Rethinking Education and Training Policy: Understanding the Sources of Skill Formation in a Modern Economy[1]

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I. Introduction

In response to the new labor market in which the real wages paid to high-skilled and highly educated workers have increased while the real wages paid to low-skilled and uneducated workers have decreased, there is renewed interest in policies designed to foster the formation of socially productive skills in the American economy. Politicians and social commentators routinely express concern about the political and social consequences of growing economic inequality. A consensus is emerging that increasing the skills of the unskilled will bring them into the modern economy and will help alleviate the problems of inequality.

Arguments for increasing college tuition subsidies rely heavily on the assumption that individuals from low income families cannot borrow adequate funds to attend college. Support for additional spending on primary and secondary schools is based on the assumption that more teachers and greater spending per pupil can substantially improve student outcomes. The success of recent welfare reforms is premised, in part, on the assumption that adult job training programs and work experience can produce skills to make current welfare recipients market-worthy job participants. In this paper, we re-examine the widely accepted assumptions behind these proposals, drawing on a body of recent scholarship that challenges them.

In analyzing the evidence for these claims and their relevance for educational policy, it is important to distinguish statements about a world in which there is no education policy from the world in which we live. The relevant question is whether we should increase current subsidies -- not whether there should be any subsidy at all. At a very low level of expenditure, increasing schooling quality definitely improves schooling outcomes. However, current expenditures on primary and secondary education are extremely high. Without any subsidies or loan programs for college, credit constraints would, no doubt, be quite important. But, the current subsidy of direct costs to students at major public universities is around 80%. Should that subsidy be increased?

Policy toward job training needs to be examined as well. Presently, the economy has a large group of unskilled workers made obsolete by a rapid shift in demand toward more skilled workers. A dangerous myth that motivates welfare reform and training policy is that it is relatively cheap and easy to adapt adult unskilled workers to the modern economy. Nearly all the evidence points to the contrary: raising the skill levels and earnings of uneducated and unskilled workers is extremely

costly, especially for older workers who spend fewer remaining years working and using newly acquired skills. While many economists have begun to recognize this, many politicians have not. It is far from obvious that investments in low skill workers who have been made obsolete by changes in technology are justified on any but political grounds. The major cost of such investment is the diversion of resources away from the young and the more trainable for whom a human capital investment strategy is likely to be more effective and for whom it is likely to produce favorable outcomes in the long run. To the extent that public funds are spent on training the unskilled, we should begin shifting subsidies toward training in the private sector where firms (and not government bureaucrats) can decide what skills should be learned.

Current policies regarding education and job training are also based on fundamental misconceptions about the way socially useful skills embodied in persons are produced. The conventional wisdom espoused by most politicians, educated laypersons, and even many academics places formal educational institutions in a central role as the primary producers of the skills required by the modern economy. It often neglects important non-institutional sources of skill formation, like families, neighborhoods, and firms, which are equally important -- if not more important -- producers of the social and cognitive skills that are needed in a modern economy.

The current emphasis in policy discussions on formal schooling to the exclusion of informal, non-institutional sources of learning can be traced to a failure to recognize that learning is a lifetime affair. Learning starts in infancy long before formal education begins and continues throughout life. Recent research in psychology and cognition demonstrates the vital importance for skill formation of the early preschool years when human ability and motivation are shaped by families and non-institutional environments. (See the paper by Ramey and Ramey in this volume.) Success or failure at this stage feeds into success or failure in school which, in turn, leads to success or failure in post-school learning. Early learning begets later learning and early success breeds later success, just as early failure breeds later failure. Formal or institutional education is only one aspect of the learning process, and recent research indicates that it is not necessarily the most important one. Since the publication of the Coleman Report (1966), we have known that families and environments play a crucial role in motivating and producing educational success as measured by test scores. Failed families produce low ability, poorly motivated students who do not succeed in school. Policies directed toward families and very young children may be more effective devices

for improving the performance of current schools than direct expenditure on teacher salaries or new computer equipment.

At the same time, current thinking about human capital formation policies focuses on improving cognitive skills to the exclusion of non-cognitive skills like motivation and social skills. A growing body of research indicates the importance of non-cognitive skills for determining success in the economy and the society at large. (See Lynch in this volume for a discussion of this issue and the discussion in Heckman, Hsee and Rubinstein, 1999.) These skills are more easily produced than cognitive skills. Thus, evidence that it is difficult to boost IQ in no way undermines programs that intervene to improve non-cognitive skills.

On the other side of the educational process, work experience and skills acquired in the workplace in the form of job search, learning-by-doing, and workplace training are often neglected in popular discussions, because they are not well-measured. Post-school learning is an important source of skill formation that accounts for as much as one-third to one-half of all skill formation in a modern economy. (See the discussion in Heckman, Lochner and Taber, 1998a.) Because much of this learning takes place in informal settings outside of educational institutions, it is often neglected by the educational technocrats and politicians who commonly equate skill formation with classroom learning. Once we recognize the importance of informal sources of learning for skill formation, we begin to think about policies to foster skill in a different way.

Consequently, we argue for a greater focus on young children, their families, and firm-provided training as more efficient means for increasing the earnings of the least-skilled. Available evidence suggests that programs which foster skills developed by the family, and private firms, can produce a wide range of socially beneficial outcomes, including increases in schooling and post-school earnings, as well as reductions in delinquent and criminal behavior. We also suggest that new policies that target young children, families, and private firms be accompanied by rigorous evaluations to ensure successful implementation and cost-efficiency. We still have much to learn about these types of programs.

It is also important to recognize that it is not necessary to make everyone highly skilled. By increasing the supply of skilled workers, unskilled workers become more scarce, driving up their wage rates. Heckman, Lochner, and Taber (1998a) suggest that these forces are already taking place, but they are leaving behind many older, unskilled workers. It may not be cost-effective to train them all for the modern economy. For individuals harmed during the transition to a new, high-

skilled economy, we propose that efforts be made to train and educate younger workers, while subsidizing the employment of older workers.

Missing from current policy discussions of education and training policy is any consideration of priorities or recognition of the need to prioritize. It is impractical to consider active investment programs for everyone. The real question is how to use available funds wisely. The best evidence supports the following simple policy prescription: for a fixed budget, current returns to policies in place indicate that the best policy is to invest more in the very young to improve basic learning and socialization skills and to invest less in mature adults, and persons with low ability and motivation, and to subsidize work for the old and the severely disadvantaged to attach them to the economy and society at large.

Figure 1 presents the argument in this paper in a succinct way. At current levels of investment, the best available evidence suggests that marginal returns are highest at the youngest ages and for the most able people. A policy based on this insight reallocates investment resources to the young so as to equalize the returns to investment across age groups. It also devotes fewer resources for human capital development to the less able. This does not mean that there should be no investment in the old and less able, just that there should be less than current levels support. For these people, subsidized work is likely to be more efficient than subsidized training.

In section II, we examine the well-documented negative correlation between family income and college attendance rates. We suggest that most of this correlation can be explained by differences in ability levels caused by long-term family and environmental deficits and not short-term borrowing constraints only experienced by families during the college-going years. In section III, we discuss the case for improving school quality in primary and secondary education. Even the most optimistic estimates suggest that spending more money on schools provides little return for students. Next, we suggest in section IV that early childhood investments, mentoring programs for children and adolescents, and other alternative adolescent programs aimed at keeping teenagers enrolled and actively participating in school provide some of the best long-run solutions for improving the lot of the disadvantaged. In section V, we argue that efforts to train young unskilled adults should be guided away from large public training programs and toward firms and the private sector. The case for subsidizing the work (rather than education) of older unskilled workers is discussed in section VI. Finally, we offer concluding remarks about life cycle skill formation in section VII.

II. The Evidence on Credit Constraints and Participation in Schooling and Training Programs.

One of the most widely accepted arguments in policy and academic circles is that credit constraints prevent poor persons from participating in formal education. The empirical association between family income and college enrollment presented in Figure 2 has attracted an enormous amount of attention in academic and policy circles. The most common interpretation of this evidence is that short-term family credit constraints prevent children from low income families from attending school (for examples of this argument see the chapters by Lynch and Kane and Ellwood in this volume). The Pell Grant program and the recently enacted HOPE fellowship program and many government educational programs are premised on this interpretation. It is the most popular explanation for the time series of the ethnic and racial gaps in college enrollment displayed in Figure 3. Since minority families are concentrated in the lower end of the family income distribution, their failure to respond to the increase in the economic return to schooling is widely viewed as a manifestation of the more general phenomenon of a market failure due to borrowing constraints that prevent poor people from taking advantage of the increase in the return to skills.

The common interpretation of Figure 2 and the one that guides many recent policy proposals for higher education, notes that real tuition costs have increased in percentage terms over the past 16 years. At the same time, family incomes have declined among the bottom quartiles of the family income distribution. The real wages and employment of unskilled males have declined since the late 70s. More families at the bottom of the family income distribution are headed by females with dependent children. Such families have lower earnings and income levels than families headed by males.

