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WHAT IS THE LONG-TERM IMPACT OF *ZEBLEY* ON ADULT AND CHILD OUTCOMES?

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Abstract

In 1990, the U.S. Supreme Court decision in the *Sullivan v. Zebley* case fundamentally changed, albeit temporarily, the criteria under which children qualified for the Supplemental Security Income (SSI) program based on disability. Instead of a system based on medical criteria alone, 1996 enactment of the Personal Responsibility and Work Opportunity Reconciliation Act (PRWORA) tied children's eligibility for SSI, in part, to the effects of their medically determinable impairments on their ability to function day-to-day in age-appropriate activities at home, at school, and in their communities. This paper examines what happened to the *Zebley* cohort after the age of 18 relative to cohorts who received SSI payments under stricter criteria. This paper evaluates the long-term impact on educational attainment, earnings, SSI and Social Security Disability Insurance (SSDI) participation, and other markers of adult development for the *Zebley* cohort. We find that, overall, SSI receipt in childhood is associated more positive outcomes than negative ones. The *Zebley* cohort has a longer attachment to the labor force and a lower likelihood of welfare receipt in adulthood, but also a higher likelihood of lacking health insurance coverage. In addition, those with health conditions most likely to be affected by the new evaluation criteria appear to substitute welfare benefits for disability benefits These results are consistent with the hypothesis that SSI receipt at the margin improves adult outcomes.

Introduction

The last 20 years have seen dramatic growth in the Supplemental Security Income program (SSI), the means-tested program for aged, blind, and disabled individuals in the United States. In 1990, the U.S. Supreme Court's decision in *Sullivan vs. Zebley* fundamentally, albeit temporarily, changed the criteria under which children qualified for SSI based on disability, and resulted in a dramatic increase in program costs. In 1996, the Personal Responsibility and Work Opportunity Reconciliation Act of 1996 (PRWORA), which changed the SSI definition of disability for children, also fundamentally transformed the cash welfare program. These two major events – SSI programmatic changes and welfare reform – are widely cited as the underlying reasons for the particularly dramatic growth in the disabled child caseload. This paper looks at an array of outcomes for the cohort of children who received SSI during the period between these two historic events, and tries to quantify what we gained from the spending related to the *Zebley* decision.

Prior to the *Zebley* decision, children's eligibility for SSI payments was based on medical criteria alone. From 1990 until the 1996 enactment of PRWORA, children's eligibility for SSI was based, in part, on an Individualized Functional Assessment (IFA) of the effects of their medically determinable impairments on their ability to function day-to-day in age-appropriate activities at home, at school, and in their communities, much as an adult's eligibility is tied to the ability to function in gainful employment. At the same time, there were separate but similar changes in the procedures for evaluating mental impairments in children. After the *Zebley* decision, the number of child applications more than quadrupled, and the acceptance rate increased from one-third to over one-half. This growth was accompanied by considerable change in the case mix: most of the growth came from children suffering from mental conditions other than mental retardation, including Attention Deficit Hyperactivity Disorder (ADHD) (for which there was a new medical listing), learning disorders, and behavioral problems (National Academy of Social Insurance 1995).

The dramatic growth in the caseload spurred a statutory change in the definition of disability for children and a consequent tightening of SSI eligibility rules under the PRWORA. The PRWORA changes, along with a mandatory re-evaluation in 1997 (using the new SSI rules) of all children whose determinations were based on an IFA, and of children allowed under the mental impairment listings whose disability determinations involved "maladaptive behavior," led

to the termination of SSI payments for over 90,000 children. Davies, Rupp, and Wittenburg (2009) find that the SSI termination rate is disproportionately higher for the 1990 and 1995 SSI child cohorts. Hemmeter and Gilby (2009) also show that the age-18 redetermination cessationrate was highest for those originally entitled to payments between 1991 and 1996. These findings suggest that these programmatic changes influenced both the acceptance into and exit from the SSI program.

Theoretically, SSI receipt could have either a positive or negative impact on later-life outcomes. First, SSI increases income for recipient households. Duggan and Kearney (2007) find that for every $100 increase in SSI income, total household income increased by $72, indicating only modest crowd-out of income from other sources. Second, the financial benefit of receiving SSI may also encourage parents to diagnose and treat their children. Presumably, increases in household income and treatment for disorders would benefit children. On the other hand, labeling a child with relatively mild behavioral problems as disabled may create lower expectations and lower educational attainment for the child (Wu 2009).[1] This outcome, in turn, could lead to an increased dependence on the welfare system, disability system, or lower earnings later in life.

This paper continues as follows. Section 2 discusses in detail the SSI program for children and the programmatic changes that occurred between the *Zebley* decision and PRWORA. Section 3 presents the theoretical model for examining the impact on children affected by the court's decision. Section 4 discusses the data and our estimation strategy. Section 5 presents the results. Section 6 concludes that *Zebley* had a positive impact on long-term outcomes.

2. Background and Related Literature: SSI for Children

SSI is a federal means-tested program under Title XVI of the Social Security Act enacted in 1972, replacing previous federal-state grant-in-aid programs for the elderly, blind, and disabled. As of 2010, 22 states supplemented the federal benefit level (SSA 2011). To receive SSI, children under 18 must be unmarried, have an identifiable disability expected to last at least 12 months, and meet income and resource criteria.

[1] It is also possible that the financial incentive encourages bad behavior on the part of parents in order to get their children deemed eligible for SSI payments, as was reported in Boston Globe (Wen 2010). We will abstract away from this possibility in the text and modeling by assuming altruistic parents.

Means Testing in the SSI Program. Since SSI is a means-tested program, SSI eligibility and payment amounts depend on income and assets. In 2010, the federal maximum payment, which is indexed to inflation, was $674 for an eligible individual. Over 60 percent of SSI children receive the full federal payment and any state supplement available; in 2010, the average SSI-child payment was $597. In determining the child's income eligibility, the Social Security Administration (SSA) looks at the child's earnings – typically zero – plus a fraction of the income and assets of the family members "deemed" to the child. The fraction deemed to the child adjusts to account for non-SSI-eligible family members. Almost 16 percent of children have income deemed from their parents (SSI Annual Statistical Report, 2010). The deeming rules and income exclusions are such that in 2010, an SSI-eligible child in a one-parent household could receive maximum SSI payments when the parent earns as much as $1,433 a month if there were no other children in the house, $1,770 if there was one non-disabled sibling, and $2,107 if there were two siblings. In addition, SSI payments phase-out at a rate of $0.50 per dollar of earned income. While the AFDC/TANF benefit levels and income rules vary by state, the SSI program is more generous in three different ways. First, low-income households can maintain full SSI payments at higher earnings thresholds than would be permitted under the TANF program.[2] Second, the relative financial gain related to having one child on the SSI-program is often much higher than having an additional child count towards the TANF program, where there are often child-cap policies. Third, for families earning more than these income thresholds, the TANF-phase-out is dollar-for-dollar.

History of the SSI-program for Children

1974-1990: The Pre-Zebley Period. There were not many dramatic changes to the SSI-child program for the first 15 years of its existence. In July 1975, Congress required SSI payments to be adjusted for inflation. The number of child recipients was relatively stable during this period, increasing from 0.15 percent to 0.40 percent of the population aged 0-17 during this time period (See Figure 1).

[2] Income under TANF generally includes all earnings, but states differ substantially in their treatment of unearned income and in setting earnings disregards and the income standards. This leads to wide variation in earnings while eligible for TANF: in 2009 TANF-eligible families of three could earn as little as $269 per month in Alabama and as much as $1802 per month in Hawaii. Monthly benefits also vary by state; the maximum monthly benefit amount for a family of three ranged from $170 in Mississippi to $923 in Alaska. TANF benefits tend to phase-out dollar-for-dollar of earned income, although many states disregard the first dollars of earnings.

1990-1996: The Zebley Period. The *Sullivan vs. Zebley* case centered on the Supreme Court's ruling that SSA's regulations for determining disability in children were in violation of the SSI statute. The law provided that a child would be found disabled if he or she had a medically determinable physical or mental impairment "of comparable severity to one that would disable an adult" (i.e., that would prevent an adult from working). Prior to 1990, an adult or a child could be found disabled if his or her impairment met or medically equaled the criteria of a listed medical condition in the Listing of Impairments. An adult could also be found disabled if an assessment of residual functional capacity and consideration of current age, education, and work history showed that he or she could not engage in any work in the national economy. For a child, however, there was no functional assessment to determine whether the child was disabled.[3] In response to a class action suit, the U.S. Supreme Court decided in February 1990 that the SSI statute in fact required a functional assessment in disability determinations for children, and that SSA's regulations wrongfully held children to a stricter disability standard than the "comparable severity" standard in the law.

