Human Capital Formation in Childhood and Adolescence

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Introduction

It is well documented that people have diverse abilities, that these abilities account for a substantial portion of the variation across people in socio-economic success and that persistent and substantial ability gaps across children from various socio-economic groups emerge before they start school. The family plays a powerful role in shaping these abilities through genetics and parental investments and through choice of child environments. A variety of intervention studies indicate that ability gaps in children from different socio-economic groups can be reduced if remediation is attempted at early ages. The remediation efforts that appear to be most effective are those that supplement family environments for disadvantaged children. Cunha, Heckman, Lochner and Masterov (2006), henceforth CHLM, present a comprehensive survey and discussion of this literature.

This paper summarizes findings from the recent literature on child development and presents a model that explains them. A model that is faithful to the evidence must recognize that (a) parental influences are key factors governing child development; (b) early childhood investments must be distinguished from late childhood investments; (c) an equity-efficiency trade-off exists for late investments, but not for early investments; (d) abilities are created, not solely inherited, and are multiple in variety; (e) the traditional ability-skills dichotomy is misleading because both skills and abilities are created; and (f) the "nature versus nurture" distinction is obsolete. These insights change the way we interpret evidence and design policy about investing in children. Point (a) is emphasized in many papers. Point (b) is ignored in models that consider only one period of childhood investment. Points (c), (d), and (e) have received scant attention in the formal literature on child investment. Point (f) is ignored in the literature that partitions the variance of child outcomes into components due to nature and components due to nurture.

Some facts about human development

First, ability matters. A large number of empirical studies document that cognitive ability is a powerful determinant of wages, schooling, participation in crime and success in many aspects of social and economic life (see, e.g., Heckman 1995 and Murnane, Willett and Levy 1995).

Second, more recently established, is that abilities are multiple in nature. Non-cognitive abilities (perseverance, motivation, time preference, risk aversion, self-esteem, self-control, preference for leisure) have direct effects on wages (controlling for schooling), schooling, teenage pregnancy, smoking, crime, performance on achievement tests and many other aspects of social and economic life (Borghans, Duckworth, Heckman and ter Weel 2008; Bowles, Gintis and Osborne 2001; Heckman, Stixrud and Urzua 2006).

Third, the nature versus nurture distinction is obsolete. The modern literature on epigenetic expression teaches us that the sharp distinction between acquired skills and ability featured in the early human capital literature is not tenable (see, e.g., Gluckman and Hanson 2005 and Rutter 2006). Additive "nature" and "nurture" models, while traditional and still used in many studies of heritability and family influence, mischaracterize how ability is manifested. Abilities are produced, and gene expression is governed by environmental conditions (Rutter 2006). Measured abilities are susceptible to

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environmental influences, including in utero experiences, and also have genetic components. These factors interact to produce behaviors and abilities that have both a genetic and an acquired character. Genes and environment cannot be meaningfully parsed by traditional linear models that assign variance to each component.

Fourth, ability gaps between individuals and across socio-economic groups open up at early ages, for both cognitive and non-cognitive skills. See the Figure for a prototypical figure which graphs a cognitive test score by age of child by socio-economic status of the family. CHLM present many additional graphs of child cognitive and non-cognitive skills by age showing early divergence and then near parallelism during school-going years across children with parents of different socio-economic status. Levels of child skills are highly correlated with family background factors like parental education and maternal ability, which, when statistically controlled for, largely eliminate these gaps (see CHLM). Experimental interventions with long-term follow-up confirm that changing the resources available to disadvantaged children improves their adult outcomes. See the studies surveyed in Blau (2006), CHLM or Currie (2001). Schooling quality and school resources have relatively small effects on ability deficits and have little effect on test scores by age across children from different socio-economic groups, as displayed in the Figure and related graphs (see Hansen, Heckman and Mullen 2004 and Raudenbush 2006).

Fifth, in both animal and human species, there is compelling evidence of critical and sensitive periods in the development of the child. Some skills or traits are more readily acquired at certain stages of childhood than other traits (see the evidence summarized in Knudsen, Heckman, Cameron and Shonkoff 2006). For example, on average, if a second language is learned before age 12, the child speaks it without an accent (Newport 1990). If syntax and grammar are not acquired early on, they appear to be very difficult to learn later on in life (Pinker 1994). A child born with a cataract will be blind if the cataract is not removed within the first year of life.

