Life-long consequences of early years learning

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BILDUNG

*Bildung* stands for development of the human being. *Bildung* is based on a humanistic ideal concept of the human being. It sets forward the development of human qualities such as general knowledge, creativity and a general appreciation of art and culture, moral judgments and critical thinking.

*Bildung* is the result of a life-long education process.

The early years are very important for *Bildung*. 
“Why the early years?

“If the race is already halfway run even before children begin school, then we clearly need to examine what happens in the earliest years.” (Esping-Andersen, 2005)

“Like it or not, the most important mental and behavioural patterns, once established, are difficult to change once children enter school.” (Heckman & Wax, 2004).
Rates of return to human capital investment (Heckman 2000)

Return on investment in human capital

Pre-school programs

Schooling

Job training

Preschool  School  Post-school

0  Age
Brain Development – Opportunity and Investment

From van der Gaag 2004 – presentation on World Bank - The Benefits of Early Child development programs

Brain Malleability

Spending on Health, Education, Income Support, Social Services and Crime

Conception Birth 1 3 10 60 80 Age

Public Expenditure
Public spending on childcare and pre-primary education, 2005

% GDP

- Childcare spending as a % of GDP
- Pre-primary spending as a % of GDP
Countries in the OECD tend to prioritise spending on older children.
Experience affects Brain Development

Conditions in early life affect the differentiation of billions of neurons and trillions of synapses in the brain.

Early experience sets up neurological pathways in the brain affecting:

- health
- learning
- behaviour
Front cover of “Early intervention: the next step”
Allen 2011, HM Government

3 Year Old Children

Normal

Extreme Neglect

Perry, 2003
Wealth of data from life course studies linking adversity in early life to:

- poor literacy and educational attainment
- anti-social and criminal behaviour
- substance abuse
- poor mental and physical health
- adult mortality
Early Years research

We can distinguish 2 major strategies

1. Intervention with disadvantaged groups
2. For general population
Intervention strategy

If people keep falling off a cliff, don’t worry about where you put the ambulance at the bottom. Build a fence at the top and stop them falling off in the first place.

Source: Allen & Duncan-Smith, 2010
Examples

Perry Preschool Project – preschool 3-6 years

Abecedarian Project – childcare/preschool 0-6

Early Head Start – childcare/home visit 0-3
Perry Preschool Study
(Schweinhart, Barnes & Weikart, 1993)

- 123 young African-American children, living in extreme poverty and at risk of school failure
- Randomly assigned at ages 3 and 4 to program and no-program groups
- Daily High/Scope classes with planned learning activities and weekly home visits to families
More children intellectually ready to learn

Ready to Learn

(Kindergarten entry IQ of 90 or more)

Only 1 out of 3 of these poor children would have been ready for school intellectually; high-quality preschool made 2 out of 3 ready.
Higher achievement, more finishing school

- Program group
- No-program group

Grade 8 basic achievement (10th percentile)
- Program group: 49%
- No-program group: 15%

Graduated from high school
- Program group: 66%
- No-program group: 45%
Return on investment

Program Benefits Versus Cost

Benefit $88,433
Cost $12,356

Return on the dollar invested $7.16

1992 dollars, 3% annual discount rate
Abecedarian Project

111 African-American disadvantaged children randomly assigned at age 3 months to:

- High quality centre-based provision (day-care and preschool)
- Control group:

- Both groups followed into adulthood
Abecedarian Project

Results up to age 21 years

- Intervention group showed
  - Higher cognitive development from 18 months on
  - Greater social competence in preschool
  - Better school achievement
  - More college attendance
  - Delayed child bearing
  - Better employment
  - Less smoking and drug use

- Cost – benefit - Savings 2.5 times costs
Early Head Start --- 0-3 year olds

3000 disadvantaged families studied from birth – randomly assigned:
• Home-based programme
• Centre-based programme
• Centre and home visits
• Control group

At age 3 intervention improved Cognitive and Language Development, sustained attention and reduced aggression

Also:
• Improved parent-child interaction
• Improved home environment (more reading – less spanking)

Centre and home > centre > > home-based
Also – better implementation overall → better effects
What about the general population?
Are the early years important for all?
Non-intervention studies
– General population

Day Care Project – London 1980’s

Effective Preschool & Primary Education – EPPE
3000 children followed from age 3

Effective Preschool Provision in Northern Ireland - EPPNI
London Day Care Project - 1980’s (Melhuish et al., 1990)

