

# ASSESSING THE LONG-RUN BENEFITS OF TRANSFERS TO LOW-INCOME FAMILIES

**Kristin F. Butcher**

Marshall I. Goldman Professor of Economics, Wellesley College  
Research Associate, NBER

## SUMMARY

Should many government transfer programs be considered public investments? If a transfer program affects children's lives in ways that improve their well-being as adults, that program isn't much different from a road project or a government-funded scientific breakthrough. A growing body of research finds that transfers to low-income families with children have long-run payoffs.

This paper surveys the literature on the long-run impact on children of cash transfers, food and nutrition programs, health care and health insurance, and housing initiatives. There is mounting and dramatic evidence that transfers to low-income families early in children's lives manifest later in life. Work from across disciplines has developed a robust body of research indicating that children's environment in the prenatal, neonatal, and early childhood periods can profoundly affect the capacities that children develop. These capacities persist into adulthood, affecting earnings, health, and other life outcomes.

Among the findings:

- 1. Cash transfers:** The Earned Income Tax Credit (EITC) appears to have a direct effect on children's health and educational outcomes. The EITC matters for children in ways that potentially translate into greater productive capacity later in these children's lives.
- 2. Food and nutrition programs:** Children in counties that were early adopters of food stamps, the predecessor to the Supplemental Nutrition Assistance Program, compared to similar children in other counties, had higher birthweights and lower neonatal mortality, and later in life those who were exposed to food stamps from ages 0-5 had better health outcomes. The Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) also appears to have a positive effect on birth weight.
- 3. On health care and health insurance:** Medicaid eligibility early in life reduces adult mortality and disability rates, and improves economic outcomes. Providing health insurance early in children's lives has substantial long-run benefits.
- 4. On housing programs:** There is limited evidence on the long-run impact of the primary government housing programs, but the "Moving to Opportunity" experiment, which paid for participants to move from high-poverty to lower-poverty communities, appears to have had substantial, positive long-run effects on those children who were younger than 13 at the time of the move. As adults, recipients earn more money and live in higher income households. They are more likely to go to college and they attend colleges that are higher quality.

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## I. INTRODUCTION

Government spending on research and development, infrastructure, and education is often thought of as an investment in productive capacity. New discoveries spark growth, roads and bridges allow workers to get to jobs and goods to get to markets, and education raises the productive capacity of the next generation. Although there may be disagreement about how much to fund these endeavors and how best to finance them, there is generally agreement that these are investments: for an upfront outlay, society has every expectation of being paid back more than that original outlay. Spending on transfer programs to low-income families, on the other hand, are generally viewed very differently. Food stamps, housing, cash grants, health insurance, and the like are viewed as transfers that raise current consumption and guard against undue suffering in the current period.<sup>1</sup> These programs are generally viewed with suspicion because they have work disincentives, and these may have long-term adverse consequences if they reduce a family's ability to be self-sufficient in the future, and particularly, if the next generation learns to be less self-reliant.<sup>2</sup> If, however, transfers to low-income families that affect children fundamentally change the productive capacity of the next generation, then these transfers should be viewed as investments as well. These investments, in human capital, may pay off for society just as investments in physical capital can. This paper assesses recent research findings on the long-term effects of transfers to low-income families, in particular those transfers that are likely to disproportionately affect low-income children, and investigates whether these are rightly thought of as investments in human capital. As the U.S. decides what to fund and what to cut, it is important to understand the evidence about what leads to greater productive capacity and growth.

The paper is organized as follows: section II lays out how we would ideally assess long-term effects of programs. Section III describes the evidence for the influence of early life conditions on later-in-life outcomes. Section IV presents the measurement and methodological challenges researchers face when evaluating the long-term effects of transfer programs. Section V turns to describing the transfer programs themselves. This section is organized according to the type of program: cash transfers, food and nutrition, health care and health insurance, and housing. In each section, I discuss theoretical considerations, as well as provide an overview of the literature on the effectiveness of these programs. I especially focus on the small-but-growing literature examining the long-term returns to these transfer programs. Section VI concludes and discusses what else we would like to know and how we might learn it.

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1 Transfers that solely raise current consumption for low-income families are bound to be controversial as they involve taking money from higher-income individuals and giving it to lower-income individuals. Higher-income individuals may consent to this for many reasons: they may be directly adversely affected by observing suffering. They may believe that ensuring current consumption staves off violent upheaval. They may have motives that are closer to self-interest, because they recognize that the world is an uncertain place, and they may be counted among the low-income sometime in the future, and thus they may have the foresight to support programs that they may rely on one day. Transfers that merely raise current consumption may improve overall well-being in society if a dollar taken from a wealthy family does less to diminish that family's well-being than the same dollar does to enhance the well-being of a poor family.

2 Indeed, some evidence from Scandinavian countries, for example, suggests there can be an intergenerational transmission of welfare dependency (Dahl, Kostol, and Mogstad 2014, Heckman and Landerso 2016). However, whether evidence from countries with famously generous safety net programs has implications that are directly applicable to the U.S. is open to debate.

## II. HOW TO ASSESS THE LONG-TERM RETURN ON INVESTMENTS OF TRANSFER PROGRAMS

Ideally, society would undertake all social programs that pass a cost-benefit analysis such that the present discounted benefits are greater than the costs. The costs would include the direct costs of the program—how much money is spent both in the transfer and its administration—plus any decreases in well-being and deadweight losses that are created by taking money from one group and transferring it to another.<sup>3</sup> In principle, calculating the costs (at least the direct costs) is relatively straightforward. We would then like to compare those costs to the benefits. The present value of the benefits needs to include both the current improvement in quality of life of the individuals receiving the benefit, and any effects on future well-being. That future well-being could be due to things that are relatively easy to measure, like wages or to things that are more difficult to assess, like improved quality of life from better health. Ideally, one would measure and monetize all current and future costs and benefits, use a discount rate to turn them into a present discounted value, and undertake all programs where the benefits are greater than the costs.

This, of course, is a tall order. Programs are generally evaluated much more narrowly. For example, job training programs might be evaluated on whether increased earnings after the program, summed up over the participants' working life, are greater than the costs of the training program (all properly discounted). (See for example Jacobson, LaLonde, and Sullivan (2005) and cites therein.) Usually, potential benefits (or costs), like participants enjoying the program or improvements in mental health that come from better job market outcomes, are not taken into account. For the transfer programs described in this paper, even a narrowly cast cost-benefit analysis is not always possible, either because the data on costs and benefits are not available, or because we do not know how to monetize the benefits and appropriately measure them. As a first step, the paper will present recent evidence that links publicly-provided transfers received in the past to adult outcomes and assess whether the effects of these transfers are positive, negative, or neutral for adult outcomes. When a comparison of costs and benefits is available, it will be noted.

## III. EVIDENCE ON THE LASTING IMPACT OF EARLY LIFE: POTENTIAL PATHWAYS

In order for transfers to low-income families to be an investment in human capital, early-in-life outcomes must directly affect adult outcomes. In addition, it must be the case that *transfers* are of a type and size that actually can meaningfully change early-in-life outcomes. It could be, for example, that transfers of resources are so small that they cannot meaningfully affect early-in-life circumstances. Similarly, it could be the case that the families who receive transfers do not use them in ways that alter early-in-life outcomes in productive ways. For example, if a family receives a cash transfer, it is possible that the family reduces work effort by the amount of the cash transfer, and uses that time in ways that do not promote the future well-being of the children.<sup>4</sup>

3 There is a current benefit and a current cost to the households who receive and lose the amount of the transfer, respectively. It is easy to believe that the happiness gained from an extra dollar to a low-income household is greater than the happiness lost by the removal of that one dollar from a well-off household, if we believe that individuals exhibit diminishing marginal utility of income. Diminishing marginal utility is the idea that one's first dollar adds more to one's happiness than one's second, etc. "Deadweight loss" is the notion that interfering in markets can create losses from one group that do not show up as gains to anyone else.

4 Of course, if the family reduces labor supply in response to the cash transfer, but uses the additional time in activities that benefit the children—talking to them, reading to them, playing with them, or preparing nutritious meals for them—then it may be that this would qualify as a productive long-term investment.

In this section, we will examine the pathways through which early-in-life environments may alter children's long-term prospects. Section V will turn to evidence on how transfer programs function in altering that environment.

## A. Links between early and later-in-life outcomes

Research over the last decade has contributed to our understanding of the correlation between outcomes in early and later life. For example, Black et. al. (2007), using administrative data from Norway linking birth weight to later-in-life outcomes, find that, even within twin pairs, having higher birth weight is associated with higher stature later in life, higher IQ, higher likelihood of high school completion, and higher earnings. Case and Paxson (2008) present evidence from the United States and the United Kingdom that individuals who are taller also have higher cognitive ability. Height in adulthood is determined by the accumulation of growth over childhood, and there are two periods of intense growth: from 0-3 in early childhood, and the adolescent growth spurt. Research suggests that individuals who experience deprivation in adolescence may make up for it with a longer growth period (Steckel 1995). However, those who experience deprivation during the *earlier* period have permanently reduced stature. If the environmental (nutritional and disease, primarily) conditions that promote individuals meeting their full height potential are also those that promote individuals meeting their full cognitive potential, then it makes sense that those who are taller, will, on average, have greater cognitive ability (Case and Paxson 2008 and cites therein).<sup>5</sup>

The above research makes the case that early-in-life outcomes are correlated with later-in-life outcomes. However, we also want to know if those early-in-life outcomes are malleable. If, for example, some women simply have physical characteristics that limit the pass-through of nutrients from their blood stream to the *in utero* environment, then changing the mother's nutritional environment would not alter potential fetal development. Or, if shorter-stature individuals simply have digestive tracts that are, for randomly occurring reasons, less able to extract nutrients from the food they consume, then that would suggest there is little to be done by altering their environment that can affect their long-term outcomes.

However, a mounting body of evidence indicates that early life experiences can be altered and that these changes have lasting causal effects. This literature documents that, early in life, people's exposure to different environments may cause irreversible differences in their capacities. The "fetal origin's hypothesis," makes the case that the in utero and early childhood environment may cast a particularly long shadow over an individual's future. As Barker (2001) describes in "Fetal and Infant Origins of Adult Disease," the early life period may program individuals for different later-in-life environments. That work uses the following example to demonstrate how early life experiences affect later-in-life outcomes:

The platform for the fetal origins hypothesis is that, like other living creatures in their early life, human beings are "plastic" and able to adapt to their environment. The development of the sweat glands provides a simple example of this [3].<sup>6</sup> All humans have similar numbers of sweat

<sup>5</sup> This does not, of course, mean that all tall people are endowed with greater cognition than all short people. It simply means that the environmental conditions that allow people to achieve their full height potential are similar to the environmental conditions that allow them to achieve their full cognitive potential.