SSA responded quickly to the *Zebley* ruling. In May 1990, SSA developed interim regulations requiring functional assessments of children who would have been denied payments due to their lack of a listed condition. In February 1991, the final regulations were adopted.[4] Staff training occurred between February and April 1991, and a major outreach effort was conducted to all children who had been denied SSI payments for medical reasons between 1980 and 1991. Notices were mailed in July 1991, and almost 40 percent of these cases replied by September 1991. SSA estimated that virtually all of these previously denied cases were processed by December 1992.

In December, 1990, a similar but unrelated change was also made to the SSI-program child eligibility rules. SSA implemented new childhood mental impairment regulations implementing the comparable severity standard. The regulations required that if a child's impairment or combination of impairments did not meet or medically equal a listed impairment, an adjudicator would do an Individualized Functional Assessment to determine whether the child was disabled based on the effects of the impairment(s) on his or her ability to function age-

[3] Regulation 404.1523 requiring consideration of the combined effects of multiple impairments was published in the Federal Register on March 5, 1985, However, it was not in effect during the continuing disability review of Brian Zebley's case in the early 1980's, or in 1983 when the class action lawsuit was filed.

[4] The final rules were published in the Federal Registrar in September 1993. These rules were a slight revision from the February 1991 rules, but were largely the same.

appropriately. In February 1991, the final regulations were adopted.[5] Staff training occurred between February and April 1991, and a major outreach effort was conducted to all children who had been denied SSI eligibility between 1980 and 1991. Notices were mailed in July 1991, and almost 40 percent of these cases replied by September 1991. SSA estimated that virtually all of these previously denied cases were processed by December 1992.

In December 1990, SSA made a similar but unrelated change to the SSI eligibility rules for children. New regulations expanded the list of mental impairments considered in childhood cases, and included functional criteria for determining the effects of a mental impairment on a child ability to function age-appropriately. Although focused on mental impairments, these new regulations had results very similar to those of the *Zebley* decision.

After 1990, the number of applications more than quadrupled, and the allowance rate increased from one-third to over one-half.[6] This growth was accompanied by considerable change in the case mix; most of the growth came from children suffering from mental conditions other than mental retardation, such as ADHD (which had a new medical listing), learning disorders, and behavioral problems (National Academy of Social Insurance 1995). Government reports estimate that 59-69 percent of this growth was due to the mental impairment regulations, with the remaining 31-41 percent of the growth due to the *Zebley* decision (GAO1994 and U.S. DHHS 1994, respectively). Due to the concurrent nature of these changes, we follow the rest of the literature and refer to all of these as *Zebley* impacts (Brady et al. 1998).

After 1996: The Post-Zebley Period. Dramatic growth in SSI's caseload spurred a statutory revision of the definition of disability for children and a consequent tightening of eligibility rules as part of PRWORA. After the 1996 act passed, the eligibility of all child recipients (most of whom had been found disabled based on IFAs) was re-evaluated according to interim rules using the new definition; these reevaluations led to the termination of SSI payments for more than 90,000 children. The *Zebley* cohort – those SSI recipients who started receiving payments between 1990 and 1996 – was the most likely to be terminated both in 1997 (Davies,

[5] The final rules were published in the Federal Registrar in September 1993. These rules were a slight revision from the February 1991 rules, but were largely the same.

[6] There was also a change in the parental income deeming rules in 1992. Hannsgen and Sandell (1996) estimate that the deeming rule change increased the child SSI rolls by 2 percent.

Rupp, and Wittenburg, 2009) and at the age-18 redetermination point (Hemmeter and Gilby, 2009).

At the same time, PRWORA made major changes to the cash welfare program, eliminating the AFDC program and replacing it with the TANF program. TANF is both less attractive and less accessible to families in which there is disability, due to the explicit time limits imposed on how long families can receive benefits. Finally, in 1998, college students age 18-21 began being treated as children instead of adults, consistent with other needs-based programs (SSA 1997).

Much of the recent work on child SSI recipients has focused on the relationship between AFDC/TANF and SSI programs. Indeed, Kubik (1999) and Garrett and Glied (2000) find that the take-up of SSI after 1990 is related to the financial gain related to SSI enrollment compared to receiving AFDC benefits. Kubik (2003) also finds that states with the most fiscal difficulties had the most individuals switch from the AFDC to the SSI program. We use this documented interdependency between the two programs in our identification strategy.

3. Data and Empirical Estimation

To gauge the long-term impacts of the *Zebley* decision, one could compare outcomes of SSI-children based on when they received SSI during the pre-*Zebley*, *Zebley*, and post-*Zebley* periods. One benefit from a research-standpoint is that the *Zebley* decision impacted only potential applicants with health conditions that are related to the ability to function in an age-appropriate manner, including their participation in scholastic activities.[7] For example, children with a congenital defect, mental retardation, or cancer were less likely to have been directly affected by the change in screening criteria, as many conditions within these categories would have fallen under the Listings of Medical Impairments. In contrast, children with mental health conditions (other than retardation) were far more likely to obtain SSI payments under the *Zebley*-era criteria than before or after (Figure 2). Though the number of applications did not rise at

[7] The evaluation of the child's ability to function in school is not an evaluation of the child's academic performance. Instead, the standard under the Individual Functional Assessment used during the *Zebley* years required that the applicant child have limitations in two or three functional areas: response to stimuli (applied birth to age 1), cognition, communication, motor functioning (applied birth to age 3), social functioning, personal and behavioral functioning (applied age 3 to age 16), and concentration, persistence, and pace (applied age 3 to age 16) (Erkulwater 2006). Adolescents age 16 to 18 were evaluated with respect to physical and mental activities expected of individuals at least 18 years old. While academic performance is likely correlated with many of these functional areas, the child's grades, for example, were not and are not an explicit part of the evaluation.

nearly the same rate as mental health conditions, some physical health conditions, like asthma (respiratory system) and diabetes (endocrine system), may be evaluated differently during the *Zebley* years if they were not previously included in the Listings but are correlated with the child's functional abilities. Thus we have a natural difference-in-differences estimation setting: SSI recipients entering during *Zebley* with health conditions that were tied to age-appropriate functioning and that manifested in the effects on a child's ability to participate in age-appropriate activities (what we call "manageable" conditions hereafter), compared to SSI recipients either just before or just after *Zebley* or with conditions that are less influenced by the *Zebley* criteria.

We use the 1994-2005 years of the *National Health Interview Survey* (NHIS), matched to SSA administrative data. NHIS is a cross-sectional household survey including information on health, disability, demographics, and labor market outcomes. The linked SSA data contain information on the year of SSI receipt, and up to two disabling conditions for each application. In addition, the SSA data file includes the number of "quarters of coverage" earned in each year by the individual up to 2007, which captures the individual's work experience.[8]

Table 1 details the sample selection criteria. We are primarily interested in NHIS respondents who received SSI payments between the ages of 5 and 17 between 1987 and 1999. We also exclude individuals who applied for SSI before the age of 5, since they would be unaffected by the *Zebley* ruling.[9] Finally, we want to observe the individual in the NHIS after SSI application to measure outcomes, decreasing our final sample to 5.8 million weighted observations.

The estimation model considers numerous outcomes, appropriate to whether the SSI recipient is a child or adult when observed by either the NHIS survey or the SSA data. Table 2 outlines the source and sample for each outcome variable. NHIS outcomes are observed only at the time of NHIS sampling; some SSI recipients are still children, while others are adults. For children, the outcomes of interest include health insurance coverage, welfare receipt, health measures, and being behind in school. Adult outcomes from the NHIS include educational attainment, one's earnings category, hours worked, and indicators for having positive earnings,

[8] While the rules always refer to "quarters of coverage," it has been a misnomer since 1978. Covered quarters are calculated by the amount one makes in a calendar year, not the amount of time one was employed. In 2010, earnings of $1,120 are required to earn one quarter of coverage.

[9] Children getting on to SSI before age 5 could potentially be another control group for our analysis, but these recipients largely have congenital defects or retardation that make them poor comparisons to recipients entering solely because of changes in the evaluation criteria during *Zebley*.

living with one's parents, health insurance coverage, welfare receipt, being married, owning one's home, and health measures. Other adult outcomes are obtained from the SSA data: indicators for ever receiving SSDI or SSI as adults, and the number of covered quarters, both at the time of NHIS sampling and through 2007.