Different types of abilities appear to be manipulatable at different ages. IQ scores become stable by age 10 or so, suggesting a sensitive period for their formation below age 10. (See Hopkins and Bracht 1975.) There is evidence that adolescent interventions can affect non-cognitive skills (see CHLM). This evidence is supported by the neuroscience that establishes the malleability of the prefrontal cortex into the early 20s (Dahl 2004). This is the region of the brain that governs emotion and self-regulation. On average, the later remediation is given to a disadvantaged child, the less effective it is. A study by O'Connor, Rutter, Beckett, Keaveney, Kreppner, and the English and Romanian Adoptees Study Team (2000) of adopted Romanian infants reared in severely deprived orphanage environments before being adopted supports this claim. The later the Romanian orphan was rescued from the social, emotional and cognitive isolation of the orphanage, the lower was his or her cognitive performance at age 6. Classroom remediation programs designed to combat early cognitive deficits have a poor track record.

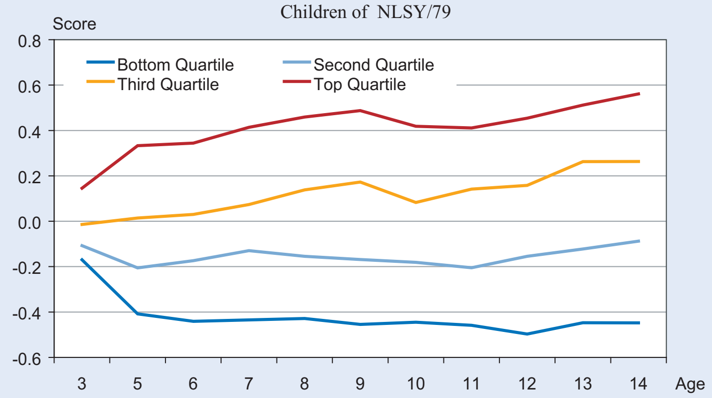
At historically funded levels, public job training programs, and adult literacy and educational programs, like the GED, that attempt to remediate years of educational and emotional neglect among disadvantaged individuals have a low economic return and produce meager effects for most persons. A substantial body of evidence suggests that returns to adolescent education for the most disadvantaged and less able are lower than the returns for the more advantaged (Meghir and Palme 2001; Carneiro and Heckman 2003, and the evidence they cite).

The available evidence suggests that for many skills and abilities, later remediation for early disadvantage to achieve a given level of

Figure

Average Score on Cognitive Development Factor by Quartile of Permanent Income

Children of NLSY/79



Source: Cunha and Heckman (2007).

adult performance may be possible, but is much more costly than early remediation (Cunha and Heckman 2007). The economic returns to job training, high school graduation and college attendance are lower for less able persons (Carneiro and Heckman 2003).

Sixth, despite the low returns to interventions targeted toward disadvantaged adolescents, the empirical literature shows high economic returns for remedial investments in young disadvantaged children (see Barnett 2004, the evidence in CHLM, and the papers they cite). This finding is a consequence of dynamic complementarity and self-productivity captured by the technology developed in the next section.

Seventh, if early investment in disadvantaged children is not followed up by later investment, its effect at later ages is lessened. Investments appear to be complementary and require follow-up to be effective. Currie and Thomas (1995) document a decline in the performance of Head Start minority participants after they leave the program, return to disadvantaged environments, and receive the low levels of investment experienced by many disadvantaged children.

Eighth, the effects of credit constraints on a child's outcomes when the child reaches adulthood depend on the age at which they bind for the child's family. Recent research summarized in CHLM demonstrates the quantitative insignificance of family credit constraints in the child's college-going years in explaining a child's enrollment in college. Controlling for cognitive ability, under meritocratic policies currently in place in American society, family income during the child's college-going years plays only a minor role in determining child college participation, although much public policy is predicated on precisely the opposite point of view. Holding ability fixed, minorities are more likely to attend college than others despite their lower family incomes (see Cameron and Heckman 2001, and the references they cite). Augmenting family income or reducing college tuition at the stage of the life cycle when a child goes to college does not go far in compensating for low levels of previous investment.

Carneiro and Heckman present evidence for the United States that only a small fraction (at most 8 percent) of the families of adolescents are credit constrained in making college participation decisions. This evidence is supported in research by Cameron and Taber (2004) and Stinebrickner and Stinebrickner (2008). Permanent family income plays an important role in explaining educational choices, insofar as it is a proxy for the high level of investment in abilities and skills that wealthier families provide, but it is not synonymous with family income in the adolescent years, nor with tuition and fees.