255 children studied 0-6 years

4 groups

1. Home - no non-parental care

2. Relative day care - grandmother etc.

3. Childminder – individual carer

4. Nursery – Group day care
MAJOR RESULTS

After controlling for family background factors

1. Language development related to quality of care in first 3 years
   – particularly communication and responsiveness

2. These effects persisted to 6 years of age

Results from this study informed the childcare regulations in the 1989 Children Act
Similar results found in several countries:

- Quality of childcare affects development.
- The biggest effects in first 3 years for language development.
- Those children with good language development then do better on literacy and most educational outcomes.
NICHD Study of Early Child Care in USA

Early Child Care has Benefits and Risks

- Higher **quality** child care linked to
  - better pre-academic skills
  - better language skills

- **Experience in child care centres** linked to
  - better language skills
  - more problem behaviors

- **More hours in child care centres** linked to
  - more problem behaviors—aggression, disobedience
Effective Pre-School and Primary Education

EPPE

A Longitudinal Study Funded by the DFES

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Pam Sammons – University of Oxford
Iram Siraj-Blatchford – Institute of Education, University of London
Brenda Taggart – Institute of Education, University of London
Edward Melhuish – Birkbeck, University of London
EPPE STUDY

(3+ yrs)

- 25 nursery classes
  - 590 children

- 34 playgroups
  - 610 children

- 31 private day nurseries
  - 520 children

- 20 nursery schools
  - 520 children

- 24 local authority day care nurseries
  - 430 children

- 7 integrated centres
  - 190 children

- home
  - 310 children

School starts

- 6 yrs
- 7 yrs
- 16 yrs

Key Stage 1

- 600 Schools
- approx. 3,000 children

Key Stage 2

- 800 Schools
- approx. 2,500 children
Quality and Duration matter
(months of developmental advantage on literacy)
Effects of child, home, and pre-school compared

**EFFECTS UPON LITERACY**

- Gender
- Low birthweight
- Quality pre-school
- Duration pre-school
- Social class

<table>
<thead>
<tr>
<th>EFFECT</th>
<th>0.6</th>
<th>0.5</th>
<th>0.4</th>
<th>0.3</th>
<th>0.2</th>
<th>0.1</th>
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<td>0.4</td>
<td>0.5</td>
<td>0.6</td>
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<td>Duration pre-school</td>
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<td>0.6</td>
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<tr>
<td>Social class</td>
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<td>0.6</td>
<td>0.7</td>
<td>0.8</td>
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</table>
Home Learning Environment

Parents were asked about learning and play activities in the home. An index of the home learning environment (HLE) was constructed. There were seven types of home learning activities. These were:

- Reading
- Painting and drawing
- Library visits
- Playing/teaching the alphabet or letters
- Playing/teaching of songs/nursery rhymes
- Playing/teaching with numbers/shapes
- Playing with letters or numbers

Each activity was rated on a scale 0–7 where 0 is not occurring and 7 is occurring very frequently. These ratings were then combined to form the Home Learning Environment index (HLE) (Melhuish et.al. (2001)).
Social class and pre-school on literacy (age 7)

Social class by occupation
Mean year 2 reading level
Pre-school
No pre-school
Expected minimum

Professional  Skilled  Un/semi skilled

Mean year 2 reading level
1.8  2.0  2.2  2.4  2.6  2.8
Five areas were particularly important:

- Quality of the adult-child verbal interaction.
- Knowledge and understanding of the curriculum.
- Knowledge of how young children learn.
- Adults skill in supporting children in resolving conflicts.
- Helping parents to support children’s learning at home.
Measuring the effectiveness of primary schools

- Data every child in England in state school
- 600,000 children in each year, \( N = 15,771 \) primary schools

We used data to calculate the **effectiveness** of each school
EFFECTIVENESS

• Schools where children make greater progress than predicted on the basis of initial attainment and pupil and area characteristics can be viewed as *more effective*.

• Schools where children make less progress than predicted can be viewed as *less effective*.

