The Economics of Early Childhood Development

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Ability gaps can open early!
Trends by *socioeconomic status*:

Chowdry et al. (2010)
Social Mobility in the UK

Children of parents who attended university are 3.5 times more likely to attend university themselves – compared to children of parents with only high school education.

71% of children with university educated parents attend university, whereas only 21% of children with low-educated parents do.
Today’s Questions

Why is Early Childhood Development important?

Why may governments invest in ECD?

How can governments intervene?

How can research help?
But first... What is Early Childhood Development?
ECD is Complex and multidimensional

Main focus is from conception to 5 years

There are multiple dimensions:

1. Health e.g. hospitalisations, stunting...
2. Cognitive skills e.g. maths, reading...
3. Socio-emotional skills e.g. internalising (e.g. withdrawal)/externalising (e.g. aggression) behaviours, resilience
4. Motor skills e.g. writing, walking

These all contribute to human capital
What is ‘investing’ in Early Childhood?

Not just spending money on children...

**Stimulating environments**
- Creative and stimulating play
- Words and verbal interactions
- Play materials
- Loving relationships

**Healthy environments**
- Nutrition
- Physical activity
- Vaccinations

**Who invests?**
- Parents: time, money, facilities
- Government: childcare, education
- Other agents?
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Importance of ECD

Deprivation of health and nutrition in early life has important consequences for human capital accumulation (Almond and Currie, 2011)

• Hindering of cognitive and non-cognitive development
• Hindering of school achievements
• Hindering economic productivity in adulthood
• Contributing to inter-generational transmission of poverty

Childhood is a sensitive period where investment into human capital can yield maximal benefits (Wachs et al. 2014)

The first 1000 days of life, including in-utero, are considered a critical ‘window of opportunity’ for nutrition (Victoria et al., 2010)
Today’s Questions

Why is Early Childhood Development important?

Why may governments invest in ECD?

How can governments intervene?

How can research help?
Why should the government intervene?

1. Efficiency
   • Parents/guardians may under invest

2. Equity
   • Government may have preference against highly unequal incomes and socio-economic situations
   • Intervene to reallocate resources towards worse off in society

Is there a trade off?
1. Why would there by underinvestment by parents? (Elango, Heckman et al., 2015)

Positive externalities: Private benefit < social benefit

E.g. higher education, higher productivity, higher taxes, reduced crime, reduce inequality...

Borrowing constraints

Investment is costly in both money and time - Parents may want to invest more in ECD but they are unable to

Lack of information

Parents may be unaware of the benefits of investment or how to invest

Insufficient altruism

Parents may not put as much weight of their child in their own utility as the social planner and the child cannot invest in themselves
2. Equity argument

Early childhood outcomes are strongly correlated with socio-economic status of the parents (current inequality)

Early childhood outcomes are strongly correlated with future socio-economic status of the child (future inequality)

- **Indirect:** Different returns to different skills in the labour market, but the foundations of skills are established during early childhood

- **Direct:** Adverse shocks in utero and early childhood (health shocks, environmental shocks, economic shocks) predict poorer adult outcomes, whereas interventions can improve outcomes
Equity and Social mobility

This can prevent **social mobility**

- Poorer early childhood development
- Poverty
- Lower income into adulthood
So far...

1. ECD is broad
2. ECD is important
3. ECD is likely underinvested for 4 main reasons
4. The government may want to intervene for efficiency and equity sake
Today’s Questions

Why is Early Childhood Development important?

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How can governments intervene?

How can research help?
...Many policy options

E.g. childcare
- Subsidise, regulate or provide childcare?
- Change substitutes e.g. maternity, paternity leave?

E.g. pre-school programs
- At what age exactly?
- Universal?

E.g. cash transfers
Why may subsidies help?

Private market underprovides

Price

Quantity

PMB

SMB

PMC

PMC - subsidy

SUBSIDY

P2

P1

P*

Q1

Q2=Q*

Q*
Why is Early Childhood Development important?

Why may governments invest in ECD?

