

Creating and Measuring Capabilities

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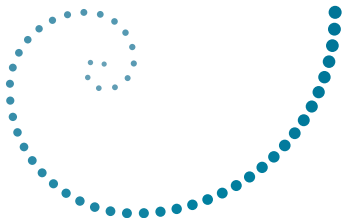
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HUMAN CAPITAL AND
ECONOMIC OPPORTUNITY
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- In my lecture today, I want to consider effective policies to foster social inclusion, to reduce economic and social inequality, and to promote economic and social opportunity for all Chinese.
- The traditional approach to reducing inequality is to transfer income to the poor.
- To create social safety nets that respect dignity and yet give incentives for the poor to help themselves out of poverty.
- Such policies are in place around the world and are an important component of the modern welfare state.

- Most notably, the Brazilian program Bolsa Familia attempts to do this.
- The U.S. tried this to similar effect in its War on Poverty in the 1960s, and it substantially reduced poverty through transfers.
- At issue is whether these policies reduce long-run inequality - do they promote social mobility and reduce economic inequality in the next generation?
- There, the evidence is not so strong.
- In the U.S., the failure of income transfer policies to promote intergenerational social mobility led to Clinton's welfare reforms of the 1990s.
- Recent evidence suggests that the policy reforms of the Clinton administration failed to produce the desired intergenerational mobility out of welfare.

Predistribution, Not Redistribution

- Today, I present a more effective strategy for reducing long-run poverty and promoting social mobility built on research on human development in neuroscience, developmental psychology and economic analysis.
- It is a strategy based on hard empirical analysis and rigorous, long-term evaluations of numerous interventions, and studies of family influence.
- It is a strategy of **predistribution** as an effective way to foster economic and social mobility.

The capacities to function and create further capacities are central to producing social and economic opportunity.

- Capabilities are the capacities to function in a variety of aspects of economic and social life.

A Comprehensive Approach to Capability Formation

- To foster the capabilities of its people, China should implement this knowledge and take a comprehensive approach to understanding the economics of capability development.
- Formulate policies that clearly recognize what capabilities matter, how they are produced and how to prioritize public policy for producing capabilities.
- Doing so avoids a fragmented and often ineffective approach to public policy that misses the pervasive importance of capabilities in shaping life outcomes.

Fragmented Solutions

- Current policy discussions often have a fragmented quality.

Examples of Fragmented Solutions

- For crime, have more police.
- To promote skills, build more schools, hire better teachers, and raise test scores.
- For health, have more doctors and medical facilities. Promote nutrition: micro and macronutrients.
- For teenage pregnancy, conduct pregnancy prevention programs.
- To reduce inequality, give cash transfers and promote housing programs for the poor.

Policy Synergies

- Current research suggests a **unified approach** to policy that addresses these problems and others using a strategy of human development to promote social mobility and productivity, and to reduce inequality.
- It is a policy that promotes capabilities at the stages of the life cycle where they are most effectively produced.
- It is a policy of prevention and empowerment, not just remediation.

The Ingredients of an Effective Skill Formation Strategy

- Any effective strategy for promoting human development has to recognize **three key ingredients**:
 - The powerful role of family life and the early years in shaping adult capabilities.
 - *Multiple* capabilities shape the ability of agents to function in society. A core set of capabilities promotes success in many aspects of life.
 - The technology of capability formation: capabilities beget capabilities.
 - There are fundamental synergies associated with capability formation.
 - Different capabilities interact dynamically to shape the evolution of future capabilities.
 - There are different periods of effective investment for the development of different capabilities.



Modern Understanding of Human Development

- ① A core, low-dimensional set of capabilities – capacities that promote functioning in society and personal growth in those capacities – explains a variety of diverse socio-economic outcomes.
- ② The performance of any society is based on the capabilities – the functionings – of its people.
- ③ Low levels of these capabilities **cause** major social problems (dropping out of school, crime, teenage pregnancy, obesity, and poor health).

4 Capabilities are multiple in nature.

- i Current public policy discussions focus on measuring, enhancing, and rewarding cognitive ability using achievement tests. For example, PISA scores are used to judge the performance of schools, students in those schools, and entire school systems.
- ii An important lesson from recent research is that cognitive capabilities are only part of what is required for success in life.
- iii Personality traits, “soft skills,” physical and mental health, perseverance, attention, motivation, and self confidence are also important and are often neglected aspects of human flourishing.
- iv Cognitive and non-cognitive capabilities are both important causal determinants of life cycle outcomes with equal strength for many outcomes.

- 5 Gaps in capabilities across socio-economic groups open up very early:
 - a Persist strongly for cognitive capabilities
 - b Less strongly for non-cognitive capabilities
 - c Widen with age for many biological capabilities
- 6 Capabilities are not set in stone at birth, but they solidify as people age. They have genetic components. However, capabilities evolve and can be shaped in substantial part by investments and environments.

- ⑦ The family lives of young children are major influences on cognitive and socio-emotional capabilities. Adverse early family lives of children create adult crime, health problems, obesity, and a variety of other social problems.
 - i Family influence extends well beyond the transmission of genes.
 - ii Cognitive and social skills are not fixed at birth, they are not solely genetically determined, and they can be enhanced.
- ⑧ The powerful role of early family influence is a concern because family environments in rural China and in other regions have deteriorated in many dimensions in recent years. Conditions of child-rearing in these regions have worsened compared to the rest of China in both absolute and relative terms.

- 9 Supplementing the family and its resources, engaging it in enriching the early life of the child, in supporting the child in school, and in giving sound advice to children, are effective policies. So are policies that enhance the skills of parents to be parents.
- i If society intervenes early enough and in a consistent fashion over the life cycle of a child, it can promote cognitive and socio-emotional capabilities, as well as the health and well-being of children born into disadvantage.
 - ii Through multiple channels, these effects percolate across the life cycle and across generations.
 - iii For example, high-quality early interventions reduce inequality by promoting schooling, reducing crime, and reducing teenage pregnancy.
 - iv They promote health and healthy behaviors.

- v They also foster workforce productivity.
- vi These interventions have high benefit-cost ratios and rates of return. They pass efficiency criteria that any social program should be asked to pass.
- vii Quality early childhood policies are among the rare social policies that face no equality-efficiency tradeoff.
- vii **What is fair is also economically efficient.**
- ix Early interventions that build the capability base of children have much higher economic returns than later remediation and prevention programs, such as public job training, convict rehabilitation programs, adult literacy programs, tuition subsidies, or expenditure on police to reduce crime.

- 10 This greater return arises because of the dynamics of capability formation.
- i Life cycle capability formation is a dynamic, synergistic process. Capabilities beget capabilities; motivation begets motivation. If a child is not motivated and stimulated to learn and engage early enough in life, the more likely it is that when the child becomes an adult, it will fail in social and economic life.
 - ii The longer society waits to intervene in the life cycle of a disadvantaged child, the more costly it is to remediate disadvantage.
 - iii Similar dynamics are at work in creating child health and mental health.
 - iv China needs to implement more nuanced capability formation policies that recognize recent knowledge about what interventions at which stages of the life cycle are the most effective for producing capabilities.