We use a difference-in-differences framework to determine whether children entering SSI during *Zebley* with disabling conditions that pertain to functioning in the scholastic environment ("manageable" conditions) have different outcomes than childhood SSI recipients who entered SSI during a different period or with a disabling condition less likely to be affected by the addition of functional criteria ("other" conditions).

The reduced-form specification has the structure:

$$Y_{iT} = f(\beta_0 + \beta_1 Cond_{it} + \beta_2 Zebley_{it} + \beta_3 Post_{it} + \beta_4 Cond_{it} Zebley_{it} + \beta_5 Cond_{it} Post_{it} + \gamma X_{iT}) + \varepsilon_{iT}. \quad (1)$$

The specification of *f* depends on the outcome variable *Y* in NHIS year *T*, as listed in the rightmost column of Table 2; for nonlinear regressions, we report the marginal effects of the included variables and their interaction effects, taking into account the nonlinearity (Ai and Norton 2003). *Cond* is an indicator equal to one where the individual *i* entered SSI in year *t* reported having a disabling condition related to the applicant's functional assessment ("manageable"): mental illness (excluding retardation), and in some specifications an endocrine or respiratory condition. *Zebley* equals one if year *t* is between 1991 and 1996, inclusive; in some specifications, we split this period into 1991-1992 and 1993-1996 (with appropriate interactions), due to the processing of prior applicants in the first few years of implementation. *Post* equals one if year *t* is 1997 through 1999; the omitted condition, therefore, is entering SSI from 1987 to 1990. Due to the small sample size in the reduced-form regression, *X* only includes age at the time of NHIS sampling and its square.

The key marginal effect is the non-linear analogue of β_4; a statistically significant interaction effect (with standard errors calculated by the Delta Method) indicates that SSI entrants during the *Zebley* period with a condition subject to the new evaluation criteria had different outcomes in later years than those entering in other years or with conditions that were less likely to be affected by *Zebley*.

4. Results

Table 3 reports summary statistics for childhood SSI recipients, separately by the time one entered the SSI program. The time period is broken into four based on the changes in the screening criteria: before *Zebley* (1987-1990), the first years after the decision (1991-1992), the years while *Zebley* was fully implemented (1993-1996), and after PRWORA (1997-1999). The summary statistics compare applicants reporting a "manageable" health condition – one that would affect functioning in an age-appropriate context, most notably school (mental illness excluding retardation, a respiratory condition, or an endocrinal condition) -- and those with "other" health conditions. The rightmost columns report the unconditional difference-in-differences between these health condition groups before and after the *Zebley* decision. It is important to note that these difference-in-differences estimates are unadjusted for age, and are measured at the time of the NHIS sampling (1994-2005) at any age 18-35 for the adult-outcomes, and any age 5-17 for the child-outcomes.

The proportion of the sample with positive earnings and the average annual earnings in the year of NHIS sampling shows a consistent downward trend over time for those with "other" health conditions, which could simply reflect the age-wage profile. The time-trend is similar for manageable health conditions, with the exception of a slight increase in both earnings measures for individuals who applied for SSI during the early-*Zebley* years, and is actually higher for SSI applicants with manageable health conditions in the early years of *Zebley*. Except for the first years under the new evaluation procedure, working hours as an adult increase over time for other health conditions, but generally exhibit a decreasing pattern over time for manageable conditions. The proportion who ever applied for SSDI as an adult decreases over time for both groups of health conditions. Most difference-in-difference estimates are larger in magnitude comparing the 1991-1992 period to the pre-*Zebley* period than for other periods, suggesting that the re-invitation and the introduction of the *Zebley* ruling could have had a big impact on the characteristics of the applicant pool.

Tables 4A and 4B report results of the regressions of each outcome on indicators for manageable health conditions in the during-*Zebley* (1991-1996) and post-*Zebley* (1997-1999) periods, controlling for age and its square. Each row reports the marginal effects of interest of a separate regression model. Table 4A focuses on outcomes measured as adults; Table 4B presents the outcomes measured in childhood and those measured at any age. The second panel

of each table presents the regression results when the *Zebley* period is broken into two, between 1991-1992 and 1993-1996.

While adults who received SSI as children due to manageable health conditions do not demonstrate any differences in labor market outcomes, they are less likely to live with their parents or have routine care limitations; on the other hand, they are also less likely to have health insurance coverage as adults. SSI recipients that are observed in the NHIS as children are more likely to live in a household that receives welfare, and less likely to have a routine care limitation. As expected, given that the estimate is similar for adults and children, NHIS respondents of any age with an SSI receipt history are 10 percent less likely to have a routine care limitation; like adults but not children, they are also less likely to have health insurance.

In Panel (1) of Tables 4A and 4B, the estimates indicate that SSI recipients entering the program during the *Zebley* years are better off (to a statistically significant degree) than pre-*Zebley* SSI recipients in notable ways: they work more covered quarters by the time of the NHIS interview, are less likely to receive welfare as an adult, and are less likely to have a routine care limitation as children or at any age. On the other hand, *Zebley*-era recipients are less likely to have health insurance as adults or at any age.

Panel (2) of each table separates the during-*Zebley* years into 1991-1992 and 1993-1996, and reveals that the decline in later welfare receipt as an adult and the increase in work experience are entirely from those entering SSI in the later *Zebley* years. The decline in routine care limitations among NHIS children is driven by entrants during the early-*Zebley* period, but for all ages, both *Zebley* periods have statistically significant decreases. The decline in health insurance coverage for all ages is driven by the early period. Interestingly, NHIS children and respondents of all ages entering SSI in 1991-1992 are *more* likely to receive welfare subsequently. This suggests that instead of using SSI as a substitute for other welfare, re-contacted SSI applicants found other child welfare programs for which they were eligible, though the decrease among later-*Zebley* entrants of all ages more than compensates for this increase.

In both specifications, several outcomes for post-*Zebley* SSI recipients are statistically significantly different from pre-*Zebley* entrants. Later entrants have higher prevalence of both homeownership and health insurance coverage as adults, and are less likely to receive welfare as

children. The downside is that entrants after 1996 are more likely to have a routine care limitation as children or at any age than those who received SSI before 1991.

The models in Tables 5A and 5B add interactions between the *Zebley* period indicators and the health condition variable, trying to measure the difference in outcomes for SSI recipients who were most likely impacted by the *Zebley* criteria. The non-interacted marginal effects are similar in sign and significance, though the work experience among late-*Zebley* recipients is no longer significantly different from pre-*Zebley* recipients. The only statistically significant difference between those who entered SSI during the *Zebley* years with manageable health conditions and those who entered at other times or with other health conditions are in public program receipt. SSI recipients entering the program during 1991-1992 are 16 percent less likely to report receiving welfare as an adult, but their SSDI and SSI application prevalence increased by nearly the same amount (Table 5A, second panel). Welfare receipt is relatively unchanged among early *Zebley* SSI recipients sampled by NHIS as children, so the effect for all ages is smaller and barely statistically significant (Table 5B).[10]

Tables 6A and 6B test the sensitivity of the interaction results to the definition of "manageable health conditions," and instead use an indicator for mental illness (excluding retardation) only. The results are largely similar in sign and significance for the *Zebley* indicators without interactions, but the lower frequency of mental conditions within the sample increases the standard errors and eliminates the statistical significance of almost all interaction estimates; only fair or poor self-reported health has a statistically significant decrease among early-*Zebley* recipients sampled by NHIS as children, relative to pre-*Zebley* entrants.

Robustness Check: Instrumental Variables Estimation. The major limitation of these estimates is the inability to make any causal inferences about SSI receipt and later outcomes. The concern is the potential endogeneity of the decision to apply to SSI. SSI eligibility criteria were easier to meet in the *Zebley* period, which likely changed the case mix and general severity of the conditions of individuals receiving SSI. In order to estimate causal effects of SSI-receipt on outcomes, we also estimate an instrumental variable (IV) model.

[10] Not surprisingly, given the few statistically significant interaction effects, omitting the manageable condition indicator has little effect on the marginal effect estimates for the *Zebley* periods. The inclusion of other time-invariant characteristics – sex and indicators for black, Asian, other race, and Hispanic – also has little effect on the *Zebley* period marginal effects.

