

Families and Early Years Policies

Economics 85600

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Lecture 9

Overview

A closer look at family and public investments in children during the early years, and their longer run implications

- 1 adapt the Becker-Tomes model to account for multiple types of skills, and a multi-period model of child development rooted in major lessons from the brain sciences
- 2 quick overview of evaluations of the impact of public programs targeted to less advantaged children
- 3 an assessment of a universal program in the short and longer term in light of our more refined theoretical framework

The science of the brain

economics has imported some important lessons from neurobiology

A YouTube kitten video

- 1 plasticity
- 2 neural sculpting
- 3 critical and sensitive periods

A simplified Becker-Tomes model

two periods, one skill dimension, “mechanically” transmitted endowments

$$\ln Y_t = \gamma H_t + \lambda E_t + \ell_t \quad (1)$$

$$H_t = \delta E_t + \theta \ln Y_{t-1}, \quad \theta \geq 0 \quad (2)$$

$$E_t = \alpha + h E_{t-1} + v_t \quad (3)$$

A useful framework that we have used to understand and appropriately interpret changes over time and across space. What direction does it take us in terms of causality, market failures, and public policy? What is the role of the family? Does public policy crowd out private investments?

Rethinking theory with new facts: Multiple skills, multiple periods

A recursive model of child development

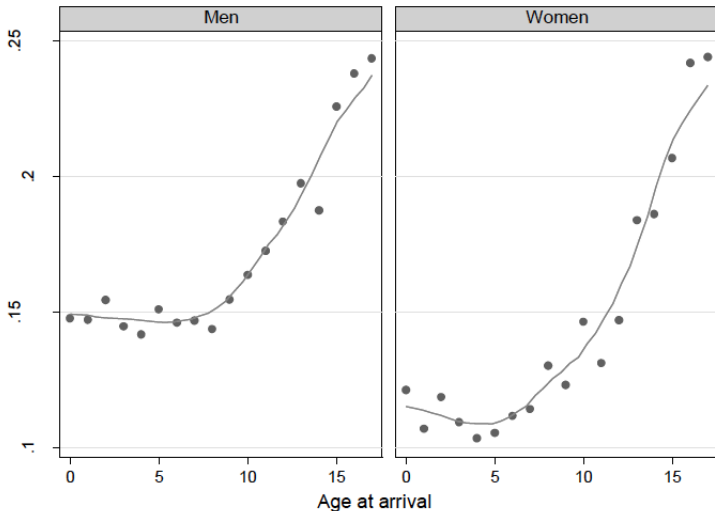
each stage through which children pass influences the risks and opportunities of success in subsequent stages

socio-economic circumstances early in life (even *in utero*) →

- birth weight and cognitive/social/emotional development →
- readiness to learn →
- language development →
- problems in school, society, and ultimate educational achievement →
- skills and mental well-being in young adulthood →
- labour market success and job characteristics →
- stress, disability, mortality

Rethinking theory with new facts: Multiple skills, multiple periods

Immigrant children from non-English speaking countries are more likely to be high school drop-outs if they arrive after the onset of puberty

