

Enduring Influences of Childhood Poverty

Katherine Magnuson
School of Social Work
University of Wisconsin–Madison
E-mail: kmagnuson@wisc.edu

Elizabeth Votruba-Drzal
Department of Psychology
University of Pittsburgh
E-mail: evotruba@pitt.edu

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Abstract

Poverty is a common experience for children growing up in the United States. Although only about one in five children are in poverty each year, roughly one in three will spend at least one year living in a poor household. Child poverty is a significant concern to researchers and policymakers because early childhood poverty is linked to a multitude of worse outcomes, including reduced academic attainment, higher rates of non-marital child bearing, and a greater likelihood of health problems. Moreover, childhood poverty, especially when it is deep and persistent, increases the chances that an individual will be poor as an adult, thereby giving rise to the intergenerational transmission of economic disadvantage.

In this chapter the authors review research on the dynamics of child poverty and the influences of poverty on development during childhood and early adulthood in the United States. They begin by describing trends in child poverty. Next, they present three dominant frameworks for understanding the influences of poverty on families and discuss challenges faced by researchers interested in measuring causal effects. Then they review studies that estimate childhood poverty's influence on development in three domains: educational attainment and achievement, behavior, and physical health. They conclude by discussing policies that show promise in attenuating the links between childhood poverty and development across the life course.

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CHILD POVERTY DYNAMICS

In the U.S., child poverty rates are higher than rates for the adult and elderly populations (Wallace and Meyer, this volume). In 2006, nearly 17.4 percent of children lived in families with incomes below the official poverty threshold compared with only 10.8 percent of adults. Another 22 percent of children lived in families with incomes less than 200 percent of the poverty threshold. Although it is difficult to make international comparisons, research suggests that U.S. has one of the highest rates of child poverty among western industrialized nations (Bradbury and Jäntti, 2001).

Young children have higher rates of poverty than older children—the 2005 poverty rate for children under age 3 was 21 percent while it was 15 percent for children ages 12–17 (Douglas-Hall, Chau, and Koball, 2006). The parents of young children do not earn as much as parents of older children because they are younger and have less work experience. It is also possible that the higher cost of child care for young children reduces parents' employment. Poverty rates are also higher among racial and ethnic minority children. In 2006, the poverty rate for children under age 18 was 33 percent for blacks, 28 percent for Hispanics, 15 percent for Asians, and 12 percent for whites. Children of immigrants also experience higher rates of poverty than children of native-born parents (24 percent vs. 12 percent) (Fass and Cauthen, 2007).

These annual poverty rates provide only a snapshot of the number of children in poverty. With child poverty rates remaining relatively stable over time, it would be easy to mistakenly conclude that the population of children experiencing poverty also changes little. Yet, analysis of longitudinal data reveals substantial turnover among the poor, as events like unemployment and divorce push families into poverty, and reemployment, marriage, and career gains pull them out. Building on the research of Duncan and Rodgers (1988), Kathleen Ziol-Guest calculated that on average children experience 1.8 out of the first 15 years of life in poverty. This average masks considerable heterogeneity (Table 1), about 65 percent of children never experience poverty, whereas 15 percent of children are poor for at least 5 of 15 years.

African American children are considerably more likely than white children to experience chronic poverty. Ziol-Guest found that the average African American child was poor for nearly 5.5 years, whereas the average white child was poor for less than a year. Moreover, only 30 percent of African American children never experienced poverty compared with 75 percent of white children. Children born to unmarried mothers and mothers with less than a high school diploma were also more likely to experience chronic poverty with an average of about 5.4 and 5.0 years spent in poverty during childhood, respectively.

Childhood poverty can also be characterized by the number of poverty spells that are experienced. Most poverty spells are relatively short, ending within two years (Gottschalk, McLanahan,

Table 1: Fifteen-Year Poverty Experiences of Children in the Panel Study of Income Dynamics Born between 1975–1987, by Race and Maternal Characteristics at Birth

	Average Number of Years Poor	Never Poor	Poor for at least 5 years	Poor for at least 8 years
Total Sample	1.81	65%	15%	10%
African American	5.53	30%	46%	37%
White	0.93	75%	7%	4%
Unmarried Mother	5.39	24%	46%	33%
Mother Education: < High School Degree	5.03	31%	44%	33%

Notes: Calculations of the Panel Survey of Income Dynamics conducted by Kathleen Ziol-Guest, Harvard University. Figures in this table are based on weights that adjust for differential sampling and response rates.

and Sandefur, 1994). However, about half of poor individuals who escape poverty, experience another spell of poverty within four years (Stevens, 1999). Recurrent poverty spells are also evident among children, more than half of children who are ever poor experience more than one spell of poverty (Ashworth, Hill, and Walker, 1994).¹ Children who are in poverty for longer periods of time are more likely to experience deep poverty (Ashworth, Hill, and Walker, 1994).

THEORETICAL FRAMEWORKS FOR UNDERSTANDING HOW POVERTY MIGHT AFFECT FAMILIES AND CHILDREN

Three main theoretical frameworks describe the pathways through which child poverty may affect development: family and environmental stress, resource and investment, and cultural theories. We begin our discussion of the consequences of child poverty by summarizing these approaches. Each framework is grounded in a different disciplinary background but, they share similarities and may be complimentary. Although developed primarily in the U.S. context, each theory has cross-national and cross-cultural applications.

¹Some entries and exits from poverty reflect just slight fluctuations of family income above or below the poverty threshold, suggesting that transitions into or out of poverty may not reflect a significant change in economic resources.