The previous literature suggests an instrument: the relative financial gain to the family to identify who was likely induced into the SSI-program. This variable is calculated as the potential SSI benefit for the child (the sum of the federal and state benefits), less the difference between what that child's family receives from AFDC/TANF with that child included and the family's AFDC/TANF benefit with that child excluded.[11] This variation occurs at the state-level, as well as the family-size level, since the relative financial gain depends on the number of children in the household. Kubik (1999) shows that the relative financial gain is a strong predictor of disability determination in children, even after controlling for AFDC benefit levels, state fixed-effects, year fixed-effects, and state-specific linear time trends. We include the maximum AFDC/TANF benefit available to the family as an additional instrument. Unlike the reduced form regression, our sample for the IV model also includes individuals who did not receive SSI benefits in childhood, though we limit the sample to those who have family incomes of 200 percent or less of the federal poverty line at the time of NHIS sampling, to capture those who are most likely to be income-eligible for SSI as children.

Unfortunately, the suggested instruments are weak predictors of childhood SSI receipt. Because the potential endogenous variable is categorical, we run several first stage regressions, with receipt of SSI beginning before, during, and after *Zebley* as the dependent variable.[12] The F-test statistic for joint significance of the instruments exceeds ten only in predicting receipt after 1996, and the marginal effect for each instrument is only rarely statistically significant. As evidence of our weak instrument problem, the marginal effects from the second-stage estimation explode: the magnitudes are bigger by a factor of ten or more, and many more estimates are statistically significant, though not necessarily in a consistent direction. In further work, we will

[11] AFDC, later replaced by TANF, awards benefits based on family size, excluding SSI recipients. That means that a household with three children, one of whom may be eligible for SSI, must compare the gain from that child receiving SSI benefits from the loss of AFDC/TANF benefits by switching from a three-child household to a two-child household (for welfare purposes).

[12] The IV estimation has three further complications. First, the endogenous variable for SSI receipt at a particular time isbinary. Second, the model includes interactions of this categorical endogenous variable with the manageable condition indicator. Third, the manageable condition indicator is observed only for those who actually applied to SSI. To solve the first challenge, we use the two-stage residual inclusion (2SRI) technique (Rivers and Vuong 1988; Terza, Basu, and Rathouz 2008). To solve the second challenge, we follow Wooldridge (2002), and use the predicted values of *Zebley* and *Post* from equations (2) and (3), and their interactions with *Cond*, as instruments in a linear IV model. To solve the third challenge, we experiment with limiting our sample only to actual SSI recipients, as well as dropping the manageable condition variable. Our main challenge, however, is the weakness of the proposed set of instruments.

explore other ways to account for the potential endogeneity of SSI receipt during the *Zebley* era, in the hopes of making causal inference about SSI receipt on adult and childhood outcomes.

5. Conclusions

The *Zebley* case fundamentally transformed the SSI program for children. Before PRWORA reformed the program in 1996, the SSI-child caseload increased 185 percent, while the corresponding growth rate among adults (18-64) was 45 percent, and the elderly caseload remained stable. This represents a dramatic increase in program costs; this paper tries to quantify what we gained from this spending.

We estimate that the SSI recipients who entered the program during the *Zebley* years are largely better off years later: they accumulate more work experience, are less likely to receive welfare benefits as an adult, and are less likely to report a routine care limitation as a child. The caveat is that more *Zebley*-era SSI recipients lack health insurance coverage. We find qualitatively different outcomes for those who entered SSI during the first years after *Zebley* compared to those entering only after re-applications from previously rejected applicants had been processed: early *Zebley* entrants actually have higher welfare prevalence as children, but later entrants are less likely to receive welfare. In addition, those who entered SSI during the first years of *Zebley* with a mental, endocrinal, or respiratory condition appear to substitute welfare receipt for increased prevalence of disability application. This latter effect could be due to increased awareness of the program and its processing, or a decreased stigma effect of being on the program, which has been previously documented in the SNAP program (Wu 2009). While the SSI program was clawed back with PWRORA, our estimates suggest that the families enrolled in SSI during the *Zebley* years are still reaping positive benefits from the SSI program. We do not appear to have reached the "flat of the curve" within the SSI program. Further work should examine the costs of the *Zebley* extensions in order to do a full cost-benefit analysis to see if the gains achieved are worth the money spent.

References

Ai, Chunrong and Edward C. Norton. 2003. "Interaction Terms in Logit and Probit Models." *Economic Letters* 80: 123-129.

Davies, Paul S., Kalman Rupp, and David Wittenburg. 2009. "A Life-Cycle Perspective on the Transition to Adulthood Among Children Receiving Supplemental Security Income Payments." *Journal of Vocational Rehabilitation* 30(3): 133-152.

Duggan, Mark G. and Melissa Schettini Kearney. 2007. "The Impact of Child SSI Enrollment on Household Outcomes." *Journal of Policy Analysis and Management* 26(4): 861-886.

Erkulwater, Jennifer L. 2006. *Disability Rights and the American Social Safety Net*. Ithaca, NY: Cornell University Press.

Garrett, Bowen and Sherry Glied. 2000. "The Impact of the Zebley Decision on Children's Participation in SSI and AFDC." *Journal of Policy Analysis and Management* 19(2): 275-296.

Hannsgen, Greg P. and Steven H. Sandell. 1996. *Deeming Rules and the Increase in the Number of Children with Disabilities Receiving SSI: Evaluating the Effects of a Regulatory Change*. *Social Security Bulletin* Vol. 59, No. 1, Spring.

Hemmeter, Jeffrey and Elaine Gilby. 2009. *The Age-18 Redetermination and Postdetermination Participation in SSI*. *Social Security Bulletin* 69(4): 1-25.

Kubik, Jeffrey D. 1999. "Incentives for the Identification and Treatment of Children with Disabilities: The Supplemental Security Income Program." *Journal of Public Economics* (73): 187-215.

National Academy of Social Insurance. 1995. *Restructuring the SSI Disability Program for Children and Adolescents*. Washington, DC: Report from the Committee on Childhood Disability to the Disability Policy Panel of the NASI.

Rivers, Douglas and Quang H. Vuong. 1988. "Limited Information Estimators and Exogeneity Tests for Simultaneous Probit Models." *Journal of Econometrics* 39: 347-366.

Social Security Administration. 1997. *Children Receiving SSI.* Baltimore, MD: Office of Research, Evaluation and Statistics, December.

Social Security Administration. 2011. *State Assistance Programs for SSI Recipients.* January. http://www.ssa.gov/policy/docs/progdesc/ssi_st_asst/2011/ssi_st_asst2011.pdf

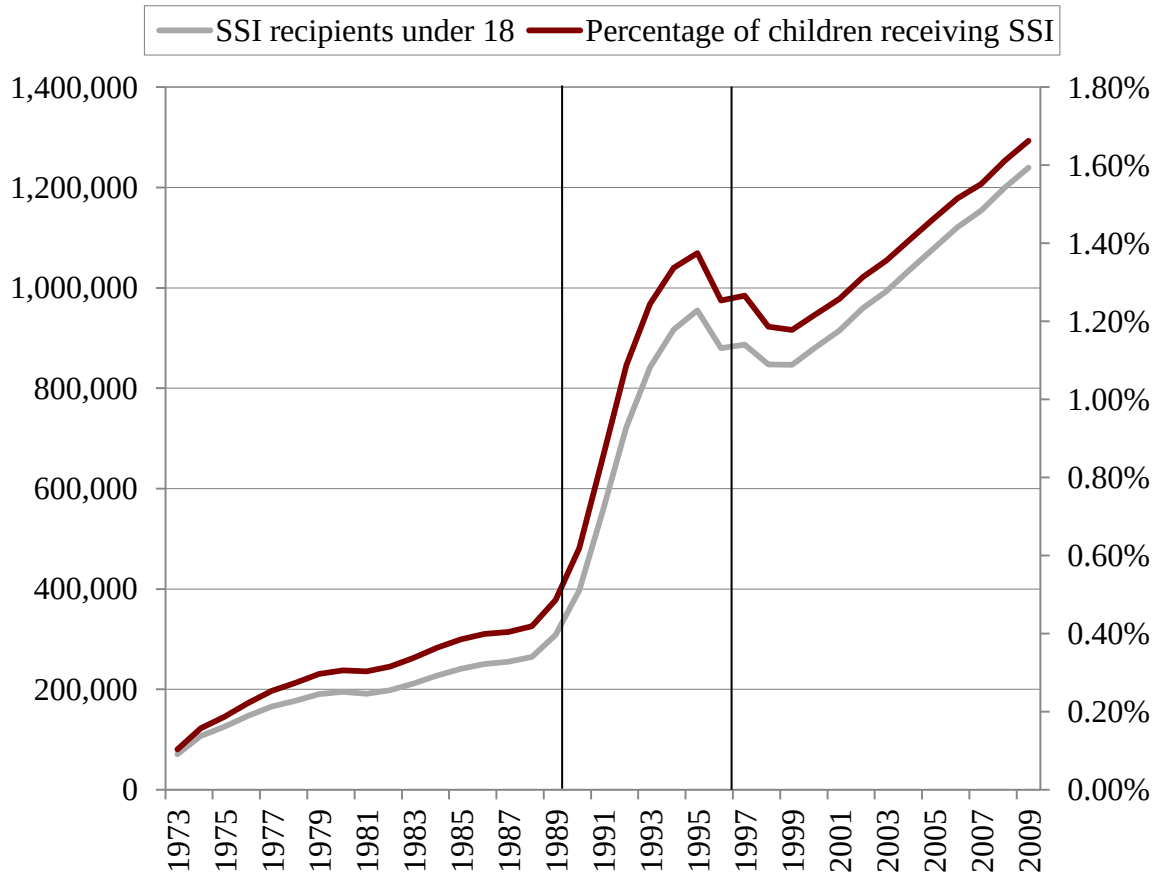
Terza, Joseph V., Anirban Basu, and Paul J. Rathouz. 2008. "Two-Stage Residual Inclusion Estimation: Addressing Endogeneity in Health Econometric Modeling," *Journal of Health Economics* 27: 531-543.