According to this interpretation, rising tuition costs and declining family resources have had a devastating impact on the college attendance decisions of children from low income families. Based on this interpretation, policies that further subsidize the already substantial subsidies available to educate children from low income families have been advocated (Hauser, 1993; Orfield, 1992).

It is certainly true that real tuition costs have risen over the past 16 years. Between 1980 and 1997, average public “sticker price” tuition levels rose by 100% at public four-year colleges and

universities and by 77% at public two-year colleges (NCES, 1997). At the same time, it is important to recognize that government subsidies to higher education are already large. All told, individuals attending public institutions of higher education pay, on average, less than 20% of the total direct cost of attending college. (Direct cost does not include foregone earnings.) Moreover, a substantial fraction of that 20% is actually paid by private foundations and charities that extend aid directly to students.[2]

It is easy to exaggerate the contribution of tuition costs toward explaining the gap in the college attendance of children from rich and poor families. Substantial loan and aid programs already exist that are targeted towards students from poorer families. At public two- and four-year institutions in the U.S. in 1996, average costs of tuition and fees were about $2,300. To offset these costs, both the Pell grant and subsidized student loan programs are available to children of low income families. In 1997, a first-year dependent college student is eligible for a maximum of about $8,000 in Federal grants and subsidized loans. The maximum rises to $11,000 for third and fourth year college students as subsidized loan limits rise. A host of other Federal programs direct money to students in some form or another. In 1996, total institutional subsidies alone were approximately the size of the entire Pell grant program (The College Board, 1997).

Two Explanations for the Positive Relationship Between Family Income and College Enrollment

The argument that family credit constraints are the most plausible explanation for the relationship depicted in Figure 2 starts by correctly noting that human capital is different from physical capital. With the abolition of slavery and indentured servitude, there is no asset market for human capital. People cannot sell rights to their future labor earnings to lenders in order to secure financing for their human capital investments. Even if they could, there would be substantial problems in enforcing performance of contracts on future earnings given that persons control their own labor supply and the effort and quality of their work effort. The lack of collateral and the inability to monitor effort are widely cited reasons for current large-scale government interventions to finance education.

[2] Cameron and Heckman (1999a,b) discuss the extent of subsidy in greater detail.

If people had to rely on their own resources to finance all of their schooling costs, there is no doubt that, in the long run, the level of educational attainment in American society would decline. To the extent that subsidies do not cover the full costs of tuition, persons are forced to raise tuition through private loans, through work while in college or through foregone consumption. Children from families with higher income have access to resources that children from families with lower income do not have, although children from higher income families still depend on the goodwill of their parents to gain access to funds. Limited access to credit markets means that the costs of funds are higher for the children of the poor and this limits their enrollment in college.

The purchase of education is governed by the same principles that govern the purchase of other goods. There is, undoubtedly, a consumption component to education. Families with higher incomes buy more of the good (in this case, education) for their children and buy higher quality education as well. This factor partly explains the relationship between family income and college attendance presented in Figure 2. Evidence presented in the chapter by Kane and Elwood also suggests that this may be an important component of enrollment differences between high and low income families. After controlling for parental education, measured achievement, demographics, and tuition levels, they find a 9% difference in college enrollment rates (at four year institutions) between children from families in the highest and lowest income quartiles. However, two-thirds of that gap is explained by differences between the two highest income quartiles--hardly the group we expect to be credit constrained. Heterogeneity in the consumption value of schooling is a more likely explanation for differential responses at the high end of the income distribution.

An alternative and not necessarily mutually exclusive interpretation of the entire body of evidence is that long-run family and environmental factors play a decisive role in shaping the ability and expectations of children. Families with higher levels of resources produce children who are better able to perform in school and take advantage of the new market for skills.

Children whose parents have higher income have access to better quality primary and secondary schools. Children's tastes for education and their expectations about their life chances are shaped by those of their parents. Educated parents are better able to develop scholastic aptitude in their children by assisting and directing their studies. The influences of family factors that are present from birth through adolesence accumulate over many years to produce ability, college readiness, and tastes for schooling.

This alternative interpretation stresses the role of family and the environment and does not necessarily rule out the importance of short-term borrowing constraints as a partial explanation for Figures 2 and 3. However, if the finances of poor but motivated families hinder them from providing decent elementary and secondary schooling for their children, thereby producing insufficient college preparedness, government policy aimed at reducing the short-term borrowing constraints for college expenses is unlikely to be very effective. Policy that improves the environments that shape ability may be a more effective avenue for increasing college enrollment in the long-run. The issue can be settled empirically.

The distinction between long-run family factors that promote college readiness and short-term borrowing constraints can be conceptualized by imagining an experiment in which poor families win the lottery. For lottery winners with young children, a much larger response to the lottery would be expected in terms of the college attendance of their children if parents invest in better schools and more academic opportunities for their children over a longer horizon. On the other hand, if short-term credit market constraints are the significant factor governing college attendance, then we expect a large response in college enrollments by children of poor families irrespective of the age of their children at the time the lottery is won.

Only to the extent that the family income and borrowing capacity of able high school graduates interested in attending college falls below levels required to pay for college will short-term credit market constraints hinder college entry. Given the current college financial support arrangements that are available to low income and minority children, the prospect that bright students are being denied access to college because of credit constraints is highly suspect in the U.S. We suggest that high tuition is not the main culprit explaining the relationship shown in Figure 2.

Some Evidence on Ability and Short-Term Credit Constraints

We now pose and answer two questions:

(1) Which factors have the most influence on schooling attainment?

and

(2) Is the estimated influence of family income on college attendance a consequence of long-run family effects or short-term borrowing constraints?

To answer these questions, we compare the estimated effects of family background and family on college attendance when scholastic ability (AFQT) is included as an explanatory variable in a statistical analysis and when it is not. Measured scholastic ability is the outcome of long-term family and environmental factors produced in part from the long-term permanent income of families. To the extent that the influence of family income on college attendance is diminished by the inclusion of scholastic ability into an analysis of college-going, one would conclude that long-run family factors crystallized in AFQT scores are the driving force behind schooling attainment, and not short-term credit constraints.

Table 1 presents a summary of a recent study by Cameron and Heckman (1999a,b), who examine what portion of the gap in college attendance between minority youth and whites is due to family income, to tuition costs, and to family background. Not controlling for ability measured at an early age, about half (5 points) of the 11 point gap between black and white college attendance rates is due to family income; more than half (4 points) of the 7 point difference between hispanics and whites is due to family income. When scholastic ability is accounted for, only one half of one point of the 11 point black-white gap is explained by family income. For hispanics, the gap actually widens when family income is included, suggesting that income does not explain away differences in enrollment. Equalizing ability more than accounts for minority-majority college attendance gaps. (See line 5.) Similar differences show up in high school graduation rates and overall college attendance rates that do not condition on high school graduation. (See the evidence in Cameron and Heckman, 1998, 1999a,b.) Ability produced by families and environments, and not financial resources, accounts for pronounced minority-majority differences in schooling attainment. The disincentive effects of tuition on college attendance are dramatically weakened when ability is entered into the analysis of college attendance.

Additional evidence in support of this point is provided by Brooks-Gunn and Duncan (1997). They establish that family income received at early ages determines completed schooling - not income received during high school or in the college going years. This relationship holds up even when the same parental background factors are entered into an empirical analysis. Cameron

and Heckman (1998, 1999a,b) provide further empirical support of this. Their estimates reveal large effects of family income on the probability that a student has completed the 9th grade (on track) by age 15, but smaller effects on high school graduation by age 24, and negligible effects on college enrollment conditional on high school completion. Whether they control for AFQT scores or not, the effects of family income on educational outcomes decline substantially with age. This evidence suggests that it is college readiness - and not short term credit constraints - that best explains the income-college going relationship in Figure 2. It is also consistent with the importance of early interventions in promoting skill formation which we discuss below.

Our analysis suggests that it is long run factors more than short term borrowing constraints, that explain the evidence in Figures 2 and 3. Long run factors affect both college preparedness and preferences for schooling. Evidence presented by Cameron and Heckman (1998, 1999a,b) and Brooks-Gunn and Duncan (1997) supports the former while results in the Kane and Elwood chapter suggest that latter may also be important. None of these studies find strong evidence of substantial short term credit constraints among college-age youth from low income families. Credit constraints are more binding with respect to early investments in children. Early on in the family life cycle, parents may have more difficulties finding adequate funds to provide their children with the resources that foster lifetime skills. Programs like Hope scholarships that operate late in the life cycle are likely to be ineffective in promoting college attendance and wasteful of public funds. We now consider just how ineffective and wasteful they are.

