Intergenerational Payoffs of Education

Neeraj Kaushal

Summary
Better-educated parents generally have children who are themselves better educated, healthier, wealthier, and better off in almost every way than the children of the less educated. But this simple correlation does not prove that the relationship is causal. Neeraj Kaushal sifts through the evidence from economics and public policy and reviews large national and international studies to conclude that, indeed, education has large intergenerational payoffs in many areas of children's lives, and that these payoffs persist over time.

Kaushal shows that, if anything, traditional measures of returns to education—which focus on income and productivity—almost certainly underestimate the beneficial effects that parents' education has on their children. She reports causal positive effects not only on children's test scores, health, and behavior, but also on mothers' behaviors that can affect their children's wellbeing, such as teenage childbearing and substance use. Her findings suggest that, as a component of two-generation programs, helping parents extend their education could go a long way toward reducing inequality across generations and promoting children's healthy development.

Thus the rationale for two-generation programs that boost parents' education is compelling. However, Kaushal cautions, the U.S. education system reinforces socioeconomic inequality across generations by spending more money on educating richer children than on educating poorer children. By themselves, then, two-generation programs will not necessarily ameliorate the structural factors that perpetuate inequality in this country.

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Neeraj Kaushal is an associate professor of social work at Columbia University, a research associate at the National Bureau of Economic Research, and a research fellow at the Institute for the Study of Labor (IZA) in Bonn, Germany.

In 1848, in a report to the Massachusetts State Board of Education, the American educational reformer Horace Mann wrote, "Education then, beyond all other devices of human origin, is a great equalizer of the conditions of men,—the balance wheel of the social machinery." Over the next 160 years, research across disciplines, countries, and time periods has documented that parents' education is highly correlated with the education, earnings, and health of their children. If this relationship is causal, education could be a "great equalizer" not just of the conditions of men (and women), but also of their children.

Education influences not only economic and noneconomic opportunities, but also lifestyle choices, for example, decisions about marriage, sex, and fertility.

Parents' education affects the wellbeing of their children through a multitude of channels. Perhaps the most obvious is family income. Researchers have established a strong causal relationship between education and earnings.[1] On average, each additional year of schooling raises a person's earnings by 10 percent.[2] Better-educated parents thus have higher incomes, an important determinant of wellbeing across all stages of life.

Parents with higher incomes simply have more resources to invest in their children. Children who grow up in families with fewer financial constraints are better nourished. They live in more prosperous neighborhoods that have better schools and other amenities, as well as physical environments that are conducive to positive psychosocial development.[3] They are healthier, and, more importantly, their families have the resources to deal with chronic health conditions that can have a cumulative impact on health in adulthood. Indeed, many of the investments in children that a higher family income makes possible bring dividends in the form of a healthy and prosperous adulthood.

Family income, however, is just one of the many ways that better-educated parents contribute to the lives of their children. Better-educated parents invest more efficiently in the education and wellbeing of their children. Arguably, they are better able to understand and use health information for themselves and their children. Further, expectations of higher income and better health make better-educated parents more future oriented, which may influence their life choices and the choices they make for their children.

Education basically augments an individual's stock of knowledge. This augmented knowledge affects numerous decisions, ranging from everyday questions of nutrition, health, and entertainment to less frequently made choices such as how much money to save every month, whether to invest in stocks or bonds, and so on. Further, children learn from the attitudes and behaviors of their parents, which are often informed by knowledge acquired through education. Thus education influences not only economic and noneconomic opportunities, but also lifestyle choices, for example, decisions about marriage, sex, and fertility.

Hundreds of studies document correlations that support these channels of

intergenerational transmission.[4] Social scientists, however, have been cautious about drawing inferences from the simple correlations between parents' education and the education, health, income, and overall development of their children. In this article, I review the evidence from the fields of economics and public policy about whether these associations are causal, and discuss the policy implications.

Broadly, the studies I review show that education has high intergenerational payoffs in multiple areas of life. But they also document that the U.S. education system reinforces socioeconomic inequality across generations. This is not for lack of investment in education. The Organisation for Economic Co-operation and Development (OECD) calculated in 2012 that the United States spends 7.3 percent of its GDP on education, which is higher than the average of 6.2 percent among the OECD's 34 member nations. Yet the odds that the children of parents without a secondary education will go to college are much lower in the United States than in other countries—29 percent, versus the OECD average of 44 percent.[5]

In the United States, a large number of young adults who do not yet have a college education have children. Many of them adjust to parenthood by forgoing further investments in their own skills and education, but some enroll in two- or four-year undergraduate institutions. In 2011, nearly a quarter of U.S. college students were parents with dependent children.[6] Programs that help these families invest both in the parents' education and skills and in their children's development should reduce intergenerational transmission of socioeconomic inequality and enhance children's life chances.