Wen, Patricia. 2010. "Cash and hard choices in disability program for children" Boston Globe "The Other Welfare" series, December 12.

Wooldridge, Jeffrey M. 2002. *Econometric Analysis of Cross Section and Panel Data*. Cambridge, MA: MIT Press.

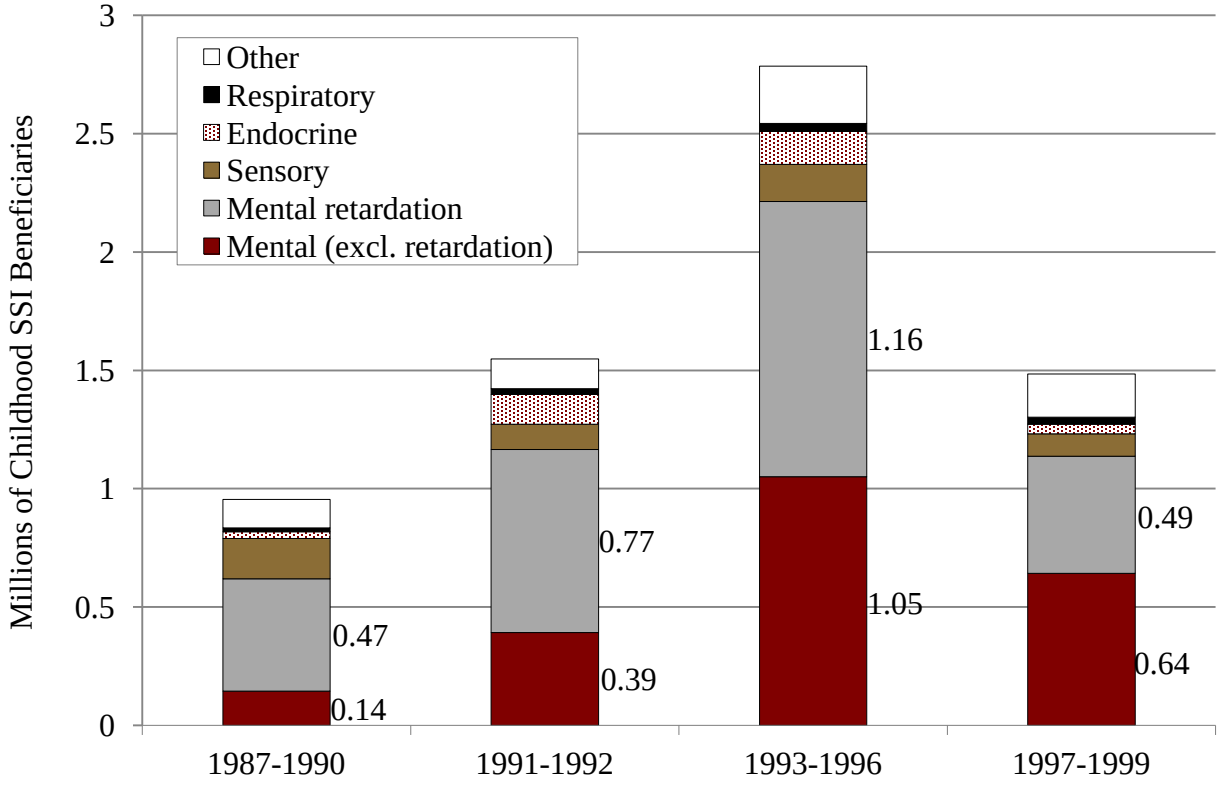
Wu, April Yanyuan. 2009. "Why Do So Few Elderly Use Food Stamps?" Chicago, IL: The Harris School of Public Policy Studies, The University of Chicago, October.

Figure 1. *Trends in Child-SSI Recipients*



Sources: U.S. Census Bureau, *Current Population Reports*; and Social Security Administration, *Annual Statistical Supplement* Table 7.A9, 2011.

Figure 2. *Primary Disabling Conditions for Childhood SSI Recipients Before, During, and After Zebley*



Source: Social Security Administration, *Supplemental Security Record*, 1987-1999.

Table 1. *Sample Selection Criteria*

Starting sample: All respondents in NHIS 1994-2005		3,287,813,440
No match to SSA data or no SSI successful SSI application as kid 87-99		-3,277,330,846
Applied for SSI before age 5		-3,995,361
Sampled by NHIS before SSI application		-684,776
	Final sample:	5,802,457

Table 2 Outcomes by sample and source

Outcome	Child	Adult	All	Model
Educational attainment		22+		Ordered probit
Earnings category		X		Ordered probit
Positive earnings		X		Probit
Hours worked		X		OLS
Live with parents		X		Probit
Health insurance coverage	X	X	X	Probit
Receive any welfare	X	X	X	Probit
Married		X		Probit
Own home		X		Probit
Health fair or poor	X	X	X	Probit
Limited in ability to maintain personal care or routine needs	X	X	X	Probit
Ever receive SSDI as adult		X		Probit
Ever receive SSI as adult		X		Probit
Behind in school	X			Probit
Covered quarters by NHIS year		21+		OLS
Covered quarters by 2007		21+		OLS

Table 3 Summary statistics of adult outcomes, by *Zebley* period and health condition

	1987-1990		1991-1992		1993-1996		1997-1999		Difference-in-differences = (Manageable – Other) – (Period – 1987-1989)		
	Other	Manageable	Other	Manageable	Other	Manageable	Other	Manageable	1991-1992	1993-1996	1997-1999
Labor Market Outcomes											
Annual Earnings*	1761	1282	1622	1600	1139	765	144	177	457	106	512
	(424)	(385)	(338)	(414)	(307)	(194)	(100)	(91)			
Positive earnings	0.212	0.104	0.152	0.163	0.103	0.091	0.035	0.036	0.119	0.096	0.109
	(0.037)	(0.027)	(0.029)	(0.026)	(0.019)	(0.014)	(0.030)	(0.015)			
Hours worked	30.0	34.4	27.7	32.1	33.4	29.7	33.7	31.1	0.0	-8.0	-6.9
	(2.2)	(3.2)	(2.8)	(2.8)	(2.1)	(1.9)	(5.5)	(7.2)			
Program Participation Outcomes											
Ever SSDI	0.176	0.184	0.129	0.183	0.194	0.100	0.047	0.079	0.045	-0.103	0.023
	(0.035)	(0.034)	(0.024)	(0.023)	(0.026)	(0.013)	(0.025)	(0.019)			
Ever SSI	0.257	0.250	0.251	0.275	0.231	0.199	0.166	0.072	0.032	-0.024	-0.087
	(0.037)	(0.037)	(0.033)	(0.026)	(0.030)	(0.017)	(0.044)	(0.019)			
Receive welfare	0.827	0.889	0.821	0.799	0.703	0.783	0.726	0.833	-0.084	0.019	0.046
	(0.032)	(0.029)	(0.030)	(0.026)	(0.034)	(0.021)	(0.048)	(0.027)			
Health Outcomes											
Health fair or poor	0.238	0.266	0.215	0.156	0.194	0.197	0.233	0.210	-0.086	-0.025	-0.051
	(0.035)	(0.041)	(0.030)	(0.022)	(0.024)	(0.018)	(0.048)	(0.031)			
Routine care limitation	0.288	0.177	0.200	0.098	0.240	0.131	0.521	0.378	0.009	0.002	-0.032
	(0.045)	(0.043)	(0.035)	(0.023)	(0.033)	(0.019)	(0.109)	(0.083)			
Health insurance coverage	0.894	0.861	0.806	0.801	0.893	0.864	0.948	0.960	0.028	0.003	0.045
	(0.026)	(0.029)	(0.033)	(0.023)	(0.023)	(0.017)	(0.022)	(0.014)			
Lifestyle Outcomes											
Live with parents	0.809	0.727	0.697	0.754	0.841	0.811	0.879	0.809	0.139	0.051	0.012
	(0.035)	(0.039)	(0.041)	(0.028)	(0.023)	(0.019)	(0.042)	(0.030)			
Married	0.094	0.097	0.084	0.071	0.038	0.031	0.026	0.025	-0.016	-0.010	-0.005
	(0.027)	(0.023)	(0.025)	(0.017)	(0.013)	(0.008)	(0.020)	(0.011)			
Own home	0.756	0.584	0.699	0.705	0.782	0.665	0.898	0.894	0.178	0.055	0.169
	(0.041)	(0.042)	(0.034)	(0.029)	(0.027)	(0.022)	(0.038)	(0.024)			
Weighted N	363,643	308,433	381,141	497,537	459,928	759,170	221,492	390,333			