<sup>6</sup> Barker DJP (1998).

glands at birth, but none of them function. In the first 3 years after birth a proportion of the glands become functional, depending on the temperature to which the child is exposed. The hotter the conditions, the greater the number of sweat glands that are programmed to function. After 3 years the programming is complete and the number of sweat glands is fixed. Thereafter the child who has experienced hot conditions will be better equipped to adapt to similar conditions later in life, because people with more functioning sweat glands cool down faster. (p. S2).

Similarly, it is thought that *in utero* and early post-natal periods may program human beings for the nutritional environment they will face. Those who are relatively deprived in their early development may be more likely to develop obesity, type II diabetes, and coronary disease (often termed “metabolic syndrome”) than those who were not deprived. Studies using laboratory techniques and mouse models have found that mice that are deprived *in utero* and during early childhood are more likely to be obese, for example.

Recent research on human beings also suggests that changes to a child’s environment—*in utero* and in the early life period—can change long-term outcomes. In a series of papers, Almond, Mazumder, and co-authors (2011, 2015) looked at cases in a number of countries and found that being *in utero* during the Ramadan fast can affect birthweight (Michigan), disability (in Uganda and Iraq), and test scores (Pakistani and Bangladeshi children in the UK). These studies rely on the fact that the Islamic holy month is not a fixed date, so in different years, pregnancies during different parts of the year will be affected by the fast. The authors compare outcomes for those who were *in utero* in the first, second, or third trimester that overlapped with Ramadan with those who were *in utero* during the same months, but in years when Ramadan did not fall in those months. Although they do not assess whether or not a pregnant woman actually fasted during Ramadan, they find adverse effects, particularly if Ramadan fell early in the pregnancy. These findings are striking for many reasons, but in particular, the fast during Ramadan is only during daylight hours and thus deprivation may be short-lived relative to the deprivation generated by famines, for example.

Almond and Currie (2011) provide a thorough review of the economics literature on the fetal origins hypothesis and finds strong support, from research using many different sources of variation,<sup>7</sup> for the prenatal environment’s long-lasting impact on many different outcomes.<sup>8</sup> The results of this literature are sobering. It is clear both that the prenatal environment affects early-in-life outcomes—like birthweight—and that early-in-life outcomes are linked to longer-term outcomes like height, cognition, health, and earnings. The medical literature has posited a plausible pathway through which these changes may occur: by “programming” the human body to interact with its environment in different ways. Further, the literature suggests that *changes* in the early life environment induced by maternal illness and other adverse events can systematically affect these early and later-in-life outcomes. Effects of changes in the early environment

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7 Amongst other sources, studies have examined the impacts of: earthquakes (Torche 2011), radioactive fallout (Almond et al. 2009, Black et al. 2013), infectious disease exposure (Almond 2006), and pollution (Currie 2011, Sanders 2011). Duncan et al. 2015 uses the timing of the Super Bowl vis-à-vis pregnancies and finds that babies in utero during a “hometown” Super Bowl have an increased probability of lower birthweight.

8 It is worth noting that not all research points to long-term effects of every in utero change. Black et. al. (2016), for example, use rich administrative data from Norway to examine the effects on birth outcomes and later-in-life outcomes of an acute psychological stressor: the death of woman’s parent during her pregnancy. While the results suggest that there are small effects on birthweight and weeks of gestation, there do not appear to be later-in-life effects on educational attainment, earnings, cognitive test scores, height, or BMI.

and longer-term outcomes are quite robust across time periods and places with different levels of economic development.

## B. Poverty, stress, and child development

Recent research by Aizer et al. (2015) may help provide an overarching theme to the literature described in the last section. Perhaps maternal stress, potentially created by many mechanisms—from natural disasters, to infections, to economic shocks—changes the *in utero* environment in ways that adversely affect the child, and the adult that the child grows into. Aizer et al. show that children whose mothers exhibit higher levels of stress hormones (cortisol) during pregnancy have worse health and educational attainment in adulthood compared to their siblings for whom their mother exhibited lower levels of stress hormones. This finding suggests that stress hormones change within a given mother for different pregnancies and that these hormones are related to long-term outcomes. Might poverty be a source of stress that affects the *in utero* environment and long term outcomes?

What of other periods of development in a child's life? Research in neuroscience suggests that there are “sensitive” periods when the development of a type of capacity may be affected, and critical periods during which the capacity must be developed (Knudsen 2004, Cunha and Heckman 2009). As Cunha and Heckman (2009) summarize, interventions to affect the development of cognitive capabilities are most effective early in life. Non-cognitive capabilities have “sensitive” periods later in a child's life, and may be affected by the environment through adolescence.<sup>9,10</sup> Might poverty, or adverse economic shocks, affect sensitive and critical periods of development in ways that affect development of cognitive and non-cognitive skills?

Research certainly suggests there is a link between poverty and child development. For example, Duncan et al. (2010) use the Panel Study of Income Dynamics—a panel data set that allows researchers to observe and link high quality measures of family income during early childhood to later-in-life outcomes—to examine the relationship between poverty from the prenatal year through the 5th birthday on adult outcomes. This work documents that, even controlling for income later in childhood, poverty in the 0-5 years is associated with lower adult earnings and work hours. Recent work in neuroscience using magnetic resonance imaging demonstrates that there are differences in the brain structures of children living in poverty and that these differences can explain a large share of achievement test score gaps (see, for example, Hair et al. 2015). An increasing volume of research<sup>11</sup> suggests that a causal link exists between poverty and neurological differences that manifest in personality traits and behavioral differences, and this link may be due to the effects of “toxic stress” on development.<sup>12</sup> “Toxic stress” occurs when children are repeatedly subjected to adversity; the biological responses to this hardship can result in cognitive impairment and stress-related diseases. So-called “non-cognitive” functioning may also be impaired, as

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9 Non-cognitive capabilities include executive functioning and self-regulation, key elements of personality. See Cunha and Heckman (2009), Cunha, Heckman, and Schennach (2008), and cites therein.

10 As Heckman et al. (2013) reports, important personality traits may also be affected through early-childhood interventions like the Perry Pre-School program.

11 Center on the Developing Child (2016).

12 Note that poverty may affect cognition through mechanisms other than effects on the developing brain. Mani, Mullainathan, Shafir, and Zhao (2013) show that experimentally inducing thoughts about scarcity create poorer cognitive functioning in adults.

the child becomes overly reactive to perceived threats in ways that affect academic measures of cognitive performance as well as social interactions and eventual job performance.

The research summarized here provides evidence on four key points. First, adult outcomes are affected by variation in the *in utero* and early childhood environment. Second, a plausible mechanism is that stress *in utero* and in early childhood may affect the neurological architecture as children develop, and this may manifest itself in both cognitive and non-cognitive dimensions. Third, poverty during critical and sensitive periods of development is linked to long-term outcomes. Fourth, poverty is plausibly a source of stress during critical and sensitive periods of development.

What we do not know from the literature cited above is whether public policy can effectively address these “insults” to child development. In particular, do policies that transfer resources to low-income families have positive long-term effects?<sup>13</sup> To answer this question, it is important to understand whether such policies can induce a change in the early life environments of low-income children and whether those changes are substantial enough to have a long term impact. There is also emerging direct evidence on the long-term effects of transfer programs. Before presenting that evidence, however, it is important to discuss why it is difficult to answer a question like “what are the long-term effects of transfer programs?”

#### **IV. CHALLENGES IN DETERMINING LONG-TERM EFFECTS OF TRANSFER PROGRAMS: METHODOLOGY AND MEASUREMENT**

There are many reasons that it is difficult to discern the long-term effects of transfer programs. I will focus on two in particular: limited availability of appropriate data and difficulties in establishing causality. I’ll consider the data needs first. First, we need to define what we mean by the “long term.” Generally, we would like to know whether transfers to low-income families result in better outcomes in adulthood for the children in those families. To address this, we need to know if individuals’ families of origin received a transfer of some kind of program when they were under the age of 18. It would be better if we knew the ages of the individuals when they received the transfer in order to better assess the peak time to make investments. Next, we need to be able to link that to adult outcomes. Outcomes like completed education tend to be observable by age 25, marital status and completed fertility by age 35-40, peak earnings by age 45-50, morbidity by age 45-65, and mortality at age 60 and above. Thus, if one wants to know the long-term effects of transfers during pregnancy and the neonatal period on mortality, one is going to need data that span more than 60 years.

The U.S. has relatively little data adequate for addressing these questions.<sup>14</sup> There are several long-standing panel data sets that can be used to try to answer questions about the effects of early-in-life

13 It is common in the literature investigating the fetal origins hypothesis to refer to those things that may adversely affect development as “insults” (see Currie and Almond 2011).

14 Data come in three types: cross-sectional, time-series, and panel. Cross-sectional data are data on many different people (or other objects, like homes) from a point in time. We have many examples of such data that are regularly collected: the Current Population Surveys, which are fielded each month to, among other things, collect information about unemployment status; the Census, fielded every decade to count the population, and the American Communities Surveys. These data are household surveys and give a rich snapshot of people at a point in time. They do not, however, make it easy to link one’s early-in-life environment with one’s later-in-life outcomes, because there are no questions asked about one’s early-in-life outcomes, and even if they were asked directly, the individuals may not know whether their mothers received food stamps while pregnant, for example. Thus, although some of these cross-sectional data sets are used to answer long-term questions, it takes a clever scheme to extract that information from them.

conditions on later-in-life outcomes. For example, the Panel Study of Income Dynamics began in 1968 with about 5,000 families. The individuals in this original data set have been followed over time, even as they splinter off to form their own households. Much of what we know about the relationship between early-in-life conditions and later-in-life outcomes in the U.S. comes from the PSID.

That said, the data set is relatively small, so it is difficult to find statistically meaningful effects. If a transfer program is small but effective, the change it creates may be too small to detect among the myriad things that go into determining adult outcomes. The larger the data set, the smaller the effects one can meaningfully distinguish from statistical noise. Since transfers often are not large, and outcomes one would like to affect are complicated, it can be difficult to discern an effect.

Other countries, in fact, have data that are better suited to examine the effect of changes in childhood on long-term outcomes. In particular, Scandinavian countries have very rich data, merged from sets of administrative records, that allow one to track outcomes from birth through death, and everything in between, sometimes even across generations. Many of the papers cited above on the links between outcomes at birth and outcomes later in life were done using these data from Scandinavia.<sup>15</sup>

The other element that is needed to discern the long-term effects of transfers to poor families is the difference in treatment between plausibly similar groups. Here, the United States may have an advantage over other nations as there is often variation in programs offered or the administration of them across time and place.

It is worth taking a moment to discuss why that variation across plausibly similar families in access to programs is important. Many questions one might be interested in are excruciatingly difficult to answer because it is often the case that so many things—both bad and good—go hand-in-hand. A family that has additional resources to devote to a child during gestation and the neonatal period may also have additional resources to devote to her later in life. A mother who is malnourished during pregnancy may also be a mother who is ill-equipped to oversee a child's schooling. It can be difficult to disentangle these effects. When interventions are used to try to remedy the situation, those remedies often are targeted to the neediest cases. In those cases, we may find no evidence that the recipients of the intervention do better because they were chosen for intervention precisely because they were in dire need. Whether they are doing better or worse than non-recipients of the transfer is irrelevant, because what we need to know is whether they are doing better than they would have been without the transfer. That counter-factual observation is, impossible to observe. However, social scientists have developed a tool kit of methods to identify a plausible counterfactual outcome.