Family and Environmental Stress Perspective

Economically disadvantaged families experience higher levels of stress in their everyday environments, and these disparities in environmental stress may affect human development. The family stress model was developed first by Glenn Elder to document the influence of economic loss during the Great Depression (Elder, 1974; Elder, Nguyen, and Caspi, 1985). According to this perspective, poor families face significant economic pressure as they struggle to pay bills, purchase important goods and services, and are forced to cutback on daily expenditures. This economic pressure, coupled with other stressful life events that are more prevalent in the lives of poor families, create high levels of psychological distress, including depressive and hostile feelings, in poor parents (Kessler and Cleary, 1980; McLeod and Kessler, 1990). Psychological distress spills over into marital and co-parenting relationships. As couples struggle to make ends meet, their interactions become more hostile, conflicted, and they tend to withdraw from each other (Brody, Stoneman, Flor, McCrary, Hastings, and Conyers, 1994; Conger and Elder, 1994). Parents' psychological distress and conflict, in turn, are linked with parenting practices that are on average more punitive, harsh, inconsistent, and detached as well as less nurturing, stimulating, and responsive to children's needs. Such lower quality parenting may be harmful to children's development (Conger et al., 2002; McLoyd, 1990).

An understanding of environmental stress as a pathway through which poverty may affect individuals must extend beyond the family environment to consider other sources of every day stress that poor children encounter. Compared to their more affluent peers, poor children are more likely to live in housing that is crowded, noisy, and characterized by structural defects (e.g. leaky roof, rodent infestation, inadequate heating) (Evans, 2001, 2004). Poor families are more likely to reside in neighborhoods characterized by high rates of crime and neighborhood risk factors, such as boarded up houses, abandoned lots, and inadequate municipal services (Evans, 2004). The schools that poor children attend are more likely to be overcrowded and have structural problems (e.g. problems with noise, lighting, and ventilation) compared with the schools more affluent children attend (Evans, 2004). Economically

disadvantaged children also tend to be exposed to greater air pollution from parental smoking, traffic, and industrial pollution (Evans, 2004). These environmental conditions create physiological and emotional stress in the lives of impoverished children which, in turn, may have harmful effects on socio-emotional, physical, cognitive, and academic development. For example, childhood poverty heightens children's risk for lead poisoning, which has been linked to health, behavior, and neurological problems which may endure into adolescence and adulthood (Cecil, Brubaker, Adler, Dietrich, Altaye, Egelhoff, Wessel, et al., 2008; Shonkoff and Phillips, 2000).

The field of cognitive neuroscience provides related evidence that stress may affect poor children. Researchers have documented the harmful effects of stress on animal brain development. Stress exposure and the elevation of stress hormones, such as cortisol, negatively influences animals' cognitive functioning, leading to impairments in brain structures such as the hippocampus, which is of central importance for memory (McEwen, 2000). For obvious ethical reasons, these studies have not been replicated in humans. However, non-experimental studies have found low-SES children do have significantly higher levels of stress hormones than their more advantaged counterparts (Lupien, King, Meaney, and McEwen, 2001; Turner and Avison, 2003). Thus, disparities in stress exposure and stress hormones may partially explain why poor children have lower levels of cognitive ability and achievement (Farah et al., 2006). Although this explanation is compelling, to date studies have not established a clear causal sequencing of these associations or isolated the role of poverty per se in these processes.

Resource and Investment Perspective

Household production theory has played a central role in how economists view child development. Gary Becker's (1991) *A Treatise on the Family*, posits that child development is affected by a combination of endowments and parental investments. Endowments include genetic predispositions and the values and preferences that parents instill in their children. Parents' preferences, such as the importance they place on education and their orientation toward the future, combined with their resources, shape parental investments. Economists argue that time and money are the two basic resources that

parents invest in children. For example, investments in high quality child care and education, housing in good neighborhoods, and rich learning experiences enhance children's development, as do nonmonetary investments of parents' time. Links between endowments, investments, and development likely differ by the domain of development (e.g. achievement, behavior, health) under consideration. Characteristics of children also affect the level and type of investments that parents make in their children (Becker, 1991; Foster, 2002). For example, if a young child is talkative and enthusiastic about learning, parents are more likely to purchase children's books or take the child to the library (Raikes et al., 2006).

Household production theory suggests that children from poor families trail behind their economically advantaged counterparts because parents have fewer resources to invest in their children (Becker, 1991). Compared with more affluent parents, poor parents are less able to purchase inputs for their children, including books and educational materials at home, high quality child care settings and schools, and safe neighborhoods. Economically disadvantaged parents may also have less time to invest in children, due to higher rates of single parent families, nonstandard work hours, and less flexible work schedules (Smolensky and Gootman, 2003). This too may have negative consequences for their children.

Investments in cognitively stimulating and enriching home environments reflect familial investments of time and money into the materials and experiences that promote learning. Children from poor households tend to experience lower quality home environments than advantaged peers and these differences, in turn, explain some of the influence of poverty's effects on child educational achievement (Duncan and Brooks-Gunn, 2000). The central role of learning experiences in the home environment in accounting for poverty's effects is perhaps not surprising, given the known influence of environmental enrichment on the structure and functioning of a wide range of brain areas in animals (van Praag, Kempermann, and Gage, 2000). Disparities in the cognitive development of low- and middle-SES children are most pronounced in brain regions that are important for language, memory, and cognitive control (Farah et al., 2006, Noble, McCandliss, and Farah, 2007). These differences may, in part, stem from differences in exposure to enriching environments and corresponding effects on brain development (Farah et al, in press).