Notes: Standard deviation in parentheses. * The NHIS includes earnings as a categorical variable; for this table, the categorical variable is converted to a continuous variable by randomly assigning an earnings value within the category.

Table 4a Reduced form regression results without interactions, adult outcomes

	(1)				(2)				
Adults (18+)	Manageable				Manageable				
Outcome variable	condition	1991-1996	1997-1999	Wgt N	condition	1991-1992	1993-1996	1997-1999	Wgt N
Labor Market Outcomes									
Covered quarters by NHIS	-0.008	0.029 *	0.040	1,294,320	-0.009	0.016	0.042 **	0.039	1,294,320
	(0.015)	(0.017)	(0.051)		(0.015)	(0.019)	(0.020)	(0.051)	
Covered quarters by 2007	-0.011	-0.009	-0.004	4,444,795	-0.011	-0.010	-0.002	-0.001	4,444,795
	(0.009)	(0.011)	(0.022)		(0.009)	(0.012)	(0.013)	(0.021)	
Hours worked	3.019	-3.437	-0.240	352,741	2.994	-3.594	-3.214	-0.293	352,741
	(2.797)	(2.644)	(5.559)		(2.849)	(3.202)	(3.176)	(5.601)	
Positive earnings	0.041	0.038	-0.050	2,113,730	0.042	0.027	0.008	-0.049	2,113,730
	(0.042)	(0.060)	(0.077)		(0.042)	(0.054)	(0.053)	(0.080)	
Earnings categories									
$1,000 - 5,000	-0.042	-0.049	0.078	2,113,730	-0.043	-0.031	-0.016	0.078	2,113,730
	(0.039)	(0.051)	(0.062)		(0.039)	(0.049)	(0.049)	(0.065)	
$5,000 - 10,000	0.015	0.018	-0.030		0.015	0.011	0.006	-0.030	
	(0.013)	(0.019)	(0.026)		(0.013)	(0.017)	(0.018)	(0.027)	
$10,000 - 15,000	0.006	0.007	-0.012		0.006	0.004	0.002	-0.012	
	(0.006)	(0.007)	(0.009)		(0.006)	(0.007)	(0.007)	(0.010)	
$15,000 - 20,000	0.008	0.009	-0.014		0.008	0.006	0.003	-0.014	
	(0.007)	(0.009)	(0.011)		(0.007)	(0.009)	(0.009)	(0.011)	
$20,000+	0.013	0.015	-0.022		0.014	0.009	0.004	-0.022	
	(0.013)	(0.016)	(0.017)		(0.013)	(0.016)	(0.015)	(0.018)	
Program Participation Outcomes									
Ever SSDI	-0.025	0.019	-0.055	2,423,944	-0.025	0.015	0.003	-0.055	2,423,944
	(0.030)	(0.047)	(0.057)		(0.030)	(0.043)	(0.043)	(0.059)	
Ever SSI	-0.002	0.022	-0.083	2,423,944	-0.002	0.009	0.008	-0.083	2,423,944
	(0.032)	(0.050)	(0.063)		(0.032)	(0.047)	(0.048)	(0.065)	
Receive welfare	-0.017	-0.148 ***	0.102	2,290,520	-0.015	0.025	-0.181 ***	0.105	2,290,520
	(0.034)	(0.057)	(0.064)		(0.033)	(0.053)	(0.055)	(0.068)	
Health Outcomes									
Health fair or poor	-0.009	-0.062	0.036	2,416,776	-0.012	-0.062	0.003	0.035	2,416,776
	(0.030)	(0.053)	(0.074)		(0.030)	(0.044)	(0.047)	(0.075)	
Routine care limitation	-0.098 ***	-0.068	0.079	2,345,026	-0.099 ***	-0.026	-0.036	0.078	2,345,026
	(0.026)	(0.050)	(0.070)		(0.026)	(0.045)	(0.044)	(0.072)	
Health insurance coverage	-0.083 **	-0.097 **	0.098 *	2,375,405	-0.085 **	-0.067	-0.027	0.099 *	2,375,405
	(0.033)	(0.048)	(0.051)		(0.033)	(0.046)	(0.045)	(0.054)	
Lifestyle Outcomes									
Live with parents	-0.089 **	0.025	-0.109	2,265,430	-0.091 **	-0.029	0.051	-0.110	2,265,430
	(0.040)	(0.058)	(0.078)		(0.040)	(0.055)	(0.053)	(0.080)	
Married	0.035	-0.034	0.023	2,413,885	0.036	0.006	-0.041	0.025	2,413,885
	(0.026)	(0.037)	(0.052)		(0.026)	(0.035)	(0.032)	(0.054)	
Own home	-0.021	0.042	0.095 *	2,379,186	-0.022	-0.010	0.059	0.093 *	2,379,186
	(0.030)	(0.041)	(0.049)		(0.030)	(0.039)	(0.037)	(0.051)	
Educational attainment									
No high school	0.019	-0.007	0.004	1,010,566	0.019	0.011	-0.019	0.007	1,010,566
	(0.019)	(0.035)	(0.066)		(0.019)	(0.029)	(0.027)	(0.070)	
Some high school	0.036	-0.013	0.008		0.036	0.020	-0.038	0.014	
	(0.031)	(0.063)	(0.119)		(0.031)	(0.052)	(0.053)	(0.119)	
High school degree	-0.028	0.010	-0.006		-0.028	-0.016	0.028	-0.011	
	(0.028)	(0.051)	(0.097)		(0.027)	(0.043)	(0.040)	(0.102)	
Some college or more	-0.027	0.010	-0.006		-0.027	-0.015	0.029	-0.010	
	(0.022)	(0.047)	(0.088)		(0.022)	(0.038)	(0.041)	(0.087)	

Note: * significant at 10%, ** significant at 5%, *** significant at 1%.