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15 It can be fiendishly difficult to answer even the simplest question about early life conditions in the U.S. Consider, for example, the case of a potential cancer cluster for people who grew up near Cold Water Creek in Florissant, MO. Because of the industrial history of that area, those who lived around the creek in the 1960s and 1970s may have been exposed to cancer-causing radioactive agents while the subdivision was being built. Because of demographic change, the people who lived there decades ago are not those living in the area now. Thus, testing for a cancer cluster among current residents is not useful for discovering whether those raised along the creek are at risk for later-in-life health challenges. A group of childhood friends became suspicious about high cancer rates in their group, but had no way to definitively answer questions like, "what fraction of this type of cancer cases in the U.S. are occurring in people who grew up in a particular area?" Eventually, their advocacy efforts got the government to test the soil, which indeed showed high levels of dangerous materials. Finding out whether there are higher rates of disease among a group raised in a particular area at a particular time would be a relatively straightforward question to answer in Finland, for example, and would have immediate implications for public health—namely that individuals at risk could be tested for disease, and appropriate action taken.



The first tool in that kit is randomized-controlled trials (RCTs), often regarded as the “gold standard” for understanding whether there is a causal effect from an intervention. For RCT’s, one needs to be able to randomly assign similar families to receive the transfer or not and a sufficiently large number of families to detect statistically meaningful differences between the treatment and control group, if any. There are relatively few RCTs evaluating transfers to poor families because of both the expense of mounting them, and the tricky ethics of denying a benefit to some families, especially if there is a strong suspicion that they would benefit from it. That said, there are some RCTs that have been used to examine transfers to low-income families, and we will highlight some below.

The other methodological tool in the kit is the “natural experiment.” Here, researchers find “naturally” occurring variation—often generated by policies—that creates plausible treatment and control groups. The potential for a natural experiment often arises when policies are rolled out over time and across space, or when arbitrary thresholds for intervention are put into place. Variation across time and space are often leveraged by a “difference-in-differences” methodology, where changes that occur over time in the place that adopted a policy (the “treatment” group) are benchmarked against changes that occur over time in places that did not (the “control” group). Under a few assumptions, this approach will yield an estimate of the causal effect of the intervention. One of those assumptions is that the control group changes over time in the same way as the treatment group would have changed in the absence of the program. In other words, it can’t be the case that the policy was adopted for the treatment group precisely because it was on a terrible path that the control group was not on. The other required assumption is that nothing else changed differentially over time in the treatment and control areas that would have affected the outcome. This precludes the treatment area both adopting the transfers to poor families and also, for example, a disease eradication program that may have had similar effects.<sup>16</sup> Many research projects that attempt to assess the impact of transfers to poor families use difference-in-differences methodologies.

Finally, some of the research depends on “treatment” and “control” groups being created when an arbitrary threshold for intervention is adopted for a particular type of transfer. This method is referred to as “regression discontinuity design” or RDD. For example, imagine children are given math tests and those who score less than 30% are offered a tutor. It is sensible to expect that there is very little difference in innate mathematical ability, or a family’s ability to assist a child with math homework, between children who receive 30% on the math test and those who receive 30.5%. There will, however, be a large difference in whether they receive tutors or not. Thus, comparing subsequent performance in math among students on either side of that arbitrary threshold yields insight into the causal effect of a tutor on math performance; two groups that are essentially identical received different treatments. This type of technique is often used in education or medical contexts where interventions are switched on when the observation of a child’s status above or below a given threshold—a test score or birth weight, for example—triggers an intervention.

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<sup>16</sup> Note, the technique might still plausibly tell one the sum total of the two simultaneous interventions, as long as the other assumption holds, but would not allow one to parse out the effects between them.

All of the techniques described above are meant to ensure a study's "internal validity." By that, we mean that we have, in fact, discovered differences that are caused by the intervention that is being studied; there is no "third factor" that is potentially driving the observed results. A second consideration is the "external validity" of the study. External validity is the consideration of whether, if rolled out to the population at large, the intervention will have a similar effect? Consider studies in psychology: they often recruit subjects from among the college students at the institutions where the researchers work. They use strong protocols to divide the recruits into treatment and control groups, so they can be reasonably sure of the internal validity of the study—that is, that the effect is due to whatever stimuli they are applying to the treatment group and not some third factor. However, the study may not tell us very much about how the wider world would behave under similar circumstances, nor may they tell us much about how institutions or norms may change if policies are applied broadly.

Randomized controlled trials are often subject to critique about their external validity. Are those recruited really representative of the population? Even if they are, do people drop out of the study such that the outcomes are not observed for a representative population? Is the adherence to the ideal protocol so well observed during the study phase that one cannot hope to reproduce it once the intervention is rolled out to everyone everywhere? Would there be other changes if the program were rolled out to everyone everywhere? For example, if everyone received job training, would additional skills generated by the program still fetch a wage premium?

In regression discontinuity design studies, external validity concerns take the form of asking whether one would get the same results if the threshold for the intervention were different. If we find that math tutors are effective for students who received 30% on an exam compared to those who received 30.5% and thus were not given a tutor, that does not necessarily mean that a tutor can improve the score of someone who got 10% or 75% on the exam. For studies that use difference-in-differences strategies, those concerns are somewhat mitigated because one is observing on average, what happens overall in the treatment and control groups, and those groups are usually fairly large (like a state population).

That said, all studies are subject to a specific external validity critique: that was then, this is now; or its geographic correlate: that was there, this is here. Context is important, as context affects what is available to the control group. So, if we have an educational intervention to enrich the early childhood learning environment, it may matter a great deal whether in that time and place the children in the control group would have been left alone, with a relative, or in childcare center that is less state-of-the-art (Klein and Walters 2015).

In what follows, I review the evidence on the effect of transfers to poor families. Where we have good evidence on the long-term effects of programs, that will be highlighted. I will consider cash and in-kind transfers, including food, housing, and medical transfers.<sup>17</sup>

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<sup>17</sup> Early childhood educational interventions are also important, but these long-term effects have received a great deal of high-quality attention (Heckman, Pinto, and Savelyev 2013).

## V. THE EFFECT OF TRANSFER PROGRAMS<sup>18</sup>

Transfer programs, broadly speaking, take one of two forms: cash or in-kind.<sup>19</sup> Cash transfers like the Temporary Assistance for Needy Families (TANF) or the Earned Income Tax Credit (EITC) give families that meet certain criteria extra money to spend on whatever they choose. In-kind transfers, like the Supplemental Nutrition Assistance Program (SNAP), housing vouchers, and medical insurance, help families provide for specific necessities.

In-kind transfers are often more popular with the taxpaying public because they may be perceived to be more likely to directly alter the investments families make in their children. If one gives cash, what is to keep the low-income family from purchasing soda pop rather than fresh vegetables for their children? If the transfer consists of fresh vegetables (or vouchers that can only be used for fresh vegetables), then society may not need to worry that the transfer may be diverted for unproductive purchases.

Transfers targeting children can be thought to have a “principal-agent” problem.<sup>20</sup> Presumably, society would primarily like to invest in low-income children, but has no choice but to do that through the child’s “agent”: his or her parent(s). If the agent has different objectives than the long-term best interest of the child, then society may have an interest in tying the hands of the agent in some way to ensure that the child receives the benefits of the transfer.

In-kind transfers may seem more likely to accomplish the targeting that society wants than cash transfers. Whether that is the case is not at all clear. Both cash and in-kind transfers are, to some extent, fungible. If the transfer is in the form of a free vaccine given to a child, then there is no way that parents can “undo” the transfer. However, if the parents were already planning on getting their child vaccinated, then having that directly provided by a transfer is the same as giving the parent the cost of the vaccine in cash. That “budget relieving” transfer may free up cash for the parents to use on other productive inputs for their children, or may free it up for other purposes. Whether cash and in-kind transfers are different in their effect depends on what the family would have done with cash. A textbook example in Econ 101 is that if a family currently spends \$200 on food and receives \$100 in food stamps (SNAP), then the family will consume the same amount of food whether it receives that transfer in in-kind or cash benefits.<sup>21</sup> The family may well spend more on food once the transfer is received, because it has more money overall to spend on all items, but it will not shift toward more food if it receives the transfer in in-kind benefits. On the other hand, if a family wants to spend \$50 on food, and receives \$100 in food stamps, then it will spend more on food, but would not if it received the transfer in cash.

Another important consideration is the effect of transfers on a family’s work behavior and thus on its short-term and long-term prospects. A great deal of attention in economics has been paid to the potential work

18 Much of the background in this section relies on the two excellent 2016 volumes edited by Robert A. Moffitt: *Economics of Means Tested-Transfer Programs in the United States*. Readers interested in more details on these programs and their effects are referred to the thorough reviews in these volumes.

19 There are also conditional cash transfers that offer cash to low-income families for a certain set of behaviors: health visits, children attending school, etc.

20 Of course, it may also simply be paternalism, since we give SNAP benefits to adult only households as well.

21 Behavioral economics suggests that SNAP benefits may be structured to nudge consumers toward particular choices (United States Department of Agriculture, 2016).

disincentives that transfer programs may create: if a family works and earns more money, benefits are cut. An oft-cited remark is that the discipline of economics can be summarized as “People respond to incentives. The rest is commentary.” (Mankiw 2015), and there is ample evidence that transfer recipients face substantial marginal tax rates as their incomes rise. Moffitt (2016) reports results from a Congressional Budget Office simulation showing that for families with incomes between 100-149 percent of poverty the median marginal tax rate faced is 32 percent.<sup>22</sup> This has led to considerable concern about transfer programs creating a “poverty trap” where families undertake actions to remain sufficiently low-income as to continue to be eligible for benefits.<sup>23</sup> To be sure, there are disincentives to work inherent in any transfer program for which only those with low incomes are eligible. Whether those incentives elicit a large or small response, and whether there is a net gain of resources and time that is devoted to developing the capacities of children in the household is an empirical question, and will be discussed in the next section.

## A. Cash transfers

**Table 1: Overview of cash assistance programs in the United States**

Program Name	Eligibility	Dates
Mothers’ Pension program	States’ discretion (child under 14/15/16, no father present, low-income).	1911-1935
Aid to Dependent Children (ADC) <sup>24</sup>	States’ discretion (children, no father present, low-income).	1935-1962
Aid to Families with Dependent Children (AFDC) <sup>25</sup>	Low-income families with children under 18, deprived of financial support of at least one parent (by death, abandonment, unemployment).	1962-1996
Temporary Assistance for Needy Families (TANF) <sup>26</sup>	Children in low-income families. Lifetime cap of 60 months on payments to adults with Federal funds. Work requirements that vary by single/two-parent status and age of youngest child.	August 1996 <sup>27</sup>
Earned Income Tax Credit (EITC)	Low-income families; more generous to families with children. Max. eligible income for married filing jointly family with 3 children \$53,505 for 2016. <sup>28</sup>	1975
Child Tax Credit (CTC)	Families with children under 17 are co-resident. Reductions in size of credit begin at \$110K adjusted gross income for married filing jointly. <sup>29</sup>	1997

Source: Aizer et al. 2016 and Moffitt (2016) and cites therein.