Theoretical Issues

To study intergenerational mobility, economists have generally followed what is commonly referred to as the Human Capital Model, which is based on the works of Gary Becker and Nigel Tomes.[7] This model allows for biological or genetic transmission across generations, but it also assumes that economic factors—such as parents' investments in their own education and skills, family income, and wealth—play an important role.[8] It predicts that intergenerational transmission happens in two ways: first, better-educated parents invest more or more efficiently in their children's human capital (that is, their skills, knowledge, and health); second, health and ability are transmitted from parents to children biologically or genetically.

The Human Capital Model thus helps explain why intergenerational inequalities persist. The policy question is whether government policies and programs can reduce these inequalities. Gary Solon has expanded the Becker and Tomes model by allowing for governmental investment in education.[9] Solon assumes that intergenerational transmission due to genetic and biological factors is the same across countries. Thus, in Solon's model, differences in intergenerational transmission from country to country could arise either from income inequalities or from differences in governments' investments in education or social policies that support the education of low-income parents. Solon's model predicts that intergenerational perpetuation of inequalities should be lower in countries with less inequality and greater public support for programs that help low-income families enhance their education.[10] Cross-national research supports these predictions.

One study of 42 countries, for instance, estimated that the correlation between parents' and their children's years of schooling is the strongest in countries with more inequality and low investment in public education, and the weakest in countries with high investment in public education.[11] The United States was somewhere in the middle. These simple correlations, however, do not establish causality. Indeed, it is challenging to estimate the causal effect of parents' level of schooling on their children's education without controlling for the abilities or health that children inherit from their parents genetically. Further, people who are more future oriented may invest more not only in their own education and health, but in the health and education of their children as well.[12] Thus a spurious third factor (genetic endowments, or future orientation of parents) may be behind the correlation between parents' education and their children's education, or other measures of their children's wellbeing. In the next few sections, I review studies that have systematically investigated the causal association between parental education and the wellbeing of their children.

Intergenerational Mobility in Education

To estimate the effect of parents' education on their children's education, researchers have used innovative approaches to at least partially control for unmeasured heritable ability. These studies can be divided in two groups:

- studies that compare siblings, studies that compare twins, or studies that compare adoptees and biological children to control for family characteristics and genetic endowments, and;
- studies of natural or quasi-natural experiments—for example, changes in laws of compulsory years of schooling, or random assignment into educational programs—to see whether an increase in parents' education triggered by such an event influences the education of their children.

Studies of Siblings, Twins, and Adoptees

In one of the first studies to control for unmeasured abilities or endowments, researchers compared test scores of siblings, aged 5 to 8, whose teenage mothers received additional schooling between the siblings' births. They found that standardized achievement test scores of children born after the mother acquired a high school degree were 5 percent higher than the test scores of children born before the degree.[13] Further, continuing schooling after childbirth did not impede the intellectual development of the child who was born before the mother acquired additional schooling. These findings suggest that programs that encourage teenage women to postpone having children (for example, Temporary Assistance to Needy Families) or policies that encourage teenage mothers to remain in school after childbirth (for example, welfare-to-work and education-first programs) may have the added benefit of helping their children succeed in school. But a caveat is in order: birth order could also explain the study's results. More experienced mothers may be more skilled at raising children, meaning that the younger siblings' higher test scores could be attributed, at least in part, to the fact that they were born to a mother who already had child-rearing experience.