- 11 There are critical and sensitive periods in the development of capabilities.
 - a Sensitive periods are those where investment is most productive.
 - b Critical periods are those where it is essential.
 - c These periods:
 - i Come earlier for cognitive capabilities
 - ii Early years also important for non-cognitive capabilities, but there is more malleability to later ages
 - iii Vary depending on the particular biological (health) capability being studied

- 12 Many successful early childhood interventions followed over the life cycle operate primarily through boosting non-cognitive capabilities. IQ is often barely budged.
- 13 Long-term evaluations of interventions often provide a different assessment of the effectiveness of interventions than do short-run evaluations.
- 14 Adolescent remediation as currently implemented is largely ineffective, especially for cognitive interventions.

- 15 Remediation is less effective than prevention when there are good detection strategies for identifying risk factors for later life.
- 16 There is growing recognition of which early conditions and environments create risk factors.
- 17 A major refocus of public policy is required to incorporate modern understanding of the life cycle dynamics of capability formation.
 - i Although schools and schooling are important, effective social policy targets and strengthens the family.
 - ii Many studies have shown that inequality in families – far more than inequality in the resources applied to schools – produces inequality in schooling outcomes among social and economic classes.

The Importance of Cognition, Character, and Health

- (a) Major advances have occurred in understanding which capabilities matter for success in life.
- (b) Cognitive capabilities measured by achievement tests are important.
There is hard empirical evidence on their importance.
- (c) So are the **socio-emotional capabilities** – sometimes called character traits or personality traits:

- Motivation
- Sociability; ability to work with others
- Attention
- Self Regulation
- Self Esteem
- Ability to defer gratification
- Health and Mental Health

- (d) **Health and basic biological architecture** play crucial roles – not only in promoting adult health, but in promoting cognition and character.

- These correspond to traditional Chinese values.
- Confucius wrote that the basis of education was formed by six arts:
 - (a) Rites
 - (b) Music
 - (c) Archery
 - (d) Charioteering
 - (e) Calligraphy
 - (f) Arithmetic
- These correspond (roughly) to
 - (a) Personality and Character
 - (b) Cognition
 - (c) Health
- They also include aesthetic sensibilities.

- **Beyond PISA scores**

Fostering and Measuring Skills:

Improving Cognitive
and Non-Cognitive Skills to
Promote Lifetime Success

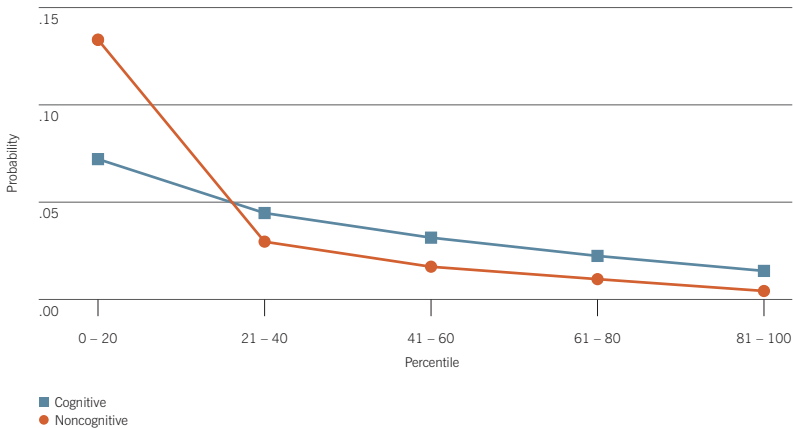
Tim Kautz, James J. Heckman, Ron Diris,
Bas ter Weel, Lex Borghans



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Link to Report PDF

<http://tinyurl.com/OECD-Report-2014>

Figure 1 : Ever Been in Jail by Age 30, by Ability (Males)

Note: This figure plots the probability of a given behavior associated with moving up in one ability distribution for someone after integrating out the other distribution. For example, the lines with markers show the effect of increasing non-cognitive ability after integrating the cognitive ability.

Source: Heckman, Stixrud, and Urzua (2006).

Figure 2 : Cognitive and Socio-Emotional Factors: Physical Health, Males

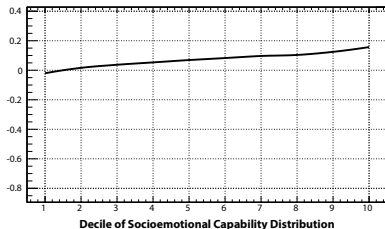
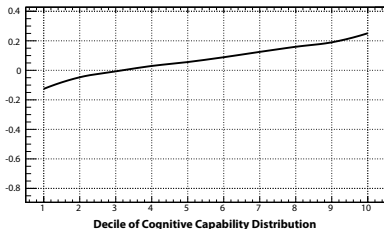


Figure 3 : The Effect of Cognitive and Socio-Emotional Endowments on Mental Health at Age 40

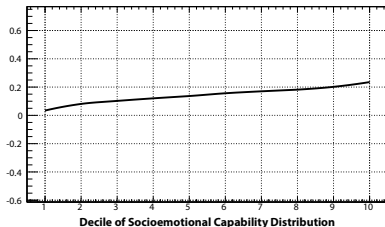
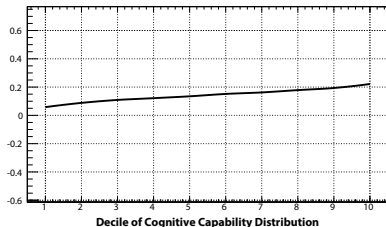
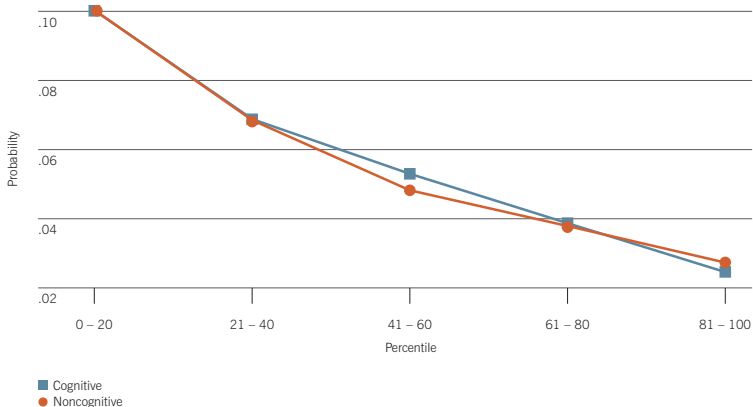


Figure 4 : Probability of Being Single with Children (Females)



Note: This figure plots the probability of a given behavior associated with moving up in one ability distribution for someone after integrating out the other distribution. For example, the lines with markers show the effect of increasing non-cognitive ability after integrating the cognitive ability.

Source: Heckman, Stixrud, and Urzua (2006).