22 Table I.2 in Moffitt (2016). The 10th percentile marginal tax rate is 22 percent and the 90th percentile marginal tax rate is 61 percent.

23 See for example, “The War on Poverty: 50 years later,” A House Budget Committee Report, House Budget Committee Majority Staff, March 3, 2014.

24 <https://www.ssa.gov/history/reports/ces/cesbookc13.html>

25 <https://www.census.gov/population/socdemo/statbriefs/whatAFDC.html>

26 States are free to use funds for services and noncash benefits (Burke 1996). See review in Zilliak (2016).

27 Established by the Personal Responsibility and Work Reconciliation Act, signed into law on August 22, 1996.

28 <https://www.irs.gov/credits-deductions/individuals/earned-income-tax-credit/eitc-income-limits-maxim>

29 <https://www.irs.gov/pub/irs-pdf/p972.pdf>

Cash transfers in the United States have taken different forms across the years. Eligibility for these programs is typically “low-income and \_\_\_\_\_,” with each program having different criteria. A brief overview is provided in Table 1.

The first thing to note is that the first cash transfers began in 1911 with the Mothers’ Pension program. Other programs, however, are much more recent. Understanding whether Aid to Families with Dependent Children, and its successor, Temporary Assistance to Needy Families, has had an effect on adult mortality is not possible since the earliest childhood recipients are just now in their 50’s. Other programs are more recent. Thus, I will discuss some of their shorter-term effects and whether those seem likely to translate into longer-term outcomes.

What can cash transfer programs do to alter the long-term outcomes of children in families that receive benefits? First, and most obviously, they can provide money that can be used to provide food, shelter, clothing and investments in education for those children. Additional money may also cause families to reduce work effort. This may free up time to devote to productive activities with children, but may not end up reducing material hardship. Programs that encourage adults to work may lead to better work role models for children, or may result in money being spent on transportation and work clothes that could otherwise have been spent on children.

A large body of research has examined the effects of the 1996 welfare reform (the Personal Responsibility and Work Reconciliation Act of 1996), which transitioned welfare programs from AFDC to Temporary Assistance for Needy Families. This reform had as an explicit goal reducing the disincentives to work for welfare recipients and reducing long-term reliance on welfare, by creating work requirements and a five-year limit on receipt of federal funds through the program. A thorough review of that literature by Ziliak (2016) notes that the closest we come to consensus on the effects of welfare reform are that it reduced participation in welfare, that it increased employment and earnings among recipients, but reduced total after-tax and transfer incomes of the lowest income single mothers.<sup>30</sup> Ziliak further notes that the areas in which the research is most lacking, or too mixed, are in the areas of longer-term effects on mothers’ human capital development and employment and children’s well-being. We do not yet know whether the initial work requirements translate into greater labor force attachment and on-the-job training that in turn translate into higher earnings growth and greater well-being for adults and children over time.

The evidence on the effects of TANF (compared to AFDC) on children’s short-term well-being is mixed at best. Morris et al. (2009), relying on data from randomized assignment experiments, report that programs that had income supplements combined with maternal employment increased pre-school children’s achievement. However, if there were no income supplements, such that mothers’ employment increased but income did not, then children’s achievement was not affected. Ziliak (2016) notes there is evidence of a negative effect on children’s health including lower rates of breastfeeding (Haider et al 2003), reduced prenatal care (Kaestner and Lee 2005), and increases in substantiated child maltreatment (Paxson and Waldfogel 2003). Leonard and Mas (2008) finds that, as time limits bind for some women in some states, infant mortality increases. The magnitudes of the increase are large with between a 20 percent to 48

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30 In Moffitt (2016), p. 380.

percent increase in infant mortality being attributed to time limits.<sup>31</sup> Ziliak (2016) reports some “bright spots” for adolescents in the form of reduced teen fertility and lower dropout rates (Offner 2005, Dave et al. 2012, Miller and Zhang 2012).

It is important to keep in mind the counterfactual in the evaluations of TANF. In general, these studies compare outcomes for children in households who go from receiving cash assistance without requiring that the adults in the household work and without any time limit on assistance, to receiving cash assistance with a work requirement and the end to that assistance after a certain period of time. Where the combined effect of assistance plus earnings is less than the total income prior to the regime change, studies tend to find worse outcomes for children. Where the source of variation is families being time-limited out of TANF (Leonard and Mas 2008), we see worse outcomes for children. Again, the change from AFDC to TANF is too recent for studies to evaluate the impact on outcomes in adulthood for children.

Another type of cash assistance is the Earned Income Tax Credit (EITC) and the Child Tax Credit (CTC). The EITC began in 1975 and the CTC in 1997. Both these programs give “credit” back to households out of earnings. The amount of credit depends on income and the number of children, with the amount of credit increasing with income and then beginning to phase out as incomes rise. For a single parent family with two children in 2014, for example, the maximum EITC credit was reached at about \$15,000 and began to decline at \$20,000, before disappearing at about \$42,000 (Nichols and Rothstein 2016). The benefits have had this trapezoid shape throughout the years of the program, but the benefit levels have been increased and the rates of phase out have changed over time and by the number of children in the family. In particular, there were increases in the EITC during early 1990s and in 2009 (ARRA). The 2009 increase was particularly large for families with three or more children. The CTC has a similar design, but it does not completely phase out until much higher up the income distribution. For example, married families with three or more children received some CTC benefits up to about \$170,000 in adjusted gross income in 2013 (Nichols and Rothstein 2016).

A robust body of research leverages changes in the program over time and across family types to try to identify the causal effect of the EITC on various outcomes. Given that the program design was meant to “make work pay,” much of the research has focused on the effect of the program on labor supply. Theoretically, there are potential positive effects for people at the low end of the income distribution as these subsidies are available only if one works, so we would expect to see people moving into the labor force and employment. At the higher end, the subsidy begins to phase out, and thus there might be negative effects on hours of work, especially as a worker approaches the threshold where the subsidy disappears. As Nichols and Rothstein (2016) note in their thorough review of the literature (on which I rely heavily in this section):

There is remarkable consensus around a few key results. In particular, essentially all authors agree that the EITC expansion led to sizable increases in single mothers’ employment rates, concentrated among less skilled women and among those with more than one qualifying child.

— Effects on hours of work, and on male labor supply at either margin, were generally small.

31 Note that “scarring” versus “culling” effects are important in the fetal origins hypothesis (Almond and Currie 2011). Whether the increase in infant mortality noted found in Leonard and Mas (2008) resulted in “culling” that resulted in the cohort of surviving infants being in better health, or in “scarring” such that those who survived were compromised due to the insults accumulated in the prenatal period is not known.

How these subsidies affect children in the household is another area of active research. Nichols and Rothstein (2016) report that the combination of the CTC and the EITC is very successful at reducing child poverty, lowering the Supplemental Poverty Measure (a more comprehensive measure of poverty than the official poverty measure) from 22.8 percent to 16.4 percent. Also reported in Nichols and Rothstein (2016), EITC recipients tend to use their EITC refunds on increased purchases of durables—including vehicle repair—and on reducing debt (Barrow and McGranahan 2000, Goodman-Bacon and McGranahan 2008, Gao, Kaushal, and Waldfogel 2009).

Research examining the effect on children's outcomes has found a direct effect on measures of health and educational achievement. Hoynes, Miller and Simon (2015) estimate each extra \$1,000 from the EITC reduces the incidence of low birth weight by 7 to 11 percent. Given the studies that show lasting effects of low birth weight on later-in-life outcomes, this provides prima facie support for the idea that subsidies through the EITC may have effects that last into adulthood.

Similarly, a growing body of work suggests that there are important effects of the EITC on children's academic achievement. Researchers have found that subsidies through the EITC raise children's test scores (Dahl and Lochner 2012, Chetty, Friedman, and Rockoff 2011). In addition to test scores, research has shown effects on the amount of education attained including the likelihood of ever enrolling in college (Micheltmore 2013, Manoli and Turner 2014), and attaining a bachelor's degree (Micheltmore 2013). As Nichols and Rothstein note in their extensive review (2013), there are unresolved questions about whether these effects are concentrated among children who were older or younger at the time of the EITC expansion, and whether these effects are due to the income subsidy or to the shift in parental labor supply that alters care giving arrangements for children.

Additionally, as Nichols and Rothstein's review points out, research finds that women's physical and mental health are improved. Thus, EITC subsidies may have multiple pathways through which they affect children's outcomes, and the literature has not yet sorted these out. The evidence, however, strongly suggests that the EITC matters for children in ways that may translate into greater productive capacity later in these children's lives.

Another important cash transfer program is Supplemental Security Income. This program supports non-elderly who are low-income and disabled. (Eligibility for the elderly is not contingent on a qualifying disability). In their thorough review of the program, Duggan, Kearney, and Rennane (2016) point out that there are similar theoretical concerns with this program to those associated with other means-tested programs: Work disincentives embodied in the program create the potential to reduce resources available to the family compared to those that would have been available had the adults been working. As with other programs, this is complicated by the fact that working provides income, as well as potentially shifting childcare arrangements for the children in the family; further, working in an early period may build human capital and thus, adverse initial labor supply shifts may have longer term consequences for family income. That said, their review of the research suggests that receipt of SSI reduces poverty (Duggan and Kearney 2007) and food insecurity (Schmidt, Shore-Sheppard, and Watson 2013). They point out, however, that there is virtually no research on SSI that examines how households use the income from SSI: increased

consumption, increased leisure, or investments in children’s education. Understanding how participation in SSI affects these inputs to child development would be useful in predicting longer-term outcomes, as would direct evidence on links between family SSI receipt and children’s academic achievement.<sup>32</sup>

The research cited in this section examines the effects of low-income transfer programs on measures of childhood well-being associated with adult outcomes. Akee and co-authors (2010, 2015) provide further evidence on the effect of cash assistance by leveraging the random variation in household income that comes from the opening of Native American casinos. The researchers compare differences in outcomes for children before and after the introduction of the casino, among families that did and did not receive disbursements from the casinos. The research shows that the increase in unearned income generated by the casino payouts increases educational attainment of children, and reduces the chances of committing minor crimes (Akee et al. 2010). The researchers also find that children’s emotional-behavioral symptoms and personality traits are improved by the increase in unearned income (Akee et al. 2015). The researchers posit that a likely mechanism is improved child-parent interactions and improved parenting. Importantly, although this is not a U.S. government transfer program, the amounts received by families are comparable to levels of assistance provided by TANF and SNAP benefits; however, the benefits studied in Akee et al. are effectively a permanent increase in income.<sup>33</sup>

### *Evidence of long-term effects of cash assistance*

As the research above makes clear, one would ideally observe the long-term effects of cash assistance in childhood on adult outcomes of those children in order to assess whether those transfers are rightly thought of as investments. Suppose a family receives cash assistance and this frees up the budget constraint for the family. Suppose that the parent of the family takes that opportunity to reduce work hours, and thus the family’s total consumption remains about the same. One might look at that short-term outcome and determine that the family just “undoes” the transfer. However, without more information, one can’t know that. If the adults in the household use that extra time in unproductive (or harmful) activities, then, indeed, we might expect no long-term benefits from these transfers. On the other hand, if parents reduce their work hours to spend more time playing with, speaking to or reading to their children, then the long-term outcome may be quite different from the perceived short-term effects. Indeed, early support for cash transfer programs came from the idea that children would benefit if their widowed (or abandoned) mothers could stay home with them rather than going out to work (Aizer et al. 2016). Thus, to see whether there are long-term effects of these early-in-life transfers, ideally one would connect them to later-in-life outcomes, as monitoring contemporaneous effects may or may not lead to the correct inference about the long term.