There is some evidence, however, that credit constraints operating in the early years have effects on adult ability and schooling outcomes (Dahl and Lochner 2005; Duncan and Brooks-Gunn 1997; Duncan and Kalil 2006; Morris, Duncan and Clark-Kauffman 2005). Carneiro and Heckman (2003) show that adding a control for family permanent income reduces the estimated effect of early income on child outcomes. Permanent income has a strong effect on child outcomes. The strongest evidence for an effect of the timing of parental income for disadvantaged children is in their early years. The best documented market failure in the life cycle of skill formation in contemporary American society is the inability of children to buy their parents or the lifetime resources that parents provide and not the inability of families to secure loans for a child's education when the child is an adolescent.

Ninth, socio-emotional (non-cognitive) skills foster cognitive skills and are an important product of successful families and successful interventions in disadvantaged families. Emotionally nurturing environments produce more capable learners. The Perry Preschool Program, which was evaluated by random assignment, did not boost participant adult IQ but enhanced performance of participants on a number of dimensions, including scores on achievement tests, employment and reduced participation in a variety of social pathologies. See Schweinhart, Montie, Xiang, Barnett, Belfield and Nores (2005).

A model of skill formation

We analyze a model with multiple periods of childhood, $t \in \{1,2,\dots,T\}$, $T \geq 2$, followed by A periods of adult working life, $t \in \{T+1,T+2,\dots,T+A\}$. The T childhood periods are divided in S stages of development, $s \in \{1,\dots,S\}$, with $S \leq T-1$. Adult outcomes are produced by cognitive skills, $\theta_{C,T+1}$, and non-cognitive skills, $\theta_{N,T+1}$, at the beginning of the adult years. This model generalizes Becker and Tomes (1986) who assume only one period of childhood (T=1) and consider one output associated with "human capital" that can be interpreted as a composite of cognitive (C) and non-cognitive (N) skills. Denote parental investments at age t in child skill k by $I_{k,t}$, k ∈ {C,N}. Skills evolve in the following way. Each child is born with initial conditions $\theta_1 = (\theta_{C,1},\theta_{N,1})$ Family environments and genetic factors may influence these initial conditions (Olds, 2002). We denot by $\theta_p = (\theta_{C,p},\theta_{N,P})$ parental cognitive and non-cognitive skills, respectively. $\theta_t = (\theta_{C,t},\theta_{N,t})$ denotes the vector of skill stocks in period t. The technology of production of skill k in period t and developmental stage s depends on the stock of skills at date t, θ_t, investment at t, $I_{k,t}$, parental skills, θ_p, and the production function at stage s:

$$\theta_{k,t+1} = f_{s,k}(\theta_t, I_{k,t}, \theta_P) \qquad (1)$$

for k ∈ {C,N}, t ∈ {1,2,…,T}, and s ∈ {1,…,S}. We assume that $f_{s,k}$ is monotone increasing in its arguments, twice continuously differentiable, and concave in $I_{k,t}$. In this model, stocks of skill produce next period skills and affect the current period productivity of investments. Stocks of cognitive skills can promote the formation of non-cognitive skills and vice versa because θ_t is an argument of (1).

Direct complementarity between the stock of skill l and the productivity of investment $I_{k,t}$ in producing skill k in period t arises if $\frac{\partial^2 f_{s,k}}{\partial I_{k,t}\partial\theta_{l,t}} > 0$, t ∈ {1,…,T}, l, k ∈ {C,N}. Period t stocks of abilities and skills promote acquisition of skills by making investment more productive. Students with greater early cognitive and non-cognitive abilities are more efficient in later learning of both cognitive and non-cognitive skills. The evidence from the early intervention literature suggests that the enriched early environments of the Abecedarian, Perry and CPC programs promoted greater efficiency in learning in high schools and reduced problem behaviors.

Adult outcome j, Q_j, is produced by a combination of different beginning of period T+1 skills:

$$Q_j = g_j(\theta_{C,T+1}, \theta_{N,T+1}) \qquad (2)$$

These outcome equations capture the twin concepts that both cognitive and non-cognitive skills matter for performance in most tasks in life and have different effects in different tasks in the labor market and in other areas of social performance. Outcomes include test scores, wages, achievement in an occupation, hours worked, criminal activity, teenage pregnancy, etc.