Cultural Perspectives

Sociological theories about how the norms and behavior of the poor affect children began with the “culture of poverty” theory put forth by Oscar Lewis (1969). Based on his field work with poor families in Latin America, he argued that the poor were economically marginalized and had no opportunity for upward mobility. Individuals responded to their marginalized position by adapting their behavior and values. The resulting culture of poverty was characterized by little impulse control and inability to delay gratification, as well as feelings of helplessness and inferiority. These adaptations manifested in high levels of female-headed households, sexual promiscuity, crime, and gangs. Although Lewis (1969) acknowledged that these behaviors emerged in response to structural factors, he argued that over time, these values and behaviors were transmitted to future generations, and therefore became a cause of poverty. He writes:

“By the time slum children are age six or seven they have usually absorbed the basic values and attitudes of their subculture and are not psychologically geared to take full advantage of changing conditions or increased opportunities” (Lewis 1966, p. xlv).

Cultural explanations for the effects of poverty on children were prevalent in the mid-1980s through the 1990s. These approaches suggested high levels of nonmarital childbearing, joblessness, female-headed households, criminal activity, and welfare dependency among the poor were likely to be transmitted from parents to children. Theorists agreed that behavioral differences exist, but they did not agree on the origins of these differences. For example, Lawrence Mead (1986) emphasized the role of individual characteristics and the liberal welfare state’s perverse incentives that reward single-mother households and joblessness among men. Douglas Massey (1990) and William Julius Wilson (1987; 1996) stressed the importance of structural and economic factors: the concentration of neighborhood poverty, the social isolation of poor inner city neighborhoods, and the deindustrialization of urban economies. They contended that these structural factors negatively influence the behavior of inner-city adults and their children.

A common criticism of culture of poverty explanations is that they fail to differentiate the behavior of individuals from their values and beliefs (Lamont and Small, 2008). Evidence suggests that disadvantaged individuals hold many middle class values and beliefs. However, unlike the middle class, circumstances make it difficult for the poor to behave in accordance with their values and beliefs. For example, Edin and Kefalas (2005) show that poor women value marriage and recognize the benefits of raising children in a two-parent household. However, their low wages as well as black men's high rates of unemployment and incarceration lead poor women to conclude marriage is out of their reach. Traditional notions of a culture of poverty do not account for this sort of disconnect between values and behaviors.

Recently, sociologists have developed more sophisticated approaches to examine the intersection of culture and poverty, drawing on cultural concepts, including repertoires, frames, narratives, as well as social and cultural capital, to understand how poor adults experience, perceive, and respond to their economic position (Lamont and Small, 2008). For example, studies suggest that poverty is related to smaller and less supportive social networks (Tigges, Browne, and Green, 1998). The notion that norms and behaviors are passed down from generation to generation is implicit in cultural theories, even if it has not been well documented.

One exception is Lareau (2003) who identifies differences in cultural childrearing repertoires. Lareau finds that middle class parents engage in "concerted cultivation" by providing stimulating learning activities and social interactions. As parents, they believe that they should do everything possible to promote their children's social and cognitive development. In contrast, she reports that working-class and poor parents view child development as unfolding naturally and believe it is not necessary to do more than provide basic supports (e.g., food, shelter, comfort). These differences in cultural repertoires provide a distinct advantage to middle-class children and contribute to the intergenerational transmission of social class.

CHALLENGES OF STUDYING THE CAUSAL EFFECTS OF CHILD POVERTY

In the sections that follow, we document associations between childhood poverty and academic achievement/attainment, social functioning, and physical health. In doing so, we differentiate studies that are more descriptive in nature from those that are more methodologically rigorous, and thus more conducive to making causal claims about poverty's effects. Researchers interested in identifying the causal influences of child poverty face formidable challenges. They must take seriously threats to internal validity from a variety of sources, including simultaneity considerations and potential omitted variables, and particularly genetic explanations. They also must contend with possible heterogeneity in poverty effects. We touch briefly on each issue before reviewing the literature.

Simultaneity Bias

Despite the abundance of research documenting links between childhood poverty and later outcomes, it is difficult to determine whether these outcomes are consequences or causes of poverty. However, there is evidence that causal pathways exist in both directions between child poverty and outcomes. For example, consistent associations have been found between childhood poverty and a wide range of health outcomes. Evidence suggests that these in part, reflect causal effects of child poverty on health (Case, Lubostsky, and Paxson, 2002; Currie and Stabile, 2003). At the same time, mothers of children who have poor health status are less likely to be involved in the paid labor force, tend to work fewer hours, and have a greater likelihood of experiencing job loss (Earle and Heymann, 2002; Gould, 2004; Kuhlthau and Perrin, 2001; Powers, 2001, 2003). Researchers face considerable challenges in ruling out this type of simultaneity bias, but the failure to do so may result in an overestimation of poverty's effects.

Omitted Variables

A second challenge involves isolating the effects of poverty from other disadvantages that poor families face. Children who live in poverty often have parents with lower levels of education and ability,

as well as mental health, and they are more likely to live with only one parent. All of these factors may have an independent negative effect on children. Thus, to ascribe a causal effect to poverty per se requires ruling out other explanations for the association between poverty and children's development.