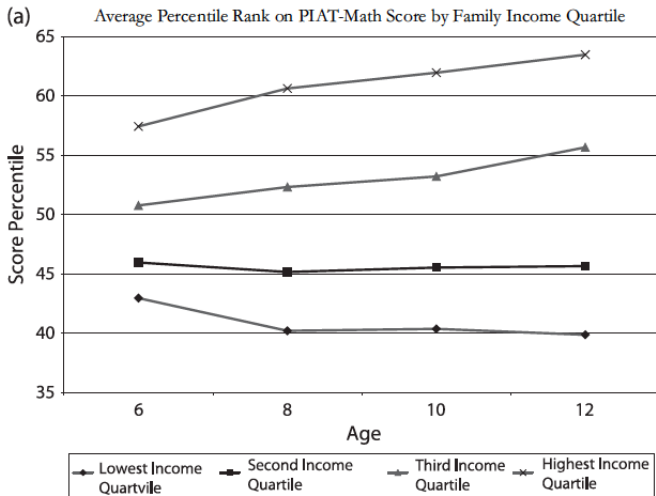


Rethinking theory with new facts: Multiple skills, multiple periods

Large differences in cognitive skills

by family income appear early and grow as children age

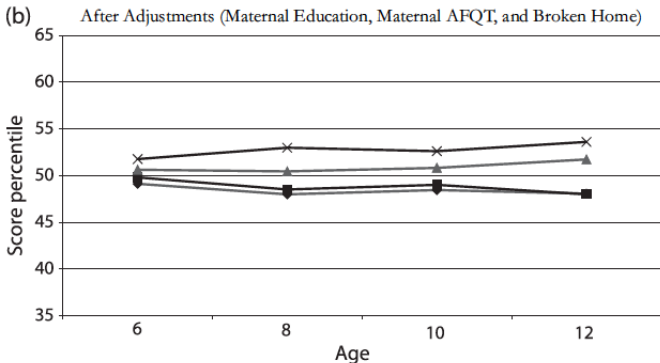
(Heckman 2008 figure 11a)



Rethinking theory with new facts: Multiple skills, multiple periods

Large differences in cognitive skills

disappear when non-monetary aspects of background are controlled
(Heckman 2008 figure 11b)



Residualized on maternal education, maternal AFQT (corrected for the effect of schooling) and broken home at each age.

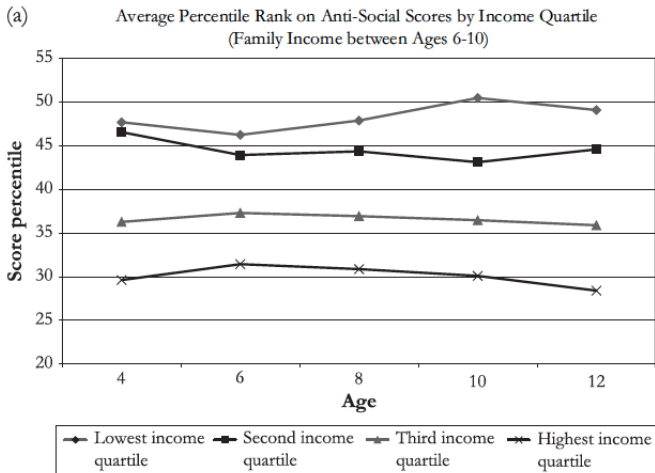
◆ Lowest income quartile ■ Second income quartile ▲ Third income quartile × Highest income quartile

Rethinking theory with new facts: Multiple skills, multiple periods

Large differences in non-cognitive skills

by family income appear early and grow as children age

(Heckman 2008 figure 12a)

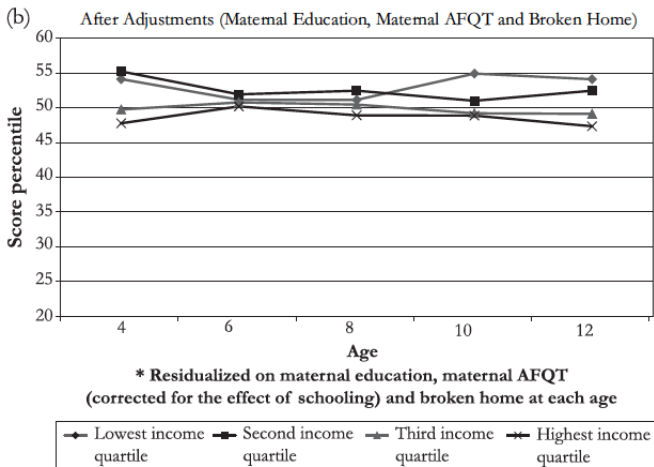


Rethinking theory with new facts: Multiple skills, multiple periods

Large differences in non cognitive skills

disappear when non-monetary aspects of background are controlled

(Heckman 2008 figure 11b)