Table 4b Reduced form regression results without interactions, child and all-age outcomes

	(1)				(2)				
Child (5-17)	Manageable				Manageable				
Outcome variable	condition	1991-1996	1997-1999	Wgt N	condition	1991-1992	1993-1996	1997-1999	Wgt N
Health insurance coverage	0.004	-0.037	0.037	3,304,710	0.001	-0.055	0.003	0.040	3,304,710
	(0.016)	(0.030)	(0.023)		(0.016)	(0.034)	(0.027)	(0.025)	
Receive welfare	0.043 *	0.016	-0.098 ***	3,038,520	0.046 **	0.080 **	-0.029	-0.098 ***	3,038,520
	(0.023)	(0.033)	(0.036)		(0.022)	(0.031)	(0.033)	(0.038)	
Health fair or poor	0.008	-0.027	0.025	3,351,095	0.007	-0.028	-0.008	0.027	3,351,095
	(0.024)	(0.034)	(0.034)		(0.024)	(0.034)	(0.033)	(0.036)	
Routine care limitation	-0.111 ***	-0.280 ***	0.588 ***	1,389,436	-0.118 ***	-0.178 ***	-0.060	0.595 ***	1,389,436
	(0.031)	(0.064)	(0.080)		(0.031)	(0.048)	(0.059)	(0.084)	
Behind in school	-0.027	-0.010	-0.024	3,378,513	-0.027	0.000	-0.005	-0.023	3,378,513
	(0.031)	(0.042)	(0.040)		(0.031)	(0.044)	(0.041)	(0.043)	
All Age (5+)									
Outcome variable									
Health insurance coverage	-0.031 *	-0.065 ***	0.060 ***	5,680,115	-0.033 *	-0.058 **	-0.014	0.062 **	5,680,115
	(0.017)	(0.025)	(0.023)		(0.017)	(0.025)	(0.023)	(0.024)	
Receive welfare	0.015	-0.035	-0.063 *	5,329,040	0.017	0.062 **	-0.080 ***	-0.067 *	5,329,040
	(0.019)	(0.030)	(0.033)		(0.019)	(0.029)	(0.030)	(0.035)	
Health fair or poor	0.000	-0.043	0.028	5,767,871	-0.002	-0.043	-0.005	0.031	5,767,871
	(0.018)	(0.028)	(0.032)		(0.018)	(0.027)	(0.028)	(0.033)	
Routine care limitation	-0.108 ***	-0.143 ***	0.263 ***	3,734,462	-0.110 ***	-0.078 **	-0.052	0.261 ***	3,734,462
	(0.021)	(0.043)	(0.064)		(0.021)	(0.035)	(0.036)	(0.065)	

Note: * significant at 10%, ** significant at 5%, *** significant at 1%.

Table 5a Reduced form regression results with interactions

Adult (18+) Outcome variable	Manageable condition	1991-1992	1993-1996	1997-1999	Manageable × 91-92	Manageable × 93-96	Manageable × 97-99	Wgt N
Labor Market Outcomes								
Covered quarters by NHIS	-0.043 *	-0.004	0.014	0.060	0.048	0.058	-0.026	1,294,320
	(0.024)	(0.022)	(0.030)	(0.079)	(0.033)	(0.036)	(0.101)	
Covered quarters by 2007	-0.010	-0.009	0.008	-0.039	-0.001	-0.014	0.063	4,444,795
	(0.015)	(0.014)	(0.014)	(0.030)	(0.021)	(0.021)	(0.040)	
Hours worked	0.576	-4.987	-2.734	-5.440	3.633	1.022	11.920	352,741
	(5.164)	(3.378)	(4.205)	(4.539)	(7.447)	(6.925)	(12.335)	
Positive earnings	0.041	0.038	0.010	-0.059	0.105	0.047	0.074	2,113,730
	(0.074)	(0.073)	(0.074)	(0.109)	(0.095)	(0.097)	(0.148)	
Earnings categories								
$1,000 - 5,000	-0.057	-0.039	-0.018	0.085	-0.094	-0.026	-0.052	2,113,730
	(0.084)	(0.067)	(0.069)	(0.090)	(0.088)	(0.090)	(0.121)	
$5,000 - 10,000	0.003	0.014	0.008	-0.033	0.030	0.009	0.027	
	(0.031)	(0.024)	(0.025)	(0.038)	(0.034)	(0.035)	(0.053)	
$10,000 - 15,000	-0.003	0.006	0.003	-0.012	0.013	0.004	0.008	
	(0.020)	(0.010)	(0.010)	(0.013)	(0.013)	(0.013)	(0.018)	
$15,000 - 20,000	0.001	0.007	0.003	-0.015	0.017	0.005	0.008	
	(0.019)	(0.012)	(0.012)	(0.016)	(0.016)	(0.016)	(0.021)	
$20,000+	0.013	0.012	0.004	-0.024	0.033	0.008	0.009	
	(0.023)	(0.022)	(0.022)	(0.025)	(0.027)	(0.027)	(0.031)	
Program Participation Outcomes								
Ever SSDI	-0.022	0.016	0.010	-0.059	0.164 **	-0.128	-0.052	2,423,944
	(0.053)	(0.059)	(0.059)	(0.081)	(0.082)	(0.088)	(0.118)	
Ever SSI	0.000	0.013	0.011	-0.085	0.146 *	-0.042	-0.090	2,423,944
	(0.061)	(0.064)	(0.065)	(0.091)	(0.087)	(0.090)	(0.131)	
Receive welfare	-0.018	0.031	-0.183 **	0.106	-0.165 *	0.050	0.120	2,290,520
	(0.065)	(0.070)	(0.077)	(0.094)	(0.090)	(0.099)	(0.129)	
Health Outcomes								
Health fair or poor	-0.012	-0.066	0.002	0.033	-0.045	-0.061	0.065	2,416,776
	(0.059)	(0.061)	(0.064)	(0.104)	(0.091)	(0.093)	(0.150)	
Routine care limitation	-0.100 *	-0.032	-0.039	0.079	-0.077	-0.001	-0.052	2,345,026
	(0.052)	(0.063)	(0.061)	(0.101)	(0.104)	(0.098)	(0.144)	
Health insurance coverage	-0.085	-0.073	-0.028	0.099	-0.016	-0.037	-0.055	2,375,405
	(0.066)	(0.063)	(0.062)	(0.072)	(0.080)	(0.081)	(0.099)	
Lifestyle Outcomes								
Live with parents	-0.088	-0.031	0.052	-0.107	0.103	-0.003	-0.216	2,265,430
	(0.078)	(0.078)	(0.075)	(0.110)	(0.111)	(0.108)	(0.154)	
Married	0.036	0.006	-0.042	0.021	0.008	-0.032	0.101	2,413,885
	(0.054)	(0.049)	(0.047)	(0.076)	(0.069)	(0.072)	(0.106)	
Own home	-0.022	-0.009	0.060	0.091	-0.009	0.058	-0.032	2,379,186
	(0.058)	(0.053)	(0.052)	(0.070)	(0.078)	(0.084)	(0.105)	
Educational attainment								
No high school	0.018	0.008	-0.025	0.040	0.025	0.020	-0.173	1,010,566
	(0.031)	(0.040)	(0.040)	(0.123)	(0.063)	(0.066)	(0.213)	
Some high school	0.031	0.023	-0.040	0.018	0.027	0.034	-0.243 *	
	(0.054)	(0.061)	(0.065)	(0.104)	(0.083)	(0.089)	(0.144)	
High school degree	-0.042	-0.014	0.035	-0.051	-0.034	-0.025	0.236	
	(0.058)	(0.055)	(0.053)	(0.140)	(0.082)	(0.083)	(0.234)	
Some college or more	-0.030	-0.018	0.030	-0.006	-0.018	-0.029	0.180	
	(0.042)	(0.047)	(0.053)	(0.089)	(0.065)	(0.072)	(0.126)	

Note: * significant at 10%, ** significant at 5%, *** significant at 1%.

Table 5b Reduced form regression results with interactions

Children (5-17) Outcome variable	Manageable condition	1991-1992	1993-1996	1997-1999	Manageable × 91-92	Manageable × 93-96	Manageable × 97-99	Wgt N
Health insurance coverage	0.003	-0.049	0.008	0.041	0.033	-0.038	0.083	3,304,710
	(0.032)	(0.044)	(0.037)	(0.038)	(0.065)	(0.063)	(0.073)	
Receive welfare	0.043	0.081 *	-0.031	-0.102 **	-0.033	-0.042	0.047	3,038,520
	(0.037)	(0.042)	(0.043)	(0.050)	(0.056)	(0.055)	(0.067)	
Health fair or poor	0.009	-0.032	-0.010	0.026	-0.123	0.063	-0.045	3,351,095
	(0.046)	(0.047)	(0.045)	(0.049)	(0.077)	(0.071)	(0.074)	
Routine care limitation	-0.112 **	-0.184 ***	-0.099	0.628 ***	0.024	-0.019	0.088	1,389,436
	(0.055)	(0.068)	(0.085)	(0.112)	(0.097)	(0.113)	(0.161)	
Behind in school	-0.029	-0.001	-0.006	-0.027	-0.019	-0.086	0.083	3,378,513
	(0.059)	(0.060)	(0.057)	(0.059)	(0.088)	(0.085)	(0.090)	
All (5+) Outcome variable								
Health insurance coverage	-0.033	-0.056 *	-0.013	0.060 *	-0.008	-0.040	0.074	5,680,115
	(0.033)	(0.034)	(0.032)	(0.036)	(0.044)	(0.043)	(0.052)	
Receive welfare	0.017	0.059	-0.083 **	-0.067	-0.084 *	0.011	0.047	5,329,040
	(0.036)	(0.038)	(0.041)	(0.048)	(0.050)	(0.053)	(0.066)	
Health fair or poor	-0.002	-0.047	-0.007	0.031	-0.073	0.012	-0.015	5,767,871
	(0.037)	(0.037)	(0.037)	(0.045)	(0.057)	(0.056)	(0.066)	
Routine care limitation	-0.112 ***	-0.078	-0.049	0.263 ***	-0.045	0.007	-0.043	3,734,462
	(0.041)	(0.049)	(0.050)	(0.090)	(0.083)	(0.080)	(0.127)	

Note: * significant at 10%, ** significant at 5%, *** significant at 1%.