In one ambitious effort to control for genetic factors, researchers studied differences in years of formal schooling among the children of identical twins in the Minnesota Twin Registry.[14] They assumed that variations

in schooling between the identical twins themselves were random. Breaking the sets of twins down by gender, the researchers found that the fathers' schooling level had a positive and significant effect on their children's education. The mothers' level of education had a positive but statistically insignificant effect in some models, and a negative but significant effect in other models. The assumption that variations in schooling between the twins were random, however, was criticized by several scholars, who argued that educational differences in twins indicated that there were other unmeasured differences between them, and that such differences likely increased bias due to measurement error.[15]

Researchers have also studied the differences between adopted and biological children to tease out the effect of genetics in measuring the intergenerational benefits of parental education.[16] Unfortunately, these studies are based on two somewhat implausible assumptions. First, they assume that the adoptees are randomly assigned to the adopting families. Second, they assume that parents treat their adopted and biological children in the same manner. If these assumptions were valid, however, the effect of genetics on children's education could be estimated by comparing the correlations between parents' schooling and the schooling of their biological children, on the one hand, and between the same parents' schooling and the schooling of their adopted children, on the other. Keeping in mind that their core assumptions must be valid for the results to be accurate, these studies suggest that genetic factors have a larger influence on children's education than parents' level of schooling does, although parents' schooling has a statistically significant and nontrivial effect.

The correlation between parents' and their children's years of schooling is the strongest in countries with more inequality and low investment in public education, and the weakest in countries with high investment in public education.

Policy Experiments

During the 20th century, many countries, developing as well as industrialized, passed laws that either imposed or raised mandatory minimum years of schooling. Researchers have exploited the increases in education that followed to study how parents' education affects their children's educational attainment. This empirical technique is known as the Instrumental Variables method; in this case, it estimates the effect on children's educational success of an increase in their parents' schooling that was imposed by law and was thus not related to unobserved characteristics of the parents, such as heritable ability.

One group of researchers took advantage of differences in mandatory years of schooling among U.S. states.[17] Between 1915 and 1970, states increased the number of years of compulsory schooling for children by different amounts. The researchers found that a one-year increase in the education of either parent lowered the probability that 7- to 15-year-old children would repeat a grade by

two to seven percentage points, and lowered the probability that 15- to 16-year-old children who lived at home would drop out of school by two to four percentage points.

Another study exploited variation in fathers' education resulting from the World War II GI Bill. Among veterans born between 1923 and 1926, the bill increased postsecondary education levels by 20 percent.[18] Using the increase in education that the G.I. Bill produced across cohorts of fathers, this study found that a one-year increase in fathers' education reduced the probability that their 8- to 15-year-old children would repeat a grade by about two to three percentage points. However, this study could be thrown off by an obvious confounding factor: the fathers' military service.

Studies based on changes in mandatory years of schooling in other countries have produced modest results. A study of such changes in Norway, for example, generally found weak and statistically insignificant evidence of a causal relationship between parental education and children's educational attainment. However, the causal effect was statistically significant when the samples were restricted to less-educated mothers.[19] Another study exploited the U.K. Education Act of 1972, which increased the minimum school-leaving age from 15 to 16. It found that mothers' schooling, but not fathers' schooling, had a positive effect on children's educational attainment.[20]

In the United States, researchers have also applied data from evaluation studies of programs or policies designed for low-income parents (for example, welfare-to-work programs), but evidence of an effect on children's educational attainment is weak. The National Evaluation of Welfare-to-Work Strategies Child Outcomes Study, for example, randomly assigned welfare recipients with young children to either an education-first or a job-first program. The evaluation also included a control group assigned to neither program. Examining data from this evaluation, researchers found that mothers' education was positively associated with children's readiness for school, and negatively associated with mothers' reports of children's academic problems.[21] But the study found that mother's education had no effect on children's problem behaviors such as lying, bullying, and cheating, or on social behaviors such as getting along and cooperating with others. Further, there was only weak evidence that the observed effects persisted in later years.

Does mothers' education bring greater intergenerational returns than fathers' education? As we've seen, the empirical evidence is mixed. An extensive review of the research concludes that despite a decade of work on the subject, "we have a wide range of findings about whether it is mother's or father's education that matters more for offspring."[22] The question is an important one, both because mothers are the primary caregivers for many young children and because of a persistent education gender gap in many countries. An increase in a mother's human capital would increase her bargaining power, which she might use to steer family resources toward investments that enhance her children's well-being. Education also increases the value of parents' time, and it may affect the amount of time parents spend with their children as well as the productivity of the time they spend in child-enhancing activities.[23] Some have argued that a mother's schooling and employment could compete with her child-rearing activities and thus adversely affect her children's wellbeing.[24] On the other hand, better-educated mothers also tend to have fewer

children. The increased time they spend in school and at work thus does not necessarily mean that they spend less time per child than the less educated do. Indeed, research based on the American Time Use Survey concludes that better-educated mothers spend more time on average with their children.[25]