The Likely Impact of the HOPE Scholarship Program

Cameron and Heckman (1999a) present a simulation of the recently-enacted HOPE scholarship program, using estimated enrollment responses to local college tuition rates. Two questions are relevant. First, holding other factors constant, what is the predicted enrollment response to the program? Second, how much of the cost of the program will go to families whose children would have gone to college without the program? The main feature of the program is a tax credit of up to $1500 for two years of college.[3]

Their estimated enrollment response to the HOPE program is a 4.2 percentage point increase in two-year enrollments and a 0.9 percentage point decrease in four-year enrollments.

[3] See Cameron and Heckman (1999a) for details.

Thus, most of the response to the program will come in enrollment in two-year schools. At least 91% of the total expenditure of this program will be spent on people who would enter college in the absence of the program. Simulations by Heckman, Lochner, and Taber (1998b) suggest that once general equilibrium effects are accounted for, the effects on enrollment are likely to be one-tenth that size.[4] These findings offer little endorsement for additional college tuition subsidies. We now turn to an examination of other policy proposals to promote skill formation to see if they have any better empirical foundations.

III. Primary and Secondary Schools

State and local governments heavily subsidize primary and secondary education. Virtually all direct operating costs are completely subsidized through high school; only the opportunity cost of the student's time remains unsubsidized. Many have questioned whether the amounts spent are adequate. Should teachers be paid more? Should class sizes be reduced? The latest pronouncements from Washington indicate that class size reductions promise big gains in test scores. Test scores are commonly used to guide the success or failure of educational reforms. Yet, the link between test scores, especially those measured in the early years of schooling, to later outcomes, is weak at best. Fortunately, in recent years, a series of studies have appeared that link measures of schooling quality to measures of lifetime earnings and lifetime occupational achievement.

From this literature, there is a growing consensus indicating that within current ranges, measured inputs such as class size and spending per pupil have little, if any, effect on the future earnings of students. (See Heckman, Layne-Farrar, and Todd, 1996, and Card and Krueger, 1996.) The most optimistic estimates show a mere 1-2% rise in future earnings for every 10% increase in per-pupil spending; however, even those estimates have been shown to depend crucially on ad hoc assumptions made by researchers. When those assumptions are relaxed, the effects of variation of per pupil spending and class size around sample means are small and poorly determined (Heckman, Layne-Farrar, and Todd, 1996).[5]

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[4] Increasing the relative supply of college graduates reduces their relative wages and causes fewer to enroll than would be predicted by the standard partial equilibrium analysis.

[5] Krueger (1997) carefully examines the evidence from the widely celebrated STAR program on the effect of reducing class size on test scores of primary school children and finds little evidence for a strong effect of the program except in the first year of small classes (especially kindergarten). His evidence actually supports the case for intensive early interventions that we discuss below and not the case for a widescale expansion of class sizes at all ages.

Even if we take the most favorable estimates from the literature and combine them with the best case scenario for the costs of raising schooling quality at the secondary level, an across-the-board increase in spending per pupil is not a wise investment. A few simple calculations make this clear. Consider the (gross) discounted returns to schooling quality for a 10% increase in per pupil expenditure. A high estimate (relative to the literature) of a 2% increase in future earnings for a 10% rise in per pupil spending yields a negative net return of such expenditure increases for all schooling levels. For high school graduates, the net loss is about $3,800, and for college graduates the net loss is over $4,400. Unless the same increase in spending raises future earnings by 5% or more per year -- a number far higher than produced by any study in the literature -- the financial costs of school quality far outweigh the returns. In order to justify additional spending on primary and secondary schools, we would need to appeal to other social benefits that are not captured by earnings.[6]

This evidence does not prove that school quality does not matter. Surely, it does. We know that when increasing it from very low levels, it matters greatly. But, there is little evidence that marginal improvements from current levels of schooling quality are likely to be effective. Pouring more funds into schools to lower class sizes by one or two pupils or to raise spending per pupil by a few hundred dollars will not solve the problems of our primary and secondary school system. While the effects of quality vary across environments and additional funding for some schools may be justified, more fundamental changes are required if we hope to see a significant improvement in our educational system.

IV. Non-Traditional Early Childhood, Middle Childhood, and Adolescent Investments

Recent studies of early childhood investments have shown remarkable success and indicate that the early years are important for learning and can be beneficially manipulated. This should not be surprising given the evidence presented in Section II on the importance of family income at early ages. Early childhood interventions of high quality have lasting effects. Disadvantaged subnormal

[6] These calculations were suggested to us by Sam Peltzman and first presented in Heckman, Lochner, Smith, and Taber (1997). They assume that current expenditures are $6,500 per pupil, individuals work 2,000 hours per year until age 65, and discount future earnings at a 7% interest rate. All figures are in 1990 dollars.

IQ children randomly assigned to the Perry Preschool program were administered intensive treatment at ages 4-5. Treatment was then discontinued and the persons were followed over their lives. These people are now about 35 years old. Evidence on them indicates that those enrolled in the program have higher earnings and lower levels of criminal behavior in their late 20s than do comparable children randomized out of the program. Reported cost-benefit ratios for the program are substantial. Measured through age 27, the program returns $5.70 for every dollar spent. When returns are projected for the remainder of the program participants' lives, the return on the dollar rises to $8.70. As with the Job Corps (a residential adolescent training program we discuss further below), a substantial fraction (65%) of the return to the program has been attributed to reductions in crime (Schweinhart, Barnes and Weikart, 1993). The Syracuse Preschool program provided family development support for disadvantaged children from prenatal care through age five. Reductions in problems with probation and criminal offenses ten years later were as large as 70% among children randomly assigned to the program. Girls who participated in the program also showed greater school achievement (Lally, Mangione, and Honig, 1988). The Early Training program also targeted disadvantaged children ages 4-6, providing them and their families with home visits and part-day preschool services in the summer. It produced short-term gains in IQ and increases in high school graduation rates (Gray, et al., 1982). These and other studies of early intervention programs have found short-term increases in test scores, less grade retention, and higher secondary school graduation rates among enrolled children. Of those studies that examine pre-delinquent or criminal behavior, most have found lower rates of deviant behavior among program participants. See Table 2 for a summary of the effects of selected early intervention programs on student test scores, schooling, earnings, and delinquency and Tables 3A and 3B for a summary of the Perry Preschool findings.[7]

Evidence on the more universal Head Start program is less clear, but the program is quite heterogeneous and is much less funded than the Perry preschool program. Currie and Thomas (1995) found short-term gains in test scores for all participating children; however, most of those gains decayed quickly for African-American children. They conclude that either differences in local program administration or in subsequent schooling quality are at the root of the differences between the outcomes for black and white children. It is important to note, however, that similar declines in test scores were found for programs like Perry Preschool, Syracuse Family

[7] Karoly, et al. (1998) provides a comprehensive survey of early intervention programs.

Development Research Program, and Early Training, but their long-term evaluations are quite favorable. The psychometric test score literature is not clear about the relationship between early test scores and success in school, graduation rates, socialization, and labor market outcomes. The fade-out effects in test scores do not imply that long-term beneficial effects of Head Start are not present. Head Start may improve the lifetime prospects of its participants, despite yielding only short-term gains in test scores.

However, there is some evidence that Head Start may have smaller long-term impacts than more intensive programs. Studies of Head Start's impact on special education placement and grade retention have produced less dramatic results than have been achieved from smaller demonstration projects like the Perry Preschool Program (Haskins, 1989). This is not surprising given the much lower spending per child and quality of service provided by the Head Start program. Unfortunately, there are no reliable long-term evaluations of the Head Start program that link interventions to conventional socioeconomic outcome measures like occupational attainment and earnings.

The weaknesses of Head Start can be attributed to its shorter period of intervention, lower intensity, and less qualified staff than is typical of more ideal programs (Zigler, 1994). With Head Start, as with most other things in life, you get what you pay for. For example, children enrolled in the Perry Preschool program received high quality full-time preschool services for 1-2 years (most received two years), and their parents benefitted from weekly home visits by their children's teachers. There is substantial evidence that parents as well as children benefit from the family interventions. The parents are more likely to work, improve their education and reduce welfare participation. This produces a change in the home environment that lasts long after the initial intervention has ended. On the other hand, Head Start offers a much lower quality (and lower paid) staff, part-time classes for children, and limited parental involvement. There is little effect of the Head Start program on parental outcomes, in contrast to the Perry Preschool program or the Abcedarian Program. (See Ramey and Ramey, this volume.) In addition, the schools attended by the Abcedarian and Perry Preschool program after the intervention ended appear to be of higher quality than those attended by the typical Head Start child (Ramey and Ramey, this volume). Improvements in Head Start, proponents argue, are likely to produce effects closer to those observed in more successful small-scale programs. Given the potential for success (as exhibited by the Perry Preschool experiment), more studies of the long-term impacts of various types of small-scale and broad-based early intervention programs are certainly warranted. In particular, studies

examining which interventions work best for children at different ages and with different backgrounds and defficiencies are in short supply -- most studies are isolated and only study the impacts of one program on a very homogenous group of children.