It is convenient to focus on a CES version of technology (1) where we assume that $\theta_{C,t},\theta_{N,t},I_{C,t},I_{N,t},\theta_{C,p},\theta_{N,p}$ are scalars. Output of skills at stage s is governed by:

$$\theta_{C,t+1} = \left[\gamma_{s,C,1}\theta_{C,t}^{\varphi_{s,C}} + \gamma_{s,C,2}\theta_{N,t}^{\varphi_{s,C}} + \gamma_{s,C,3}I_{C,t}^{\varphi_{s,C}} + \gamma_{s,C,4}\theta_{C,P}^{\varphi_{s,C}} + \gamma_{s,C,5}\theta_{N,P}^{\varphi_{s,C}}\right]^{\frac{1}{\varphi_{s,C}}} \qquad (3)$$

and

$$\theta_{N,t+1} = \left[\gamma_{s,N,1}\theta_{C,t}^{\varphi_{s,N}} + \gamma_{s,N,2}\theta_{N,t}^{\varphi_{s,N}} + \gamma_{s,N,3}I_{N,t}^{\varphi_{s,N}} + \gamma_{s,N,4}\theta_{C,P}^{\varphi_{s,N}} + \gamma_{s,N,5}\theta_{N,P}^{\varphi_{s,N}}\right]^{\frac{1}{\varphi_{s,N}}} \qquad (4)$$

where $\gamma_{s,k,l}$ ∈ [0,1], for k ∈ {C, N} and s ∈ {1,…,S}, $\sum_{l=1}^{5}\gamma_{s,k,l} = 1$. The expression

$$\frac{1}{\sqrt{1-\varphi_{s,k}}}$$

is the elasticity of substitution in the inputs producing $\theta_{k,t+1}$, where $\varphi_{s,k}$ ∈ (–∞,1] for k ∈ {C, N}.

A CES specification of adult outcomes in periods after T writes

$$Q_j = \left[\rho_j\theta_{C,T+1}^{\varphi_{Q,j}} + (1-\rho_j)\theta_{N,T+1}^{\varphi_{Q,j}}\right]^{\frac{1}{\varphi_{Q,j}}} \qquad (5)$$

where ρ_j ∈ [0,1], and φ_{qj} ∈ (-∞,1] for j = 1,…,J. The expression $\frac{1}{1-\varphi_{Q,j}}$ is the elasticity of substitution across different skills in the production of outcome j. The importance of cognition in producing output in task j is governed by share parameter ρ_j. The ability to compensate cognitive deficits by non-cognitive skills is governed by $\varphi_{Q,j}$.

To gain some insight into this model, consider a special case where childhood lasts two periods (T=2), there is one adult outcome ("human capital") so J=1, and the elasticities of substitution are the same across technologies (3) and (4) and in the outcome (5), so $\varphi_{s,C} = \varphi_{s,N} = \varphi_Q = \varphi$ for all s ∈ {1,…,S}. Assume there is one investment good in each period that increases both cognitive and non-cognitive skills, though not necessarily by the same amount, ($I_{k,t} = I_t$, k ∈ {C, N}). In this case the adult outcome function in terms of investments, initial endowments and parental characteristics can be written as

$$Q = \left[\tau_1 I_1^{\varphi} + \tau_2 I_2^{\varphi} + \tau_3\theta_{C,1}^{\varphi} + \tau_4\theta_{N,1}^{\varphi} + \tau_5\theta_{C,P}^{\varphi} + \tau_6\theta_{N,P}^{\varphi}\right]^{\frac{1}{\varphi}}, \qquad (6)$$

where τ_i for i = 1,…,6 depend on the parameters of equations (3)–(5). Cunha and Heckman (2007) analyze the optimal timing of investment using a special version of the technology embodied in (6). Let $R = \sum_{t=3}^{A}\frac{w}{(1+r)^{t-3}}$ denote the net present value of the child's future income. Parents have resources M that they use to invest in period "1", I_1, and period "2", I_2, or to transfer in risk-free assets, b. Assume that the price of investment in period "1" is one, the relative price of investment in period "2" is $\frac{1}{1+r}$. Parents maximize the present value of net wealth of their children. Formally, the problem of the parents is to $Max_{I_1,I_2,b}\frac{RQ+\mathbf{b}}{(1+\mathbf{r})^2}$ subject to the technology of skill formation (6), the standard budget constraint,

$$\mathbf{I^1}+\frac{\mathbf{1}}{(\mathbf{1}+\mathbf{r})}\mathbf{I}^2+\frac{\mathbf{1}}{(\mathbf{1}+\mathbf{r})^2}\mathbf{b}=\mathbf{M} \qquad (7)$$