Some researchers have argued that income effects are largely spurious and the result of unmeasured differences that are correlated both with income and child outcomes (Mayer, 1997). In other words, unmeasured characteristics, such as parental mental health or motivation that contribute to greater earnings may also enhance child development, leading to a spurious correlation between income and child development. This threat of omitted variable bias remains of significant concern in most current research. Studies that use rigorous statistical techniques to clarify issues of causality tend to uncover smaller effect sizes than studies that do not attempt to reduce omitted variable biases (Duncan, 2006).

Some researchers argue that trying to isolate the causal effects of poverty is misguided because it is difficult to know the extent to which related disadvantages, such as low levels of education or mental health, are themselves caused by poverty (Gershoff, Aber, and Raver, 2003). Parsing out the effects of related dimensions of disadvantage from those of poverty is likely to present a distorted or incomplete view of the extent to which economic disadvantage affects children. Nevertheless, to answer the question of whether a policy that increases family incomes will improve children's outcomes, it is important to know whether childhood poverty per se affects children.

Genes

Genetic explanations for the transmission of social and cognitive capacities represent a specific form of omitted variable bias in poverty research. Many skills, characteristics and traits are in some part inherited by children from their parents. This has led some to argue that differences between poor and non-poor children are primarily determined by genes (Rowe and Rodgers, 1997). Yet, efforts to parse out genetic or environmental determinants of development have been questioned as recent evidence indicates that gene expression is the result of a complex interplay between genetic endowments and environmental experiences (Collins et al., 2000; Lerner, 2003). Nevertheless, because genetic processes are likely linked

with both children's outcomes and parents' economic resources, researchers face the challenge of gene-environment correlations (Jencks and Tach, 2005; Scarr, 1992).

How genetics should be incorporated into poverty research is not obvious. One simple approach might be to try to parse out how much of the correlation between poverty and an outcome is due to genetics.² In a recent review of genetic studies, Jencks and Tach (2006) conclude that at most 40 percent of the correlation between parents' income and their children's income might be due to genes, suggesting that the bulk of the associations between parents' income and their children's outcomes cannot be attributed solely to genes. This tactic, however, ignores the fact that heritability may vary substantially in low- and high-SES families, and is typically strongest in advantaged families (Guo and Stearns, 2002; Rowe, Jacobson and Van den Oord, 1999; Turkeheimer et al., 2003). Individual differences in achievement in higher-SES environments appear to be driven more by genetic processes, whereas individual differences in low SES environments appear to be more closely linked to environmental influences. Whether this is also the case for other skills and traits is uncertain. However, the differential heritability of cognitive ability in high- and low-SES environments suggests that any simple approach to addressing genetic bias in estimating the role of poverty may be misguided.

Heterogeneity of Effects- Age, Gender, Race, Immigration Status

In seeking to understand the effects of child poverty, researchers face theoretical and empirical questions about whether the effects of poverty differ by social categories or other individual characteristics. Below we briefly discuss why poverty's influence may depend on a child's age, gender, race, ethnicity, and immigrant status. Poverty's effects may also be contingent on other characteristics of individuals, such as personality or temperament, but this has generally not been the focus of research.

²Despite limitations, researchers have turned to twin and adoption studies in attempt to disentangle the relative contributions of parental genes and environments to children's development. If siblings who are identical twins are more similar than fraternal twins, then this might suggest a role for genes. Likewise, if biological children are more similar to their parents than adopted children, this too might indicate a role for genes. These studies, however, involve small and unrepresentative samples and rest on assumptions about the independence of genetic and environmental influences on development that are tenuous (Bouchard and McGue, 2003; Stoolmiller, 1999).

Both economic and psychological perspectives suggest that poverty may be more harmful to preschool-aged children compared to children who experience poverty during middle childhood or adolescence. Infancy and early childhood are times of rapid cognitive and socioemotional development and young children are uniquely sensitive to environmental influences (Shonkoff and Phillips, 2000). The foundation of children's capacity to learn and regulate their emotions develops during this time through children's reciprocal interactions with the environment. Insensitive, inattentive, or unstimulating caregiving, which is more common in economically disadvantaged households, is thus particularly detrimental to child wellbeing. The salience of poverty in early childhood is also consistent with economic theory that highlights the importance of early investments, arguing that early investments maximize the time for realizing returns as "skills beget skills" (Heckman, 2006). Empirical support for the importance of early poverty is especially strong for educational achievement and attainment, which is reviewed in our discussion of the consequences of child poverty that follows.

The influences of child poverty may also differ by child gender, but few studies have considered whether girls or boys fare worse. Elder's early work on families during the Great Depression suggested that gender differences in the influence of economic loss are complex and depend on children's stage of development. Among early adolescents, financial loss threatened girls' psychological well-being, but not boys (Elder, Nguyen, and Caspi, 1986). The disproportionate effects on girls may reflect their greater psychosocial vulnerability in early adolescence as well as gender roles which lead girls to take on greater household responsibilities, thereby increasing their exposure to family stress that accompanied economic decline. Among younger children, however, boys were more likely than girls to be affected by economic loss during the Great Depression (Elder, 1979). This pattern may be explained by the fact that young boys tend to be more reactive and vulnerable to environmental stress than young girls (Zaslow and Haynes, 1986). Still, more studies are needed to systematically identify gender differences in poverty's effects.

The disproportionate representation of immigrant children and children of color among the poor raises the question of whether the effects of poverty are similar for these groups. Theories about how poverty influences development provides little direct guidance on this question. Poverty may be more

detrimental to children of color and immigrant children because their families face multiple sources of disadvantage, including discrimination and segregation, and have fewer resources to draw on when coping with poverty (Raver, Gershoff, and Aber, 2007). Alternatively, the overwhelming challenges associated with living in poverty may overwhelm any ethnic, racial, or cultural specificity (Mistry, Vandewater, Mistry and McLoyd, 2002). To date, this question has received little systematic theoretical or empirical treatment in the literature.

