Public Assistance in America: Explaining Intergenerational Transitions and Persistence

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Abstract

Public assistance programs provide a safety net to low-income households and are intended to help them improve their economic well-being and transition off of government support and into employment. This study examines the intergenerational persistence of public assistance participation from childhood into adulthood with data from the Add Health study. Using linear probability models, we identify factors associated with downward economic mobility among adults who did not receive public assistance during their childhoods and upward economic mobility among adults who did receive public assistance during their childhoods. We find that 55% of adults who received public assistance in childhood do not receive public assistance in adulthood. Transitioning off of public assistance and upward economic mobility in adulthood is significantly associated with children's educational attainment. Transitioning onto public assistance and downward economic mobility in adulthood is significantly associated with adolescents' educational attainment, poor health, and risky health behaviors.

Introduction

It is commonly believed that there is a high degree of intergenerational persistence in public assistance, with receipt of assistance in childhood and adulthood being highly correlated (Reid 2014; Spalding 2012). In an effort to reduce inter- and intragenerational dependence on government assistance, the 1996 Personal Responsibility and Work Opportunity Reconciliation Act (PRWORA) replaced the Aid to Families with Dependent Children (AFDC) program with Temporary Assistance for Needy Families (TANF), which removed federal eligibility and payment rules and gave states much greater discretion in designing public assistance programs and eligibility criteria. States were also given discretion on the design and implementation of work preparation programs to help individuals meet PRWORA work requirements. PRWORA imposed a federal lifetime limit of 60 months to receive TANF-funded aid. However, states had some leeway on the limits and were able to exempt 20 percent of their caseload from the lifetime limit, implement shorter limits if they wanted, or continue funding recipients past 60 months solely from state funds (Blank 2002; Moffitt 2003).

Although the TANF policies at the state level varied, the reforms were generally seen as welfare tightening and pro-work (Bitler, Gelbach, and Hoynes 2005). The restrictions and limits introduced by PRWORA were put in place to incentivize individuals to leave welfare and seek work (Blank 2002; Bitler, Gelbach, and Hoynes 2005). However, the PRWORA reforms did not affect all groups equally. In particular, legal immigrants who arrived after August 1996 were largely not eligible for TANF and other public assistance programs such as Supplemental Nutrition Assistance Program (SNAP) and Supplemental Security Income as a result of PRWORA (Blank 2002). The overarching aim was to reduce caseloads by encouraging

employment and break the cycle of welfare dependence that was perceived to exist (Vobejda 1996).

Caseloads for TANF decreased significantly in the years after reform, but similar declines did not necessarily take place in other public assistance programs. Over time, SNAP enrollment between 1996 and 2013 increased from 10% to 15% of the population enrolled in SNAP (U.S. Census Bureau 2001; U.S. Census Bureau 2012; United States Department of Agriculture 2014). In this same time period, TANF participation dropped dramatically from over 12.3 million recipients in 1996 to 3.7 million recipients in 2013 (U.S. Department of Health and Human Services 2014; U.S. Census Bureau 2014). Furthermore, many individuals who were no longer eligible for TANF switched into Supplemental Security Income (SSI) (if they met program requirements) (Schmidt and Sevak 2004). Among those who left welfare shortly after the reform and were not working, an estimated 23 percent received income from SSI (Loprest 1999). In fact, in 1995 before the reforms, the number of SSI recipients was about 6.5 million. This increased to approximately 7.5 million by 2008 (U.S. Census Bureau 2014). With individuals switching between programs, a reduction in caseloads in TANF did not necessarily imply a reduction in caseloads for all public assistance programs. These trends call into question whether the 1996 reforms actually limited the dependence and intergenerational transmission of public assistance, or if other factors were at play.

It is widely known that childhood circumstances have an impact on adult economic and social outcomes. This paper seeks to determine what childhood factors explain the persistence of and mobility patterns of public assistance from childhood into adulthood in the post-PRWORA contemporary period. Despite considerable interest in the topic of intergenerational persistence on public assistance and transitions into and out of public assistance, few studies have examined

the issue using detailed longitudinal data. Furthermore, few studies, to our knowledge, have considered the role that childhood health plays in predicting welfare receipt in adulthood. Using national longitudinal data spanning a period over 14 years, we assess intergenerational relationships in public assistance receipt among a cohort that was exposed to the 1996 reforms.

Models of the intergenerational transmission of welfare

Welfare Culture

One hypothesis that attempts to explain the intergenerational transmission of welfare is the welfare culture argument. The argument posits that public assistance provision induces values, attitudes, and behaviors among recipients that are then passed on to children of recipients, thus perpetuating dependence on public assistance. Specifically, public programs create incentives that encourage people to take actions in the short term that might have negative consequences in the long-term, such as childbearing out of wedlock (Murray 1985; Murray 1994; Murray 1993). Another way in which welfare receipt is thought to change values is through its impact on attitudes toward work. Participation in public assistance, it is argued, encourages self-defeating work attitudes and a poor work ethic among recipients, and these values are passed on to children who ultimately become dependent on welfare themselves (Corcoran 1995; Harris 1997). According to this argument, welfare receipt induces behaviors among parents that put their children at risk of welfare use, perpetuating the intergenerational transmission of public assistance use.

The prevalence of neighborhood dependence on welfare also facilitates intergenerational transmission of welfare by reducing the stigma associated with it, which may make welfare a

more attractive option for children in the future (Antel 1992; Corcoran 1995; Rank and Cheng 1995). Children who grow up with welfare may not have as great a distaste for welfare as those children who did not grow up with welfare (Antel 1992). These children may learn by observing their parents that welfare is an available source of income and may not develop the human capital necessary to obtain a job, leading to a greater risk of public assistance use later in life (Rank and Cheng 1995). Parent's welfare participation may also lower costs for children in participating in welfare. That is, since children can directly observe how their parents participate and navigate the welfare system, the learning costs are decreased for them, reducing barriers to participating in welfare relative to children who did not grow up in welfare homes (Antel 1992; Rank and Cheng 1995). Taken together, the welfare culture argument highlights a cultural process where children learn from their parents and neighborhood that relying on public assistance is an acceptable, or at least not stigmatized, behavior (Harris 1997). These learned behaviors then become ingrained and result in a pattern of intergenerational welfare participation (Rank and Cheng 1995).