Recent work by Aizer et. al. (2016) makes this connection between childhood receipt and long-term outcomes examining the impact of the Mothers’ Pension program, which was in effect from 1911 to

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32 Understanding the long-term effects of receiving SSI in childhood on adult outcomes of those recipient children is extremely difficult because most of the disabilities that qualify people to receive SSI as children are lifelong. We know from work by Deshpande (2016) that people who are removed from SSI as the transition to adulthood fare very poorly in the labor market.

33 Although an increase in unearned income may, in theory, reduce work, no changes in employment among adults in the household are observed in this work. Another important difference between this and government means-tested programs is that these do not disappear as earned income rises beyond an eligibility threshold, thus theory would suggest fewer work disincentives.



1935. This was a cash assistance program, meant to improve the living conditions of children whose “breadwinner” had died, left, or become disabled. According to the authors, transfers generally represented 12 to 25 percent of family income, and typically lasted for 3 years. Individual-level administrative records from 11 states on mothers and their families who applied for the Mothers’ Pension program. are matched to Census records for educational outcomes, World War II records for height and weight records, and death records for mortality. The researchers were able to match data only for sons because daughters so frequently changed their names upon marriage. Further, there are no African Americans in the data set because there were too few of them in states for which data were gathered.

In order to ensure that the findings have a causal interpretation, the authors use data on those who applied and were initially deemed eligible but then later deemed ineligible.<sup>34</sup> The “treatment” group includes families that received the program, and the “control” group are people who applied, but ultimately were found to be ineligible. As those who ultimately were deemed ineligible are, if anything, likely to be slightly better off than those who received the transfer, the results of this comparison are likely to be understated.

The study finds that, on average, men who received the transfer as children lived about one year longer. They also were about 50% less likely to be underweight, a sign of malnourishment, and they had 0.3-0.4 more years of education. Further, they had about 14% higher earnings in early adulthood. All of these—better nourishment, additional education, and higher incomes—have been found to independently affect mortality, and thus these channels account for about 75% of the increase in longevity. The research also finds some evidence, but not strong from a statistical point of view, that receiving the benefits had a larger impact on longevity when the boys were younger at the time of receipt, adding further to the mounting evidence that targeting the early life development period may produce the largest effects for long-term outcomes.

As amazing as it may seem, this research is the first to use a rigorous treatment/control methodology to analyze the impact of cash transfer programs on long-term outcomes, like mortality. As described in Section II, there is strong evidence, continuing to accumulate, that altering the early-life environment has profound long-run implications. There is evidence mounting that altering young families’ access to resources through cash transfers can alter early-in-life outcomes, like birthweight.<sup>35</sup> However, Aizer et al (2016) provides some of the first evidence that purely cash transfers aimed at altering children’s environments have important effects for long-term outcomes like education and mortality.

There are, of course, important questions to be asked about whether giving poor families access to cash today will have the same long-term implications for this generation. It might be that the amount of resources we are willing to transfer today are insufficient.<sup>36</sup> It might be that the conditions that exist without the transfer

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34 Why they were deemed ineligible is not clear, but possibly those administering the program found them to be less needy on closer inspection than was originally perceived. If those deemed ineligible on secondary inspection are, in fact, somewhat better off than those who went on to participate in the program, that would tend to push the researcher away from finding a beneficial effect of the program.

35 Amarante et. al. (2016), finds, using a regression discontinuity design, that mothers who receive cash have higher birthweight babies than mothers who just barely miss receiving the assistance. This finding in Uruguay in 2005-2007 suggests that mothers being better nourished during pregnancy leads to faster intrauterine growth.

36 The Mother’s Pension program is estimated to be about 12-25% of income (Aizer et al 2016); the maximum EITC credit in 2015 for a two child family was \$5,548 and the minimum income that could achieve that credit was \$13,870, meaning EITC would be 29% of combined earned income and EITC (Nichols and Rothstein 2016).

are fundamentally better than they were in 1911-1935—a time frame that overlaps with part of the Great Depression—such that adding more resources cannot fundamentally alter outcomes. We might believe that families given cash assistance today are more likely to behave in ways that are not consistent with their children’s long-term interest. Or, we might believe that women have more labor market opportunities today and thus are better able to provide for their children through their own earnings. However, the findings on shorter-term effects of the EITC, for instance, give one hope that today’s cash transfers will similarly translate into better adult outcomes.<sup>37</sup>

## B. Food and nutrition

Food and nutrition programs constitute an important component of in-kind transfers in the U.S. Table 2 provides an overview of government programs and their beginning dates. The National School Lunch Program is the longest standing program, and the largest program is the Supplemental Nutrition Assistance Program (SNAP), formerly known as food stamps.

As described earlier, there is a question as to whether in-kind transfers of food should be primarily thought of as directly affecting nutrition outcomes, or as relieving the budget constraint and allowing families to afford more of all goods and services.

**Table 2: Overview of (four largest)<sup>38</sup> food assistance programs in the United States**

Program Name	Eligibility	Beginning date
Supplemental Nutrition Assistance Program (SNAP), formerly Food Stamps	Households with gross monthly incomes less than 130 percent of the poverty line.	Pilot in 1961; Permanent program in 1975
Special Supplemental Nutrition Programs for Women, Infants and Children (WIC)	Pregnant women and children less than 5 years old deemed at “nutritional risk” in families with gross monthly income less than or equal to 185 percent of the poverty line.	Pilot in 1972; Permanent program in 1974
National School Lunch Program (NSLP)	Free lunch if family income less than or equal to 130 percent of poverty line; reduced-price lunch if family income less than or equal to 185 percent of the poverty line.	1946
School Breakfast Program	Free breakfast if family income less than or equal to 130 percent of poverty line; reduced-price breakfast if family income less than or equal to 185 percent of the poverty line.	Pilot in 1966; Permanent program in 1975

Source: Hoynes and Schanzenbach, Table 3.1, in Moffitt (2016).



37 Although as noted above, the EITC may have different labor supply effects than cash transfers of non-labor income.

38 See Hoynes and Schanzenbach (2016) in Moffitt for information on other programs including the Child and Adult Care Food Program, the Summer Food Service Program, the Special Milk Program, and the Fresh Fruit and Vegetable Program.

Recent evidence suggests that SNAP/food stamp benefits have very similar effects as cash benefits. Evidence from the introduction of food stamps in the early 1960s (Hoynes and Schanzenbach 2009) suggests that households who received food stamps increased their food consumption, but reduced their out-of-pocket expenditures on food. This work also suggests that household food expenditure responds very similarly to a dollar of food stamps and a dollar of cash. WIC programs should affect the family budget constraint in similar ways, although there is a nutrition education component that might affect preferences over consumption. The school lunch and breakfast programs are “take it or leave it” benefits and all else equal, as the quality of the benefit improves, one would expect more families to take it. If families take it, then it has budgetary relieving properties (Hoynes and Schanzenbach 2016), allowing families to spend money that they otherwise would on breakfasts and lunches on school days on something else.

As with all sources of means-tested income, there are disincentives to working embodied in the phase out of the program as incomes go beyond the eligibility thresholds.<sup>39</sup> If adults restrict their labor supply to qualify for the programs, and thus do not enjoy wage increases and improved labor market connections over time, and do not demonstrate the advantages of work to their children, the long-term effects of these programs could be deleterious.

Hoynes and Schanzenbach (2016 in Moffitt 2016) provide a rich and detailed overview of the effects of food and nutrition programs on outcomes that may be linked to adult outcomes of child-recipients. They report that the literature tends to find mixed effects of SNAP participation on contemporaneous health outcomes for children. However, they conclude that the studies using variation in laws and policies over time and across space are more reliable than those that use within-family differences over time in exposure to these programs. This is because of the potential for the factor that drives a particular family to participate in programs for one child but not another may also drive the outcome in question. Studies that rely on variation across time and space in program availability or generosity “tend to find either positive or null effects of SNAP on health.”

Research on WIC tends to focus on birth outcomes and health. In her review of the existing literature, Currie (2003) concludes that there is broad consensus that women who participate in WIC give birth to healthier babies than they otherwise would. Hoynes and Schanzenbach (2016, in Moffitt), update that literature review. Recent studies tend to focus on narrowly defined treatment and control groups (see Figlio, Hammerma, and Roth 2009, and Bitler and Currie 2005, for examples). Hoynes, Page and Stevens (2011) use the beginning of the WIC program in the 1970s to make comparisons across births in counties where WIC was available and where it was not. Rossin-Slater (2013) uses data generated by opening and closings of WIC clinics in Texas in 2005-2009 to compare births for the same mother at times when the program was available and when it was not.<sup>40</sup> This more recent literature is consistent with the finding that birth weight outcomes are improved by pregnant women’s access to WIC.<sup>41</sup> The results are quite

39 Although as has been pointed out, if additional food and improved nutrition increase the capacity for work among adults in the household, there could be offsetting effects on labor supply (Currie and Gahvari 2008).

40 Rossin-Slater (2013) further finds improvements in breastfeeding initiation.

41 Hoynes and Schanzenbach point out that most studies focus on WIC’s effects through receipt by pregnant women, rather than receipt by children, who account for about three-quarters of WIC participants.

consistent whether the setting is during the initial rollout of the program in the 1970s or later in the 2000s. If the availability of resources to those who do not receive the program were very different in these two time periods, one might expect different outcomes.

The contemporaneous findings of an effect of WIC on birth weight, combined with the literature on the long-term links between birth weight and later-in-life outcomes, strongly suggest that there is scope for this program to improve adult capabilities of those who were exposed to the program as children.