and the constraint that parents cannot leave negative bequests to their children,

$$b\geq 0. \qquad (8)$$

When φ =1, early and late investments are perfect CES substitutes. The optimal investment strategy for this technology in this simple environment is straightforward. The price of early investment is EUR 1. The price of the late investment is EUR $\frac{1}{(1+r)}$. Thus the parents can purchase (1+r) units of I_2 for every unit of I_1. The amount of human capital produced from one unit of I_1 is τ_1, while EUR (1+r) of I_2 produces (1+r) τ_2 units of output Q. Therefore, the parent invests early if $\tau_1>\tau_2(1+r)$ and late otherwise. Two forces act in opposite directions. High productivity of initial investment (the skill multiplier τ_1) drives the agent toward making early investments. Intertemporal prices (the interest rate) drive the agent to invest late. It is optimal to invest early if $\tau_1>\tau_2$ (1+r).

As $\varphi\to -\infty$, the CES production function converges to the Leontief case and the optimal investment strategy is to set $I_1=I_2$. In this extreme case, CES complementarity has a dual face. Investments in the young are essential. At the same time, later investments are needed to harvest early investments. On efficiency grounds, early disadvantages should be perpetuated, and compensatory investments at later ages are economically inefficient.

For $-\infty<\varphi<1$, the solution is interior solution and the optimal ratio of period "1" investment to period "2" investment is:

$$\ln\frac{I_1}{I_2}=\left(\frac{1}{1-\varphi}\right)\left[ln\left(\frac{\tau_1}{\tau_2}\right)-ln(1+r)\right]$$

Ceteris paribus, the higher τ_1 relative to τ_2, the higher first period investment should be relative to second period investment. The parameters τ_1 and τ_2 are affected by the productivity of investments in producing skills, which are generated by the technology parameters $\gamma_{s,k,3}$, for s ∈ {1,2} and k ∈ {C,N}, and also depend on the relative importance of cognitive skills, ρ, versus non-cognitive skills, 1-ρ in producing the adult outcome Q. Ceteris paribus, if $\frac{\tau_1}{\tau_2}>(1+r)$, the higher the CES complementarity, (i.e., the lower φ), the greater is the ratio of early to late investment. The greater r, the smaller should be the ratio of early to late investment. In the limit, if investments complement each other strongly, optimality implies that they should be equal in both periods.

To see how the self-productivity parameters affect the ratio of early to late investment, suppose that early investment only produces cognitive skill, so that $\gamma_{1,N,3}=0$, and late investment only produces non-cognitive skill, so that $\gamma_{2,C,3}=0$. In this case, the ratio $\frac{\tau_1}{\tau_2}$ can be expressed in terms of the technology and outcome function parameters:

$$\frac{\tau_1}{\tau_2}=\frac{\rho\gamma_{2,C,1}+(1-\rho)\gamma_{2,N,1}}{1-\rho}\frac{\gamma_{1,C,3}}{\gamma_{2,N,3}}.$$

For a given value of ρ (the weight placed on cognition in final outcomes), the ratio of early to late investment is higher the greater the ratio $\frac{\gamma_{1,C,3}}{\gamma_{2,N,3}}$. To investigate the role ρ plays in determining the optimal ratio of investments, assume that $\gamma_{2,C,1}\geq\gamma_{2,N,1}$, so that the stock of cognitive skill, $\theta_{C,1}$, is at least as effective in producing next period cognitive skill, $\theta_{C,2}$, as in producing next period non-cognitive skill, $\theta_{N,2}$. Under this assumption, the higher ρ, that is, the more important cognitive skills are in producing Q, the higher the equilibrium ratio I_1/I_2. If, on the other hand, Q is more intensive in non-cognitive skills, then I_1/I_2 is smaller.

This simple model also has implications for the timing of interventions. Suppose that there are two families A and B such that $M_A > M_B$ and family A is unconstrained (i.e., restriction [8] does not bind) while family B is constrained (i,e., restriction [8] binds). Consequently, in equilibrium, the marginal return to one dollar invested in the poor child from family B is above the marginal return to the same dollar invested in the rich child from family A, so family B underinvests compared to the unconstrained family A.