Structural/Economic Resources Models of Welfare Transmission

A competing argument points to the lack of material resources as the main reason welfare is transmitted from parent to child. These structural arguments acknowledge a link between parental and child use of welfare, but identify disadvantaged economic backgrounds as the main reason welfare is transmitted from parent to child (Rank and Cheng 1995; Bartholomae, Fox, and McKenry 2004; Harris 1997). For instance, poor parents may have less schooling than their wealthier counterparts, or fewer resources to expend on the development of their child's human capital (Corcoran 1995; Rank and Cheng 1995). Owing to lower income, parents on welfare are

more likely to live in poorer neighborhoods, which have lower quality schools, fewer positive role models, less social controls, and fewer job networks (Corcoran 1995). Families in poverty are also more likely to be female-headed households, which increases the risk of children dropping out of high school, teen pregnancy, and joblessness (Corcoran 1995), which again increases the risk of perpetuating the cycle of welfare. The cycle of dependency thus begins with parents' lack of education, income, and other resources, which leads to a limited investment in children's human capital. This decreased human capital investment, combined with growing up in a disadvantaged household and neighborhood, increases the chance of perpetuating welfare use (Bartholomae, Fox, and McKenry 2004). This argument implies that a change in the economic opportunity would help break the cycle of welfare use (Corcoran 1995; Harris 1997).

Several empirical studies have tested the link between parent and child welfare use and have found evidence in support of the structural argument over the cultural argument. If the culture of welfare argument were true, it would imply that there should be perfect correlation between parent and child welfare participation. Examining AFDC use among parents and their daughters, Duncan, Hill, and Hoffman (1988) categorized dependence into three categories: none, moderate, and high. "AFDC dependence" was defined based on whether AFDC income was reported by parents or daughters in none of the years (no dependence), one or two years (moderate dependence), or all three years (high dependence) (individuals were observed for three year periods). They found that among parents who reported high dependence, only 20% of daughters were also highly dependent and only about 16% were moderately dependent. In fact, 64% of daughters whose parents had high dependence did not report any AFDC use in adulthood (Duncan, Hill, and Hoffman 1988). Several other subsequent studies found very similar results that not all children whose parents received welfare ended up on welfare themselves in adulthood

(Antel 1992; Rank and Cheng 1995; Harris 1997). These findings are in stark contrast to the culture of welfare argument that says parental welfare use is passed on to children.

While there is not perfect correlation between parent and child's welfare use, it is true that growing up in a welfare household increases a child's probability of participating in public assistance later in life relative to a child whose parents did not receive welfare. Duncan, Hill, and Hoffman (1988) found that 20 percent of daughters with highly dependent parents were also highly dependent on welfare themselves, while only 3 percent of daughters whose parents did not have AFDC were highly dependent themselves. Several other studies confirm that those who grow up on welfare are at higher risk of receiving welfare themselves relative to those whose parents never received welfare (Antel 1992; An, Haveman, and Wolfe 1993; Pepper 1995; Rank and Cheng 1995; Harris 1997).

To explain the increased probability of welfare use among those who grew up with public assistance, studies have found support for the structural argument of intergenerational transmission of welfare. Parents who received welfare were also more likely to be in lower socioeconomic strata (Rank and Cheng 1995; Harris 1997). In addition, after controlling for educational attainment, employment status, having a work-limiting disability, and growing up in a female-headed household, the coefficient on parents' use of welfare in childhood was no longer statistically significant (Rank and Cheng 1995; Bartholomae, Fox, and McKenry 2004). These findings suggest that parents' economic background and the children's human capital explain welfare use later in life. These structural factors, namely growing up with limited resources, rather than parents' use of welfare, appear to better explain public assistance participation in adulthood.

Conceptual Model

We present a conceptual model that illustrates how our study examines the intergenerational transmission and persistence of welfare (Fig. 1). Given the theoretical importance of structural barriers among welfare recipients that may prevent human capital development and economic opportunity, we identify education as a potential mediator between welfare use in childhood and adulthood. To the extent that receipt of public assistance in childhood provides more resources that allow children in recipient households to remain in school and perform better than poor children not receiving public assistance, educational attainment may represent a route by which an individual is able to escape poverty and not require public assistance in adulthood. Our study will test education as a mediating mechanism and will also examine whether there are differential trends by race and ethnic group.

Childhood health also plays a prominent role in the intergenerational transmission of socioeconomic status (Case, Fertig, and Paxson 2005). While very few studies have specifically examined the link between childhood health and welfare use in adulthood (e.g., Corcoran 1995; Nielsen, Juon, and Ensminger 2004), several studies have demonstrated a strong link between childhood health and educational attainment or poor labor market outcomes as an adult (Nielsen, Juon, and Ensminger 2004; Case, Fertig, and Paxson 2005; Palloni et al. 2009; Palloni 2006; Fletcher and Richards 2012). By influencing educational attainment, childhood health has an indirect effect on adulthood welfare use. Furthermore, it can be argued that health during childhood also plays an important direct role in predicting welfare use in adulthood. Since poor childhood health predicts poor socioeconomic status in adulthood, we hypothesize that poor childhood health has a direct effect on welfare use in adulthood. The case of disability status is a case in point, and for which the SSI program was originally developed; but other health

conditions not commonly studied may play a similar role in disadvantaging the development of

human capital during childhood and chances of obtaining employment in adulthood.

Accordingly, we test for both direct and indirect effects of childhood health on later-life welfare

use.

Data

We used data from Waves 1 through 4 of the National Longitudinal Study of Adolescent

to Adult Health (Add Health). Add Health is a nationally representative study of adolescents in

grades 7 through 12 in the United States in 1994-1995. The study used a multistage, stratified,

school-based, cluster sampling design that drew from 80 high schools (both public and private)

and their corresponding feeder schools. Adolescents were followed into adulthood with four in-

home interviews over a 14-year period, with the most recent interview (Wave 4) occurring in

2008-09. Along with in-home interviews, the study collected data about schools, parents, and

neighborhoods. School data came from administrators (usually principals) who were surveyed in

Wave 1. Similarly, parent surveys were conducted in Wave 1, which was typically completed by

the resident mother. Neighborhood contextual data were obtained from 1990 census data linked

to adolescents' addresses. Further details on the survey and sampling design have been

extensively described elsewhere (see Harris 2013).

In Wave 4, 15,701 of the original Add Health respondents were re-interviewed (80.3% of

eligible sample members).   Our study focuses on Whites, Asians, Blacks and Hispanics and

excluded youth who were of Native American heritage (N=209) or who have missing sampling

weights are also excluded from the analysis (N=892). Our primary outcome of interest is public

assistance receipt by Wave 4, when all respondents have reached early adulthood (i.e. ages 24-34). Those who did not respond to the public assistance variable in Wave 4 are excluded (N=30). The primary independent variable of interest (i.e. public assistance participation in childhood) is obtained from parent surveys and supplemented by Add Health respondent reports to in-home surveys in Waves 1 and 2. Respondents without full information on public assistance participation in childhood (N=38) and other independent variables (N=395) are excluded from the sample. These restrictions result in a final analytic sample of 14,137 respondents.