The evidence on the impact of the National School Lunch Program and National School Breakfast program are more mixed (see Hoynes and Schanzenbach 2016). Some research has focused on body weight outcomes (Schanzenbach 2009 and Millimet, Tchernis, and Husain 2010, Gundersen, Kreider and Pepper 2012). Obesity is an important outcome because overweight children are very likely to be overweight adults. However, the findings on the effect of WIC on body weight range from increases in obesity, to no effect on body weight, to decreases in obesity. This range of outcomes make it hard to know whether the optimal policy is to cut the program or to improve the nutritional content of the foods served.

Other work on the breakfast and lunch programs focuses on educational achievement and attainment. Here, there is some evidence of the programs having a positive effect on educational outcomes including test scores and educational attainment, at least among some populations (Hinrichs 2010, Imberman and Kugler 2014, Schanzenbach and Zaki 2014).

As with cash programs reviewed above, the short term effects may or may not translate into long-term outcomes for those who receive benefits as children. However, food and nutrition programs, broadly speaking, have been found to affect poverty, birth weight, and test scores, all of which are tied to long-term outcomes.

### *Evidence of long-term effects of food and nutrition programs*

A recent series of papers by Almond, Hoynes, and Schanzenbach (2011, 2016) looks at the effects of the introduction of the food stamp program. Food stamps were introduced county by county from 1961 through 1975, allowing comparisons between similar people who did and did not have access to food stamps *in utero* or in early childhood. This series of papers connects the dots nicely: using vital statistics data, they find that having food stamps available three months prior to birth increases birth weight and lowers neonatal mortality (Almond, Hoynes, Schanzenbach 2011).<sup>42</sup>

Another paper by these researchers uses data from the PSID, the panel data set that follows individuals over time allowing one to link a host of adult outcomes to information on early life—including the county where one was born and spent one’s early childhood. Focusing on children in disadvantaged families (defined as parents with less than a high school degree), they find evidence that access to food stamps

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42 Currie and Moretti (2008) focus on the county-by-county roll out in California and find a reduction in birth weight, particularly among first births to teenagers.

led to improved adult health outcomes for everyone, and improved economic self-sufficiency<sup>43</sup> outcomes for women. The health improvements included lower incidence of metabolic syndrome among women and men, and a higher probability of reporting being in “good health” among women. Economic self-sufficiency is an index that combines increased educational attainment, higher employment and earnings, and lower reliance on welfare programs as an adult.<sup>44</sup> The benefits are strongest for people who were exposed to the food stamp program in the pre-natal period through age 5. These findings are comparable to the effects reported in the medical literature on the effects of *in utero* and early life deprivation.<sup>45</sup>

This research provides a rigorous platform from which to draw causal inference. People who were *in utero* and under 5 years old when their county began the food stamp program have better health and economic (for women) outcomes as adults than similar people in places that did not have access to food stamps early in life. One can, of course, ask whether the counterfactual today is the same as it would have been in the 1960s and 70s when the program was rolled out. However, this research demonstrates that transfers can be of a magnitude to have a meaningful impact on long-term outcomes. Hoynes and Schanzenbach (2009) indicates that food stamps had the same impact as a cash transfer would have. All of which suggests that families who had access to more resources, via food stamps, acted in ways that improved their children’s long-term outcomes.

There are no similar studies on the impact of WIC, school lunch and breakfast programs on adult outcomes of child recipients. However, the evidence on birth outcomes for WIC and food stamps give one reason to believe that long-term outcomes may be similar. Supports through food and nutrition programs appear to improve the adult capabilities of children who received them. This is consistent with the evidence in the fetal origins literature that indicates that devoting resources to children early in life is an investment in their human capital that has long-term benefits.

### C. Health care and health insurance

Health insurance coverage of children has increased since the 1980s. By 2012, children’s health insurance coverage rates ranged from about 80 percent at the lowest levels of family income to about 95% for families with incomes at 480 percent of the poverty line (Figure 1 in Buchmueller, Ham and Shore-Sheppard, 2016). Expansions in state children’s health insurance and expansions in Medicaid coverage through the Affordable Care Act have more or less eliminated the sharp drop in coverage that was observed around 100 percent of the poverty line in the 1980s.

Health insurance coverage may affect adult outcomes of children by addressing health crises when they arise, encouraging preventive care, and buffering the family from financial shocks associated with adverse health events. As the review by Buchmueller et al. (2016) demonstrates, there is a great deal of evidence—both from cross-state variation in program rules and through eligibility cutoffs around income thresholds—that insurance coverage affects access to health care.

43 Economic self-sufficiency is a composite index of underlying outcomes, defined such that a higher index is a better outcome. The components are: high school graduate, employed, not poor, not on TANF, not on food stamps, earnings, and family income.

44 See footnote 38 for the exact components. Kling, Liebman, and Katz (2007) discusses how the combination of outcomes into an index can improve statistical power.

45 There is also evidence that the introduction of WIC substantially improved birthweight outcomes (Hoynes, Page, and Stevens 2011)..

46 <https://www.medicaid.gov/medicaid/eligibility/index.html>

**Table 3: Overview of government health insurance programs in the United States**

Program Name	Eligibility	Beginning date
Medicaid	Low-income individuals <sup>46</sup> (ACA 2010 extended eligibility to children at least up to 133 percent of poverty line; states given option to extend to adults in families with incomes less than or equal to 133 percent of poverty line).	1966
State Children’s Health Insurance program	Uninsured children in families with incomes below 200 percent of the poverty line (who are ineligible for Medicaid).	1997
Medicare	People 65 years and older; people with qualifying disabilities (receive income disability from Social Security or Railroad Retirement Board (25 months after benefits begin); those with end stage renal disease or Lou Gherig’s disease).	1966

Source: Buchmueller, Ham, and Shore-Sheppard, in Moffit (2016), other cites therein.



Evidence for the effect of access to health insurance on *health* is more mixed. Health status is a “stock” that is the result of accumulated events, so it is unlikely that access to health insurance would have an immediate effect on health (Buchmueller et al. 2016). In order for health insurance to affect health, one must have a health event that could have been prevented or ameliorated by access to health care. Thus, effects of health insurance on morbidity, mortality, labor market outcomes and the like are more likely to be observed in the long-term.

Finkelstein et al. (2012) present evidence from a lottery in Oregon that randomly assigned able-bodied, uninsured adults with incomes below 100% of the poverty line to receive insurance coverage or to a control group. The results after one year showed increased health care utilization, improvements in self-reported physical and mental health, and decreased financial strain, but no clinically detectable effects on health (which may take longer to develop). Mazumder and Miller (2016) examined the impact of the Massachusetts health care reform—a precursor to the Affordable Care Act—on financial outcomes in consumer credit data. That study uses a difference-in-differences strategy to compare changes in financial outcomes between counties and age groups that had larger increases in coverage due to the reform and those that were less affected. The study reports that the Massachusetts health reform reduced personal bankruptcies, reduced third-party collections, reduced the amount of debt that was due, and improved credit scores. A more recent study of the impact of health insurance coverage on consumer credit outcomes by Hu et al. (2016) compares outcomes for individuals living in states that expanded Medicaid coverage through the Affordable Care Act, to those in states that did not. For individuals residing in low-income zip codes with high uninsured rates prior to the reform, there was a significant reduction in the number of unpaid bills and the amount of debt sent to third party collection agencies. Their estimates suggest a reduction in collection balances in the range of \$600-\$1000 among those who gained Medicaid coverage in ACA expansions.

These studies suggest a pathway, beyond the direct effects of access to health care, through which children's long-term outcomes may be affected. If health insurance protects families from financial distress due to health shocks, then it may reduce exposure to "toxic stress" that the neuroscience research suggests fundamentally affects brain architecture.

Providing access to prenatal and neonatal health care may similarly have a direct effect on children's potential during the time period when research suggests long-term capabilities are particularly malleable. A recent study using data from Chile and Norway (Bharadwaj et. al. 2013) provides evidence of the long(ish) term effects of neonatal health interventions. While this may not be directly relevant because it is about health interventions per se, rather than a health insurance benefit, it helps show that health care interventions early in life can have an important effect on outcomes, and thus, presumably, access to health insurance that would allow those interventions to take place may have an effect on outcomes. The study links interventions at the time of birth to test score outcomes when the children are in 1st-8th grade (Chile) or 10th grade (Norway). In both countries, if a baby is born with very low birth weight (below 1500 grams) there is a strict protocol of medical interventions to deal with common health issues that affect these tiny babies. Since very low birth weight status is triggered by a birth weight that is below a given threshold, the authors are able to use a regression discontinuity design and compare later-in-life outcomes for children whose birth weight was just below (the treatment group), and just above the threshold (the control group). The children who received the extra medical treatment had test scores that were from 0.12 to 0.22 standard deviations higher than very similar children who did not receive the extra care. While these outcomes are observed in childhood, they suggest improved cognitive ability. In other studies, improved test scores are linked to higher educational attainment, and multiple studies show that higher educational attainment is linked to higher earnings<sup>47</sup> and longevity, thus suggesting the potential for marked long-term effects over these children's lifetimes.

### *Evidence of long-term effects of health care access*

As with the cash transfers and food and nutrition programs discussed above, the children affected by substantial changes in health insurance coverage are now beginning to be old enough to investigate the impact of these reforms on their adult outcomes. As discussed in Buchmueller et al. (2016), the series of expansions of the Medicaid program from 1984 through 1992, and later the expansions in the State Children's Health Insurance programs have provided researchers with the opportunity to use differences in exposure to Medicaid based on age, year, and state to make comparisons between otherwise similar children who did and did not have Medicaid coverage.<sup>48</sup> A recent paper by Brown, Lurie, and Kowalski (2015) is the first to use these Medicaid and SCHIP expansions to investigate the long-term impacts of health insurance eligibility on adult outcomes. Using administrative data from the Internal Revenue Service, they examine the impact of health insurance eligibility from birth to age 18 on earnings, taxes paid, college attendance, mortality, and EITC receipt by age 28. They find Medicaid eligibility increases cumulative

47 Calibrating their impact on test scores with evidence from Chetty et al (2011) which shows the correlation between test scores and later-in-life earnings, the authors suggest that the improvements in test scores that these medical interventions cause potentially yield a 2.7 percent and 1.8 percent increase in incomes in Chile and Norway, respectively.

48 Also see cites in Brown et al. 2015.

income and payroll taxes paid (especially for women), decreases EITC receipt (especially for women, but also for men), has a positive but not statistically significant effect on wages for women,<sup>49</sup> reduces mortality (by age 28), and raises the likelihood of any college by age 22 for women.

The authors offer a useful cost-benefit calculation. They project that the government will recoup about 56% of each dollar spent by the time these recipients reach age 60, due to increased income and lower EITC payouts. Of course, this underestimates the benefits because it does not take into account other benefits that accrue to the people, through college attendance, higher income, and decreased mortality. This calculation is also based on expansion in eligibility, not on those who actually received Medicaid: scaling the results by the ratio of beneficiaries of Medicaid to those who are eligible for it implies the results would be almost twice as large.