To sum up, this short review of intergenerational persistence of educational inequality leads to four main conclusions:

- Simple correlations grossly overstate the association between parents' educational attainment and that of their children because of confounding factors (for example, heritable ability).
- Parents' education has a positive effect on the education of their offspring, and the effect is somewhat higher for less-educated or low-income parents, lending support to policies that target less-educated parents.
- The jury is still out on whether mothers' or fathers' schooling produces greater intergenerational transmission of education.
- There is at best only weak evidence that programs designed to educate or train less-educated mothers can improve their children's educational attainment, though the lack of stronger evidence could be the result of poor study design or implementation.

The Role of Family Income

Better-educated parents earn higher wages and are less likely to experience unemployment. Research into the causal effect of education on earnings has concluded that an additional year of schooling raises earnings by an average of 10 percent.[26] Further, recent studies show that education is a more important determinant of earnings now than it was a quarter-century ago.[27] Scholars at the Brookings Institution's Hamilton Project have estimated that, for someone starting college in 2010 and going on to earn a degree, lifetime earnings would be $450,000 more than those of someone with a high school degree—an earnings gap 75 percent larger than the gap three decades earlier (that is, for someone who started college in 1980).[28]

Better-educated parents thus simply have more resources for raising their children. Hundreds of studies have documented a positive association between family income and children's health, educational attainment, and behavior.[29] Compared with more affluent parents, low-income parents are less able to invest in education-related items and activities for their children.[30] Low-income parents also have less of their own time to invest in their children because they are more likely to be single parents, to work nonstandard hours, and to have inflexible work schedules.[31] Children from high-income families are more likely than poorer children to enroll in college and to persist through graduation when they do, and these gaps have widened in recent decades. For example, children from low-income families who were born around 1980 finished college at a rate only four percentage points higher than did low-income children born in early 1960s. Among children from high-income families, the corresponding increase was 18 percentage points.[32]

However, these simple associations between family income and children's education do not establish causality, and only a few studies have been able to make a persuasive case for it.[33] Critics of the idea that the relationship is causal argue that household income depends on parental characteristics. Many such characteristics can be observed by researchers, and thus they can be controlled for in

statistical analyses. But some characteristics cannot be observed and could have a confounding effect. For example, children inherit many of their parents' characteristics. The mere fact that children from high-income families have more education and higher earnings as adults thus tells us little about causation; the correlation could simply reflect transmission due to genetic factors rather than the effect of income.

But some researchers have taken advantage of policies and programs that give families additional income to investigate income's influence on children's wellbeing, and they have concluded that family income has positive and sometimes large effects. A number of studies have used information from experiments with a negative income tax that were conducted during the 1970s. One found that elementary school children in the experimental group (whose families gained $2,000 per year, an increase in income of about 50 percent) did better in school and had better attendance records.[34] Another study concluded that the income gains from these experiments increased adolescents' attendance and high-school completion rates, but not their test scores.[35]

Another common technique to control for unmeasured factors such as parents' abilities and mental health is to compare siblings. One study compared the educational outcomes of younger and older siblings when they were of the same age to study the effect of different levels of income in the same family over time and found that economic conditions in early childhood are important determinants of years of completed schooling. [36] (It is likely that higher income improved parents' mental health and increased their nonmonetary investments in children; if so, this study may be seeing both direct and indirect effects of income on children's education.) Similarly, recent studies of experimental welfare reform, antipoverty policies, and the expansion of the Earned Income Tax Credit have consistently found that increases in family income have positive effects on children's academic achievement.[37]

Knowledge spurs parents to adopt healthy lifestyles and behaviors themselves and to inculcate the same in their children.

One innovative study collected longitudinal data about children in 11 counties of western North Carolina and compared data on children in Native American families who benefited from casino profits with data on nonnative families who did not receive any benefit. The study found that an increase in income led to higher levels of education and a lower incidence of criminality among children.[38] Further, the effects were larger in poorer families; an additional $4,000 per year for the poorest households increased children's educational attainment by one year by the time they reached age 21, and reduced the chances that 16- and 17-year-old children would commit a minor crime by 22 percent.