CONSEQUENCES OF CHILD POVERTY

Academic Achievement and Attainment

Does poverty affect children's achievement and educational attainment? Income gaps in achievement are present when children enter school and grow during the school years (Maldonado and Votruba-Drzal, 2007). The magnitude of the gaps differs across studies and measures, but typically amounts to a modest difference of about one third of a standard deviation (Blau, 1998; Smith et al., 1997). Effects on educational attainment are larger, with the mean differences amounting to over a year of schooling (Duncan, Kalil, and Ziol-Guest, 2008). Differential rates in high school completion and college attendance are also large—poor children are one third as likely to complete high school (Corcoran, 2001) and the gap in college attendance between the lowest quintile and highest quintile of income is nearly 50 percentage points (Haveman and Wilson, 2007). These differences in children's achievement and attainment likely contribute to differences in job opportunities and later earnings (Jäntti, this volume).

Despite theoretical predictions and correlational evidence, whether family income and poverty are causal determinants of children's achievement and education behavior remains a controversial issue. As noted above some scholars argue that both low family incomes and low achievement are the by-products of genetic, psychological, and social differences between poor and non-poor families, which are the “true” causes of poor achievement and attainment (Mayer, 1997).

Duncan (2006) described a continuum for evaluating the methodological rigor of studies aimed at estimating poverty and income's influence on child development. On one end are correlational studies that analyze associations between concurrent measures of family income and child outcomes, with few adjustments for confounding factors. These studies are common, but likely plagued by biases. On the other end are experiments, in which families are randomly assigned to receive additional income, without any strings attached. If implemented correctly, experiments provide unbiased estimates of income effects, but such studies are exceptionally rare. Between these two extremes, ranging from more to less rigorous, are natural experiments, studies that employ econometric techniques to reduce omitted variable bias (e.g., fixed effects, instrumental variables regression), and longitudinal studies.

The only randomized interventions to consider "pure" income effects on children are the Negative Income Tax Experiments conducted between 1968 and 1982 to identify the influence of guaranteed income on labor force participation. Some sites collected data on a limited set of child outcomes. Researchers found that elementary school children in the experimental group exhibited higher levels of early academic achievement and school attendance in some sites, but the result was not evident for adolescents. Youth in the experimental group did, however, have higher rates of high school completion and educational attainment in the two sites where these outcomes were assessed (Salkind and Haskins, 1982). This suggests that income's effects may be causal, but the data were limited. In addition, it is impossible to distinguish the effect of income from the reduction in parental work effort that accompanied the income increase (Moffitt, 2003).

Researchers have analyzed longitudinal data to better understand the effects of family income on children's achievement and education. Duncan and Brooks-Gunn (1997) coordinated analyses of researchers working with 10 different longitudinal data sets seeking to isolate the effects of permanent income from other SES components. The researchers used statistical controls to hold constant confounds such as family structure and maternal education. They found, first, that the effects of household income appear to be non-linear, with larger associations between income and achievement for families in the lower end of the income distribution. Second, family income in early childhood appears to be more

important for shaping ability and achievement than income during middle childhood or adolescence.

Finally, they discover that experiences of persistent poverty and deep poverty are particularly detrimental to children's achievement.

Mayer (1997) employed a more rigorous study design because she was concerned that controlling for the effects of maternal education and family structure was an insufficient correction for biases associated with the omission of unmeasured factors (e.g. parental ability or mental health). She used income measured later in life as a proxy for unmeasured parental characteristics. When later income is held constant, she argued, the estimated effect of early income is likely to be less biased. She also analyzed components of parental income that are somewhat independent of the actions of the family (e.g., income from family investments such as interest and stock dividends). Mayer found that these methods lead to large reductions in the estimated impact of parental income, leading her to conclude that much of the estimated effect of income is spurious rather than causal.

Mayer's strategy, as she pointed out, has potential flaws. If families anticipate future income changes and adjust their consumption accordingly, and the consumption changes affect children, then future income does indeed causally affect earlier child outcomes. In addition, measurement error in income from dividends and interest will impart a downward bias in their coefficients. Moreover, because interest and dividends are almost non-existent among poor families, these income sources are not useful for estimating income effects among these families.

Blau's (1999) study used family fixed-effect models that relate sibling differences in test scores to sibling differences in the individual children's income histories during middle childhood. He employed two alternative measures of parental income: income (or wage rates) during the calendar year prior to the measurement of the child outcome and average household income (of the mother) over all years in which the data were available. He found small and insignificant effects of current income on achievement and larger (though still modest) effects of long-run income. A limitation, however, is the assumptions that families can smooth consumption perfectly and that income effects in early childhood are equivalent to the effects of income received in other stages of childhood.

Experimental welfare reform evaluation studies undertaken during the 1990s provided a unique opportunity to observe how increases in family income affect poor children's development (Morris et al., 2006). Although all of the experimental programs increased parental employment, only some increased family income. Comparing the effects of programs that only boosted parental employment with those that boosted both employment and income provides estimates of the extent to which increases in family income benefits children. Preschool and elementary-school children's academic achievement was improved when income increased, but not by programs that only increased parental employment (Morris et al., 2006). Such benefits were not apparent for adolescents. These findings suggest that income might play a causal role in children's achievement, although these programs increased both income and parental employment.