Table 6a Reduced form regression results for mental illness and its interactions

Adult (18+) Outcome variable	Mental illness	1991-1992	1993-1996	1997-1999	Mental illness × 91-92	Mental illness × 93-96	Mental illness × 97-99	Wgt N
Labor Market Outcomes								
Covered quarters by NHIS	-0.009	0.003	0.033	0.054	0.033	0.017	-0.029	1,294,320
	(0.024)	(0.022)	(0.028)	(0.075)	(0.036)	(0.034)	(0.098)	
Covered quarters by 2007	-0.019	-0.020	0.000	-0.033	0.025	0.004	0.063	4,444,795
	(0.017)	(0.013)	(0.014)	(0.028)	(0.024)	(0.023)	(0.039)	
Hours worked	4.651	-4.807	-1.233	-3.869	3.962	-4.278	8.526	352,741
	(5.576)	(3.171)	(3.624)	(4.317)	(8.363)	(7.108)	(14.710)	
Positive earnings	0.027	0.037	0.007	-0.066	-0.019	0.092	0.117	2,113,730
	(0.075)	(0.074)	(0.074)	(0.109)	(0.099)	(0.099)	(0.148)	
Earnings categories								
$1,000 - 5,000	-0.047	-0.040	-0.015	0.092	0.018	-0.072	-0.080	2,113,730
	(0.086)	(0.068)	(0.068)	(0.091)	(0.092)	(0.091)	(0.121)	
$5,000 - 10,000	0.002	0.016	0.006	-0.037	-0.008	0.024	0.037	
	(0.031)	(0.024)	(0.025)	(0.039)	(0.035)	(0.035)	(0.052)	
$10,000 - 15,000	-0.003	0.006	0.002	-0.014	-0.003	0.010	0.012	
	(0.020)	(0.010)	(0.010)	(0.014)	(0.014)	(0.013)	(0.018)	
$15,000 - 20,000	0.000	0.007	0.003	-0.016	-0.003	0.013	0.013	
	(0.019)	(0.012)	(0.012)	(0.016)	(0.017)	(0.016)	(0.021)	
$20,000+	0.010	0.011	0.004	-0.025	-0.004	0.024	0.017	
	(0.023)	(0.022)	(0.021)	(0.024)	(0.028)	(0.028)	(0.031)	
Program Participation Outcomes								
Ever SSDI	-0.036	0.012	0.007	-0.052	0.059	-0.079	-0.032	2,423,944
	(0.054)	(0.059)	(0.058)	(0.083)	(0.082)	(0.086)	(0.118)	
Ever SSI	-0.012	0.012	0.012	-0.078	0.115	-0.025	-0.067	2,423,944
	(0.062)	(0.066)	(0.066)	(0.094)	(0.091)	(0.091)	(0.132)	
Receive welfare	-0.003	0.034	-0.180 **	0.090	-0.078	-0.034	0.149	2,290,520
	(0.066)	(0.072)	(0.076)	(0.096)	(0.093)	(0.096)	(0.133)	
Health Outcomes								
Health fair or poor	-0.056	-0.066	0.007	0.027	-0.089	-0.060	0.123	2,416,776
	(0.055)	(0.060)	(0.063)	(0.105)	(0.089)	(0.090)	(0.147)	
Routine care limitation	-0.102 **	-0.035	-0.037	0.095	-0.053	0.029	-0.049	2,345,026
	(0.048)	(0.061)	(0.060)	(0.102)	(0.091)	(0.089)	(0.140)	
Health insurance coverage	-0.070	-0.075	-0.029	0.107	-0.011	-0.038	-0.031	2,375,405
	(0.064)	(0.064)	(0.062)	(0.071)	(0.086)	(0.084)	(0.100)	
Lifestyle Outcomes								
Live with parents	-0.108	-0.037	0.053	-0.074	0.085	0.053	-0.230	2,265,430
	(0.077)	(0.076)	(0.074)	(0.110)	(0.108)	(0.108)	(0.153)	
Married	0.057	0.009	-0.043	0.007	0.033	-0.041	0.089	2,413,885
	(0.057)	(0.049)	(0.046)	(0.074)	(0.071)	(0.071)	(0.108)	
Own home	-0.033	-0.009	0.061	0.096	0.017	0.083	-0.024	2,379,186
	(0.060)	(0.054)	(0.052)	(0.070)	(0.082)	(0.085)	(0.106)	
Educational attainment								
No high school	0.014	0.009	-0.024	0.038	0.009	0.019	-0.131	1,010,566
	(0.032)	(0.040)	(0.040)	(0.120)	(0.060)	(0.063)	(0.174)	
Some high school	0.024	0.023	-0.042	0.032	0.006	0.037	-0.204	
	(0.057)	(0.063)	(0.067)	(0.119)	(0.086)	(0.094)	(0.167)	
High school degree	-0.034	-0.014	0.034	-0.052	-0.012	-0.025	0.184	
	(0.058)	(0.057)	(0.054)	(0.149)	(0.083)	(0.084)	(0.215)	
Some college or more	-0.024	-0.018	0.032	-0.018	-0.003	-0.031	0.151	
	(0.042)	(0.047)	(0.054)	(0.092)	(0.065)	(0.074)	(0.137)	

Note: * significant at 10%, ** significant at 5%, *** significant at 1%.

Table 6b Reduced form regression results for mental illness and its interactions

Children (5-17) Outcome variable	Mental illness	1991-1992	1993-1996	1997-1999	Mental illness × 91-92	Mental illness × 93-96	Mental illness × 97-99	Wgt N
Health insurance coverage	-0.004	-0.050	0.008	0.039	0.018	-0.016	0.069	3,304,710
	(0.032)	(0.044)	(0.037)	(0.038)	(0.061)	(0.057)	(0.063)	
Receive welfare	0.058 *	0.084 **	-0.032	-0.106 **	-0.044	-0.017	0.049	3,038,520
	(0.033)	(0.042)	(0.044)	(0.053)	(0.052)	(0.054)	(0.068)	
Health fair or poor	-0.046	-0.044	-0.005	0.033	-0.119 *	0.078	-0.028	3,351,095
	(0.040)	(0.047)	(0.047)	(0.050)	(0.071)	(0.067)	(0.070)	
Routine care limitation	-0.063	-0.185 ***	-0.098	0.618 ***	-0.043	0.005	0.088	1,389,436
	(0.055)	(0.071)	(0.089)	(0.120)	(0.093)	(0.109)	(0.166)	
Behind in school	-0.011	-0.001	-0.007	-0.029	-0.008	-0.078	0.050	3,378,513
	(0.056)	(0.060)	(0.058)	(0.061)	(0.082)	(0.082)	(0.087)	
All (5+) Outcome variable								
Health insurance coverage	-0.030	-0.058 *	-0.012	0.059	-0.006	-0.028	0.065	5,680,115
	(0.032)	(0.035)	(0.033)	(0.036)	(0.046)	(0.043)	(0.050)	
Receive welfare	0.033	0.062	-0.083 **	-0.074	-0.055	-0.013	0.070	5,329,040
	(0.035)	(0.039)	(0.042)	(0.050)	(0.051)	(0.052)	(0.069)	
Health fair or poor	-0.051	-0.053	-0.002	0.035	-0.096 *	0.026	0.007	5,767,871
	(0.034)	(0.036)	(0.037)	(0.046)	(0.054)	(0.053)	(0.064)	
Routine care limitation	-0.095 **	-0.084 *	-0.047	0.277 ***	-0.048	0.045	-0.066	3,734,462
	(0.039)	(0.048)	(0.050)	(0.092)	(0.070)	(0.070)	(0.124)	

Note: * significant at 10%, ** significant at 5%, *** significant at 1%.

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