How can governments intervene?

How can research help decide?
Questions that research can help with

1. When is the optimal time to invest?

2. Does investing in one period mean we do not need to invest in another?

3. Does investment depreciate? Or ‘fade out’?

4. Are there complementarities between investment types and investment periods?

We can start with a model to try and shape our understanding...
Theoretical framework of skill formation

Consider a model:

$$\theta_{t+1} = f_t(h_p, \theta_t, I_t)$$

Where

- $\theta$ is human capital of the child
- $h$ is parental human capital
- $I$ is investment in human capital

... timing of I in human capital matters

$$\frac{\delta f_t}{\delta \theta_t} > 0:$$ self productivity or ‘skills beget skills’

$$\frac{\delta^2 f_t}{\delta \theta_t I_t} > 0:$$ dynamic complementarity
\[ \theta_T = m(h_p, \theta_0, I_1 \ldots I_{T-1}) \]
Issues

- Very stylised
- Has not been fully shown empirically
- Cannot just invest in first years of life and never again (school is still very important)
- There are other important periods of life e.g. adolescence
  - Perhaps early childhood is important for resilience to negative shocks in later life
When should governments intervene?

Researchers can work with governments to design policy

Analyse different potential programs and mechanisms to design future policy.

**Question:** What is the impact of improved childcare facilities on child outcomes?

We may not be able to compare:

- good and bad childcare facilities
- facilities before they improve and after they improve
- between good and bad facilities before and after facilities changed (dif-in-dif)

**Overall problem:** Identifying the correct counterfactual

We can do a **Randomised control trial** to compare ‘identical’ groups
Randomly assign half the childcare facilities and implement an improvement in e.g. teacher training or more resources -> **treatment group**

The other half do not receive any changes -> **control group**

On average, these groups should be ‘**balanced**’ (i.e. on average the same by socioeconomic status, quality of childcare facilities) before the treatment and so the control group is a valid **counterfactual**

Compare **mean outcome** (e.g. cognitive skills of children) in the treatment group and control group to have a **causal impact** of the treatment
Example – Remediaion in Colombia

Psychosocial stimulation and child development before age 3: experimental results in Colombia (Attanasio et al., 2015)

Intervention targeted at children aged 12 to 24 months, in Bogota Columbia

- Participants from the bottom quintile of the income distribution
- Low starting points:
  - In cognitive and language development compared to internationally
  - Anaemia and other conditions caused by micronutrient deficiencies fairly prevalent amongst young children
- Large-scale RCT (1429 children in 96 towns)

**Intervention:** Delivered by specially trained ‘Madre Lideres’ (designed to be scalable)

- Teach the mothers appropriate learning activities
  - Promote cognitive and language development, teach through play, use home-made toys
- Micronutrient supplementation: Tasteless sprinkles of vitamin, iron and zinc

The intervention lasted 18 months, commencing in 2010.
Results

Positive and statistically significant effect on cognitive and language skills

- Effect size equivalent to closing $1/3^{rd}$ of the gap between rich and poor
Why is Early Childhood Development important?
• Big determinant of future outcomes

Why may governments invest in ECD?
• Equity and efficiency argument

How can governments intervene?
• Multiple options with different benefits/costs

How can research help?
• Can use theoretical understanding to help guide hypothesis
• RCTs are an effective way of evaluating ECD interventions
• Evidence from IFS work in Colombia and other countries show that it is possible to deliver these interventions in a relatively cheap and scalable way
• Future research aims to better understand delivery at scale, parental behaviour change, and interactions with policy in later years
References

Papers we discussed today:

**Attanasio et al.** *Estimating the Production Function for Human Capital: Results from a Randomized Control Trial in Colombia* (2005)

**Cunha, Flavio and James Heckman.** *The Technology of Skill Formation* (2007)

**Elango et al.** *Early Childhood Education* (2015)

**Hendren, Nathaniel and Ben Sprung-Keyser.** *A Unified Welfare Analysis of Government Policies,* *(WP 2019)*