There is no trade-off between equity and efficiency in early childhood investments. Government policies to promote early accumulation of human capital should be targeted to the children of poor families. However, the optimal second period intervention for a child from a disadvantaged environment depends critically on the nature of the technology (6). If I_1 and I_2 are perfect complements, then a low level of I_1 cannot be compensated at any level of investment by a high I_2. On the other hand, suppose that $\varphi = 1$, so the reduced form technology can be written with inputs as perfect substitutes. Then a second-period intervention can, in principle, eliminate initial skill deficits (low values of I_1). At a sufficiently high level of second-period investment, it is technically possible to offset low first period investments. However, it may not be cost effective to do so. For example, if $R^{\tau_2} < 1+r$, then the gains from future earnings do not justify the costs of investment. It would be more efficient to give the child a bond that earns interest rather than to invest in human capital in order to put the child at a certain level of income.

We previously discussed the concepts of critical and sensitive periods in terms of the technical possibilities of remediation. These were defined in terms of the technology of skill formation. Here, we consider the net effects operating through investment and market substitution. The higher φ, the greater are the possibilities for alleviating early disadvantage. When $\varphi = 1$, as in this example, it is always technically possible to remediate early disadvantage. But it may not be economically efficient to do so. From an economic point of view, critical and sensitive periods should be defined in terms of the costs and returns of remediation, and not solely in terms of technical possibilities.

Cunha, Heckman and Schennach (2008) estimate a version of technology (6) for general $\varphi_{s,j}$ $j \in \{C,N\}$, $s \in \{1, \ldots, S\}$ using the same sample as used by Cunha and Heckman (2008). They distinguish two types of maternal skills – cognitive and non-cognitive ($\theta_{C,p}$, $\theta_{N,p}$) – and introduce both as arguments of the production function. They estimate a two-stage model of childhood (S = 2). Stage 1 is birth through age 4. Stage 2 corresponds to age 5 through 14. The major findings from their analysis are: (a) Self-productivity becomes stronger as children become older, for both cognitive and non-cognitive capability formation. (b) Complementarity between cognitive skills and investment becomes stronger as children become older. The elasticity of substitution for cognitive inputs is smaller in second stage production. It is more difficult to compensate for the effects of adverse environments on cognitive endowments at later ages than it is at earlier ages. This finding helps to explain the evidence on ineffective cognitive remediation strategies for disadvantaged adolescents. (c) Complementarity between non-cognitive skills and investments becomes weaker as children become older. It is easier at later stages of childhood to remediate early disadvantage using investments in non-cognitive skills.

Cunha, Heckman and Schennach (2008) report that 34 percent of the variation in educational attainment in their sample is explained by the measures of cognitive and non-cognitive capabilities that they use. Sixteen percent is due to adolescent cognitive capabilities. Twelve percent is due to adolescent non-cognitive capabilities. Measured parental investments account for 15 percent of the variation in educational attainment. These estimates suggest that the measures of cognitive and non-cognitive capabilities that they use are powerful, but not exclusive, determinants of educational attainment and that other factors, besides the measures of family investment that they use, are at work in explaining variation in educational attainment.

Conclusion

This paper reviews the evidence from recent research that addresses the origins of inequality and the evolution of the capabilities that partly determine inequality. Both cognitive and non-cognitive capabilities are important in producing a variety of outcomes.

Comparative advantage is an empirically important feature of economic and social life. The same bundle of personal traits has different productivity in different tasks. Abilities are not invariant traits and are causally affected by parental investment. Genes and environments interact to determine outcomes. The technology of capability formation rationalizes a large body of evidence in economics, psychology and neuroscience. Capabilities are self-productive and cross-productive. Dynamic complementarity explains why it is productive to invest in the cognitive skills of disadvantaged young children but why the payoffs are so low for cognitive investments in disadvantaged older children and are even lower for disadvantaged adults. There is no equity-efficiency trade-off for investment in the capabilities of young disadvantaged children. There is a substantial equity-efficiency trade-off for investment in the cognitive skills of disadvantaged adolescents and adults. The trade-off is much less dramatic for investment in the non-cognitive skills of adolescents. Parental environments and investments affect the outcomes of children.

The right mix of intervention to reduce inequality and promote productivity remains to be determined. The optimal timing of investment depends on the outcome being targeted. The optimal intervention strategies depend on the stage of the life cycle and endowments at each stage. For severely disadvantaged adults with low levels of capabilities, subsidizing work and welfare may be a better response for alleviating poverty than investment in their skills. The substantial heterogeneity in endowments and effects of interventions at different ages suggests that a universal policy to combat the adverse effects of early disadvantage is not appropriate. Optimal investment should be tailored to the specifics that create adversity and to the productivity of investment for different configurations of disadvantage. As research on the economics of capability formation matures, economists will have a greater understanding of how to foster successful people.

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