Figure 5 : Probability of Being a Four-Year College Graduate by Age 30

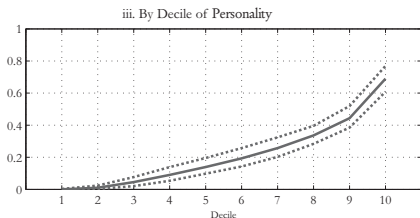
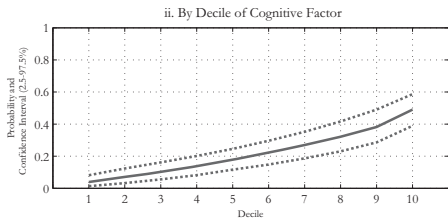
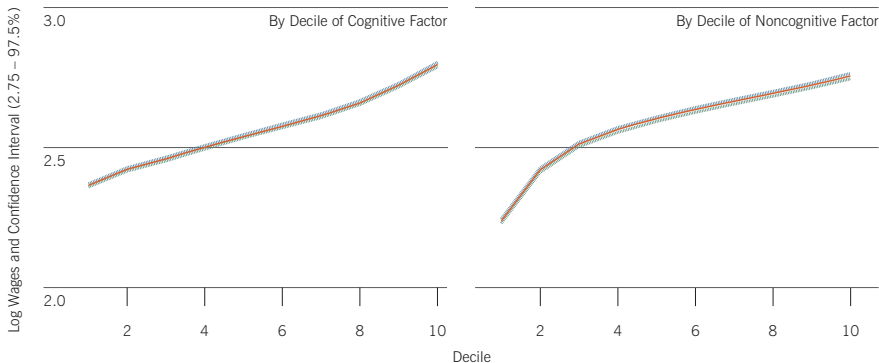
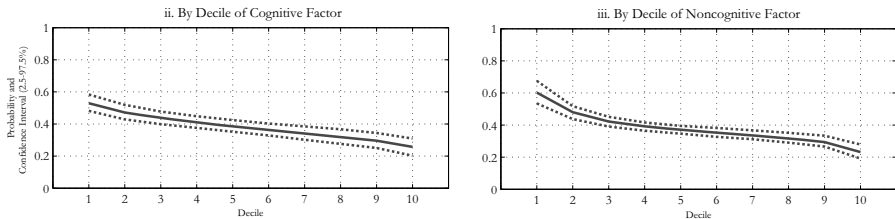


Figure 6 : Mean Log Wages by Age 30 (males)

Notes: The data are simulated from the estimates of the model and our NLSY79 sample. We use the standard convention that higher deciles are associated with higher values of the variable. The confidence intervals are computed using bootstrapping (50 draws).

Figure 7 : Probability of Daily Smoking by Age 18 (Males)



Notes: The data are simulated from the estimates of the model and our NLSY79 sample. We use the standard convention that higher deciles are associated with higher values of the variable. The confidence intervals are computed using bootstrapping (200 draws).

Figure 8 : Cognitive and Socio-Emotional Factors: Probability of Graduating from Secondary School, Males

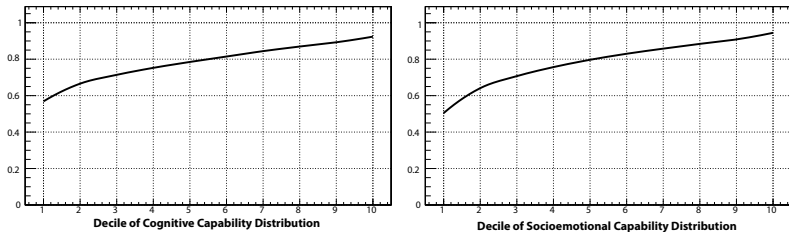


Figure 9 : The Effect of Cognitive and Socio-Emotional Endowments on Probability of White-Collar Occupation

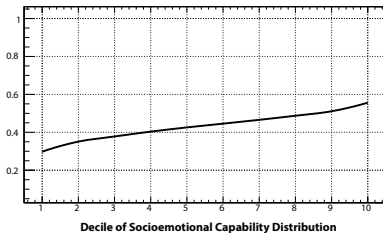
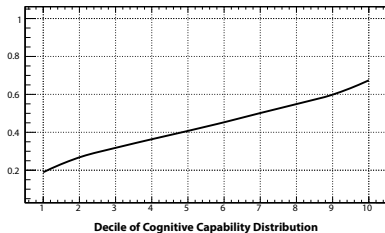


Figure 10 : The Effect of Cognitive and Socio-Emotional Endowments on Smoking

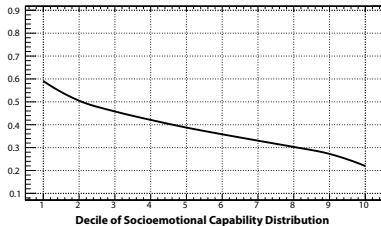
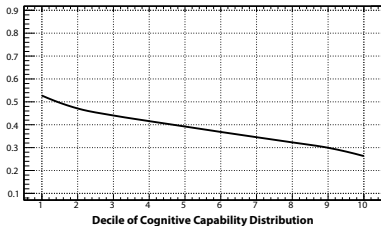


Figure 11 : The Effect of Cognitive and Socio-Emotional Endowments on Heavy Drinking During Adulthood

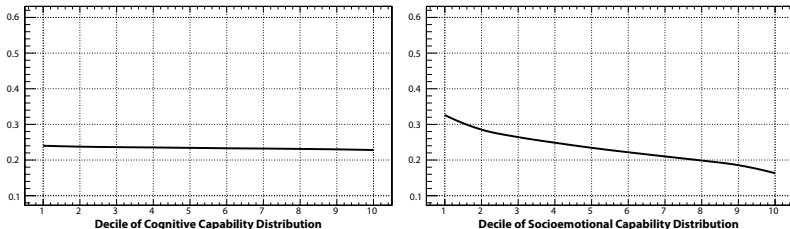


Figure 12 : The Effect of Cognitive and Socio-Emotional Endowments on Pearlin's "Personal Mastery Scale": Sense of Self-Mastery

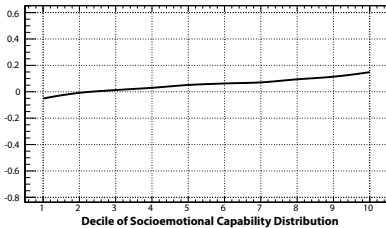
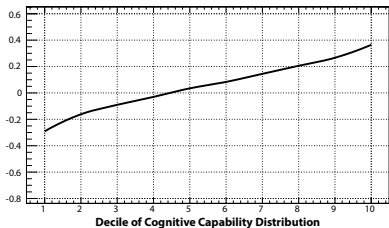


Figure 13 : The Effect of Cognitive and Socio-Emotional Endowments on Trusting People (2008)

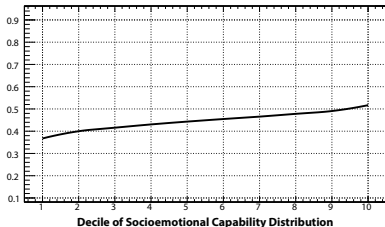
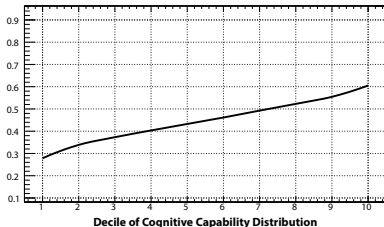
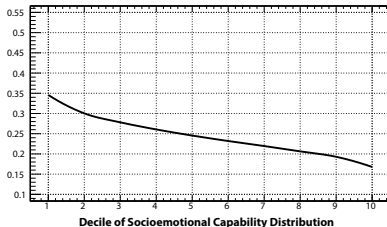
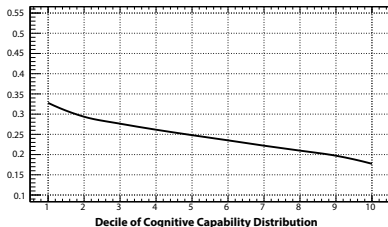
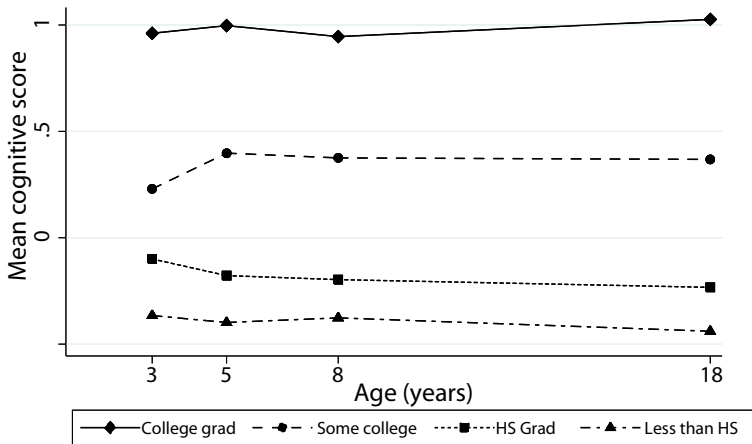