Measures

Public Assistance in Adulthood

Public assistance receipt in adulthood was measured as a binary variable based on a question that asks the respondent in Wave 4 whether they or anyone in their household had received any public assistance, welfare payments, or food stamps since their last survey. For most participants (N=11,779), the last survey was the Wave 3 interview. For some others (N=2,358), the last interview was the Wave 2 interview. To control for the longer period in which these individuals might have received public assistance, we included a dummy variable that indicates whether the respondent missed the Wave 3 interview.

Public Assistance in Childhood

Our primary exposure of interest, we defined childhood public assistance participation as a binary variable indicating whether at least one of the respondent's parents or caregivers reported receiving any type of public assistance in Waves 1 or 2. To capture the effect of public

assistance exposure during the school years, respondents over the age of 18 in Wave 2 were not coded as childhood public assistance participants as they were presumably out of high school. During Wave 1, however, there were 259 students over the age of 18 in school; these students were coded as public assistance participants. The parent survey allowed parents either to report generally whether they received any type of public assistance or welfare from the government, or to specify whether they received SSI, AFDC, food stamps, or a housing subsidy. Since not all respondent's parents participated in the parent survey, we supplemented this variable with answers to questions in Wave 1 or 2 that ask the child whether at least one of their parents received welfare or public assistance (however, the specific program is not identified). This allowed for a measure of public assistance receipt while the child was still in middle or high school. A majority of the parents reported receiving Food Stamps (N=1,426), followed by enrollment in AFDC (N=844) and SSI (N=767). A fraction of the parents reported receiving a housing subsidy or living in public housing (N=377). Another 784 children had parents that received public assistance, but the type of program was unspecified in the response (Appendix Table 1 provides a breakdown of public assistance participation in childhood). We excluded Medicaid receipt from our analyses since data on childhood Medicaid participation is only available for a subset of children with completed parent interviews, and the take up of health insurance merits separate consideration.

We grouped all the cash assistance programs into a binary variable for two reasons. The first reason is a pragmatic one, since the Add Health data generally do not provide information on participation in each individual program. The second reason is conceptual, as restrictions were placed on the use of AFDC/TANF, increases were observed in the use of both SSI and food stamps. Thus, there was a degree of substitution between programs. Overall, eligibility for

participation in public assistance programs became more restrictive between 1993/1994 (Wave

1) and 2008/2009 (Wave 4). Thus, we expected the association between public assistance

participation in childhood and adulthood to be lower than it would have been in the absence of

changes in public assistance eligibility.

Demographic Variables

All models included controls for race-ethnicity, immigrant generation, sex, age at Wave

4, and U.S. citizenship status in Wave 4. The race-ethnicity variable is based on a nine-category

variable developed by Harris (1999)and used in Perreira, Harris, and Lee (2006). This race-

ethnicity variable was defined using the respondent's self-reported ethnic identity in combination

with the country of origin for immigrant children or the country of parents' origin for children of

immigrants. Among youth who reported multiple racial and/or ethnic backgrounds, Harris

(1999) identified a single racial-ethnic category by cross-checking parents' racial-ethnic

background, dropping "other" as a multiple category, or assigning the mother's ethnic

background in the handful of cases in which parents were of different ancestries. Originally, the

nine-category variable classified race-ethnicity into the following groups (Harris 1999):

European-Canadian, African-Caribbean, Cuban, Mexican, Puerto-Rican, South-Central

American, Chinese, Filipino, and Other Asian. For the purpose of this paper, these groups were

collapsed into four racial-ethnic groups (non-Hispanic Whites, non-Hispanic Blacks, non-

Hispanic Asians, and Hispanics).

Immigrant generation was defined as a three-category variable indicating whether the

child was first, second, or third generation (also developed by Harris (1999)). First generation

children were those who are foreign-born to foreign-born parents; they migrated to the United

States as children, typically with their immigrant parents. Second generation children were those

who were U.S.-born to one or two foreign-born parents. Third generation children were those

who were U.S.-born to U.S.-born parents; however, children who were born abroad to U.S.-born

parents were also categorized as third generation.

Given the possibility for differential outcomes among various race-ethnicity and

generation groups, we combined race-ethnicity and generation into a six-category variable:

White, Black, Asian, 1st generation Hispanic, 2nd generation Hispanic, and 3rd generation

Hispanic. In this case, White, Black, and Asian represented the average effect for these racial

groups across all generations, while the generational effect is split out for Hispanic respondents.

For all models, White was the referent group.

Child's Human Capital.

The respondent's human capital was measured by using educational attainment by Wave

4 (no high school diploma, high school graduate, some college or vocational school, college or

vocational school graduate, at least some professional or graduate training). Those who obtained

a General Education Development (GED) certificate were included in the high school dropout

category, since previous studies have shown that GED holders' labor force participation rates

and earnings were more similar to that of dropouts (Cameron and Heckman 1993). We also

included the Add Health Picture Vocabulary standardized test score (AH-PVT) from Wave 1,

which was an abbreviated version of the Peabody Picture Vocabulary Test with age-standardized

scores for adolescents (Add Health n.d.). To retain individuals with missing AH-PVT scores, we

used mean imputation and include an indicator for missing data.

Parents' Human Capital

To measure parents' human capital, highest educational attainment of either parent was included in each model (high school dropout (referent group), high school graduate, some college, college graduate or more), where a "parent education missing" category was created for those who had no information on parental educational attainment. Information for this variable was taken from the parent survey with missing data filled in using the Wave 1 in-home adolescent survey. Household income is measured using the log of the parent's household income at Wave 1. To retain cases in which household income was missing, we imputed the average household income and included a missing data indicator variable. We also controlled for family structure, which is categorized as two biological parent families (referent), two non-biological parents family (including step or adoptive parents), single-parent families (either single mother or single father), and other families (i.e., non-relative caretaker, grandmother and/or grandfather caretakers).

Measures of Health and Health Behavior

We measured the general health status of the child with a three-category variable indicating self-reported health at Wave 1 (excellent or very good, good, and fair or poor). We also included an indicator for whether the child was obese in either Wave 1 or 2.

We controlled for sexual debut by indicating whether the respondent ever had sex before the age of 15. We also controlled for the respondent's substance use before the age of 18. This binary variable indicates whether the respondent was either ever a regular smoker (i.e. smoked at least one cigarette a day for at least 30 days), ever used marijuana, or ever drank more than twice

in their life. The respondent was considered a substance user if at least one of these criteria was

satisfied.