Miller and Wherry (2016) examine outcomes in early adulthood for people whose mothers were affected by the 1979-1993 expansions in Medicaid benefits to pregnant women. Using data from the National Health Interview Surveys, they find that young adults (19-35) whose pregnant mothers were eligible for Medicaid were less likely to be obese (by 1.7 percentage points, about an 8 percent reduction in incidence). Using data on hospitalization, they find these young adults are less likely to have been hospitalized for endocrine, nutritional, metabolic diseases and immunity disorders (conditions that are sensitive to the *in utero* environment). These findings are notable since there is evidence of health effects relatively early in adulthood, earlier than the typical morbidity onsets of middle and older age.<sup>50</sup>

Boudreaux et al. 2016 examines the impact of Medicaid expansions on adult health outcome using the PSID. This uses the much smaller PSID sample and again exploits variation in eligibility arising through the Medicaid expansions. This research finds that exposure to Medicaid in years 0-5 leads to an improvement in adult health, although it cannot detect an effect on economic outcomes, possibly because the sample sizes are too small. Other research examining Medicaid expansions finds a positive effect on educational attainment (Cohodes et al. 2016), improved test scores in 4th and 8th grades (Levine and Schazenbach 2009), and decreased mortality for black teens (Wherry and Meyer 2016).

Finally, a very recent paper by Goodman-Bacon (2016) reaches back to the introduction of Medicaid from 1966-1970 to examine the long-run effects of childhood Medicaid eligibility. The introduction of Medicaid in this period creates differences in eligibility based on when people were born. The federal “categorical eligibility” mandate was such that all cash welfare recipients were made eligible, which means that the increase in public insurance eligibility was larger in areas with higher welfare participation. This research compares different birth cohorts, those that would have spent more and less time eligible for Medicaid, in places that had higher and lower welfare receipt. The striking results are consistent with other research on the long-term effects of access to medical care in childhood: Medicaid eligibility early in life reduces adult mortality and disability rates. For white adults, there is an increase in employment and a reduction in disability benefits and public insurance. Since these are largely offsetting, individual income is unchanged,

49 This is not conditional on working, so encompasses an effect the margin of working/not working. There is an estimated zero impact for men.

50 If the reduction in hospitalizations persists into older ages—when the bulk of health costs generally accrue—the savings will be substantial.



but Goodman-Bacon estimates that this results in government savings because the benefit payments go down, and income tax revenue increases. Goodman-Bacon estimates that this represents “a 7 percent return every year on the initial investment....and suggest that, between 2000 and 2014, the government recouped about 28 percent of the (true) original cost.”<sup>51</sup>

In sum, the evidence suggests that providing health insurance early in children’s lives has substantial long-run benefits. The potential pathways are that health care provided in the prenatal, neonatal and early childhood stages may be particularly effective at preventing or ameliorating health shocks that can have long-term repercussions for human capital. Additionally, health insurance coverage appears to ameliorate the adverse financial implications of health shocks, which may have a direct effect on familial stress, and access to resources that can be spent on other productive inputs (besides health care) for children.

## D. Housing

The final type of transfers to low-income households reviewed in this paper is housing. Like other in-kind programs, the extent to which housing programs produce the same outcomes as cash depends on what households would do if unconstrained. If programs simply allow households to purchase what they would have purchased if they had more money, then the outcomes ought to be the same as providing cash benefits. On the other hand, if housing benefits induce households to live in larger, safer, dwellings, or in better neighborhoods than they would if they had cash, they may induce a different shift in the early childhood environment. As will be discussed in the research below, inducing households to change *where* they live has been an explicit goal of some housing programs.

Table 4 provides a brief overview of the types of housing programs in the United States and their beginning dates. A recent review by Collison, Gould Ellen, and Ludwig (2016) provides an in-depth description of programs and the research examining their effects.

Support for low-income housing has taken three basic forms. The first is direct provision of housing for those with incomes below some eligibility threshold. The second is privately-owned subsidized housing, which is comprised of many programs. The Low Income Housing Tax Credit (LIHTC) was established as part of the Tax Reform Act of 1986 and provides the largest subsidy for the building of rental housing in the United States. The LIHTC program awards tax credits to developers to support the construction and rehabilitation of low-income rental housing; it is administered by state agencies, but is limited in supply and allocated to the states based on population.<sup>52</sup> Finally, there are vouchers which give renters an amount of money to subsidize their acquisition of housing on the private market.

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51 Using a 3 percent discount rate to calculate the yearly return; using observed treasury rates to discount the costs and benefits, this suggests about a 2 percent return.

52 Collison et al. (2016) highlight the paucity of research on the effect of LIHTC programs.

Source: Collison, Ellen, and Ludwig in Moffitt (2016).

The thorough review of housing programs by Collison et al. (2016) points out that the case for providing in-kind housing benefits, rather than cash, is that housing consumption may have some external effects that individuals using cash will not, or cannot, take into account when making decisions. For example, families may not know if there is lead paint around windows or asbestos in the walls, and thus cannot take into account the long-term health consequences on their children of these dis-amenities. The long-term impact of neighborhood or school quality on children's outcomes may not be salient for parents when making decisions about how much they can afford to pay in rent.

Evaluating the effects of housing subsidies on children's long-term outcomes is thorny. We know that families that are eligible for such subsidies have low incomes and there may be myriad channels through which their children's long-term outcomes are adversely affected that have nothing to do with housing per se. Research typically tries to compare people who receive housing subsidies to similar families who do not, but there are reasons to be concerned about selection into public housing, for example, on unobservable (to most empirical research) grounds: are these families unobservably worse off than other similar-seeming families because they wouldn't need housing assistance in the first place if they had a rich network of friends and family to help? Would the long-term outcomes really be determined by the lack of this rich network? Or are these families really unobservably better off because they are among the one-in-four eligible families who actually participate in the program, suggesting they may be especially savvy in getting programs to work for them? (Collison et al. 2016). Thus, are the children's outcomes better than they would be because they are the product of savvy parents? To disentangle these effects, researchers must find ways to compare families that are similar along both observable and unobservable dimensions.

Collison et al. summarize the results that use strategies that can plausibly identify the causal effects of public housing or receiving a housing voucher this way:

The evidence thus suggests that children are not much affected when their families move into public housing or receive a housing voucher. Both of those interventions improve housing conditions, but do not seem to do much to change the neighborhood environments in which children live.<sup>54</sup>

A different class of interventions tries to change the environments in which children live. Perhaps the most famous project to directly change the environments of low-income families is Moving to Opportunity (MTO), a randomized-controlled experiment carried out in the mid-1990s by the Department of Housing and Urban Development. It randomly selected families in high-poverty housing projects to receive a subsidized housing voucher to move to a lower-poverty neighborhood.<sup>55</sup> Thus, there is a treatment and control group

53 Collison et al. (2016) provide this helpful calculation: in 2014, the annual poverty income level for a family of 4 was 39 percent of area median income.

54 A notable exception is Currie and Yelowitz (2000), that uses the sex composition of children in the household to identify the effects of public housing on grade retention. Families with mixed-sexes among the children were eligible for more bedrooms, and thus more space, than single-sex child families. Thus, these families were more likely to find public housing attractive and move into it. Assuming no direct effects of sex composition of children on outcomes, this allows the authors to compare grade retention among very similar families that do and do not move into public housing. The results suggest improved housing conditions and improved grade retention.

55 The random assignment was into three groups: a control group, a group that receives a housing voucher, and a group that receives a housing voucher that can be used on the condition of moving to a low-poverty neighborhood (and also receives counseling on how to locate such housing).

that can be used to see the causal effects on moving to a lower-poverty neighborhood. Many studies have been conducted over the years since the initial project and they find that families did, in fact, experience a large difference in neighborhood environments. Although the project was conceived as a way to increase employment and earnings and reduce reliance on welfare of the adults in the households, researchers found little effect on these outcomes (Katz, Kling, Liebman 2001; Kling, Liebman, Katz 2007). On the other hand, studies have found beneficial effects on mental health for adults, and on mental and physical health and risky behavior for female youth (Kling, Liebman, Katz 2007). However, the youth results differ by gender with male youth experiencing increases in risky behavior (Kling, Ludwig, and Katz 2007).

### *Evidence of long-term effects of housing*

As with the other types of transfer programs discussed in this paper, researchers are beginning to be able to examine the long-term effects of programs on children's outcomes. New research by Chetty et al. (2016) links the children in the MTO experiment to federal income tax returns to examine their adult earnings and college attendance rates. This is possible both because the younger children in the study have now aged into having earnings and other adult outcomes, and because of the ability to link MTO participants to tax data.

The new research demonstrates that long-term effects may be profoundly different from those in the short term. For children who were under 13 at the time, random assignment into a Section 8 voucher to be used in a low-poverty neighborhood has a stunning array of positive outcomes. As adults, recipients earn more money and live in higher income households. They are more likely to go to college and they attend colleges

that are higher quality. The women who were under 13 at the time of the move are more likely to be married, and although there is no effect on the probability of having a birth or teen birth, if there is a birth, they are more likely to have a father on the birth certificate and at the birth. In adulthood, they are more likely to live in lower poverty neighborhoods with higher mean incomes. The results are strikingly consistent that moving for children who are over the age of 13 does not convey these kinds of effects, and may be detrimental due to disruption.

The authors provide a helpful cost-benefit analysis comparing the additional earnings of children randomly assigned into the treatment group below the age of 13 to the costs to the program. If a family has two young children, they estimate the increased federal tax payment from the increase in earnings of those children would be \$22,400 in present discounted value, which is more than the additional costs of the program.<sup>56</sup> As the authors conclude, "an MTO-type experimental voucher policy that moves low-income families with young children out of high-poverty housing projects will most likely save the government money." This is the cost-benefit calculation without taking into account additional benefits in terms of health and well-being, or potential reductions in the intergenerational transmission of poverty.

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<sup>56</sup> Chetty et al. (2016) estimate that the MTO experimental treatment raised individual earnings in early adulthood by 30.8 percent of the control group mean. To do this cost-benefit analysis, they translate this into a predicted lifetime earnings impact using several assumptions, including that this difference between the experimental group and the control group remains constant over the life-cycle.

The co-authors, Chetty, Hendren, and Katz, are cautious about the implications of their findings for policy. They point out that findings of other studies of housing are not always so positive. For example, Jacob et al. (2015)<sup>57</sup> find no long-term benefits to providing a subsidized housing voucher to families living in unsubsidized housing in Chicago. Chetty et. al. note their findings suggest the targeting of families with young children is critical, as is the restriction to move to a low-poverty neighborhood.<sup>58</sup> Families without

that restriction may use the subsidy to move to better housing, but in the same neighborhood. The findings in Chetty et. al. also suggest that current housing policy that lets families queue for the opportunity for a section 8 voucher are likely to result in families receiving the voucher when their children are too old to benefit from the move.