Figure 14 : The Effect of Cognitive and Socio-Emotional Endowments on Ever Divorced



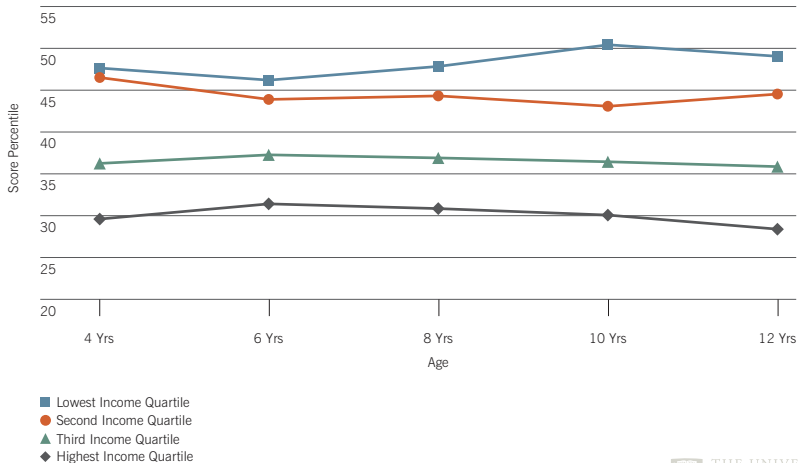
Gaps Open Up Early

Figure 15 : Trend in Mean by Age for Cognitive Score by Maternal Education



Note: Each score standardized within observed sample. Using all observations and assuming data missing at random. *Source:* Brooks-Gunn et al. (2006).

Figure 16 : Average Percentile Rank on Anti-Social Behavior Score, by Income Quartile



How to Interpret This Evidence

- Evidence on the early emergence of gaps leaves open the question of which aspects of families are responsible for producing these gaps.
- Is it due to genes?
- Family environments? Neighborhood and community effects?
- Parenting and family investment decisions?
- The evidence from a large body of research demonstrates an important role for investments and family and community environments in determining adult capacities above and beyond the role of the family in transmitting genes.
- The quality of home environments by family type is highly predictive of child success.



Mothers' Speech and Child Vocabulary: Hart & Risley, 1995

Children enter school with “meaningful differences” in vocabulary knowledge.

1. Emergence of the Problem

In a typical hour, the average child hears:

Family Status	Actual Differences in <u>Quantity</u> of Words Heard	Actual Differences in <u>Quality</u> of Words Heard
Welfare	616 words	5 affirmatives, 11 prohibitions
Working Class	1,251 words	12 affirmatives, 7 prohibitions
Professional	2,153 words	32 affirmatives, 5 prohibitions

2. Cumulative Vocabulary at Age 3

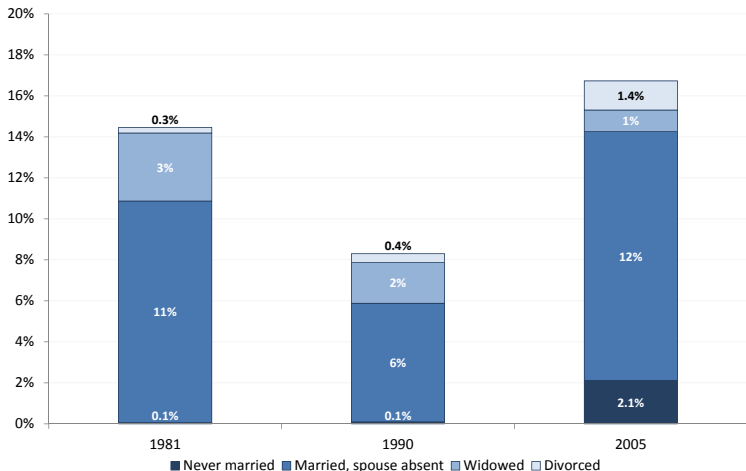
Cumulative Vocabulary at Age 3	
Children from welfare families:	500 words
Children from working class families:	700 words
Children from professional families:	1,100 words



- In many countries, including China and the U.S., a divide is opening up between the advantaged and the disadvantaged in the quality of early family environments.
- Those born into disadvantaged environments are receiving relatively less stimulation, child development resources, and access to health care than those from advantaged families.
- Fosters persistence of inequality across generations.
- Intergenerational persistence of income, father to son:
 - .15 for Denmark
 - .47 for U.S.
 - .60 for China and increasing over recent cohorts

Many Children Living in Challenging Family Environments

Figure 17 : Children under 18 Living in Single Mother Households by Mother's Marital Status, China

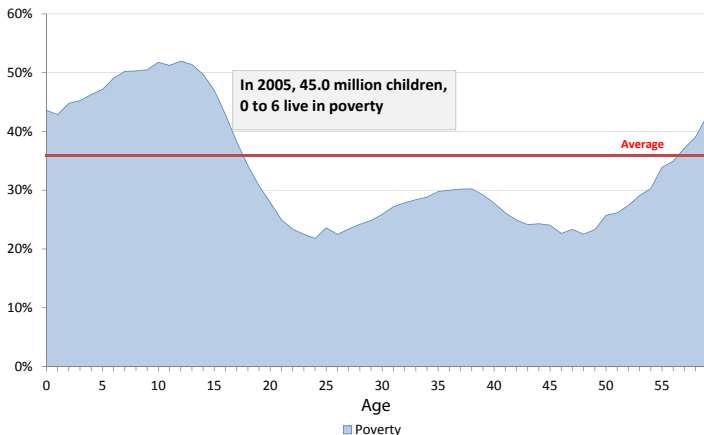


Source: Census, China – 1% samples for 1981, 1990 and 20% for 2005.