Lastly, to control for chronic health problems, we created another binary variable that

measured whether the child has ever been diagnosed with at least one of asthma, attention deficit

hyperactivity disorder (either as predominantly inattentive type, predominantly hyperactive type,

or combined type), diabetes, or a physical disability before the age of 18. In constructing the

chronic health problem variable, we created separate variables measuring asthma, attention

deficit hyperactivity disorder, diabetes, and physical disability in childhood. Asthma was

measured in Wave 1 using the parent's report of whether the child has asthma or if the child

reports having a physical condition that involves asthma. Childhood diabetes was defined as a

binary variable that indicates whether the respondent was diagnosed with diabetes or high blood

sugar before age 18. This variable was measured using responses in the parent survey, and

Waves 3 and 4 in-home respondent surveys. An individual was defined as diabetic in childhood

if the parent reported their child has diabetes, or if in Waves 3 or 4 the respondent reported

having been diagnosed as diabetic before age 18. Physical disability in childhood is measured

using both parent report and the individual's self-report in Wave 1. If the respondent reported

having difficulty using his or her hands, arms, legs, or feet because of a permanent physical

condition, or if the parent considered their child to have a physical disability, then we coded the

individual as having a physical disability in childhood.

Attention deficit hyperactivity disorder (ADHD) was categorized into three types:

inattentive type, predominantly hyperactive-impulsive type, or combined type (Centers for

Disease Control and Prevention 2014; Ouyang et al. 2008). In measuring ADHD, the Add

Health survey asked retrospective questions in Wave 3 about the respondent when he or she was

between the ages of 5 and 12. The survey questions align with the DSM-V diagnostic criteria for

ADHD, except for one question ("You were spiteful or vindictive"), which was excluded from

our measurement of ADHD. Consequently, instead of the 18 question diagnostic test employed

by the DSM-V, our measurement was based on a 17 question scale. Nine of the questions

pertain to a diagnoses of inattentive type: (1) you failed to pay close attention to details or made

careless mistakes in your work; (2) you had difficulty sustaining attention in tasks or fun

activities; (3) you didn't listen when spoken to directly; (4) you didn't follow through on

instructions and failed to finish work; (5) you had difficulty organizing tasks and activities; (6)

you were easily distracted; and (7) you were forgetful. Eight questions determined the diagnoses

of hyperactive-impulsive type: (1) you fidgeted with your hands and feet or squirmed in your

seat; (2) you left your seat in the classroom or in other situations when being seated was

expected; (3) you felt restless; (4) you had difficulty doing fun things quietly; (5) you felt "on the

go" or "driven by a motor"; (6) you talked too much; (7) you blurted out answers before the

questions had been completed; and (8) you had difficulty awaiting your turn. A symptom was

regarded as "present" if the respondent answered "often" or "very often" to any of the questions.

According to the DSM-V, a respondent who had six or more symptoms of inattention, but not

hyperactivity, was defined as Predominantly Inattentive Type. Similarly, a respondent with six

or more symptoms of hyperactivity, but not inattentiveness, was defined as Predominantly

Hyperactive-Impulsive Type. An individual who presents six or more symptoms of

inattentiveness and hyperactivity was defined as Combined Type ADHD. This, along with

asthma, physical disability, or diabetes, was used to construct a variable measuring chronic

health problems in childhood.

Measures of Community Capital

To control for community characteristics that might affect individual propensity to use welfare, we controlled for the proportion of the neighborhood (tract level) that is below the 1989 poverty line and the proportion of households in the neighborhood (tract level) that was headed by a female. We also controlled for the type of school the respondent attends at Wave 1 (public or private, as indicated by the school administrator), and for the proportion of students at the respondent's school that is eligible for free and reduced price lunch (FRPL). It was assumed that, unless otherwise indicated, private schools did not participate in free and reduced lunch programs and thus zero percent of the student body was eligible for FRPL (although some school administrators categorized their school as private and also reported that some students were eligible to receive free and reduced price lunches). To retain cases that did not have free and reduced price lunch data, we imputed the mean for public schools with missing free and reduced price lunch data and included a missing indicator variable. We also controlled for other neighborhood characteristics, such as the urbanicity of the census tract, which measured the proportion of the population that lives inside an urbanized area. Lastly, to control for individuals who move states, potentially to receive more generous public assistance benefits, we controlled for whether the respondent moved to a new state between childhood (Waves 1 or 2) and adulthood (Waves 3 or 4).

Analytic Approach

There were four investigative aims of this paper. The first was to determine the factors that predict public assistance receipt in adulthood. The second was to identify the factors that

explain persistence of childhood public assistance participation into adulthood. The third aim

was to identify the factors that explain downward mobility (i.e. public assistance participation

among those who did not receive welfare in childhood). Lastly, the fourth aim was to examine

the role of education as a mediating mechanism between child and adulthood public assistance

use.

We estimated linear probability models to determine the childhood factors that predict

receipt of public assistance in adulthood. We began by estimating the probability of receiving

public assistance as a function of parental welfare use during childhood, individual demographic

characteristics, human capital, health and health behavior, and community capital. Focusing on

the same outcome of public assistance in adulthood, we then divided the analytic sample into two

groups: those who did receive public assistance in childhood (to analyze persistence) and those

who did not (to analyze downward mobility). This approach allowed us to examine if different

variables affect public assistance participation differently across the two groups. To account for

the design effects in the sampling of Add Health, all estimates were weighted and standard errors

are clustered at the school level.

Results

Descriptive Statistics

In Table 1, we present a transition matrix of public assistance receipt in childhood and

adulthood. Note here that the sample size is unweighted but the proportions are weighted. There

was a lack of perfect correlation between welfare in childhood and adulthood, which is in line

with previous literature. Among those who received public assistance in childhood, 45%

participated in public assistance in adulthood. However, it appears that those on public assistance in childhood had a greater probability of being on public assistance in adulthood. Just under 20% of those who were not on public assistance in childhood found themselves on public assistance in adulthood, compared to the 45% of those who grew up with welfare. These summary statistics suggest evidence of some intergenerational transmission of welfare; but they also suggest some downward mobility among non-welfare children that is worth exploration.

In Table 2, we report the means of key independent variables used in the analysis and compare differences in means across those who received welfare in childhood and those who did not. A majority of the sample did not have parents who received public assistance in adolescence (83%). Among those who received public assistance in childhood, 46% were White, 34% were Black, 4% were first-generation Hispanic, 8% were second-generation Hispanic, and 6% were third-generation Hispanic. Among childhood non-receivers, 73% were White, 12% were Black, 2% were first-generation Hispanic, 4% were second-generation Hispanic, and 4% were third-generation Hispanic. Approximately half the sample was female, the average age of the sample by Wave 4 was 28 years, and nearly the entire sample (98%) were U.S. citizens by Wave 4.

There were significant differences in the sample in terms of human capital. Respondents who grew up in welfare households were more likely to be high school drop outs or have high school as the highest level of education completed by Wave 4. They also had significantly lower AH-PVT scores from adolescence, and were more likely to be raised by a parent who was a high school drop out or had high school as the highest level of education completed. Respondents who grew up in welfare households are also, as expected, more likely to have had lower

household incomes than their non-welfare counterparts. They were also less likely to be raised by two biological parents and more likely to be raised in a single parent household.