Provocative calculations recently published by John Donohue and Peter Siegelman (1998) indicate that if Perry Preschool - type programs were targeted toward high risk disadvantaged minority male youth while they were young, the substantial costs of these enriched programs evident in Table 2 would be more than repaid by the expected savings in incarceration costs alone.

A few recent studies of mentoring programs, like the well-known Big Brothers/Big Sisters (BB/BS) and the Philadelphia Futures' Sponsor-A-Scholar (SAS) programs, have shown broad positive social and academic impacts on participating school-age children and adolescents. BB/BS pairs unrelated adult volunteers with youth from single-parent households for the purpose of providing youth with an adult friend who promotes positive youth development. No specific attempts are made to ameliorate particular defficiencies or to reach specific educational goals; a broad, supportive role is envisioned for the mentor. In a random assignment study, Tierney and Grossman (1995) found that 18 months after being matched with a mentor, Little Brothers and Sisters (ages 10 to 16 at the time of the match) were less likely to have initiated drug or alcohol use, to hit someone, to skip class or a day of school, or to lie to their parents; they had higher average grades and were more likely to feel competent in their school work and report a better relationship with their parents. See Table 4.

The primary goal of SAS is to help students from Philadelphia public high schools make it to college. The program provides long-term mentoring (throughout high school and for one year beyond), substantial academic support, help with college application and financial aid procedures, and financial support for college-related expenses. In many ways, individually matched mentors serve as surrogate parents, providing a successful role-model, monitoring student progress, and providing other social encouragement and support. SAS provides students with $6,000 in financial assistance throughout college for those choosing to enroll in an accredited two- or four-year postsecondary institution. The program also provides a coordinator for groups of about 30 students to ensure a successful relationship is built between mentors and mentees. Using a matched sample of non-SAS students in Philadelphia high schools,[8] Johnson (1998) estimates statistically

[8] Comparison students were matched with participants on the basis of race, gender, school attended and ninth-grade academic performance.

significant increases in GPA for tenth and eleventh grades, as well as a 22% (16%) increase in college attendance one year (two years) after graduation from high school (Table 4). Because the primary goal of SAS was to increase college enrollment, other social and psychological measures were not studied.

Not all mentoring programs are effective (Sipe, 1996). Programs that lack the sufficient infrastructure to screen and monitor volunteer efforts or to match youth to appropriate mentors are unlikely to produce the strong positive relationships that are necessary for success. Grossman and Johnson (1998) suggest a number of indicators for success of mentor programs based on the BB/BS and SAS studies. By examining the impacts of those programs on different subgroups of program participants, they were able to isolate a number of features that can be linked to a successful mentoring relationship. While SAS tends to focus more on academics and provides financial support for college (something that is not part of BB/BS), the effectiveness of both programs can, nevertheless, be linked to similar features. Both programs suggest that the following mentor-mentee relationship quality measures are useful indicators of program effectiveness: length of relationship, frequency of telephone contact, youth's perception of closeness, youth's sense of disappointment in the mentor, youth's perception of whether the relationship was youth-centered (activities centered around what the youth wants to do), youth's emotional engagement in the relationship, and the case worker's assessment of whether the mentor took a negative approach (pushing the youth too hard and not setting appropriate limits). In addition, program impacts were typically larger for youth who were initially less successful academically (as measured by average grades), were having more school problems (as measured by days absent or classes skipped), and who had less family support. This evidence suggests that mentors can play an important and positive role as a friend or surrogate parent for children who are currently lacking such a relationship.

For disadvantaged adolescents likely to drop out of school, a few other programs offer hope. Table 5 summarizes evidence on the effects of adolescent interventions on education, earnings, and crime rates. Both school-based and training-based programs are compared. We briefly discuss a few school-based interventions, here, leaving a discussion of youth training programs for Section V.

Much like SAS, the Quantum Opportunity Program (QOP) offered four years (throughout high school years) of social and emotional support as well as financial assistance for individuals interested in post-secondary training or education. There are a few significant differences between

SAS and QOP, however. First, QOP offered disadvantaged minority students financial incentives (one dollar up front and one dollar put in a college fund plus occasional bonuses) for every hour spent in activities aimed at improving social and market skills (as compared to the $6,000 offered to all students in SAS who went to college). Students who were randomly chosen to participate in the program were provided with a mentor/counselor (approximately 25 students were assigned to each site mentor/counselor rather than making one-to-one matches as in SAS) at the beginning of ninth grade. All participants were kept in the program for four years regardless of whether they dropped out of school or not. Over four years, the average participant logged 1,286 hours of educational activities like studying with tutors or visiting museums. Two years after program completion, about a third more participating students graduated from high school (or obtained their GED) than similar non-participants. Since many participants were enrolled in post-secondary schooling at the time of the follow-up study, it is difficult to determine the program's effect on earnings. However, arrest rates for program participants were one-half those for non-participants. These benefits did not come without cost; however, as the average four-year cost per participant was $10,600. Still, a cost-benefit analysis estimated positive net social returns to QOP. See Taggart (1995) for a more detailed description of the program and its impacts. Table 6 presents a summary of the main findings from a randomized evaluation of QOP. The evaluation shows substantial reductions in crime and improvements in educational attainment.

Two other studies provide additional evidence that creative programs designed to keep adolescents in school can be effective. Ohio's Learning, Earning, and Parenting (LEAP) program and the Teenage Parent Demonstration (TPD) provided financial incentives for teenage parents on welfare to stay in school or take GED classes (or, alternatively, imposed financial penalties for non-enrollment). Both have been evaluated by randomized trials. The evidence from these programs is presented in Table 7. LEAP showed increases in high school graduation or GED rates among randomly assigned participants who were still enrolled in school when they entered the program. TPD showed mixed results on education depending on the program site. For young women who had already dropped out of school at the time of enrollment in the program (and, to a lesser extent, those who were still attending school when they entered the program), there is cause for concern that participants may have substituted GED training for high school graduation as an easier means for meeting program requirements. (Cameron and Heckman (1993) have shown that a GED commands lower wages than a high school diploma in the labor market.) Both of these programs

showed positive post-program effects on earnings and employment for students who were still in school when they entered the program. The effects were often negative, however, for participants who had already dropped out of school before entering the program. A key finding from both of these studies (see Granger and Cytron, 1998 for a summary) is that they both showed more positive impacts for individuals still enrolled in school (when compared with dropouts). It is still unknown whether that is because, on average, they are of higher ability than those who have already dropped out, or because there is some advantage to intervening before adolescents leave school.

The evidence from QOP, LEAP and TPD demonstrates that financial incentives to stay in school and participate in learning activities for disadvantaged students can increase schooling and improve employment outcomes. It should be noted that while these programs positively influence employment and earnings (and, in the case of QOP, reduce crime), they do not perform miracles. They affect motivation and social skills but have little impact on cognitive skills. Combining mentors and tutoring with incentives, as QOP does, not only encourages students to remain in school, but it also provides them with the means and support to get the most from frequently inadequate schools and environments.

The New Chance program, operating in 10 different states, provides less optimistic results for teenage mothers. (See the evidence in the last row of Table 7.) This program was voluntary for young single mothers ages 16-22, who were on welfare, had dropped out of high school, and had not yet received a high school diploma or GED. New Chance offered a comprehensive set of services to these mothers and their children, including instruction in basic skills and in subjects related to the GED, occupational training, work experience, and job placement services. The program increased the proportion of young mothers receiving a high school diploma or GED by 8.1%. However, that increase came entirely from an increase of 11.8% in GED recipients. In fact, program participants were less likely to receive a high school diploma than non-participants! There were no long-term impacts on earnings or employment (Quint, Bos, and Polit, 1997, and Granger and Cytron, 1998). Two primary differences between this program and those just described are immediate. First, participants had already dropped out of school by the time they entered the program. The impacts for TPD and LEAP were much smaller (and mostly insignificant) for dropouts than for individuals still enrolled in school.[9] Second, New Chance was a strictly voluntary

[9] The analysis of Heckman, Hsee and Rubinstein (1999) suggests that drop outs have lower levels of motivation and noncognitive skills.

program which attempted to induce welfare teenage mothers to enroll based on program benefits, while QOP, TPD, and LEAP provided financial incentives to encourage academic activities.

Two other programs aimed toward adolescents are widely discussed. The Summer Training and Employment Program (STEP) provided remedial academic education and summer jobs to disadvantaged youth ages 14 and 15. Each summer, participants enrolled in 110 hours of classes and 90 hours of part-time work. While the program achieved modest short-term gains in reading and math skills, those gains did not last. Two to three years after program completion, there were no effects on high school graduation rates, grades, or employment.