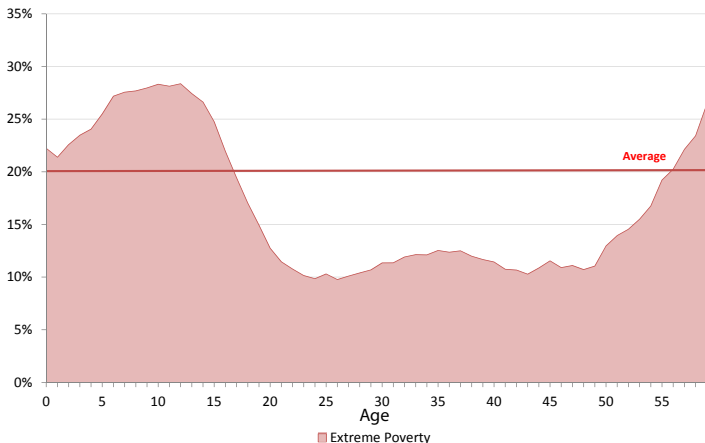
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Figure 18 : Proportion of Population Living in Poverty by Age, 2005, China



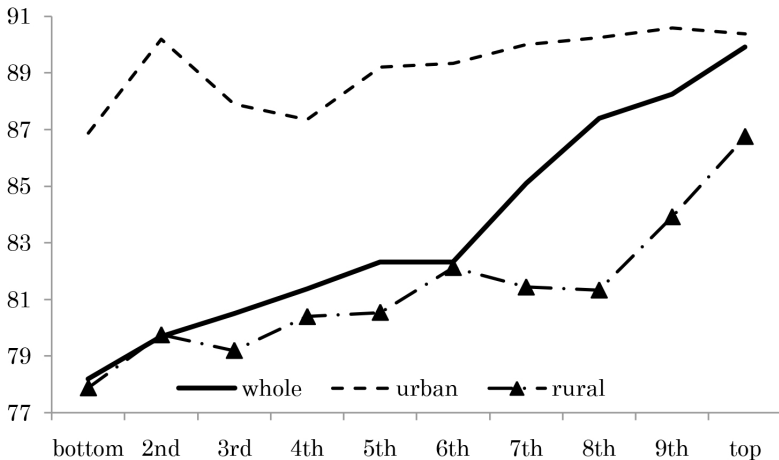
Source: Census 2005, China – 20% sample of the 2005 by-census (1% sample of the total population). Poverty Line: The annual income per family member is less than RMB 1607 (USD 200).

Figure 19 : Proportion of Population Living in Extreme Poverty by Age, 2005, China



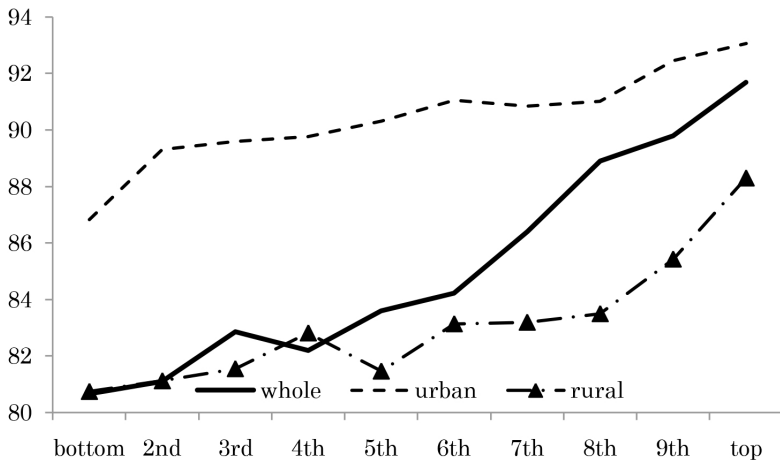
Source: Data source: 20% sample of the 2005 Census (1% sample of the total population).
Extreme Poverty Line: The annual income per family member is less than RMB 785 (USD 98).

Figure 20 : Language Test Scores in China, by Income Deciles



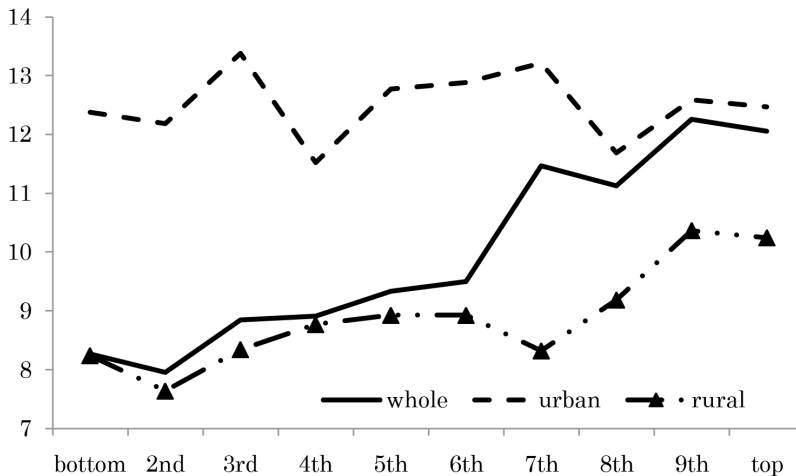
Source: Frijters et al. (2012).

Figure 21 : Mathematics Test Scores in China, by Income Deciles



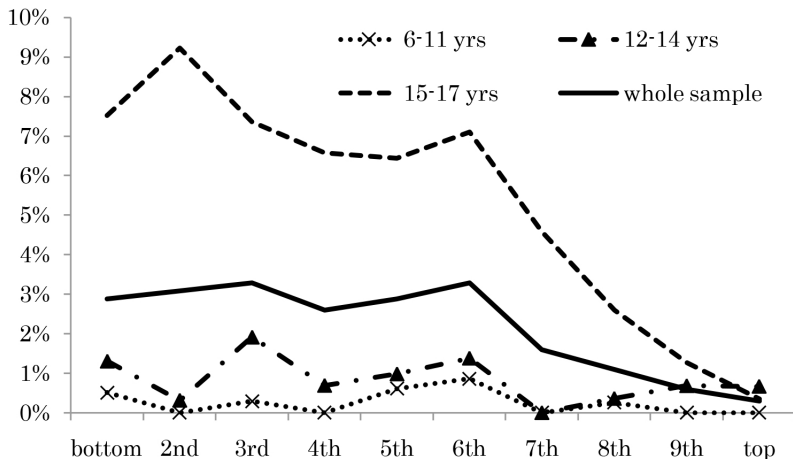
Source: Frijters et al. (2012).

Figure 22 : Time for Study after School per Week (Hours) in China, by Income Deciles



Source: Frijters et al. (2012).

Figure 23 : Percentage of Children Not in School in China, by Income Deciles and Age-Groups



Source: Frijters et al. (2012).

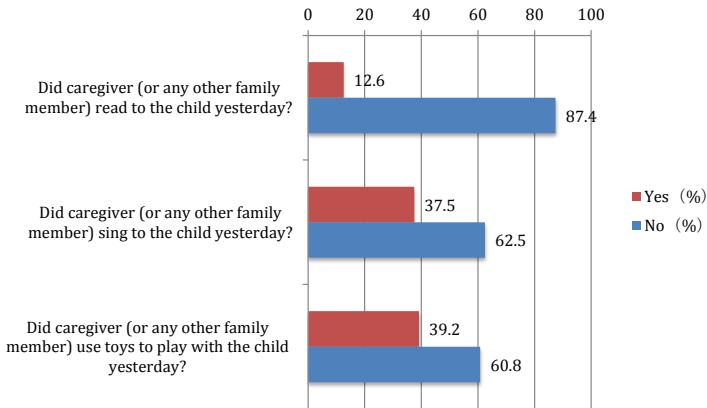
Table 1 : Mental and Psychomotor Development of Infants in Rural Shaanxi Based on the Bayley Scales of Infant Development (BSID) (N=1,442)

	Percent
Any mental impairment ($MDI < 80$)	42.0% (606)
Any psychomotor impairment ($PDI < 80$)	10.2% (147)

Source: Yue et al. (2015).