Significant differences between childhood welfare recipients and non-recipients also existed in health and health behavior variables. Respondents who grew up with welfare were more likely to have had sex before the age of 15, less likely to self-report very good or excellent health in adolescence, and more likely to have at least one chronic health condition or be obese during adolescence.

The neighborhood context also differed between childhood welfare receipt versus non-receipt. Those whose parents received welfare in childhood were also more likely to live in poorer neighborhoods and in communities with more households headed by single mothers. They were also more likely to attend public school and to attend schools where a larger proportion of students received free and reduced price lunch.

Determinants of Public Assistance Receipt in Adulthood

Table 3 shows the relationship between childhood and adulthood public assistance receipt for the whole sample. Having parents who received any form of public assistance in adolescence significantly increased the probability an individual will participate in public assistance in adulthood by 10 percentage points. Compared to the unconditional probability of adulthood welfare receipt (represented by those in the sample who received welfare in adulthood but did not come from welfare households), growing up with welfare in childhood increased the probability of receiving welfare from 20 to 30% (holding all else equal).

Black and Asian respondents were not significantly more likely to receive public assistance relative to White respondents. First- and second-generation Hispanic respondents were

9 to 10 percentage points less likely to participate in public assistance in adulthood than White

respondents. Females, however, were 12 percentage points more likely than males to receive

welfare, but this may be driven by eligibility criteria for many public assistance programs (i.e.

having a child).

Table 3 also shows that human capital variables were an important factor in predicting

the probability of public assistance participation in adulthood. The more education an individual

had, the less likely he or she relied on public assistance. Similarly, the higher the parent's level

of education, the less likely the child needed to use public assistance in adulthood. An increase in

household income in childhood also significantly reduced the probability of welfare receipt in

adulthood. Furthermore, relative to growing up with two biological parents, living in a single

parent household or having a non-biological parent significantly increased one's risk of public

assistance participation in adulthood. These results demonstrate that the socioeconomic

circumstances a child grew up in had a statistically significant impact on the probability he or she

will participate in welfare as an adult. It also appears that after controlling for individual level

socioeconomic factors, neighborhood factors were not significant.

Childhood health also had a significant impact on the probability of participating in

welfare as an adult. Early sexual debut increased the risk of public assistance participation.

Reporting good, fair, or poor health in Wave 1 significantly increased the probability of welfare

take up in adulthood relative to those who reported excellent or very good health in Wave 1.

Likewise, those who had at least one chronic illness before the age of 18 were more likely to

participate in public assistance in adulthood compared to those who did not have any chronic

illnesses. Children who were obese were also significantly more likely to be on public assistance

in adulthood than their non-obese counterparts. Adolescent substance use, however, did not have

a significant impact on welfare receipt in adulthood. This illustrates that childhood health played

an important role in whether an individual used welfare in adulthood.

Persistence of Public Assistance and Downward Mobility

In Table 4, we present the results for the two separate groups: those who grew up with

welfare (N=2,390) and those who did not (N=11,747). Among those who grew up in households

with public assistance, females were 20 percentage points more likely to use welfare in

adulthood than males. As well, relative to their White counterparts, Black individuals were 7

percentage points more likely to use welfare in adulthood. Higher educational attainment

reduced the risk of needing to rely on public assistance. However, growing up in a single-parent

household or having two non-biological parents increased the risk of adulthood welfare use

relative to individuals who lived in two biological-parent households by 8 and 12 percentage

points respectively. The only health variable that was statistically significant is childhood

obesity, which increases the probability of adulthood public assistance participation by 13

percentage points relative to non-obese children.

In contrast, different sets of variables appear to determine adulthood welfare use among

those who did not grow up with welfare. Asian and first- and second-generation Hispanic

individuals were significantly less likely to use welfare in adulthood relative to White

individuals. Furthermore, there was no significant difference in welfare use between Black and

3rd generation Hispanic individuals and their White counterparts. However, females were still

more likely than males to use public assistance in adulthood, with an increased probability of 10

percentage points.

Human capital also continued to play a significant role among non-recipient children, where more education decreased the probability of welfare use in adulthood. The educational attainment of the parents was also significant, where individuals with more highly educated parents were less likely to need public assistance in adulthood. Household income is significant; higher income levels reduced the risk of welfare use later in life. However, the only household structure variable that was significant is growing up in a two non-biological parent family. Growing up with a single parent did not significantly differ the risk of adulthood welfare use relative to those who grew up in a two-parent household.

Unlike those who grew up with welfare, health capital played a critical role in predicting adulthood welfare use among non-recipient children. Having sex before age 15, being in worse health, having at least one chronic health problem, and obesity all increased the risk of public assistance use in adulthood. Also unlike their recipient counterparts, non-recipient children were affected by their neighborhood environment. Living in a neighborhood with more female-headed households increased the chance of adulthood welfare use. Attending a school with a larger proportion of students who received free and reduced price lunch also increased the probability of participating in welfare in adulthood.

Education as a Mechanism for Public Assistance Participation in Adulthood

Given the importance of education, we examined the role education plays as a mechanism linking parental and child public assistance participation. To do so, we examined what factors impacted the probability of high school graduation for both childhood recipients and non-recipients of welfare (Table 5). Among childhood recipients of welfare use, the probability of graduating high school for Black, first-, and second-generation Hispanic individuals was 15,

20, and 13 percentage points (respectively) higher than White individuals who grew up with welfare. These values were larger in magnitude than Black and Hispanic individuals who grew up without welfare (only Asian and Black children had a statistically significant greater probability of graduating high school relative to White children). Higher levels of parental education was also positively associated with high school graduation for both groups of children, but household income only had a significant impact on high school graduation for those who grew up without welfare. Household structure also seemed to matter more for children who grew up without welfare, as having a non-biological parent or a single parent significantly reduced the probability of high school graduation relative to those who had two biological parents. Having another type of household structure (i.e. being raised by grandparents or another relative) significantly reduced high school graduation chances for both groups.

Health behavior and factors were significant in predicting high school graduation. Early sexual debut significantly reduced the probability of high school graduation by 13 and 9 percentage points for recipient and non-recipient children respectively. Substance use also reduced the probability of high school graduation by 7 and 4 percentage points for recipient and non-recipient children respectively. Self-reporting worse health in childhood negatively impacted high school graduation with one exception; non-recipient children who reported fair or poor health did not significantly differ from children who reported excellent or very good health. Also, chronic health problems reduced the probability of high school graduation for non-recipient children by 4 percentage points, but there was no significant association for recipient children. Conversely, childhood obesity significantly increased the probability of graduating high school by 9 percentage points relative to non-obese children, but this was only significant for

children who grew up with welfare. Neighborhood characteristics appear to have little impact on the probability of graduating high school.