Of course, the evaluation of the MTO voucher experiment should not be interpreted as proof that a large-scale policy to get low-income families to move neighborhoods will have the same effect. The housing voucher relieved the budget constraints facing low-income households and the group that was restricted to using that voucher in a low-poverty neighborhood received help in locating such housing. Further, the experiment was small enough that it was unlikely to change the characteristics of either the old or the new neighborhoods. Additional complexities in extending these results to housing policy come from the fact that families may have both older and younger children. If moving is good for the younger children and bad for the older children, we would like to know if the benefits to younger children outweigh any ill effects for older children.

## **VI. DISCUSSIONS, AVENUES FOR FUTURE WORK, SUMMARY, AND CONCLUSIONS**

### **A. How reliable are results?**

One might be concerned that we are more likely to be aware of research findings if they find statistically significant and/or surprising results. Academic journals may be interested in new insights that are more likely to generate citations and excitement. If random variation will give us five findings that are “statistically significant at the 5% level” out of 100, then perhaps journals only show us those five.

If studies mainly have weak results and the publication process culls out those that do not “achieve” statistical significance, then the t-statistics associated with the main findings will be very likely to cluster around 1.96, the critical value associated with a 5% chance of a type 1 error (Card and Krueger 2001). That said, an analysis of the t-statistics associated with the main results discussed here suggest that the results are not merely marginally significant.<sup>59</sup>

Replication studies can also shed light on the reliability of results and are a hallmark in scientific research.

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57 Mills et al. 2006 also find little effect of randomly assigned housing vouchers to qualified households.

58 Note that the early results from MTO showed more positive results from girls and more negative results for boys. The long term follow up shows positive results on long-term outcomes for both boys and girls, if they were under the age of 13 at the time of random assignment.

59 Appendix figure 1 presents a histogram of the absolute value of the t-statistics in the main findings of the papers cited here. The mass of the t-statistics is well-above 2, and a line fitted between the coefficient and its standard error has a slope that is statistically well-above 2. These findings suggest that the relationship between the transfers and the outcomes is robust.

In laboratory studies, scientists check to make sure that if, by adhering to the stated protocols, they can reproduce the results. In the types of social science studies described above, the replication is different. It involves taking the same data set and seeing if, making the decisions that the authors describe about how they handled the data, the results can be replicated. This can turn up mistakes in the complicated coding that accompanies these types of studies, or mistakes in documentation. Alternatively, one can do a similar study on a different population at a different time and place. While most of the studies described here—particularly those that examine long-term effects of investments in children—are too recent to have been replicated identically, we are beginning to have a body of evidence that finds long-term positive effects of transfers particularly those that occur when children are young.

## **B. What do we yet need to know and how do we learn it?**

The short answer to how do we learn more is that we need more and better data. Researchers are beginning to find remarkable things by linking data across administrative records. Indeed, much of the research cited here would not have been possible a decade ago. New computing power has allowed for advances in matching across administrative data sources and over time. That said, the Scandinavian countries are far ahead of the U.S. in the use of these types of data to answer important questions. Much of what we know about early life outcomes and links to later-in-life outcomes is from those countries.

New efforts in the U.S. hold out hope for improving access to the kinds of linked administrative records that can make answering important questions possible. The [Commission on Evidence Based Policymaking](#) has as part of its mandate to examine the ways in which administrative records in the U.S. can be used to answer these types of critical policy questions.

And there are many things yet to learn. For example, we do not know whether and what types of transfers make the most difference. Are in-kind transfers or cash more efficient ways to effect change? The evidence on food stamps versus cash suggests that it does not make much difference because families' spending patterns are not altered by the form of the transfer. Being directive about how and what people should buy with this transfer is likely expensive and not terribly productive. That said, the evidence from MTO and other housing voucher programs suggests that ensuring that families move to lower-poverty neighborhoods is critical to success, and not necessarily something that families would do on their own. Understanding when and where transfers are inframarginal and thus unlikely to be different from cash is important.

Finally, many of the studies cited answer the questions, "Did you receive this program? If so, did it improve your long-term outcome?" That is a long way from understanding the dose-response relationship between an intervention and an outcome. It is difficult to do a cost-benefit analysis that tells one what the value of the marginal dollar invested in cash, food, medical care, and housing is, when one does not know the size of the transfer to compare to the (monetized) size of the response.

We also do not know what ages are best to target for which types of interventions. There is a great deal of evidence that ages 0-5 are critical periods for nutrition, health inputs, and from elsewhere, critical periods for intellectual stimulation. Yet, there is recent evidence from the MTO experiment that ages 5-13 continue

to be periods when children's outcomes can be dramatically altered by changing their environments. Possibly, that is because these are periods of development when peers and the external environment are critical inputs.

We are still a long way from understanding all the channels through which transfers may affect long-term outcomes. That said, there is mounting and dramatic evidence that transfers to low-income families early in children's lives manifest later in life. To understand these issues better, we need better data, coupled with a tool kit that allows for causal inference.

### **C. Summary and conclusions**

The War on Poverty in the United States is about 50 years old. Over that time period we have struggled with the fundamental problem of means-tested transfer programs: if we give a family a transfer, will they reduce their work efforts leaving them with essentially the same resources as they had before the transfer? Even worse, since human capital is built while working, will the reduction in work translate into worse later-in-life outcomes for the adult recipients of the transfers, leaving fewer resources available for their consumption and investments in children? Additionally, as children learn from watching their parents, will low-income children fail to learn the forms and conventions associated with productive market work, leading them to have worse futures? Finally, does the Catch-22 of means-tested transfer programs set the final snare in the poverty trap as low-income families face a perversely high tax rate as they approach the cutoff where they are no longer eligible for benefits?

The social science, biological and neuroscience research over the past 50 years has filled in some answers to these questions. First, there are disincentives to working created by transfers of non-labor income, and by the reduction in benefits as incomes rise toward the eligibility cutoffs. However, the long-term effects on children will be governed by the overall effects of transfer programs on resources available to families, and how those resources are deployed, not simply by the effects on earned income.

Work from across disciplines has developed a robust body of research indicating that children's environment in the prenatal, neonatal, and early childhood periods can profoundly affect the capacities that children develop, and these manifest as both cognitive and non-cognitive capacities. These capacities persist into adulthood, affecting earnings, health, and other life outcomes.

The pathways through which those human capital outcomes are affected include access to adequate nutrition and health care. There is further evidence that stress, has a direct effect on children *in utero*, and may directly affect child development, or have an indirect effect through parenting quality.

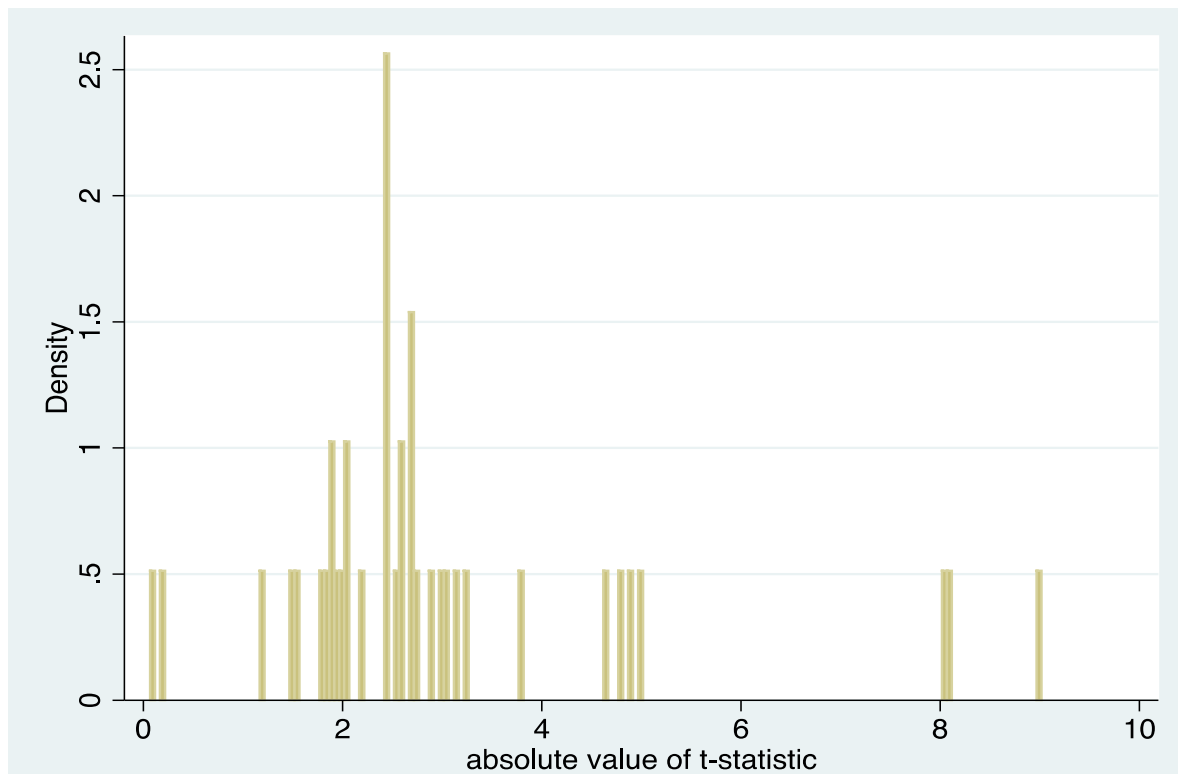
We are just beginning to understand the long-term effects of some of the transfer programs begun in the 20th century. Studies of the long-term effect of cash transfers (Aizer et al. 2016), food stamp benefits (Hoynes et al. 2016), health insurance coverage (Goodman-Bacon 2016; Brown et al. 2016, Miller and

Wherry 2016), and a particular form of housing subsidy (Chetty et al. 2016), all show remarkably consistent evidence that these transfers improved the long-term outcomes of the childhood recipients. These outcomes include adult health, education, and earnings (and mortality in some cases). The findings line up well with the biological and neuroscience research that suggests interventions prenatally and early in childhood are particularly productive. The findings suggest that whatever adverse effects these transfers may have had on the labor supply of adult recipients, they were more than offset by other changes in the household: overall access resources available to the family, reductions in stress, and access to medical care. Where available, the cost-benefit analyses suggest that these interventions had benefits that exceeded their costs.

Of course, context matters. Perhaps transfers of cash to children of single mothers in the 1930s (Aizer et al 2016), for example, have different effects than they do now. It will matter how serious the deprivation without the program, and how big a boost the transfer gives, taking into account any adult behavioral responses from the program. It seems worth noting that health insurance coverage for low-income families is a particularly important case. First, there is strong evidence of both short-term increases in access to medical care and long-term beneficial effects on human capital of Medicaid. Second, health insurance coverage has multiple pathways through which to affect children's long-term outcomes: access to effective health care (both preventative and treatment of ailments and accidents), and through reduction in financial distress, and there is evidence for both channels. Finally, provision of health insurance is unlikely to be inframarginal due to the nature of the market for health insurance, meaning that provision of health insurance likely has a different effect from a cash transfer.

## APPENDIX

**Figure 1: Histogram of t-statistics**



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