Note: Data source is author's data. Data are presented as percentages for all children. All children were administered the Bayley Scales of Infant Development (BSID), an internationally-recognized, scaled test of infant and toddler cognitive and motor development (Bayley, 1974). The test has two sub-indices, the Mental Development Index (MDI) and the Psychomotor Development Index (PDI) (Yi et al., 1995). MDI and PDI scores below 80 are indicators of any level of impairment in cognitive and psychomotor development, respectively.

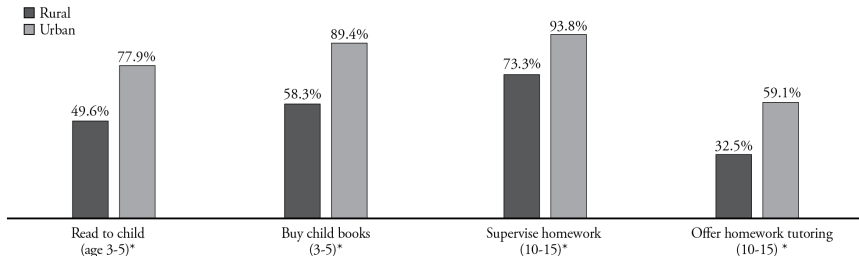
Figure 24 : Parenting Practices of Sample Caregivers in Rural Shaanxi
(N=1,442)



Source: Yue et al. (2015).

Note: Data source is author's data. Data are presented as percentages of caregiver responses.

Figure 25 : Parental Involvement in Child Education in Rural and Urban China in 2010



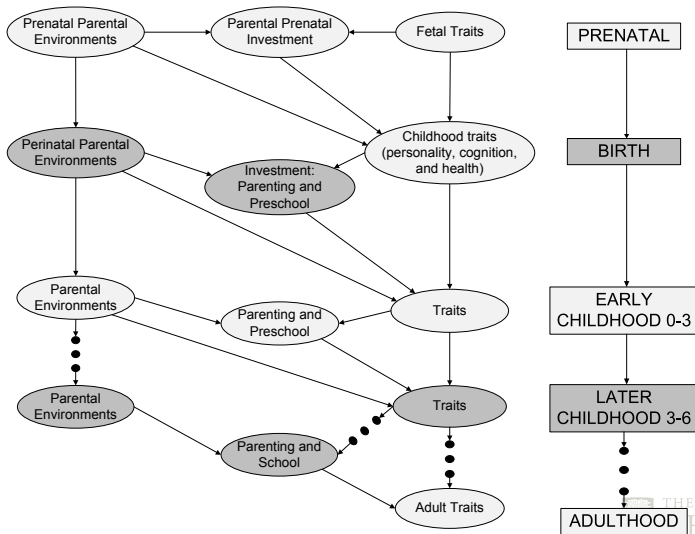
Source: CFPS 2010.

Note: * $p < 0.05$ based on designed-based Pearson chi square statistic.

Critical and Sensitive Periods

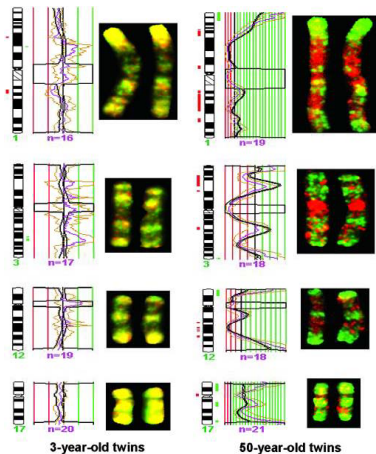
- Sensitive and critical periods have been documented extensively for many organisms. These are periods where investment is particularly effective.
- Especially clear in biological developmental processes, e.g.,
 - (i) Cataracts
 - (ii) Vitamin A deficiencies and blindness
 - (iii) Iron deficiencies and long-term IQ
 - (iv) Iodine
- A large empirical literature showing the impact of adverse early environments on child health.
 - (i) Barker (2001)
 - (ii) Gluckman and Hansen (2005, 2006)
- Need a life cycle perspective.

Figure 26 : Resilience and Development: A Life Cycle Framework for the Technology of Skill Formation



Genes, Biological Embedding of Experience, and Gene-Environment Interactions

Figure 27 : DNA Methylation and Histone Acetylation Patterns in Young and Old Twins



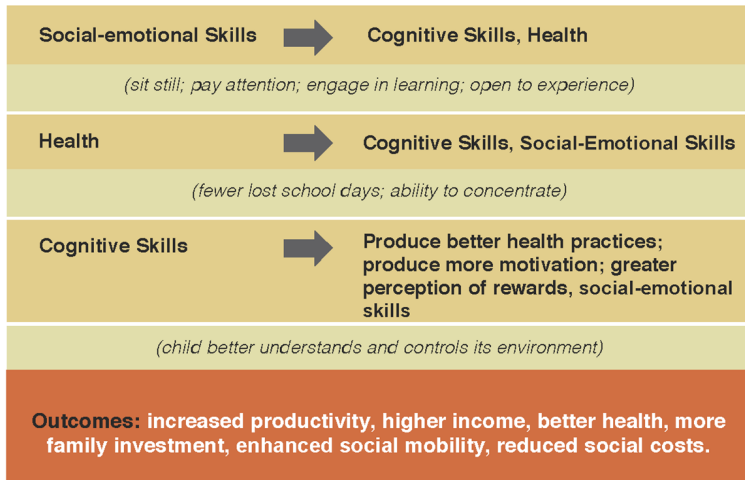
Source: Fraga, Ballestar et al. (2005)

**But Early Life Conditions Are *Not* the Full Story:
Resilience, Recovery, and Repair**

Understanding the Dynamics of Capability Formation: Capabilities Beget Capabilities

- i Based on a modern understanding of the life cycle of capability formation.
- ii Capability formation is dynamic in nature – capabilities beget capabilities. Stocks of capabilities cross-fertilize other capabilities.
- iii Dynamic and Static Complementarities.**

**Figure 28 : Capabilities Enhance Each Other:
Technology of Capability Formation**



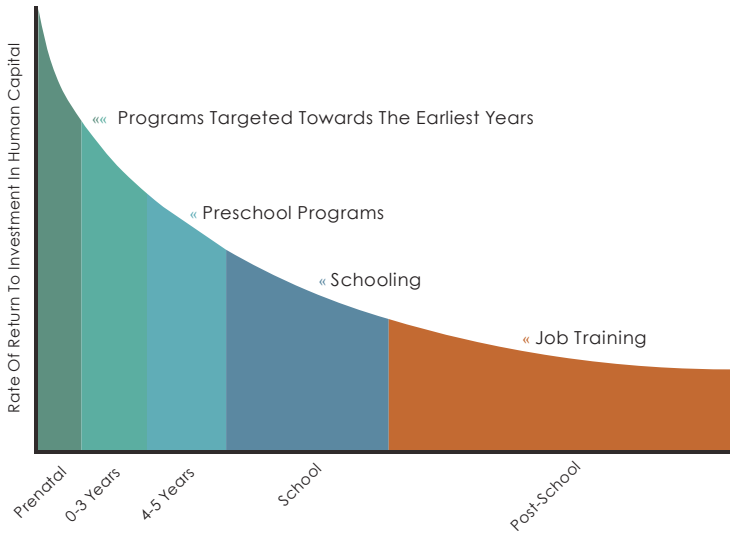
Static Complementarity

- The productivity of investment greater for the more capable.
 - High returns to more capable people
 - Does this justify social Darwinism?
 - **Matthew Effect?**
 - On grounds of economic efficiency, should we invest primarily in the most capable?
 - Not necessarily

Dynamic Complementarity

- If we invest today in the base capabilities of disadvantaged young children, there is a huge return.
- Makes downstream investment more productive.
- **No tradeoff between equality and efficiency goals.**
- Augmenting this investment by public infrastructure and schools gives agency to people and enhances economic and social functioning.