Discussion

This study examined the intergenerational transmission of public assistance using national longitudinal data from a cohort of American adolescents over a 14-year period. An important finding from our analysis is that while receipt of public assistance in childhood does not automatically translate into receipt during adulthood, it remains a strong predictor of whether or not an individual receives public assistance in adulthood. We also confirm the significance of education and parental education in predicting welfare use in adulthood. Graduating from high school is enough to significantly decrease the risk of adulthood welfare participation (relative to high school dropouts) by 9 to 16 percentage points. The significance of educational attainment in reducing the probability of welfare use emphasizes the importance of human capital investments, with a lack of education resulting in downward mobility and increased likelihood of welfare use in adulthood.

We also note the important role health capital has to play in protecting someone against welfare use. No other studies, to our knowledge, have examined the role of childhood health on public assistance use. Risky health behaviors in childhood and poor health directly predict welfare use, but only for those who did not grow up with welfare. Thus poor health in adolescence, the years when human capital investments are especially critical for future educational attainment, is a likely origin of pathways into poverty and welfare dependence for those without welfare experience in childhood. Not surprisingly there is an indirect impact of

health that is important for both groups of children. Childhood health affects welfare use

through its impact on education. That is, poor health appears to reduce the probability of

graduating high school for all children, regardless of whether their parents received welfare in

childhood. Lower educational attainment in turn increases the probability of welfare receipt in

adulthood. Thus, childhood health plays an indirect role in the probability of welfare use in

adulthood.

Childhood obesity presents a puzzle in its relationship with adulthood welfare use.

Childhood obesity increases the risk of welfare use for both groups of children, but also increases

the probability of graduating from high school for those who grew up with welfare. Although

seemingly counterintuitive, insights from the labor market literature may provide an explanation.

While our findings show that obese children on welfare were more likely to finish high school,

they may not attain as high a level of education post-secondary school as their non-obese

counterparts (Gortmaker et al. 1993). Previous studies have found that higher body weight is

associated with decreases in wages, particularly for white and black women (Cawley and

Danziger 2004; Han, Norton, and Stearns 2009). Other studies have also found that childhood

obesity predicts lowered adult income as well (Reilly et al. 2003). Furthermore, Han, Norton,

and Stearns (2009) found that obesity decreases the probability of being employed among white

and Hispanic women by 1.5 and 4.5 percentage points, respectively. A potential mechanism

explaining this wage penalty might be a distaste for hiring overweight individuals, especially for

positions that require high degree of interpersonal interaction (Han, Norton, and Stearns 2009);

or due to obesity-related disabilities or chronic illnesses that might prevent work (Renna and

Thakur 2010). Therefore, given that childhood obesity increases the risk of obesity in adulthood

(Serdula et al. 1993; Dietz 1998; Reilly et al. 2003; Singh et al. 2008), the positive association

between childhood obesity and adult welfare use might be explained by the decreases in wages and employment that is associated with higher body weights. Our results contribute to the obesity and labor market literature by demonstrating the role childhood obesity plays in public assistance receipt in adulthood.

One potential limitation of our analysis is that it does not consider the length of time parents were on welfare and how that might differentially affect children. However, Pepper (1995) found that length of time parents were on welfare had no significant impact on whether daughters participated in welfare later in life. It may be reasonable to expect that it is the receipt of welfare, not the length of time that is most important to consider.

Overall, this suggests that policies that can improve the health of children will have long-term effects that reduce the risk of public assistance in adulthood. Not only does this provide benefits to the individual, but may also result in a cost-efficient result for governments: an intervention in childhood may reduce the portion of future state budgets devoted to public assistance programs (while increasing the health and productivity of citizens). Thus, while we see evidence that parental welfare use increases the probability of the child's welfare use later in life, it is difficult to conclude that this is purely a "culture of welfare" effect, especially since the intergenerational transmission is not 100%. Rather, the importance of education and health is critical to recognize, as these mechanisms serve as protective factors from welfare use and are fundamental aspects that structure inequality in American society. The key message for policymakers is that welfare use is a much broader problem than individual poverty. Rather, effective policy measures should take a more holistic (i.e. general equilibrium) approach and address issues related to childhood health and neighborhood conditions/urban planning, as well as economic circumstances.

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Figure 1: Conceptual model linking childhood and adulthood public assistance receipt
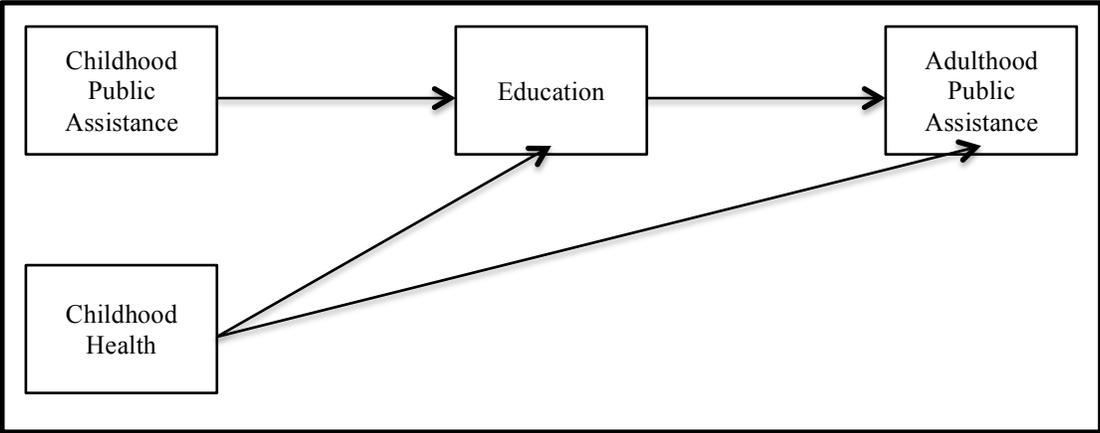
Table 1.   Transition Matrices for Public Assistance Receipt (N=14,137)

| | Received Public Assistance in Adulthood | | |
	Yes	No	Total
Received Public Assistance in Childhood			
Yes			
Cell %	7.88	9.56	17.44
Row %	45.16	54.84	100.00
N	990	1,400	2,390
No			
Cell %	16.12	66.44	82.56
Row %	19.53	80.47	100.00
N	2,242	9,505	11,747
Total	3,232	10,905	14,137
	24.00	76.00	100.00

Note: Sample N's are unweighted but proportions are weighted.