One criticism of the program was that it did not attempt to follow-up on its summer program with a school-year curriculum. Maryland's Tomorrow Program did just that. It combined an intensive summer program with a school-year follow-up, offering participants summer jobs and academic instruction, career guidance, and counseling through adult mentors, peer support, or tutoring. While the program did not reduce final dropout rates, delayed dropout (dropout rates were lower during the 9th grade but not by the end of the 12th grade). The program also increased the pass rate for 12th grade students taking the Maryland Functional Tests (a basic skills test).

These programs suggest that sustained interventions targeted at adolescents still enrolled in school can positively impact learning and subsequent employment and earnings.[10] QOP, LEAP, and TPD further suggest that simple incentives for schooling work. If successful, they can increase graduation rates, raise employment and earnings, and lower crime. However, one can only expect limited returns from merely preventing students from dropping out when they are already performing badly or their schools are failing them. The much larger and broader benefits of QOP suggest that combining incentives with the academic and social support of a caring and qualified mentor provides the greatest promise for troubled adolescents. These studies also suggest that interventions for dropouts are much less successful. Unfortunately, they do not tell us why. We do not know whether there is some advantage to intervening before the dropout decision is already made, or if those who choose to drop out have less motivation and lower ability, making programs less effective for them (regardless of when the intervention takes place). The analysis of Heckman, Hsee and Rubinstein (1999) suggests that the latter explanation is more appropriate.

[10] See the report entitled `What's Working (and What's Not)?' by the U.S. Department of Labor (1995) for a more comprehensive survey of programs aimed at increasing the skills and earnings of disadvantaged youth.

Programs that are successful in the long run do not achieve their success by boosting IQ. Evaluations of human capital programs have been preoccupied with achievement tests and measures of cognitive skill as indicators of success of an educational intervention. While it is certainly true that cognitive ability is important in life, and the return to cognitive ability has increased over time, this narrow focus on cognition ignores the full array of socially and economically valuable non-cognitive skills and motivation produced by schools, families and other institutions. It critically affects the way certain early intervention programs have been evaluated. Enriched early intervention programs do not substantially alter IQ. However, they substantially raise non-cognitive skills and social attachment of participants, and they improve the home environments of participants. An important lesson to draw from the Perry Preschool program and the entire literature on successful early interventions is that it is the social skills and motivation of the child that are most easily altered - not IQ. These social and emotional skills affect performance in school and in the workplace (Heckman, Hsee and Rubinstein, 1999). Academics are biased toward believing that cognitive skills are of fundamental importance to success in life. Because of this, the relative low malleability of IQs after early ages has led many to proclaim a variety of interventions to be ineffective.

Yet, the evidence from the Perry Preschool program, the Abcedarian program, and the other programs we have surveyed reveals that these programs are highly effective in reducing criminal activity, promoting social skills and integrating disadvantaged people into mainstream society. Similarly, the successful mentoring and other adolescent interventions operate more on motivation and socialization than on IQ. An abundance of evidence indicates that social skills and motivation have large payoffs in the labor market.

We next turn to the evidence on more traditional job training programs. Can they convert unskilled adults into skilled workers efficiently?

V. The Effectiveness of Private Sector Training and the Ineffectiveness of Public Training Programs

Due to a lack of data and a bias in favor of the funding of studies of government training, the returns to private sector training are less well understood than the returns to public sector training.

Studies by Lynch (1992, 1993), Lillard and Tan (1986), Bishop (1994) and Bartel (1992) find sizable effects of private sector training. In comparison with studies of public sector training, most of these studies do not attempt to control for the fact that more able persons are more likely to take training, so the estimated rates of return would overstate the true returns to training by combining them with the return to ability. Thus, part of the measured return may be due to more motivated and able persons taking training. Estimated initial returns range from 10 to 20% (Mincer, 1993).

An important feature of private sector training is that the more skilled do more investing even after they attain high skill levels. Different types of training and learning have strong complementarities with respect to each other. To the extent that effective training can be produced on the job, it is produced in the private sector and not in the public sector. Firms are also more sensitive to changing market demands for skills than are government bureaucracies. The best hope for getting a reasonable return from job training is to encourage private sector investment.

It is important to note, however, that private sector training typically excludes low-skilled persons. Firms can be exclusive in a way that government training programs for disadvantaged workers are designed not to be. The lack of interest of private firms in training disadvantaged workers indicates the difficulty of the task and the likely low return to this activity. In spite of this, the evidence presented next suggests that some of the more successful public training programs for disadvantaged workers were those programs which had close ties with private firms. This supports the hypothesis that efforts to train unskilled workers should be shifted to the private sector.

Evidence on Conventional Public Training and Work-Welfare Programs

How ineffective are current programs in moving people from welfare to work and in increasing their employment and earnings? Generally they are very ineffective. Consider the evidence for various groups.

Adult Women

Employment and training programs increase the earnings of adult female AFDC recipients. Earnings gains (a) are modest, (b) persist over several years, (c) arise from several different treatments, and (d) are sometimes quite cost effective. Table 8 displays evaluation results for a

variety of programs. For example, participation in an Arkansas job search program was required for AFDC recipients with children over age three. Participants attended a group job search club for two weeks and then were asked to search as individuals for an additional two months. A program in San Diego required all AFDC participants to take job search assistance and mandated work experience. The gains were high for participants in both programs. The National Supported Work program provided intensive training and job search assistance at a cost of about $16,550 per recipient. The estimated rate of return to this program was only 3.5%.

The results from the recent experiment evaluating the Job Training Partnership Act shown in Table 8 corroborate these findings. The largest impacts are for adult women, many of whom were collecting AFDC during their participation in JTPA. However, the impacts are not sufficiently large to move more than a tiny fraction of women out of poverty. As a general rule, conventional employment and training programs are often cost effective for adult women (especially if the opportunity cost of trainee time is ignored or is sufficiently low), but do not produce dramatic changes in participant earnings or employment.

Adult Men

The evidence for this group is consistent across programs. Returns are low but usually positive. Job search assistance is an effective strategy but produces only modest increases in mean earnings levels. For them, training programs will not make much of a difference in closing the wage gap between the skilled and the unskilled.

Youth

Evidence from the recently concluded JTPA experiment indicates that this program produces only low or negative impacts on earnings. For male youth, the estimated negative effect is unbelievably low. If taken seriously, participation in JTPA has a more negative impact on the earnings of male youth than participation in the Army, loss of work experience or the cost of incarceration as measured by many studies.

Only a few training programs have demonstrated a positive impact on youth earnings. The Job Corps is probably the most well-known. It is an intensive program, costing around $20,000 per

participant, which provides extremely disadvantaged youth with basic education, vocational skills, and a wide range of support services in a residential environment. A 1980 evaluation (Long, Mallar, and Thorton, 1981) showed increases in education, employment, and earnings. Combining those gains with substantial reductions in crime, the estimated return from the program is roughly 8-9%. There is some basis for supporting expansion of this program, but even for this program the evidence is questionable. Part of the high return comes from a large estimate of the reduction in murder rates caused by the program. (See Donohue and Siegelman, 1998.)

Jobstart was designed to achieve similar impacts to the Job Corps, without the associated costs. It offers less intensive services in a non-residential setting, at a cost of about $6,000 per participant (substantially more than JTPA training, but less than half the cost of the Job Corps). Not surprisingly, the savings in costs are matched by a reduction in impacts. While estimates suggest small increases in earnings and education and reductions in crime, those effects were typically not statistically significant for the overall sample of participants. Two particularly problematic subgroups showed large positive impacts on earnings: men arrested between age 16 and program entry and youth who had dropped out of school for educational reasons. Previous arrestees also showed some evidence of reduced crime and drug use as a result of the program. More surprising, however, is the sizeable impacts reported by one program site -- the Center for Employment and Training (CET) in San Jose, California.

The CET provides 3-6 months of vocational training of disadvantaged youth and adults, most of which are high school dropouts. At a cost of only $4,200 per enrollee, the program showed sustained earnings gains of over $3,000 per year (a 40% increase)! The success of this program is not entirely understood, but it does have a few distinguishing features which are suggestive (U.S. Department of Labor, 1995). First, the program has close ties to the local labor market. An industrial advisory board is set up to aid in skill selection; courses are taught by technicians from industry; and many area employers are on the advisory board. Second, CET emphasizes job skills training over learning basic skills. Basic skills are taught in the context of job training. Third, the CET curriculum is tailored specifically to the needs of each participant. Fourth, the CET has been active in San Jose for over 25 years and program staff have extensive local knowledge and contacts. It has earned a positive reputation among employers, which is likely to help the placement of new graduates.