Most research on how parents' income affects their children's development has investigated the effect of current income, which is often measured with a considerable degree of error. Economists, following Milton Friedman, often argue that families base their consumption decisions on what they consider their permanent incomes, or

average income over a considerable period of time, and not their current incomes.[39] One study that distinguished between permanent income (which the study defined as average income over the 13 years from 1979 to 1991) and current income (income in any single year) found that while current family income had a modest and often statistically insignificant effect on children's cognitive, social, and emotional development, permanent income had a somewhat larger and statistically significant effect.[40]

To sum up, substantial research on how parents' income affects children's outcomes suggests that inferences drawn on the basis of simple correlations of family income and child wellbeing overstate the role that family income plays. Studies that meticulously control for unobserved confounding factors find that income has a positive effect on children's development, but that the effect is not large. Thus researchers have concluded that government programs to boost income have a more modest role in promoting upward economic mobility than correlational studies would suggest.

Parents' Education and Children's Health

Epidemiologists consider socioeconomic status (SES) to be the key determinant of health, and education is widely acknowledged as the most basic component of SES, not least because it shapes future SES, for example, through occupational and earning opportunities.[41] Economists argue that better-educated people are more efficient at keeping themselves healthy. Arguably, better-educated parents are also more efficient at helping their children stay healthy: knowledge helps parents make informed decisions about their children's nutrition and health care. Because parental education boosts family income, education also helps provide resources for timely health care. And education influences behaviors (for example, it reduces smoking, drug abuse, binge drinking) and lifestyles (it increases physical exercise) that account for about half of premature mortality in the United States. Knowledge spurs parents to adopt healthy lifestyles and behaviors themselves and to inculcate the same in their children.[42]

Most empirical research on how parents' education affects the health of their offspring has focused on young children. Researchers commonly study children's health status as reported by parents, birth weight, and anthropometric measures such as stunting, wasting, being underweight, neonatal mortality, infant mortality, and child mortality. But because health in childhood has a cumulative effect on adult health, parents' investment in their children's health is likely to be more visible in adulthood. Thus studies based on children's health are likely to underestimate the overall effect of family income on health. Unfortunately, most nationally representative data sets do not have information that allows researchers to compare parents' education with the health of their adult children.

The evidence of an association between parents' education and children's health is extensive.[43] But because genetic endowments are the most important determinant of children's health, it is challenging to provide convincing evidence that this association is causal. One way to control for the effect of genetics is to compare the children of adoptive versus biological parents. Using a number of nationally representative U.S. data sets, a study that took this approach concluded that the relationship between parents' education and children's health is not due simply to the genetic link.

The same researchers also found not only that children's health is positively related to their parents' schooling, but that this relationship becomes more pronounced as children grow older. Further, they found that the children of better-educated parents are more likely to recover from chronic childhood health conditions. For children in low-income families, adverse health shocks accumulate, and, as a result, children in low-income families reach adulthood with poorer health. Low-income children also tend to reach adulthood with less education, and both poor health and less education are likely to affect their earning ability and therefore their general health throughout adulthood. Others have arrived at similar findings using data from Canada.[44]

In considering the relationship between parents' education and their children's health, one caveat is in order: most studies have found that the effect of parents' education is reduced or largely eliminated after controlling for income, suggesting that parents' education affects children's health primarily through its economic benefits.

Education, Marriage, and Fertility

Education may also reduce early marriage and teen parenthood, both of which adversely affect mothers' and children's health.[45] In traditional societies, women's low level of empowerment and dependency may cause them to marry early and have children in adolescence. Education, on the other hand, may increase their empowerment and lower their dependency. Because mothers are often the primary caregivers for infants and young children, their empowerment is likely to channel family resources toward mothers' and children's wellbeing. In Western societies too, teenage pregnancy often limits young mothers' options and interrupts their schooling. But in this context, teen fertility may be affecting schooling, rather than the other way around.[46]

Here again, researchers have used "natural experiments" to determine the direction of causality between education and marriage and education and teenage fertility. For example, one study, looking at the five decades from 1940 to 1990, used the opening of colleges in the county where a woman lived when she was 17 years old to predict mothers' level of education. The researchers showed that the supply of nearby colleges was closely correlated with residents' levels of education, and using this measure allowed them to control for potentially unobserved individual confounding factors such as family background or "forward-looking" behavior. (For instance, women with a forward outlook might decide to acquire a college education and postpone childbearing.) The study found that mothers' education had a positive influence on marriage, infant health, use of prenatal care, and rate of smoking.[47] Another study exploited the Universal Primary Education Program introduced in Nigeria in 1976, and exposure to this program by age and region, to study the effect of women's education on their fertility. It found that increasing female education by one year reduced early fertility, defined as the number of children born before age 25, by 0.26 births.[48]