Table 2. Descriptive Statistics of Independent Variables, by Public Assistance during Childhood

Variable		Full Sample	Received Public Assistance Yes	No	
	N	14,137	2,390	11,747	
Percentage of Full Sample			0.17	0.83	
Demographic Characteristics					
White (%)		0.68	0.46	0.73	***
Asian (%)		0.04	0.03	0.04	
Black (%)		0.16	0.34	0.12	***
Hispanic 1st Generation (%)		0.03	0.04	0.02	
Hispanic 2nd Generation (%)		0.05	0.08	0.04	*
Hispanic 3rd Generation (%)		0.05	0.06	0.04	
Female (%)		0.49	0.51	0.49	
Age, W4 (mean)		28.32	28.30	28.33	
U.S. citizen by Wave 4 (%)		0.98	0.98	0.98	
Child's Human Capital					
Less than High School/GED (%)		0.11	0.25	0.08	***
High School (%)		0.15	0.23	0.13	***
Some College/Vocational School (%)		0.37	0.35	0.38	
College (%)		0.25	0.12	0.28	***
Professional/Graduate Training (%)		0.11	0.04	0.13	***
PPVT score (10s), Wave 1 (mean)		10.15	9.34	10.32	***
Parents' Human Capital					
Parent is a HS dropout (%)		0.12	0.31	0.08	***
Parent is a HS graduate (%)		0.27	0.37	0.25	***
Parent has some College (%)		0.29	0.24	0.31	***
Parent has a College/Graduate degree (%)		0.30	0.07	0.35	***
Log of Household Income at Wave 1 (mean)		3.60	2.85	3.76	***
Two Biological Parent Family (%)		0.55	0.29	0.61	***
Two Step/Adoptive-Parent Family (%)		0.17	0.17	0.17	
Single Parent Family (%)		0.23	0.45	0.18	***
Other Household Structure (%)		0.05	0.09	0.04	***
Health and Health Behaviors					
Had Sex before age 15		0.38	0.49	0.36	***
Excellent-V. Good Health, W1 (%)		0.67	0.61	0.69	***
Good Health, W 1 (%)		0.26	0.28	0.25	*
Fair or Poor Health, W1 (%)		0.07	0.11	0.06	***
Any Substance Use, <18 (%)		0.63	0.61	0.64	
Any Chronic Health Problem, <18 (%)		0.19	0.22	0.19	**
Obesity, W1-W2		0.11	0.15	0.10	***
Community Capital (Wave 1)					
Proportion of Tract <100% FPL		0.12	0.20	0.10	***
Proportion of Female Headed HH (Tract)		0.07	0.10	0.06	***

Proportion of School with FRL (%)	0.24	0.35	0.22	***
Attends Public School (%)	0.93	0.98	0.92	**
Urban, W1 (%)	0.58	0.63	0.56	
Moved States between W1/W2 and W3/W4	0.36	0.29	0.38	***

* p<.05, ** p<.01, *** p<.001

Notes: To account for the sampling design of the Add Health survey, all models are estimated using weighted data and standard errors are clustered at the school level. All N's are unweighted but proportions are weighted.

Table 3. Linear Probability Model of Adulthood Public Assistance (N = 14137)

	Coefficient	s.e.
Independent Variable		
Public Assistance Receipt in Childhood	0.10***	(0.02)
Demographic Characteristics		
White (ref)	---	
Asian	-0.04	(0.03)
Black	0.03	(0.02)
Hispanic 1st Generation	-0.09*	(0.04)
Hispanic 2nd Generation	-0.10***	(0.02)
Hispanic 3rd Generation	-0.04	(0.02)
Female	0.12***	(0.01)
Age, W4	0.00	(0.00)
U.S. citizen by Wave 4	0.02	(0.03)
Child's Human Capital		
Less than High School/GED (ref)	---	
High School	-0.12***	(0.02)
Some College/Vocational School	-0.14***	(0.02)
College	-0.21***	(0.02)
Professional/Graduate Training	-0.25***	(0.02)
PPVT score (10s), Wave 1	-0.01*	(0.00)
Parents' Human Capital		
Parent is HS dropout (ref)	---	
Parent is HS graduate	-0.04*	(0.02)
Parent has some College Education	-0.04*	(0.02)
Parent has College/Graduate degree	-0.07***	(0.02)
Log of Household Income W1	-0.02**	(0.01)
Two Biological Parent Family (ref)	---	
Two Step/Adoptive-Parent Family	0.05**	(0.01)
Single Parent Family	0.03*	(0.01)
Other Household Structure	0.04	(0.03)
Health and Health Behaviors		
Had Sex before Age 15	0.04**	(0.01)
Excellent-V. Good Health, W1 (ref)	---	
Good Health, W1	0.03*	(0.01)
Fair or Poor Health, W1	0.07**	(0.02)
Any Substance Use, <18	0.01	(0.01)
Any Chronic Health Problem, <18	0.05***	(0.01)
Obesity, W1-W2	0.06***	(0.02)
Community Capital		
Proportion of Tract <100% FPL	0.11	(0.09)
Proportion of Female Headed HH (Tract)	0.26	(0.20)
Proportion of School with FRL (%)	0.05	(0.04)
Attends Public School (%)	0.00	(0.02)
Urban, W1 (%)	0.00	(0.01)

Moved States between W1/W2 and W3/W4	0.03**	(0.01)
N	14,137	
R^2	0.16	
F	31.01	

* $p<0.05$, ** $p<0.01$, *** $p<0.001$

Notes: Mean imputation used to replace missing values on PPVT score (N=652), household income (N=3398), proportion of students with free and reduced price lunch (N=2267). For each imputed variable, an indicator variable was included in the model to indicate responses with missing values. An indicator variable was also included to indicate observations with missing data on parents' education (N=1757). Constants and coefficients on missing values indicators are not shown. To account for the sampling design of the Add Health survey, all models are estimated using weighted data and standard errors are clustered at the school level. All N's are unweighted but coefficients reflect weighted estimates.