Returns to a Unit Hong Kong Dollar Invested



Source: Heckman (2008)

Later remediation targeted to the less able is often costly and often ineffective.

- As **currently implemented**, most adolescent remediation efforts to boost skills, especially those targeted toward promoting the adolescent cognitive abilities of the disadvantaged have low returns.
- For example:
 - ① Public job training programs
 - ② Adult literacy programs
- General pattern: strong returns on later-life programs are higher for the more able.
- Lower returns for the less able adolescents (those with lower cognitive/personality/health traits).
- There are some effective interventions – giving advice, providing information.
- Mentoring can be effective.

What should we do for the disadvantaged adolescents who do not receive skill-enhancing enriched early environments and have cognitive deficits?

- (i) Recognize that the capability base has been compromised.
- (ii) Social and personality capabilities are more malleable until later ages than cognitive capabilities (IQ). This accords with our knowledge of the slowly maturing prefrontal cortex.
- (iii) Work-place-based education that emphasizes discipline, self-control, and social engagement shows promise.
- (iv) But also recognize that current remediation programs are much less effective than early intervention programs.
- (v) Building the capability base makes it easier (less costly) to attain any given level of adult attainment.

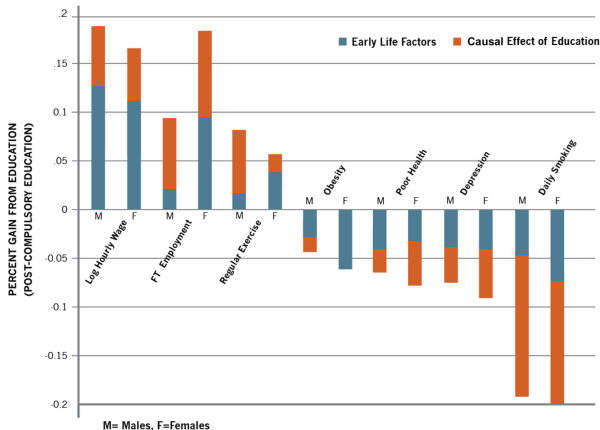
Prevention, Not Just Remediation Proactive Policies

Early life risk factors for adult problems are becoming well understood.

What About Promoting Education?

Disparities by Education (Post-Compulsory Education)

Figure 29 : Education, Wages, Employment, and Health



Source: Conti and Heckman (2010). Author's calculations using British Cohort Study, 1970.

[Link to Appendix](#)

Enriched early environments compensate in part for the risks arising from disadvantaged environments.

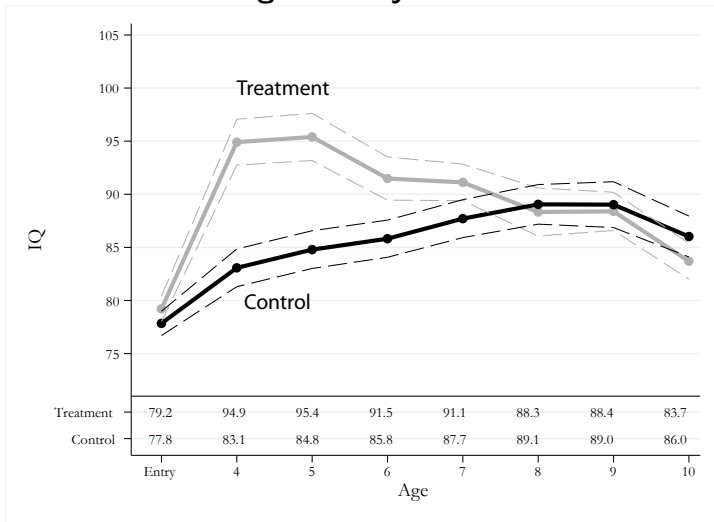
Perry Preschool Program: Overview

- The Perry preschool program enriched the lives of low income black children with initial IQs below 85 at age 3.
 - 2.5 hours per day
 - 5 days per week
 - 2 years during each school year (mid-October to May).
 - Home visits
 - Program stops after two years
- Focused on “Plan – Do – Review.”
(Teach children to plan a task, to stay on the task, and to review it – a strong and personal social skills component.)
- Also had visits with parents one day a week.

- Evaluated by the method of random assignment.
- Did not lead to sustained gains in IQ for males.

Figure 30 : Cognitive Evolution Through Time, Perry Males

Cognitive Dynamics



- Yet has a statistically significant rate of return of around 7–10% per annum – for both boys and girls – above the post-World War II stock market returns to equity in U.S. labor market, estimated to be 5.8%.
- The Perry Preschool Program worked primarily through **non-cognitive** channels.

Carolina Abecedarian Study: Overview

ABC Project

- **Where:** Conducted in Chapel Hill, North Carolina.
- **When:** The mid-1970s through the early 1980s.
- **Who:** Children born to high risk mothers, mostly African-American (with some White mothers), recruited during pregnancy.

Carolina Abecedarian Study: Overview

- **What:**

- ① Full-time Daycare (8 hours/day, 5 days/wk, 50 weeks/yr) for 5 years at age 0–5. Gave cognitive stimulation and training in self-control and social skills.
- ② Full-day need-based, individualized tutoring + bi-weekly home visits for 3 years at age 6–8, but not during early childhood.
- ③ Gave health checkups to the children in the program.

Carolina Abecedarian Study: Results

- Lasting IQ effect
- Improved parenting practices and child attachment
- Positive effect on female behavior and mental health
- Higher educational attainment
- Higher employment rate
- Reduced criminal activity
- Better child and adult health

Figure 31 : Abecedarian Project, Health Effects at Age 35 (Males)

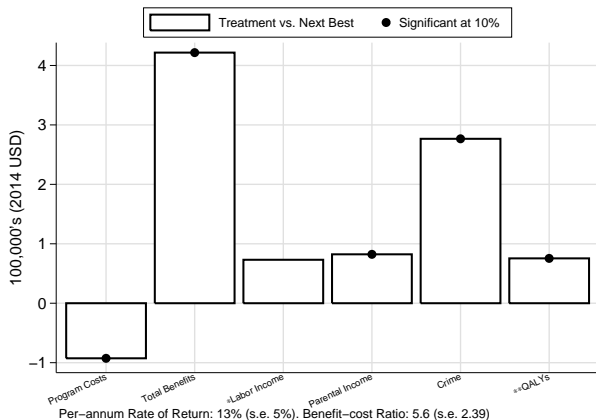
	Treatment Mean	Control Mean	Treatment p-value
Systolic Blood Pressure	125.79	143.33	0.018
Diastolic Blood Pressure	78.53	92.00	0.024
Pre-Hypertension	0.68	0.78	0.235
Hypertension	0.10	0.44	0.011
HDL Cholesterol	53.21	42.00	0.067
Cholesterol/HDL-C	3.89	4.69	0.057
Abdominal Obesity	0.65	0.87	0.136
Metabolic Syndrome	0.00	0.25	0.009

Source: Campbell, Conti, Heckman, Moon, Pinto, Pungello, and Pan (2014).



