Human Capital Formation and Economic Prosperity

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Human capital stocks in the USA are not growing at the same rate as in other developed countries.
Countries with relatively low upper secondary attainment rates can fall into one of two categories: either most individuals leave education before obtaining an upper secondary qualification (i.e. they have below upper secondary education), or they continue in education beyond this level until they earn a higher degree (i.e. they have attained tertiary education). In Australia, Canada, Ireland, Israel, Korea, New Zealand, the Russian Federation, Spain and the United Kingdom, tertiary attainment rates are higher than upper secondary attainment rates. In Luxembourg and Portugal, the rates for upper secondary and tertiary education are similar (Table A1.4a).

The gender gap in attainment rates has reversed among younger adults. On average, 25-34 year-old women have higher attainment rates in tertiary education than men of the same age. Some 84% of younger women have attained at least an upper secondary education while 81% of younger men have, on average (Tables A1.2b and A1.4b, available online).

Tertiary attainment

Chart A1.1 shows that across OECD countries, tertiary attainment (including advanced research programmes, i.e. ISCED levels 5A, 5B and 6) has increased by 10 percentage points since 2000. On average, 34% of adult women and 31% of adult men have attained tertiary education. Younger adults have spurred this growth, and the change is even larger among women: in all OECD countries, younger women have higher tertiary attainment rates than older women by an average of more than 20 percentage points (Table A1.3b, available online).

Chart A1.3. Percentage of younger and older tertiary-educated adults (2012)
25-34 and 55-64 year-olds, and percentage-point difference between these two groups


Countries are ranked in ascending order of the percentage-point difference between the 25-34 and 55-64 year-old population with tertiary education.

Source: OECD. Table A1.3a. See Annex 3 for notes (www.oecd.org/edu/eag.htm).

StatLink  http://dx.doi.org/10.1787/888933114989
1. Human capital stocks in the USA are not growing at the same rate as in other developed countries.

2. College enrollment has increased but graduation rates have stayed constant.
College Enrollment: NCES Dataset

Figure
College enrollment in the United States from 1965 to 2014 and projections up to 2025 for public and private colleges (in millions)
Digest of Education Statistics 2015, table 303.10
Comparing across the panels shown in Fig. 8.3, it is clear that changes in college degree attainment have not followed changes in college enrollment consistently over the course of the last 25 years. While college enrollment rates have increased fairly consistently, college degree attainment declined before increasing among more recent cohorts. Figure 8.4 presents the trend by birth cohort in the share of enrolled college students who complete a BA degree—essentially the trend shown in Fig. 8.3c divided by the trend in Fig. 8.3b. For both men and women, the rate of college completion has been below 50% for nearly a half century, with this level appreciably below the rate of completion achieved by men in the early part of the century.

A component of this stagnation has been a growing disparity in college completion rates by parental circumstances. For example, for high school students from the top quartile of the family income distribution, completion rates rose slightly from 67.4 to 71% between those starting college in the early 1980s and those starting in the early 1990s, while the college completion rates fell for students from other income groups (Bowen, Chingos, and McPherson (2009)). Indeed, for 1992 high school seniors who enrolled in college, the difference in college completion rates between the students...
Fostering Human Capital in the USA

1. Human capital stocks in the USA are not growing at the same rate as in other developed countries.

2. College enrollment has increased but graduation rates have stayed constant.

3. Most of the growth in enrollment takes place in “nonselective institutions” which are accepting individuals who are not “college ready.”
Mean SAT/ACT Percentile Score of Colleges, by Colleges' Selectivity in 1962

- Most selective in 1962: 4-year colleges with selectivity in the 99th %ile in 1962
- 96th-98th %ile in 1962
- 91st-95th %ile in 1962
- 71st-80th %ile in 1962
- 61st-70th %ile in 1962
- 51st-60th %ile in 1962
- 41st-50th %ile in 1962
- 31st-40th %ile in 1962
- 21st-30th %ile in 1962
- 11th-20th %ile in 1962
- Least selective in 1962: 4-year colleges with selectivity in the 1st-5th %iles in 1962
- 2 year colleges (estimated)

Figure 3: The Probability of Educational Decisions, by Endowment Levels, Some College vs. 4-year college degree


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College readiness is a process that starts in childhood and continues during adolescence and early adulthood.
Evolution of Inequality in Cognitive Skills

Average percentile rank on anti-social behavior score, by income quartile

- Lowest Income Quartile
- Second Income Quartile
- Third Income Quartile
- Highest Income Quartile
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College readiness is a process that starts in childhood and continues during adolescence and early adulthood.