Dahl and Lochner (2005) capitalized on a natural experiment to identify income's effect. Between 1993 and 1997, the maximum Earned Income Tax Credit, which provides a tax credit to working poor families increasing from \$1,801 to \$3,923 for a family with two children. This created an unexpected exogenous increase in income. Dahl and Lochner found that such increases in income predicted improvements in low-income children's achievement.³

If poverty, especially early poverty, influences children's achievement it is not surprising to find that it also affects educational attainment. Both Campbell et al. (2004) and Duncan et al. (2008) used regression-based approaches and longitudinal data to relate average household income to completed schooling. Their analyses allow for differential effects of income according to when it is received (early childhood, middle childhood, and adolescence), and, to deal with omitted-variable bias, controls for differences in family structure, parental education, and other background characteristics. These studies suggest that parental income in early childhood and adolescence affect educational attainment, although these studies focus on income rather than poverty status per se. Campbell et al. (2004) found that family

³One concern with this analysis is that other policy changes that occurred in the 1990s, such as expansions to Head Start, might be confounded with expansions in the EITC (see Jacobs and Ludwig, 2007 for a discussion of this concern).

income in early childhood and adolescence both affect educational attainment. In addition, they discovered that college attendance is affected only by income during adolescence, pointing to the possible financial barriers to higher education imposed by increasing college tuitions and credit constraints (Belley and Lochner, 2007; Kane, 2007).⁴ Duncan, Kalil, and Ziol-Guest (2008) found that an increase of \$10,000 averaged over the first five years of life would lead to a 0.4 of a year increase in completed schooling for families earning less than \$25,000. The same increase in income, however, experienced during adolescence was linked to increases in educational attainment for children only among families with incomes of \$25,000 or more.

Plug and Vijverberg (2005), analyzing a sample of adoptees, found that parental income is associated with educational attainment both among adoptees and biological children.⁵ Moreover, the estimates are quite similar across these groups, leading the authors to conclude that family income plays a causal role in determining educational attainment.

Additional studies relating changes in income during childhood to changes in child development to isolate income effects from unmeasured, and unchanging, parent and child characteristics further highlight the importance of income in early childhood for children's achievement (Dearing, McCartney and Taylor, 2001; Votruba-Drzal, 2006). Thus, poverty probably matters for children's achievement and later educational attainment, although not as much as some of the early and less rigorous studies suggested.⁶ No study has been able to rule out all sources of bias or threats to internal validity, but taken together, the robust links between early childhood poverty and later achievement and attainment, as well as adolescent income and attainment, suggest that parental economic resources play a modest causal role.

⁴Caneiro and Heckman (2002), however, argue that borrowing constraints have little impact on poor adolescents college attendance.

⁵Several adoption studies have considered the intergenerational transmission of socioeconomic status, more broadly defined than income (see Borjklund, Jäntti, and Solon, 2007).

⁶A host of recent studies relate changes in income over a child's life course to changes in their outcomes to isolate the effects of income from unmeasured, and unchanging, parent and child characteristics. These studies confirm that income in early childhood seems to affect children's achievement (Dearing, et al., 2006; Taylor et al., 2004; Ackerman, Brown, & Izard, 2004; Dearing, McCartney & Taylor, 2001; Votruba-Drzal, 2006).

Duncan (2006) concluded that the magnitude of the association between income and academic achievement was moderate among poor families, with a \$3,000 annual increment increase for several years related to between a .05 and a .18 standard deviation improvement in achievement (an average effect of .11 of a standard deviation improvement).

Behavior

Poor children are typically rated by their parents and teachers as having more behavior problems than their peers. In childhood, this is reflected in elevated levels of externalizing problems, such as aggression and acting out, and internalizing problems, such as depression and anxiety; in adolescence and later adulthood, in higher rates of non-marital fertility and criminal activity. Again, the extent to which these associations reflect causal associations remains uncertain.

Many studies have found links between poverty and behavior problems, antisocial behavior, inadequate self-regulation, and poor mental health (Blau, 1999; Mistry et al., 2002; Votruba-Drzal, 2006; Yeung et al., 2002). For example, 7.8 percent of poor vs. 4.6 percent of non-poor parents rated their children as having difficulties with emotions, concentration, behavior, or getting along with others (Simpson, Bloom, Cohen, Blumberg, Bourdon, 2005). Yet, such differences have sometimes failed to be replicated in studies that hold constant confounds, such as family structure and parental education (Duncan and Brooks-Gunn, 1997; Duncan, Ziol-Guest, and Kalil, 2008; Mayer, 1997). For example, Dearing et al. (2006) examined within-child associations between income and young child behavior and found significant negative effects of lower family income on externalizing behavior, especially for children who live in chronically poor households, but not on internalizing behavior.

Using a natural experiment whereby a casino opening on an Indian reservation gave families an income supplement that increased annually, Costello, Compton, Keeler, and Angold (2003) found that children whose families moved out of poverty experienced reductions in symptoms of conduct and oppositional defiance disorder. Reports of anxiety and depression, however, were unaffected.

These studies suggest that although poverty is associated with children's socio-emotional wellbeing, to the extent that the effects are causal, they are likely to be selective. Accumulating evidence suggests that, for example, poverty may be more strongly associated with externalizing problem behavior, such as aggression, rather than internalizing behavior, such as depression. The fact that family income may be more linked with some types of behavior than others is not surprising. However, discrepancies across studies may also be attributable to differences in study design. Studies vary considerably in the ages of children and the timing of the poverty or income measure. There is little evidence to indicate whether current or permanent income is a stronger predictor of children's behavior. Nor is there clear evidence on whether the age at which poverty is experienced or timing of poverty is salient in understanding associations between income and children's behavior.