Table 4. Linear Probability Models of Adult Public Assistance Participation

	Received Public Assistance in Childhood			
	Yes		No	
	Model 1		Model 2	
	Coefficient	s.e.	Coefficient	s.e.
Demographic Characteristics				
White (ref)	----		----	
Asian	0.10	(0.07)	-0.06*	(0.02)
Black	0.07*	(0.03)	0.03	(0.02)
Hispanic 1st Generation	-0.02	(0.11)	-0.12***	(0.03)
Hispanic 2nd Generation	-0.06	(0.05)	-0.11***	(0.02)
Hispanic 3rd Generation	-0.03	(0.06)	-0.05	(0.03)
Female	0.20***	(0.03)	0.10***	(0.01)
Age, W4	-0.01	(0.01)	0.00	(0.00)
U.S. citizen by Wave 4	0.01	(0.12)	0.02	(0.03)
Child's Human Capital				
Less than High School/GED (ref)	----		----	
High School	-0.16***	(0.03)	-0.09***	(0.02)
Some College/Vocational School	-0.20***	(0.03)	-0.11***	(0.02)
College	-0.29***	(0.05)	-0.18***	(0.02)
Professional/Graduate Training	-0.49***	(0.04)	-0.21***	(0.03)
PPVT score (10s), Wave 1	-0.02	(0.01)	-0.01*	(0.00)
Parents' Human Capital				
Parent is HS dropout (ref)	----		----	
Parent is HS graduate	-0.01	(0.04)	-0.06*	(0.02)
Parent has some College Education	0.02	(0.04)	-0.06**	(0.02)
Parent has College/Graduate degree	-0.02	(0.05)	-0.09***	(0.02)
Log of Household Income at Wave 1	-0.01	(0.02)	-0.04***	(0.01)
Two Biological Parent Family (ref)	----		----	
Two Step/Adoptive-Parent Family	0.12**	(0.04)	0.04*	(0.01)
Single Parent Family	0.08*	(0.03)	0.02	(0.01)
Other Household Structure	0.06	(0.05)	0.05	(0.03)
Health and Health Behaviors				
Had Sex before age 15	0.03	(0.03)	0.04**	(0.01)
Excellent-V. Good Health, W1 (ref)	----		----	
Good Health, W1	0.01	(0.03)	0.03*	(0.01)
Fair or Poor Health, W1	0.06	(0.05)	0.07**	(0.02)
Any Substance Use, <18	0.03	(0.03)	0.01	(0.01)
Any Chronic Health Problem, <18	0.04	(0.03)	0.04***	(0.01)
Obesity, W1-W2	0.13**	(0.05)	0.04*	(0.02)
Community Capital				
Proportion of Neighborhood BPL (Tract Level)	0.26	(0.15)	0.03	(0.10)
Proportion of Female Headed HH (Tract Level)	-0.21	(0.32)	0.50*	(0.22)
Proportion of School with FRL (%)	-0.09	(0.09)	0.08*	(0.04)
Attends Public School (%)	0.07	(0.12)	-0.01	(0.02)
Urban, W1 (%)	-0.03	(0.04)	0.01	(0.01)

Moved States between W1/W2 and W3/W4	0.03	(0.03)	0.03**	(0.01)
N	2390		11747	
R^2	0.15		0.11	
F	13.26		17.04	

* p<0.05, ** p<0.01, *** p<0.001

Notes: Mean imputation used to replace missing values on PPVT score (N=652), household income (N=3398), proportion of students with free and reduced price lunch (N=2267). For each imputed variable, an indicator variable was included in the model to indicate responses with missing values. An indicator variable was also included to indicate observations with missing data on parents' education (N=1757). Constants and coefficients on missing values indicators are not shown. To account for the sampling design of the Add Health survey, all models are estimated using weighted data and standard errors are clustered at the school level. All N's are unweighted but coefficients reflect weighted estimates.

Table 5. Linear Probability Model of Public Assistance on High School Graduation

	Received Public Assistance in Childhood			
	Yes		No	
	Model 1		Model 2	
	Coefficient	s.e.	Coefficient	s.e.
Demographic Characteristics				
White (ref)	---		---	
Asian	0.09	(0.07)	0.06***	(0.02)
Black	0.15***	(0.04)	0.07***	(0.02)
Hispanic 1st Generation	0.20*	(0.09)	0.08	(0.04)
Hispanic 2nd Generation	0.13*	(0.05)	0.04	(0.02)
Hispanic 3rd Generation	0.12	(0.07)	-0.02	(0.03)
Female	0.07*	(0.03)	0.04***	(0.01)
Age, W4	0.01	(0.01)	0.01***	(0.00)
U.S. citizen by Wave 4	-0.09	(0.09)	0.02	(0.03)
Child's Human Capital				
PPVT score (10s), Wave 1	0.04***	(0.01)	0.03***	(0.00)
Parents' Human Capital				
Parent is HS dropout (ref)	---		---	
Parent is HS graduate	0.15***	(0.04)	0.08**	(0.03)
Parent has some College Education	0.14***	(0.04)	0.11***	(0.03)
Parent has College/Graduate degree	0.28***	(0.04)	0.13***	(0.02)
Log of Household Income at Wave 1	-0.02	(0.02)	0.04***	(0.01)
Two Biological Parent Family (ref)	---		---	
Two Step/Adoptive-Parent Family	-0.01	(0.03)	-0.06***	(0.01)
Single Parent Family	-0.03	(0.03)	-0.04**	(0.01)
Other Household Structure	-0.15**	(0.05)	-0.08**	(0.03)
Health and Health Behaviors				
Had Sex before age 15	-0.13***	(0.03)	-0.09***	(0.01)
Excellent-V. Good Health, W1 (ref)	---		---	
Good Health, W1	-0.07**	(0.02)	-0.04***	(0.01)
Fair or Poor Health, W1	-0.13*	(0.06)	-0.03	(0.02)
Any Substance Use, <18	-0.14***	(0.03)	-0.05***	(0.01)
Any Chronic Health Problem, <18	-0.05	(0.03)	-0.04***	(0.01)
Obesity, W1-W2	0.09**	(0.03)	-0.01	(0.01)
Community Capital				
Proportion of Tract <100% FPL	-0.18	(0.21)	0.04	(0.08)
Proportion of Female Headed HH (Tract)	0.07	(0.36)	-0.29	(0.15)
Proportion of School with FRL (%)	-0.09	(0.10)	-0.03	(0.05)
Attends Public School (%)	-0.01	(0.05)	-0.04	(0.02)
Urban, W1 (%)	0.00	(0.04)	-0.02	(0.01)
Moved States between W1/W2 and W3/W4	0.07*	(0.03)	0.01	(0.01)
N	2,390		11,747	
R^2	0.17		0.13	

F	9.85	16.48

* p<0.05, ** p<0.01, *** p<0.001

Notes: Mean imputation used to replace missing values on PPVT score (N=652), household income (N=3398), proportion of students with free and reduced price lunch (N=2267). For each imputed variable, an indicator variable was included in the model to indicate responses with missing values. An indicator variable was also included to indicate observations with missing data on parents' education (N=1757). Constants and coefficients on missing values indicators are not shown.   To account for the sampling design of the Add Health survey, all models are estimated using weighted data and standard errors are clustered at the school level. All N's are unweighted but coefficients reflect weighted estimates.

Appendix Table 1. Breakdown of Public Assistance Participation in Childhood (N=14137)

	N	% of analytic sample
Specific Public Assistance Program		
SSI	767	5.43
AFDC	844	5.97
Food Stamps	1426	10.09
Housing Subsidy/Public Housing	377	2.67
Unspecified public assistance/welfare	784	5.55
Any Public Assistance Program	2390	16.91

Notes: Total of Specific Public Assistance Programs does not add up to the "Any Public Assistance Program" category because one individual can be on more than one public assistance program. Both N's and proportions are unweighted.