In the United States, researchers have found that better-educated couples have more knowledge and make more efficient use of contraceptive methods.[49] Similar findings have been reported in other countries.[50] A recent study based on increases in women's education in Turkey, which were triggered by education reforms, found that schooling improved women's knowledge of their ovulation cycle, increased their use of

contraceptives, increased their age at first marriage and first birth, lowered the number of children they had, and reduced child mortality.[51]

To sum up, studies conducted in the U.S. and other Western societies, as well as in developing countries, suggest that better-educated mothers are more likely to use contraceptives and have fewer children, and there is some evidence that their infants are healthier as well.

The Cost Conundrum

Governments—local, state, and federal—almost universally subsidize education to bring private investments in education close to the social optimum. Despite these subsidies, experts largely concur that the U.S. education system falls short of delivering on its promise of being a "great equalizer."[52] Michael Haut and Alexander Janus attribute half the correlation between young adults' education and those of their parents' to the American patterns of residential and school segregation.[53] They estimate that eliminating segregation and making education completely homogeneous across secondary schools would lower the intergenerational correlation in education by 40 to 50 percent.

A critical factor in postsecondary education is affordability. Over the past four decades, the cost of postsecondary education in the United States has increased faster than the median family income. In the 1970s, the annual tuition at a public university was 4 percent of the median family income; at a private university, it was 20 percent. By 2009, the figures were 10 percent and 45 percent, respectively.[54] In 2012–13, the inflation-adjusted cost of tuition and fees at four-year public colleges and universities was three and a half times what it was three decades ago; at two-year public and four-year private institutions, it was nearly three times higher.[55] And as higher education becomes less affordable, the returns to education are rising. An exhaustive study of U.S. inequality concluded that 60 percent of the rise in wage inequality from 1973 to 2005 was due to the growing difference in the wages of highly educated and less-educated people.[56]

Detailed investigations have found that financial aid, tuition, and fees affect people's decisions about whether to enroll.[57] One study, which exploited the elimination of the Social Security Student Benefit Program in 1982 to investigate how financial aid affects college enrollment and educational attainment, found that, for any given recipient, a $1,000 increase in annual grant aid (in 1998 dollars) increased educational attainment by 0.16 years and the probability of attending college by four percentage points.[58] Other studies have found that tuition subsidies have similar effects on enrollment.[59]

Traditionally, state governments have supported postsecondary education by providing universal subsidies in the form of low tuition and fees at public universities and colleges. But fiscal constraints and rising enrollment rates in recent years have compelled state governments to lower these subsidies. As a result, federal financial aid, channeled through a complex set of programs, has become the largest source of funding for postsecondary education.[60] In 2006, a commission appointed by the U.S. Department of Education called the financial aid system "confusing, complex, inefficient, [and] duplicative," adding that it "frequently does not direct aid to students who truly need it."[61]

Research suggests that the college enrollment and graduation rates of low-income adults are sensitive to tuition costs, and thus targeted tuition subsidies could make college education more affordable for low-income families. At the federal level, although education grants are almost entirely targeted to support low-income families, tax deductions for college education almost exclusively benefit families higher on the income scale. In fact, according to the OECD, the United States is one of only three rich countries that spend less on the education of poorer children than on that of richer children.[62] The U.S. system of institutional funding for postsecondary education thus perpetuates educational inequality.

As a nation, we spend big bucks on higher education. In 2011–12, the combined fiscal support for postsecondary education from state governments added up to $72 billion; federal grants and aid and federal loans, from private, state, and institutional sources, amounted to $245 billion. New college loans in constant dollars have doubled over the past decade, with outstanding student debt mounting to $956 billion in 2012.[63] Policy makers, therefore, should be asking: Are these funds well targeted and spent efficiently? Can these expenses be sustained? My review of the research on intergenerational payoffs of education shows that investment in education is an important instrument of intergenerational mobility. However, the rising cost of postsecondary education is likely to discourage low-income families from investing in it, a scenario that does not augur well for economic mobility.

Two-Generation Education Programs

Most policy interventions to improve children's wellbeing focus on children themselves. The proven intergenerational benefits of parents' education, however, suggest that investments in parents are likely to have a lasting effect on children's health and development and increase their wellbeing as adults.