Some studies show that children raised in low-income households have higher rates of arrest and incarceration than their affluent counterparts (Bjerk, 2004; Duncan, Kalil, and Ziol-Guest, 2008). Duncan et al. (2008) found that boys living in poverty during the first five years of life were more than twice as likely to be arrested as boys who had family incomes over twice the poverty threshold (28 percent vs. 13 percent). Taking into account the variety of ways in which poor families differ from wealthier families reduces the associations to statistical insignificance. Consequently, it is uncertain the extent to which criminal activity can be attributed to poverty per se, rather than the range of social disadvantages associated with poverty.⁷

Non-marital births are more prevalent among women who experienced poverty as children. Duncan et al. (2008) found that more than half of girls who experienced poverty for the first five years had a non-marital birth by age 28, compared to 21 percent for those with family incomes between 100–200 percent of the poverty threshold and only 8 percent for those with household incomes over 200 percent. Attempting to isolate a causal effect of income, Mayer (1997) reduces associations by more than

⁷Jacobs and Ludwig's (2007) study of the Chicago Housing Voucher Program provides preliminary evidence that the housing voucher, which would increase a household's disposable income, is associated with reductions in male adolescent crime.

half, but still finds a significant association between income during adolescence and non-marital fertility. In contrast, Haveman et al. (1997), argue that residing in a single parent family explains the association between non-marital childbearing and poverty.

Physical Health

Growing up in poverty is associated with a variety of worse health outcomes. Compared with children in non-poor households, poor mothers report that their children have worse overall health. Currie and Lin (2007) found that only 70 percent of poor children were reported to be in excellent or very good health, compared with 87 percent of non-poor children. In western industrialized nations, economic disparities in general health tend to grow from early childhood through adolescence (Case, Lubotsky, and Paxson, 2002; Currie and Stabile, 2003). This is, in part, is because income seems to protect children's health at the onset of early chronic conditions (Case, et al., 2002).

In the U. S., children from poor households also have higher rates of chronic conditions, such as asthma, diabetes, hearing, vision, and speech problems, with 32 percent of poor compared with 27 percent of non-poor children reporting at least one such condition. Asthma is the most common chronic condition among poor children, followed by mental health conditions, with attention deficit hyperactivity disorder being the largest diagnosis within this category (Currie and Lin, 2007). Finally, poor children suffer from higher rates of health-related activity limitations and acute illness (Currie and Lin, 2007).

Associations between childhood poverty and health extend into adulthood. Economic disadvantage in childhood has been linked to worse overall health status and higher rates of mortality in adulthood (Case, Fertig, and Paxson, 2005; van den Berg et al., 2005). Johnson and Schoeni (2007a) find that childhood poverty is linked to heightened risk for several chronic diseases in adulthood. By age 50, individuals who have experienced poverty in childhood are 46 percent more likely to have asthma, 75 percent more likely to be diagnosed with hypertension, 83 percent more likely to have been diagnosed with diabetes, 2.25 times more likely to have experienced a stroke or heart attack, and 40 percent more likely to have been diagnosed with heart disease, in comparison to individuals whose incomes are 200

percent of the poverty line or greater. Adult disparities in chronic health problems by poverty status tend to become more pronounced with age.

Unadjusted differences in physical health by childhood poverty status likely overstate the true causal effect of childhood poverty on physical health. Possible omitted variable and simultaneity biases along with the failure of most studies to account for the role of genes make it difficult to draw causal conclusions. Some researchers have used more rigorous analytic approaches to deal with these sources of bias. Van den Berg, Lindeboom, and Portrait (2005) used business cycle conditions as a source of exogenous variation in family income during early childhood. They discovered a robust effect of economic conditions in early life on individual mortality rates at all ages—being born during a recession was associated with an 8 percent increase in the mortality rate after the first year of life. Johnson and Schoeni (2007a, 2007b) uncovered large and significant links between childhood poverty and a variety of health outcomes in adulthood. However, comparing siblings who experienced different economic conditions (i.e. sibling fixed-effect models) greatly reduced these associations. The associations between childhood poverty and adult health status were robust in sibling models, but associations with a variety of diseases in adulthood (e.g. asthma, hypertension, and stroke or heart attack) were not. This raises questions about the extent to which basic correlations between childhood poverty status and adult health are causal.

With so few studies directly considering the effect of childhood poverty and later health, it is worth considering other sources of evidence that may shed light on this question. Research examining policies aimed at reducing poverty-related material hardships may provide additional information about poverty's influence on health. For example, Food Stamps, a program designed to reduce food insufficiency, has been shown to increase birth weight and reduced prematurity (Almond, Hoynes, and Schanzenbach, 2007). Furthermore, WIC participation has been linked to improved birth outcomes and reductions in childhood obesity (Bitler and Currie, 2005). Unfortunately, rigorous research on programs such as these has not yet been extended to consider physical health benefits beyond these very early years of a childhood. To the extent that programs like Food Stamps and WIC lead to improvements in the

health of economically disadvantaged, one can infer that at least some of the influence of poverty on physical health may be causal.

SUMMARY

About one in three children will experience poverty during childhood. For most, poverty will be transient; however, for some, poverty persists for many years. About 10 percent of children will spend more than half of their childhood in poverty (at least 8 out of the first 15 year). Children experiencing chronic poverty are more likely to be born into single parent families, to mothers with low levels of education, and to be African American.