A comparison of these programs suggests a few important lessons. First, you get what you pay for. The JTPA program cost very little and produced very little. The intensive residential nature of the Job Corps was not easily replaced by the less expensive Jobstart program (with the exception of CET). Second, the effects of treatment may vary substantially among subgroups. This is not only evidenced by the difference in effects for the JTPA across age and sex classifications, but it is also observed for subgroups in the Jobstart evaluation. Third, these types of programs also affect behaviors beyond schooling and work which should be considered. Both the Job Corps and Jobstart suggest that reductions in crime may be an important impact of programs targeted at male youth. (See Lochner, 1999, for additional evidence on the relationship between training, schooling, and crime.) Consistent with the evidence from early intervention and adolescent interventions, improvements in motivation and socialization skills can substantially improve the social and economic outcomes of participants in these programs. Fourth, programs that are highly integrated with the local labor market and private sector are likely to be the most successful. This supports our claim that efforts should be made to shift training subsidies to the private sector.

Workfare and Learnfare

How effective are the recent learnfare and workfare programs? An evaluation of two programs conducted in Wisconsin is of interest (see Pawasarat and Quinn, 1993). One program, the Community Work Experience Program (CWEP), required mandatory participation in unpaid community service jobs for non-exempt AFDC participants. A second program, Work Experience and Job Training, provided AFDC clients with assessment, job search activities, subsidized employment, job training and community work experience. Participants who failed to find employment after completing their education and training were also required to participate in CWEP jobs.

Using randomized trials for one county and nonexperimental methods for the rest, researchers found no effect of these programs compared to existing program alternatives. The reduction in AFDC participation that is widely cited as a consequence of these programs is essentially due to the improvement in the Wisconsin economy during the time the programs were in place. These results are disappointing but consistent with previous studies of the efficacy of such programs by the Manpower Demonstration Research Corporation (Gueron and Pauly, 1991).

Mandatory work experience programs produce little long term gain in employment or earnings. No cheap training solution has yet been found that can end the welfare problem. Lifting a welfare woman out of poverty by increasing her earnings by $5,000 per year ($100 per week) will cost at least $50,000. This is the scale of required investment. No "quick fix," low cost solution is in sight.

Training Programs for Displaced Workers

Displacement of older workers with substantial experience in the labor market has become an increasingly important phenomenon in recent years. In response to this trend, Congress passed Title III of the Job Training Partnership Act in 1982 and the Economic Dislocation and Worker Adjustment Assistance Act in 1988.

Leigh (1990, 1995) summarizes the evidence on a variety of these programs. Results from some of these evaluations suggest small to moderate wages gains lasting only about a year. A more recent evaluation by Mathematica (see Corson, et al., 1993, and Decker and Corson, 1995) of training provided under the Trade Adjustment Assistance Act to workers displaced as a result of foreign trade finds no evidence of any effect of this long-term training program on the earnings and employment of recipients. Consistent with the other studies of government employment and training programs already discussed, the overall pattern for programs aimed at displaced workers is one of weak impacts for most groups. This is in sharp contrast to the high rates of return for private on-the-job training. We cannot rely on Federal job training programs to convert adult unskilled workers into the skilled workers demanded by the modern economy.

The Impact of Training

While these evaluations have shown little effect of public training programs, Heckman, Hohmann and Smith (2000), have pointed out that they do not show that training itself has no effect. Social experiments like the JTPA estimate the effect of offering JTPA training to individuals. For classroom training, Heckman, Hohmann, and Smith (2000) show that the true effect of training is often 3-5 times as large as estimates from social experiments suggest, since nearly 30-40% of program participants receive no training and between 30% and 40% of individuals randomized out of the program receive some other form of comparable classroom training. Under reasonable

assumptions about interest rates, the persistence of effects, and program costs (including the social costs of raising taxes to pay for training), they also report that classroom training in JTPA often provides positive net lifetime returns.

The fact that many non-participants were able to find comparable training elsewhere suggests that additional training programs are not necessary. In fact, that is precisely what estimates from social experiments tell us: the availability of these programs has small effects on earnings and employment. But, training itself is not necessarily worthless, although even the corrected effects estimated by Heckman, Hohmann, and Smith (2000) do not suggest that small increases in training will pull the underpriveleged out of poverty. Rather than spending more money on large-scale (and unnecessary) public training initiatives, we suggest that money is better spent by subsidizing private training, allowing firms to decide who to train and how to train them. If training particular groups is desirable for political reasons, then subsidize firms to train them how they see fit.

VI. The Conflict Between Economic Efficiency and the Work Ethic

To the extent that there are strong complementarities between different types of skill investments, there is a conflict between policies that seek to alleviate poverty by investing in low-skill workers and policies that raise the wealth of society at large. Taking the available evidence at face value, the most **economically-justified** strategy for improving the incomes of the poor, especially adult low-ability low-skill persons is to invest more in the highly skilled, tax them, and then redistribute the tax revenues to the poor.

However, many people view the work ethic as a basic value and would argue that cultivating a large class of transfer recipients would breed a culture of poverty and helplessness. If value is placed on work as an act of individual dignity, because of general benefits to families, communities and society as a whole, then society may be prepared to subsidize inefficient jobs. Higher subsidies induce people to switch out of criminal activities (Lochner, 1999). However, job subsidies are not the same as investment subsidies. Both theory and empirical evidence point strongly to the inefficiency of subsidizing the investment of unskilled older workers.

VII. Conclusion: A Life-Cycle Perspective

In evaluating a human capital investment strategy, it is crucial to consider the entire policy portfolio of interventions together -- training programs, school-based policies, school reform, and early interventions -- rather than focusing on one type of policy in isolation from the others.

The best evidence suggests that learning begets learning. Early investments in learning are effective. Much of the recent emphasis on lower tuition costs for college students is misplaced when the value of early preschool interventions is carefully examined. In the long run, significant improvements in the skill levels of American workers, especially workers not attending college, are unlikely without substantial improvements in the arrangements that foster early learning. We cannot afford to postpone investing in children until they become adults, nor can we wait until they reach school age -- a time when, for some, it may already be too late to successfully intervene. Learning is a dynamic process and is most effective when it begins at a young age and continues through adulthood. The role of the family is crucial to the formation of social and learning skills, and government interventions at an early age that mend the harm done by dysfunctional families have proven to be highly effective. The greatest success of these programs lies in improving the motivation and social skills of the participants and not in boosting IQ. An exclusive emphasis on cognitive skills misses the important point that non-cognitive and social skills are equally important and more easily altered.

The returns to human capital investments are greatest for the young for two reasons: (a) younger persons have a longer horizon over which to recoup the fruits of their investments and (b) skill begets skill. Skill remediation programs for adults with severe educational disadvantages are much less efficient compared to early intervention programs. So are training programs for more mature displaced workers. The available evidence clearly suggests that adults past a certain age and below a certain skill level obtain poor returns to skill investment. A reallocation of funds from investment in the old and least able to the young and more trainable for whom a human capital strategy is more effective is likely to produce more favorable outcomes in the long run.

Current training policies need to be re-examined. Private training programs have two advantages that public training programs do not: they can train workers who are likely to benefit most, and they can tailor their training programs to market needs. While public training programs sometimes yield increases in participant earnings, those increases fall far short of those estimated

for private training programs. More successful public training programs are already highly integrated with the private sector. Incentives to promote private sector training should be expanded and ineffective public sector training programs should be re-evaluated and eliminated. Firms are likely to choose younger and more able workers to train, rather than expending resources on older and more difficult to train workers who will gain little from additional investments.

For older unskilled workers whose skills have been made obsolete by newer modes of production, wage subsidies offer a more efficient alternative for raising their incomes. (See the discussion in Phelps, 1997.) By encouraging work rather than unemployment and crime, wage subsidies may also provide social benefits that extend beyond individual increases in earnings.

All levels of government subsidize higher education, and those subsidies benefit both unskilled and skilled workers. The argument for increasing the current high level of subsidies however, is not well documented. The evidence that borrowing constraints are important deterrents to college attendance is very weak. Students from low-income families tend to have much lower college attendance rates for reasons other than their inability to meet tuition and living expenses. Lower family income levels are associated with less productive family and neighborhood environments as well as lower motivation and ability by prospective students. These are factors not so easily remedied by student loans or fellowships. The available evidence does not suggest that additional loans or subsidies are necessary to alleviate credit constraints. There is also no evidence to suggest that massive direct externalities to education exist that require an expansion of existing levels of subsidy to education (Heckman and Klenow, 1998). The strongest argument for social externalities of schooling are indirect. Lochner (1999) finds that, even after controlling for ability, high school graduation substantially reduces criminal participation. This does not, however, imply that *additional* education subsidies are justified -- especially beyond high school.