An augmented Becker-Tomes model

where there are two stages to childhood

$$\ln Y_t = \gamma H_t + v_t \quad (4)$$

$$H_t = [\gamma(l_1)^\phi + (1 - \gamma)(l_2)^\phi]^{1/\phi} \quad (5)$$

- l_1 and l_2 refer to investments in the child during the early years, and the later years
- where $\phi \leq 1$ and $0 \leq \gamma \leq 1$
- ϕ indexing the degree of substitutability between investments, and with $1/(1 - \phi)$ being the elasticity of substitution

An augmented Becker-Tomes model

1. investments are perfect substitutes

$$\ln Y_t = \gamma H_t + v_t \quad (6)$$

$$H_t = \gamma I_1 + (1 - \gamma) I_2 \quad (7)$$

- assuming $\phi = 1$ implies that shortfalls in investment during the early years can be rectified with investment later on
- “remediation is always possible”
- a version of our one-period model that does not permit critical or sensitive periods

An augmented Becker-Tomes model

2. investments are perfect complements

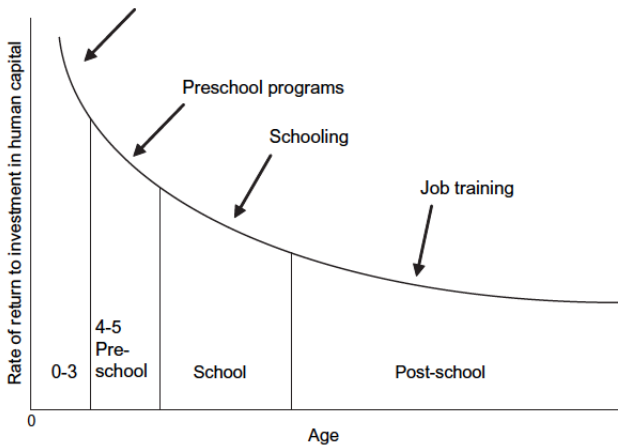
$$\ln Y_t = \gamma H_t + v_t \quad (8)$$

$$H_t = \min\{l_1, l_2\} \quad (9)$$

- assuming $\phi \rightarrow -\infty$ implies that shortfalls in investment during the early years can never be rectified with investment later on
- “remediation is never possible” and human capital in adulthood is limited by early period investments
- the early years are a “critical” period
- the point is that low investment in the early years can't easily be reversed in the later years, but also high initial investments need to be followed up in the later years

“The Heckman Equation”

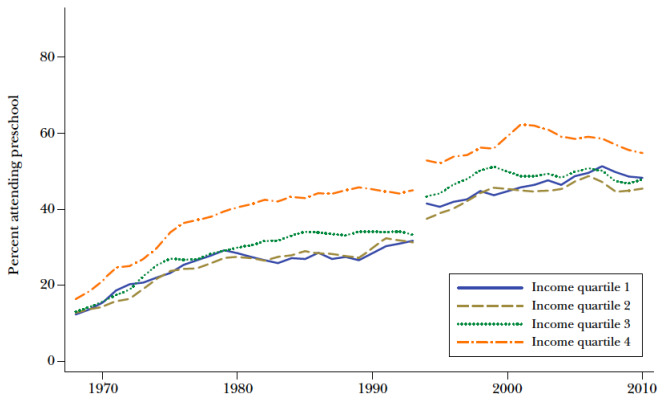
- (a) Return to a Unit Dollar Invested at Different Ages from the Perspective of the Beginning of Life, Assuming One Dollar Initially Invested at Each Age
 Programs targeted towards the earliest years



Investments in pre-school programs

(Duncan and Magnuson, figure 1)

Percent of Three- and Four-year-olds Enrolled in Preschool by Family Income Quartile



More and more discussion about universal provision of early child care and pre-school

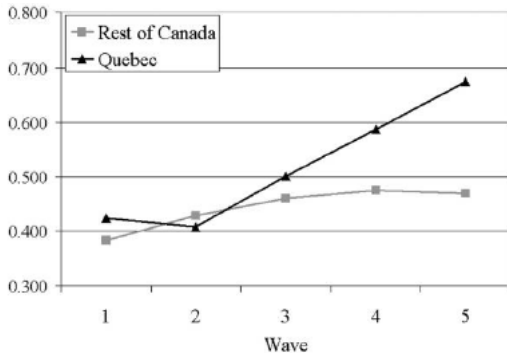
Significant expansion of early year programs in the Canadian province of Quebec have been evaluated with quasi-experimental methods