Theories suggest that experiencing poverty during childhood may affect one's life chances by increasing family stress and reducing parental investments. Families may also adapt their behaviors when facing diminished economic opportunities, and this may influence their child-rearing, leading to detrimental effects on children.

Studies confirm that children who experience persistent poverty are at risk of experiencing poor outcomes later in life across important domains: academics, behavior, and health. Because identifying the unique effect of poverty on child and adult outcomes is challenging, the extent to which these associations are causal is uncertain. Poor and non-poor families differ in a variety of ways that may also affect individual's outcomes, making it difficult to isolate the causal effect of income from that of other related disadvantages and family characteristics.

Cumulative research evidence suggests that deep and early poverty may be linked to lower levels of achievement, holding constant other family advantages. Low-family income during adolescence is likewise linked to lower levels of educational attainment. It is difficult to provide a precise estimate of how much of the associations between poverty and achievement outcomes are likely to be causal, due to differing measures and methods used in studies. Our review suggests that the causal effects of income and poverty are likely to be modest, corresponding to at most a third of a standard deviation.

The associations between child and young adult behaviors, such as problem behavior, crime, and non-marital childbearing, and poverty are more selective. Some evidence suggests that effects on externalizing behavior may be causal, although probably small. More research is necessary to better understand the associations between poverty and behavior, with particular attention to the age and timing of poverty as well as the particular type of behavior under consideration.

Although correlations between child poverty and health are well documented, there is little indication of whether these associations persist after adjustments are made for observable and unobservable differences across families. Theory and related literature provide good reasons to suspect that poverty is detrimental to children's health. Yet, the base of rigorous research is inadequate for drawing any firm conclusions about the magnitude of causal effects.

POLICY IMPLICATIONS

If at least some of the effects of poverty reviewed above are causal, what can be done? Strategies for improving the life chances of poor children focus on boosting family economic resources directly, either by providing cash supplements, in-kind benefits which offset the costs of basic necessities, or by increasing the earnings of poor workers. Interventions aimed directly at children and families provide an additional policy lever for enhancing the development of poor children. Below we prioritize these strategies for confronting the harmful consequences of child poverty

First, income support policies including child allowances and cash supplements provide a basic minimum level of support to families with children (Jane Waldfogel, this volume). Such benefits are common in advanced welfare states, but have not been prominent in US policy discussions. Instead, the US tax system has been used to redistribute cash to low-income families. The child tax credit, a partially refundable tax credit, and the Earned Income Tax Credit (EITC), a fully refundable tax credit, are two mechanisms that direct economic resources to working poor families with children (Moffitt and Scholz, this volume). The EITC, which provides cash support to low-income workers has been heralded by many policy analysts for its ability to boost family incomes and promote employment (Moffitt and Scholz, this

volume). Making the child tax credit fully refundable would provide more help to poor families. Another way to boost family income would be to increase the minimum wage (Blank, this volume) or allow for generous earnings disregards in calculating cash welfare benefits, allowing recipients to keep a larger portion of their welfare benefits as their earnings increase.

Given the links between early poverty and development, targeting additional income support to families with young children may be particularly valuable. Expansions in cash support could be targeted to families with children under age 6. Currently, the maximum child care tax credit is up to \$1000 for each child under age of 17. An expansion that increased the credit to \$2000 for all children under the age of 6, would channel needed resources to poor families with young children. Likewise, the EITC schedule of benefits could be revised to provide larger benefits to parents of young children.

Second, means-tested benefits such as food stamps, WIC, housing assistance, and children's health insurance provide poor families with valuable in-kind support and hence raise disposable income. Child care subsidies are especially important to supporting low-income working mothers by offsetting the high costs of non-parental care (Waldfogel, this volume). In-kind benefits may be effective in attenuating the effects of child poverty if they reduce economic hardship and increases investments in poor children.

Third, interventions aimed directly at enhancing the educational experiences of poor children have been shown to be effective. Jacobs and Ludwig (this volume) discuss the range of successful educational programs and policies that may benefit poor children and increase the odds that they will develop into successful adults. High quality early education programs for low-income three- and four-year olds, including Head Start and prekindergarten programs, top the list of proven interventions.

Finally, if some of the association between poverty and child development are due to poorer quality parenting by economically disadvantaged parents, parenting programs may offer another opportunity for improving the life chances of poor children. These diverse programs typically seek to improve parents' ability to provide enriching, stimulating, and sensitive care-giving. A review of parenting program evaluations suggests that although many programs can improve some dimensions of parenting, few can improve child outcomes, particularly cognitive development (see Magnuson and

Duncan, 2004; Brooks-Gunn and Markman, 2005). Important exceptions are parent management programs, such as the Incredible Years program (Webster-Stratton, 1990), designed specifically for parents with young children exhibiting high levels of problem behaviors such as aggression and intensive nurse home visitors for disadvantaged new mothers (Olds, Sadler, and Kitzman, 2007). Although parenting interventions may have effects on selective populations, on balance, it seems unlikely that existing programs can significantly improve the life chances of poor children.

There are many programs and policies that may succeed in reducing poverty among families with young children or limiting the harmful effects of poverty. Children who experience chronic and deep poverty face many threats to their healthy development, only some of which are directly attributable to poverty per se. Given the heterogeneity of circumstances across poor families, no single policy response will be sufficient to break the link between poverty and child outcomes. While it is uncertain how much of an effect poverty has on any one particular outcome, alleviating childhood poverty would almost certainly improve children's life chances.

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