of log wage residuals (ever SSI)	
SIPP mother	Percent Working ≥ 10 , ≥ 20 , ≥ 30 , ≥ 40 hours a week (ever SSI)	
SIPP mother	Avg hours given log wages ≤ 2.1 , in $(2.1, 2.35]$, $(2.35, 2.6]$ and > 2.6 (ever SSI)	
SIPP adult child	Average wage among employed (on SSI, ever SSI)	Employed in previous year (ever SSI only)
SIPP adult child	Average log wage among employed (on SSI, ever SSI)	Employed in previous year (ever SSI only)
SIPP adult child	Average weekly hours (on SSI, ever SSI)	Employed in previous year (ever SSI only)
SIPP adult child	Percent employed in each year (on SSI, ever SSI)	Employed in previous year (ever SSI only)
SIPP adult child	SD of wage among employed (on SSI, ever SSI)	
SIPP adult child	SD of log wage among employed (on SSI, ever SSI)	
SIPP adult child	Sum of log wage residuals (ever SSI)	
SIPP adult child	Percent Working ≥ 10 , ≥ 20 , ≥ 30 , ≥ 40 hours a week (ever SSI)	
SIPP adult child	Avg hours given log wages ≤ 2.1 , in $(2.1, 2.35]$, $(2.35, 2.6]$ and > 2.6 (ever SSI)	