We have a continuous scale of school effectiveness
Modelling Age 11 outcomes

Child Factors

Family Factors

Home-Learning-Environment

Pre-school

Primary School

READING

MATHEMATICS
Effects sizes for Literacy – age 11

- Gender
- Early Developmental Problems
- Birth weight
- Family income
- Mother's education
- Father's education
- Family SES
- Early years HLE
- Key Stage 1 HLE
- Preschool effectiveness
- Primary school effectiveness
Effect sizes for Numeracy – age 11

<table>
<thead>
<tr>
<th>Variable</th>
<th>Effect Size</th>
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<tbody>
<tr>
<td>Gender</td>
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<td>Early Developmental Problems</td>
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<td>Birth weight</td>
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<td>Family income</td>
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<td>Mother's education</td>
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<tr>
<td>Family SES</td>
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<td>Early years HLE</td>
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<td>Key Stage 1 HLE</td>
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<td>Pre-school effectiveness</td>
<td>0.40</td>
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<tr>
<td>Primary school effectiveness</td>
<td>0.38</td>
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</table>
Combined Impact of Pre- and Primary School – Maths

Reference Group: No Pre-School and low Primary School Effectiveness
Pre-school Quality and Self-regulation and Pro-social behaviour (age 11)

Pre-school quality
- Low
- Medium
- High

Effect size
- Self-regulation
  - Low: 0.02
  - Medium: 0.17
  - High: 0.25

- Pro-social behaviour
  - Low: 0.16
  - Medium: 0.18
  - High: 0.23
Similar study to EPPE with children in Northern Ireland. 850 children followed from to 11 years of age. Similar results to EPPE in England.

At age 11, allowing for all background factors, the effects of quality of pre-school persist until age 11 years.

High quality pre-school – improved English and maths, and improved progress in maths during primary school.

Children who attended high quality pre-schools were 2.4 times more likely in English, and 3.4 times more likely in mathematics, to attain the highest grade at age 11 than children without pre-school.
Conclusions

• From age 2 all children benefit from pre-school.
• The quality of preschool matters.
• Part-time has equal benefit to full-time.
• Quality of preschool effects persist until at least the end of primary school.
• High quality preschool can protect a child from consequences of attending low effective school.
What matters

3 elements that can lead to educational success

**Good** Home Learning Environment (pre-school)

**Good** Pre-schools for longer duration

**Good** Primary schools

Those children with all 3 will out-perform those with 2 who will out-perform those with 1 who will out-perform those with 0

All other things being equal
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- High quality preschool can protect a child from consequences of attending low effective school.
EPPE results have influenced policy:

- Retention of nursery schools
- Free part-time pre-school place for all 3 & 4 year-olds (2004)
- Childcare Bill (2006)
- Acceptance that money spent on pre-school produces savings later
Magnusson, Meyers Ruhm & Waldfogel (2003)

Results for US nationally- representative sample of 12,800 children
Age 5 Reading by sub-group & pre-school quality:

- Comparison with no pre-school

<table>
<thead>
<tr>
<th>Year Before</th>
<th>READING</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>ALL</td>
</tr>
<tr>
<td>Pre-school (High Quality)</td>
<td>1.66**</td>
</tr>
<tr>
<td>Pre-school (Low Quality)</td>
<td>1.34**</td>
</tr>
</tbody>
</table>

Pre-school in a random sample of children born in 1958 in UK

Effects on cognition and socialisation are long-lasting.

Controlling for child, family and neighbourhood, there were long-lasting effects from pre-school education.

Pre-school leads to **better cognitive scores at 7 and 16 years**.

In adulthood, pre-school was found to increase the **probability of good educational qualifications** and **employment at age 33**, and **better earnings at age 33**.
PISA results for 2009

15-year-olds who had attended pre-school were on average a year ahead of those who had not.

Also, PISA results suggest that pre-school participation is strongly associated with reading at age 15 in countries that

1. have sought to improve the quality of pre-school education
2. provide more inclusive access to pre-school education.
PISA 2009 - the relationship between pre-school and performance at age 15 is strongest when

1. larger % of population can use pre-school
2. pre-school is for more months
3. pre-school has smaller pupil-to-teacher ratios
4. more in spent per child in pre-school
OECD report on PISA results

“The bottom line: Widening access to pre-primary education can improve both overall performance and equity by reducing socio-economic disparities among students, if extending coverage does not compromise quality.”

Countries planning for economic expansion are increasing their investment in pre-school education.

E.g. China, New Zealand, Scandinavia, Canada, some US states (e.g. California, Minnesota, Massachusetts).

See

Some governments are realising—

Good quality pre-school is an essential component of the infrastructure for sustained economic development
Early childhood spending is linked with lower poverty rates

Early childhood spending as a proportion of median income - 2003
For more information

EPPE:  eppe.ioe.ac.uk

Reviews

OECD (2009). Doing Better for Children
www.oecd-ilibrary.org/social-issues-migration-health/doing-better-for-children_9789264059344-en