Public primary and secondary schools are fully subsidized by taxes. The available evidence suggests that additional spending on public school quality would be inefficient. Instead, efforts should be made to ensure that adequate early childhood learning can take place. Additional funding for flexible early childhood programs that can respond to the specific needs of targeted children is warranted. But those programs need to be accompanied by rigorous new evaluations to ensure the success and promotion of efficient programs and to prevent the growth of wasteful ones. Some innovative programs for troubled adolescents have also shown promise, offering viable alternatives to the conventional policy response that simply throws more public funds at current schools and

curricula. That is, perhaps, the best way to get more out of our current schools. For those who still have difficulties acquiring the skills required by the modern economy, a policy that subsidizes private training for younger workers and employment for older workers is most efficient. It is important to recognize that different programs and policies are needed at different stages in the lifecycle.

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hite inority ap in College ntry robabilities at Age Con itional on High hool Completion

	ithout AF ore		ith AF ore	
Amount of ap plaine y	la s 1	Hispani s	la s	Hispani s
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a groun Components				
In ivi ual Components				
1a umber of iblings	0	0	0	01
1b Highest ra e of Father	0	0	0	0
1 Highest ra e of other	00	0	00	0
1 ro en Home	01	01	00	01
uating Family In ome	0	0	00	0
uating Lo al Average ages	00	0	00	0
uating uition an	0	0	0	0
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uating 1 an	1	1	0	0
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Table 2
Effects of Early Intervention Programs

Program/Study	Costs*	Program Description	Test Scores	Schooling	Pre-Delinquency Crime
Abecedarian Project** (Ramey, et. al, 1988)		full-time year round classes for children from infancy through preschool	high scores at ages 1-4	34% less grade retention by 2nd grade; better reading and math proficiency	
Early Training** (Gray et al., 1982)		part-time classes for children in summer; weekly home visits during school year	higher scores at ages 5-10	16% less grade retention; 21% higher HS grad.rates	
Harlem Study (Palmer, 1983)		individual teacher-child sessions twice-weekly for young males	higher scores at ages 3-5	21% less grade retention	
Houston PCDC** (Johnson, 1988)		home visits for parents for 2 yrs; child nursery care 4 days/wk in year 2 (Mexican Americans)	higher scores at age 3		rated less aggressive and hostile by mothers (ages 8-11)
Milwaukee Project** (Garber, 1988)		full-time year-round classes for children through 1st grade; job training for mothers	higher scores at ages 2-10	27% less grade retention	

Table 2 (continued)

Program/Study	Costs*	Program Description	Test Scores	Schooling	Pre-Delinquency Crime
Mother-Child Home Program (Levenstein, O'Hara, & Madden, 1983)		home visits with mothers and children twice weekly	higher scores at ages 3-4	6% less grade retention	
Perry Preschool Program** (Schweinhart, Barnes, & Weikart, 1993)	$13,400	weekly home visits with parents; intensive, high quality preschool services for 1-2 years	higher scores in all studied years (ages 5-27)	21% less grade retention or special services; 21% higher HS grad. rates	2.3 vs. 4.6 lifetime arrests by age 27 7% vs. 35% arrested 5 or more times
Rome Head Start (Monroe & McDonald, 1981)	$5,400 (2 yrs)	part-time classes for children; parent involvement		12% less grade retention; 17% higher HS grad. rates	
Syracuse University Family Development (Lally et al., 1988)	$38,100	weekly home visits for family; day care year round	higher scores at ages 3-4		6% vs. 22% had probation files; offenses were less severe
Yale Experiment	$23,300	family support; home visits and day care as needed for 30 months	better language development at 30 months	better-school attendance & adjustment; fewer special adjustment; school services (age 12 1/2)	rated less aggressive & pre-delinquent by teachers and parents (ages 12 1/2)

Notes: All Comparisons are for program participants vs. non-participants.
* Costs are valued in 1990 dollars. ** Studies used random assignment experimental design to determine program impacts.
Sources: Donohue and Siegelman (1999), Schweinhart, Barnes, and Weikart (1993), and Seitz (1990).

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California A hievement est at Age 1	1		
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mployment ffe ts			
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[a] All group ifferen es statisti ally signifi ant at 0 level
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College[b]		0	
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mployment	1	10	
Crime	0	0	0
elfare	1	1	1
enefit ubtotal	0	1	1
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arnings	1	11 1	1
Crime	1	0	1
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otal enefits	10 00	1	
et resent alue		1	0

[a] Costs an ost in reases appear as negative numbers
[b] ome small portion of ollege osts are li ely to have been borne by the parti ipants but these oul not be estimate from the available information
he benefits reporte in lu e all osts pai by the employer to hire a parti ipant Allo ation to parti ipants an the general publi assume that a the marginal ta rate is b the value of fringe benefits re eive by the employee e uals 10 of salary an the value of other fringes pai by the employer e g the employer s share of so ial se urity e uals 10 of salary

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[a] For the ponsor A holar program only impa ts that are stasti ally signifi ant at the 10 level are reporte Impa ts on 1 th gra e A are not signifi ant

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Table 5
Effects of Selected Adolescent Social Programs on Schooling, Earnings, and Crime

Program/Study	Costs*	Program Description	Schooling	Earnings*	Crime*
Job Corps (Long et al., 1981)	$11,000	7 mo. of educ. and vocational training for 16-21 yr. olds (mostly male)	no effect	disc. pres. value of increased earnings of $10,000	Estimated Reduction in crime valued at approx.
JTPA** (Bloom, et al., 1993)	Males: $1,316 Females: $1,955	job training and placement services for adolescents	no effect	no effect	
STEP (Walker and Viella-Velez, 1992)		2 summers of employment, academic remediation & life skills for 14 & 15 year olds	short-run gains in test scores; no effect on school completion rates		
Quantum Opportunities Program** (Taggart, 1995)	$10,600	counseling; educ., comm., & devp. services; financial incentives for part. (4 yrs. beginning in 9th grade)	34% higher HS grad./GED rates (2 yrs. post-program)		4% vs. 16% convicted; .28 vs. .56 avg. number of arrests (2 yrs. post-program)

Source: Heckman, Lochner, Smith, and Taber (1997).
* All dollars in 1990 values. ** Studies used random assignment experimental design to determine program impacts.

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Currently in a year ollege		11	
Currently in training	1		1
Currently in		11	
Currently in ollege training or			0
L			
Currently employe full time	0		1
Currently employe part time	1	1	
Currently not in s hool training or wor	1		
Average yearly earnings all	1	1 1	1
er ent with annual earnings 0			
CHIL ARI			
Average hil ren ever parente			1
er ent with hil ever parente		1	

	arti ipants	Control roup	ifferential
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elf re eiving welfare	0		
CRI I ALI			
er ent ever arreste	1		
Average number arrests in all			
er ent males ever arreste			1
Average number arrests males		1 0	
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Average number in ar erations all	1		
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Average number in ar erations males			

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Louisville I	0	0	A
Job Search Assistance and Training Services			
est irginia	0	0	A
irginia mployment ervi es	0	0	0
an iego I	0	00	A
an iego II I	1 1 0	0	A
altimore	1 1 0	1 0	0
ew ersey	0	0	
aine	0	1 0	1 1 0
Work Experience and Retraining:			
AF C Homema er Health Care	11 0	0	A
ational upporte or	1 0	0	10

ote All figures in the table are e presse in 1 0 ollars tatisti ally signifi ant at a level

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our e loom et al 1 nrollee estimates obtaine using the pro e ure in loom 1