In many low-income families, family obligations and lack of resources keep young parents from attaining a college education or upgrading their skills. They have unstable jobs with low wages, with negative consequences for their children's wellbeing. In the past, several two-generation programs have been designed with the explicit aim to invest in parents' education and training as well as in the early education of their children. Examples of these programs include the Child Family Resource Program, funded from 1973 to 1983 by the U.S. Department of Health and Human Services (DHHS), which provided a large number of social and educational services to 1,000 families per year; the Comprehensive Child Development Program, also funded by DHHS, which supported 4,000 families in 1994 by providing them with social, health, and education services; and New Chance, supported by public and private funds, which aimed to provide comprehensive services to about 1,500 families consisting of disadvantaged young mothers and their children.

One review of the short-term effects of six two-generation programs that were implemented between 1970 and the early 1990s concluded that these programs had small short-term positive effects on children's cognitive ability, behavior, and health, and a large effect on whether parents attained a GED, but no effect on adult literacy or parents' income or employment.[64] In general, they found that two-generation programs increased the participation rates of children and their parents in social and educational

services relevant to their needs. However, comparing the funds allocated to the two-generation programs they evaluated and the combined investments in high-quality programs for child development programs and high-quality programs for adult education and parenting, the researchers concluded that a high-quality two-generation program would require a greater commitment of public funds—about 50 to 100 percent more per family—than was allocated to the programs their study evaluated.

In many low-income families, family obligations and lack of resources keep young parents from attaining a college education or upgrading their skills.

Another issue relates to the quality of services that two-generation programs provide. The study of six two-generation programs found that the intensity of child-focused services delivered under the two-generation programs they evaluated was less than that of the services delivered by high-quality early childhood programs such as the Infant Health and Development Program. As a result, the positive effects of the two-generation programs on children's cognitive development were small. Similarly, if two-generation programs are to have large effects on parental employment and income, these programs need to match the educational and training services for parents to their current skills, interests, and aptitudes, with an eye toward the economic opportunities that these services would create.

Recent years have seen renewed interest in two-generation programs, many of which are discussed in detail elsewhere in this issue. These programs are relatively new, and it is perhaps too soon to evaluate their performance. The theoretical basis for these programs is strong and compelling, but their success rests on their design and implementation.

Conclusions

This article has reviewed research in the fields of economics and public policy and presents evidence from national and international studies that increasing the education of parents generates large two-generation benefits across multiple domains. I focused on research that investigated the causal effects of parental education on a range of child wellbeing measures, including test scores, school attendance, educational attainment, health, and behavior, as well as effects on mothers that could impact child wellbeing, such as teenage childbearing, unhealthy behaviors, and knowledge and use of contraceptives. The combined evidence tells us that education has large and persistent intergenerational payoffs. These benefits are not fully captured in the traditional measures of returns to education, namely, income and productivity. Findings from these studies thus suggest that the conventional measures of returns to parental education underestimate its overall impact.

This article also shows that although the United States spends more on education as a proportion of its GDP than other rich nations do, our education system perpetuates intergenerational educational inequality by spending more on educating richer children than poorer children.

In a large number of low-income families, the adults and children alike have needs, and programs that cater to both sets of needs—by investing in parents' education and skills at the same time as they invest in children's development—would go a long way toward reducing intergenerational inequality and promoting child development. There is not enough research evidence, however, to say whether two-generation education programs, narrowly defined as those with programmatic elements for both generations, are the most cost effective and efficient way to lower intergenerational inequality. Evaluations of two-generation programs implemented during the 1980s and 1990s suggest that these programs lacked both the intensity of child-focused services that high-quality early childhood programs provided and the funding commitment that successful child education and adult parenting and education programs enjoyed. Beyond the question of two-generation programs per se, the two-generation mechanism discussed in this article—that is, improving children's lives by helping their parents get more education—has two broad implications for understanding and ameliorating social and economic inequalities. First, the causes of educational and income inequality transcend generations. Second, any policy initiative to reduce such inequality can potentially work to reduce inequality across generations.

ENDNOTES

1. For a detailed review of this literature, see David Card, "The Causal Effect of Education on Earnings," in Orley Ashenfelter and David E. Card, eds., *Handbook of Labor Economics,* vol. 3A (Amsterdam: Elsevier, 1999): 1801–63.

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