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Figure 32 : Net Present Value of Main Components of the Cost/Benefit Analysis Over the Life Cycle, ABC/CARE Males and Females



Rate of Return: 11–13% per annum, including health

Home Visiting Programs

Nutritional Programs

- **Nutrition as an investment.**
- Malnutrition in pregnancy affects the child's initial conditions in the technology capability formation, especially in critical periods.
- It **directly** affects cognitive and health capabilities.
- Malnutrition in early childhood has effects on child's ability to learn, especially concentration.
- It **indirectly** affects the accumulation of cognitive capabilities.

Effects of malnutrition on cognitive and health capabilities

Figure 33 : Effects of Nutrients on Brain Development

Important nutrients during late fetal and neonatal brain development¹

Nutrient	Brain requirement for the nutrient	Predominant brain circuitry or process affected by deficiency
Protein-energy	Cell proliferation, cell differentiation	Global
	Synaptogenesis	Cortex
	Growth factor synthesis	Hippocampus
Iron	Myelin	White matter
	Monoamine synthesis	Striatal-frontal
	Neuronal and glial energy metabolism	Hippocampal-frontal
Zinc	DNA synthesis	Autonomic nervous system
	Neurotransmitter release	Hippocampus, cerebellum
Copper	Neurotransmitter synthesis, neuronal and glial energy metabolism, antioxidant activity	Cerebellum
LC-PUFAs	Synaptogenesis	Eye
	Myelin	Cortex
Choline	Neurotransmitter synthesis	Global
	DNA methylation	Hippocampus
	Myelin synthesis	White matter

¹ LC-PUFAs, long-chain polyunsaturated fatty acids.



The Jamaican Intervention

- Randomized intervention, sample of 129 children
- Stunted children between 9 and 24 months
- Designed to individualize the different effects of nutritional and cognitive stimulation
- Follow up to age 22
- Four groups:
 - ① No intervention
 - ② Nutritional intervention only
 - ③ Cognitive stimulation intervention only
 - ④ Both cognitive and non-cognitive interventions
- Plus, a matched non-stunted group as a reference
- **The long-lasting effects were found for the cognitive/socio-emotional components of interventions**



Table 2 : Impact of Stimulation Treatment on Log Earnings

	I. Observed Sample	
	Treatment Effect	Stepdown p -value*
A. First Job		
All	0.27	0.11
Full Time	0.35	0.06
Non-Temporary	0.53	0.03
B. Last Job		
All	0.27	0.06
Full Time	0.40	0.01
Non-Temporary	0.50	0.00
C. Current Job		
All	0.27	0.09
Full Time	0.43	0.02
Non-Temporary	0.44	0.02
D. Average Earnings		
All	0.40	0.01
Full Time	0.34	0.01
Non-Temporary	0.47	0.01

* Adjusts for multiple hypothesis testing.

Table 3 : Impact of Treatment on Education and Skills

	Sample Size	Control Mean	Treatment Effect	Stepdown <i>p</i>-value
A. Schooling				
In school	97	0.15	0.17	0.04
In school full time	97	0.07	0.18	0.01
B. Skills				
Cognitive factor	102	-0.46	0.59	0.01
Externalizing Behavior factor	102	-0.23	0.22	0.30
Internalizing Behavior factor	102	-0.32	0.39	0.05
Ever expelled from school	105	0.17	-0.12	0.02

Summary

- Capability formation is a dynamic, synergistic process. Capabilities beget capabilities. Motivation begets motivation and promotes learning.
- Dynamic complementarity is a key concept – returns to investment are higher for those with greater capabilities.
- Dynamic complementarity explains why prevention is so productive and remediation is not. Why it is productive to invest in the cognitive capabilities 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.
- This evidence strongly suggests the need to prioritize.
- Early investments create a base for enhancing the productivity of later investment.

- Children from advantaged environments by and large receive substantial early investment.
- Children from disadvantaged environments typically do not.
- The role of the family in producing the capabilities that matter is fundamental.
- Family life is under challenge in China and around the world.
- The true measure of disadvantage is the **quality of parenting, not income per se.**
- The components most important in this regard are attachment, mentoring, and guidance.
- Effective targeting of child disadvantage recognizes this.
- Parental stimulation, engagement, and attachment are crucial.
- These parental resources promote resilience to adversity and promote investment.

- Successful early childhood programs supplement early family life and respect the sanctity of the family.
- It is also important to understand what the recent literature does not say.
- All of the evidence points to *investment* and not redistribution as the most effective anti-poverty policy that promotes long-run social mobility.

- It has been suggested that policies that redistribute income toward disadvantaged families might be highly effective in producing greater opportunity for disadvantaged children.
- **But income transfers alone do not solve the problem of intergenerational mobility.**
- The U.S. tried a policy of redistribution some 50 years ago, and it failed.
- China should not emulate failed American policies.
- Fostering abilities, motivations, and health in childhood is an effective strategy.

- **Predistribution** – fixing early life initial conditions – and not **redistribution**.
- If society helps early enough in the lives of children and in a sustained way, it can improve cognitive and character capabilities and the health of disadvantaged children.
- This promotes economic productivity of the workplace, social opportunity, and human flourishing.

- Need to evaluate to prioritize.
- Need to foster a culture of evaluation and measurement.
- To look at long-run outcomes.
- To understand the mechanisms of capability formation that underly all intervention and family influence studies.
- To move beyond studies of treatment effects to understand how interventions interact with and supplement families.
- Need to measure the true sources of poverty and disadvantage to make wise policies.

Appendix

Practical Issues in Implementing Early Childhood Programs

- A. Whom to target?
- B. With what programs?
- C. Who should provide the programs?
- D. Who should pay for them?
- E. Issues of compliance.
 - Basic logic and common sense. Programs that give middle class environments to disadvantaged children are the most effective.
 - **Teaching parents parenting.**
 - Nutrition, attachment and parenting for children.

Table 4 : Association Between Parenting Behavior and Child Development as Measured by Bayley Scales of Infant Development in Rural Shaanxi (N=1,442)

	MDI Score			PDI Score		
	Coefficient	95% CI	p-value	Coefficient	95% CI	p-value
Reads to child yesterday	7.04	(4.05; 10.03)	0.00	3.03	(-0.15; 6.20)	0.06
Sings to child yesterday	7.57	(-0.68; 3.49)	0.00	4.21	(1.99; 6.43)	0.00
Used toys to play with child yesterday	4.87	(2.65; 7.10)	0.00	2.74	(0.72; 4.77)	0.01

Source: Yue et al. (2015).

Note: Data source is author's data. Regression estimates from multiple linear models adjusted for gender, age, whether the child was born prematurely, whether the child is an only child, whether the child's mother was identified as the primary caregiver, maternal educational level and age, whether the family received Minimum Living Standard Guarantee Payments, and Bayley score in baseline survey. Clustering is at the village level. The results (which are not shown for brevity) were substantially the same.

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