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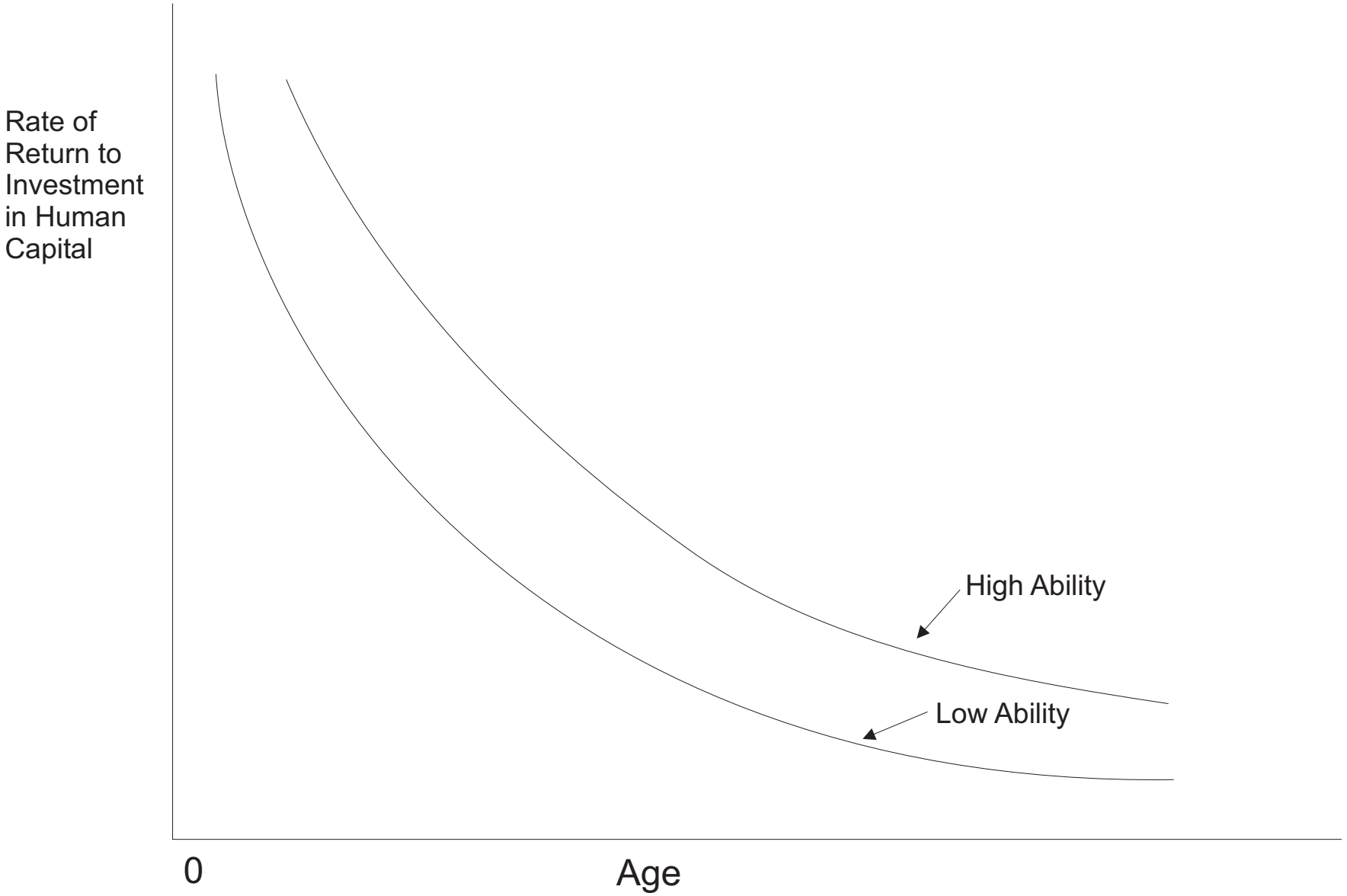
Figure 1


Rate of Return to Investment in Human Capital
High Ability
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0
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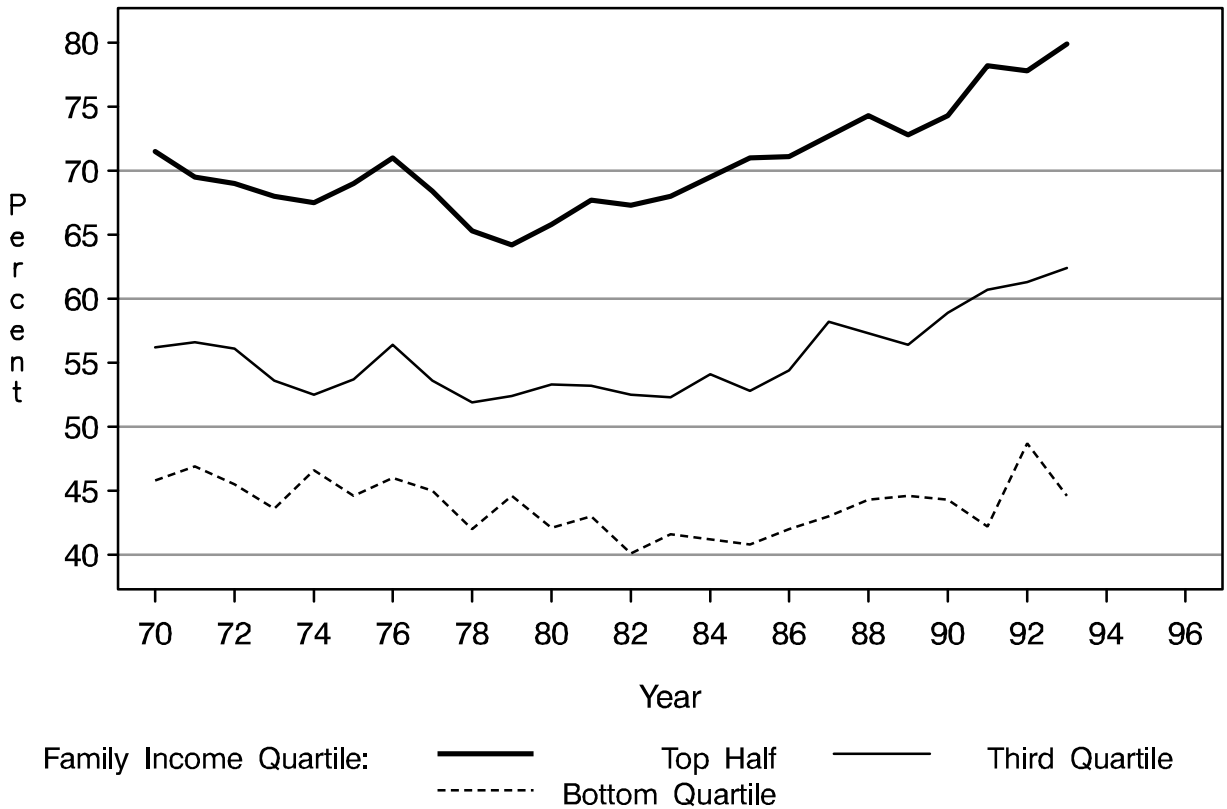
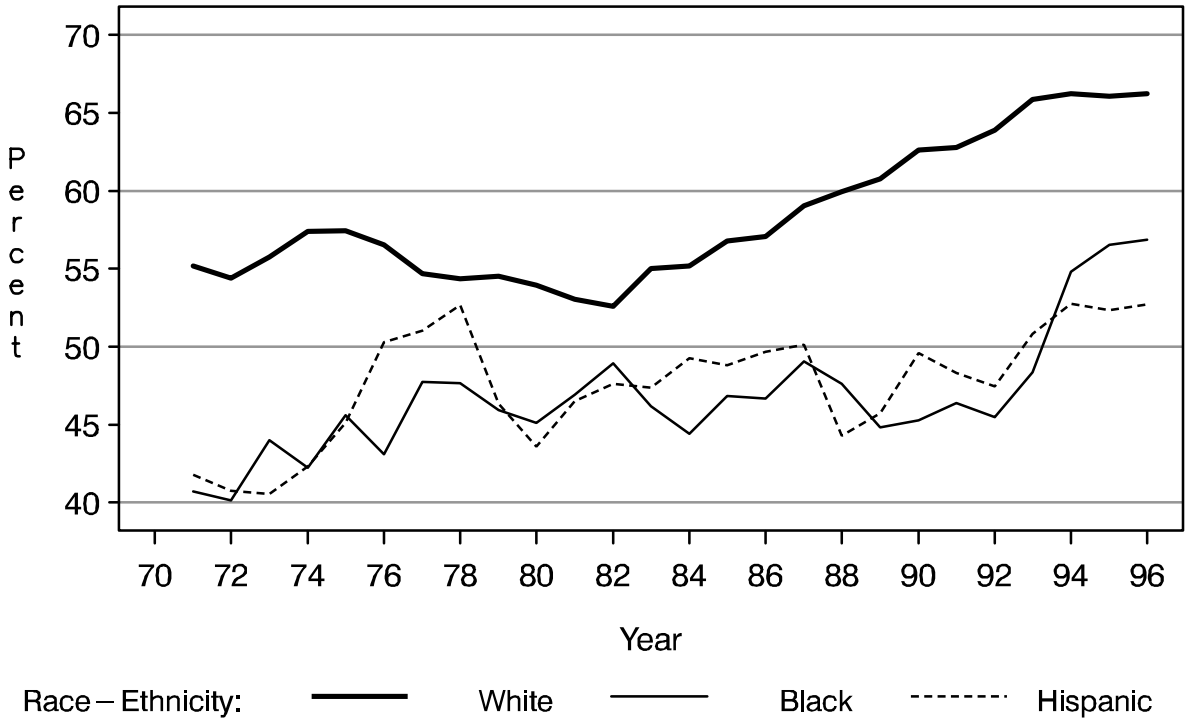
Figure 2. College Participation by 18 to 24 Year Old High School Graduates and Equivalency Degree Holders



Note.--These numbers were computed from 1971 to 1989 CPS P-20 School Reports and the 1990 to 1993 October CPS data files. Racial-ethnic categories are mutually exclusive.

Source.--Cameron and Heckman (1998)

Figure 3. College Entry Proportions of 21 to 24 Year Olds Who Have Graduated High School or Obtained an Equivalency Degree



Note.--The values represent three-year moving averages of March CPS data (two-year averages for 1971 and 1996). Racial-ethnic groups are defined mutually exclusively.
Source.--Cameron and Heckman (1998)