To increase college readiness in the USA, it is necessary to:

1. Improve targeting of early childhood programs.
2. Implement programs that promote the development of non-cognitive skills.
In joint work with James Heckman and Susanne Schennach, we have shown that the production function of human capital is roughly approximated by:

\[ H_1 = A \left\{ (1 - \gamma_L) \left[ \gamma_E (H_0) \phi_E + (1 - \gamma_E) (I_E) \phi_E \right] \frac{\phi_L}{\phi_E} + \gamma_L (I_L) \phi_L \right\} \frac{1}{\phi_L} \]

Our estimates are such that we cannot reject that 
\[ 1 > \phi_E > 0 > \phi_L >> -\infty. \]
Technology of Skill Formation

Note:

\[ H_1 = A \left\{ (1 - \gamma_L) \left[ \gamma_E (H_0) \phi_E + (1 - \gamma_E) (I_E) \phi_E \right]^{\phi_L} \phi_E + \gamma_L (I_L) \phi_L \right\} \frac{1}{\phi_L} \]

Our findings imply that:

- Early substitutability: The returns to early investments are higher for children who have low levels of \( H_0 \).
- Dynamic complementarity: The returns to late investments are higher for children who have high levels of \( \left[ \gamma_E (H_0) \phi_E + (1 - \gamma_E) (I_E) \phi_E \right] \).
Note:

\[ H_1 = A \left\{ (1 - \gamma_L) \left[ \gamma_E (H_0)^{\phi_E} + (1 - \gamma_E) (I_E)^{\phi_E} \right]^{\frac{\phi_L}{\phi_E}} + \gamma_L (I_L)^{\phi_L} \right\}^{\frac{1}{\phi_L}} \]

Our findings do not imply:

- Early childhood “determinism”.
- Interventions at later stages cannot improve stocks of human capital at adulthood.
- “Either early or late”. In fact, dynamic complementarity means that returns to early investments will be higher the higher the quality of schools and universities.
Example 1: Better Targeting of Early Intervention Programs

- We need to identify families who are at risk for investing too little in their children.
- In different studies in Philadelphia and Houston, our team is working to develop ways that we can easily separate at risk from not at risk families.
Figure 2
Pilot LENA Pro System Study in the HIPPY Program - HISD

Audio Environment per Hour

Adult Word Counts per Hour

Conversation Turn Counts per Hour

Child Vocalization Counts per Hour
Preliminary results in Philadelphia indicate that:

- High-SES families spend more meaningful time, have higher AWC and CTC counts than low SES ones.
- Back of the envelope calculation: 350,000 more words per year and 8,000 more turns per year.
- Comparing mean low-SES family with low-SES family who is one standard deviation above: pretty much same difference.
- In other words, there are many low-SES families that invest as if they were high-SES families.

Why? Our research indicates that this is due to differences in expectations about the returns to investments.
Nagaoka et al (2012) survey the literature on noncognitive skills and academic performance. According to the literature, there is strong and positive correlation between academic performance (including college graduation) and noncognitive factors such as:

- Academic behaviors
- Academic perseverance
- Learning strategies
Kautz and Zanoni (2014) provide an evaluation of noncognitive skill formation program implemented in the Chicago Public Schools.

Program designed to do a few things:
- Information on how to apply for college.
- Training and practice of how to build noncognitive skills.

Analysis by Kautz and Zanoni (2014) suggests that program improves college persistence and college performance.
The skills an individual acquires through a college education are important for economic prosperity and inequality.

So far, policy has attempted to increase access to college even for those students who are not college-ready.

This has led to increase in enrollment, but not in graduation.

To change this reality, it is necessary to promote college-readiness.

Among other things, this will require better targeting of early investments and a portfolio of interventions that foster all dimensions of human capital.