- universal provision of heavily subsidized child care was phased in beginning in 1997
 - in September 1997 all 4 year olds were eligible, then all 3 year olds in September 1998, and so on with ultimately newborn and 1 year olds eligible in September 2000
- parents paid \$5.00 per day (though this rose slightly later on)
- children were eligible whether or not the parents were working, and the number of regulated spaces increased 2 1/2 fold between 1997 and 2005

Major findings in the “short run”

Baker, Gruber, Milligan (2008)

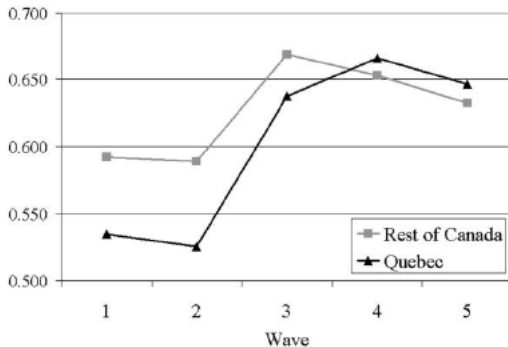
1. Significant increase in use of non-parental care in Quebec relative to the rest of Canada



Major findings in the “short run”

Baker, Gruber, Milligan (2008)

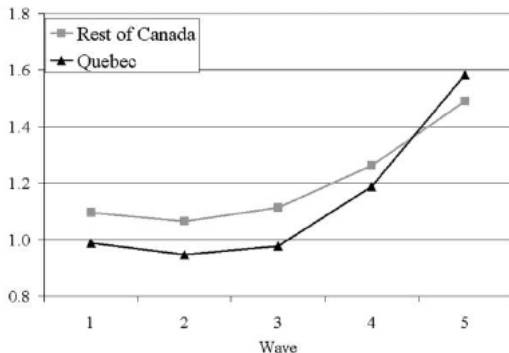
2. Significant increase in mothers working in Quebec relative to the rest of Canada



Major findings in the “short run”

Baker, Gruber, Milligan (2015) up by studying pre-teen and teen outcomes

3. Significant increase in anxiety among children in Quebec relative to the rest of Canada



- 1 No consistent impacts on cognitive outcomes associated with scores on English, math, and science tests
- 2 Decline in self-reported health and life satisfaction

Summary

- ① “skills” are multi-dimensional, develop in a recursive way as children move through a series of transitions in their development
- ② the traditional nature versus nurture distinction is not appropriate, mechanical transmission of “innate” skills should be refined
- ③ skills in the early years influence the productivity of investments in later years, and set up a virtuous dynamic complementarity
- ④ assessing evaluations require attention to the control group, but targeted programs have very different impacts than universal depending upon the degree to which family inputs are substituted for public, and the relative quality of these investments



Baker, Michael, Jonathan Gruber, and Kevin Milligan. 2008. "Universal Child Care, Maternal Labor Supply, and Family Well-Being." *Journal of Political Economy* 116 (4): 709–45.



Baker, Michael, Jonathan Gruber, and Kevin Milligan. 2015. "Non-Cognitive Deficits and Young Adult Outcomes: The Long-Run Impacts of a Universal Child Care Program." Working Paper 21571. National Bureau of Economic Research. <http://www.nber.org/papers/w21571> .



Duncan, Greg J., and Katherine Magnuson. 2013. "Investing in Preschool Programs." *Journal of Economic Perspectives* 27 (2): 109–32.



Heckman, James J. 2008. "Schools, Skills, and Synapses." *Economic Inquiry* 46 (3): 289–324.



Heckman, James J. and Stefano Mosso. 2014. *The Economics of Human Development and Social Mobility*. NBER Working Paper Series 19925. Cambridge, Mass.