Why do poor children do worse at school?

Richard Layte
Irish Policy Context

- Recognition at political and policy level that the early years matter
- Development of a national policy framework:
  - Supporting parents
  - Early intervention and prevention
  - Listen and involve young people
  - Quality services
  - Strengthen transitions
  - Cross-government coordination
• Labour prioritise equality of opportunity
• Every Child Matters 2004
• Reduce child poverty by 50% by 2010
• Eradicate by 2020
• Enshrined in law “Child Poverty Act” 2010
• 5 policy aims pursued by Minister for Children and Families
  • Good physical and mental health
  • Protected from harm and neglect
  • Developing the skills for adulthood
  • Achieving economic independence and well-being
• Initial success in poverty reduction but rate of change has slowed
Parenting has become a focus for politicians:

“...children born in poverty and those born in wealth achieved similar outcomes as long as they were brought up by 'confident and able' parents” (Cameron 11th Jan 2010)
Previous Research

- The child’s developmental trajectory is shaped by the complex interaction of child physiology with physical and psycho-social environment
- Together dictate the child’s ability to learn, establish relationships and self-regulate their emotions
- Robust evidence that SES affects cognitive and behavioural development
- Direct effects on school performance and life-chances
- Cognitive development and psychological adjustment are key mediators
  - But which is more important?
Cognitive or Psychological Adjustment?

- Cognitive ability often given precedence but ‘non-cognitive’ traits also shown to be important
- Perseverance, dependability and consistency (Bowles and Gintis 1976)
- Heckman and colleagues have argued for the primacy of emotional control and psychological adjustment over cognitive skills
• How does SES influence either of these variables?
Two Theories:

• The Family Investments model

• The Family Stress Model
The Family Investments Model (FIM)

• Lower family income and other resources means decreased capacity to buy educationally stimulating materials for the home and child:
  • Books
  • Age appropriate toys
  • Activities
  • Services
  • Parental time and effort

“Concerted cultivation”

• Lower education and psychological resources (e.g. through poverty):
  • Less cognitive and linguistic stimulation
  • Less reading and playing with children

• Such ‘investments’ foster academic and social competence and better educational performance
• Broader ‘capital’ that parents bring: disadvantaged background means own health worse; health behaviours (Bradley & Corwyn 2002; Haveman & Wolfe 1994)
The Family Stress Model (FSM)

- Family economic stress affects adolescent adjustment indirectly through:
  - Parental distress, low mood and depression
  - Poorer spousal relationship
  - Harsher parenting behaviours
  - Inconsistent parenting
  - Less warmth and responsiveness in parenting
- Changes in parent/child relationship:
  - Less positive adjustment
  - Lower attachment to parents and school success
  - Increase risk of internalising and externalising problems
- Conger et al. (1992, 93); Elder & Caspi (1988); McLoyd (1989)
Figure 1: Theoretical Model Predicting Child Educational Development

- Household Income
- Parental Investments
- Child Cognitive Development
- Child Educational Development
- Maternal Distress and Mental Health
- Child Psychological Adjustment

Direct Effect

Indirect Effect
What do these act through?

- Cognitive Development
- Emotional and Behavioral adjustment
1. Variation in educational performance by family income will be mediated by child cognitive ability

2. Measures of parental investment will predict child cognitive ability
1. Variation in educational performance by family income will be mediated by child psychological adjustment

2. Measures of parent/child relationship will predict child psychological adjustment
• Millennium Cohort Study (MCS) Waves 1 to 4
• Births in the UK over 12 months, from 1\textsuperscript{st} September 2000 in England and Wales, and 1\textsuperscript{st} December 2000 in Scotland and Northern Ireland
• Sampling frame: child benefit records
• Stratified sample with over-representation of ethnic minority and deprived areas
• Sample initially 18552 falling to 15,588 in wave 2, 15246 in wave 3 and 13857 in wave 4 (75%)
Dependent Variables

Educational Development

- Teacher assessment of the child @ wave 4 (age 7)
- Attainment relative to average: reading, writing, maths and numeracy
- Ratings were coded on a five point scale from ‘well above average’ to ‘well below average’ via average
- Principle components analysis
- Items weighted with factor weights ($\alpha=0.88$)
- mean of 7, an SD of 2.29 and minimal skew (0.22).
Dependent Variables

Psychological Adjustment

• Strengths and Difficulties Questionnaire (waves 2, 3 & 4)

• Dichotomised into abnormal (top 10%)

• Dichotomised scores for three waves summed (0-3)
Cognitive Ability

- British Ability Scales (BAS) @ wave 3 (age 5)
- naming vocabulary, picture similarities, and pattern construction subscales
- Normative scores
- Dichotomised into bottom 10% and summed (0-3)
Independent Variables

- Household and Maternal Characteristics:
  - Mothers age
  - Ethnicity
  - Parents relationship quality
  - Persistent low income (years in lowest quintile net equivalised)

- Child Characteristics:
  - Chronic illness (long-standing conditions) + mental and behavioural condition
  - Absence from school (days) current year
  - Child temperament
  - Birthweight

- School and Teacher Characteristics:
  - Teacher’s teaching experience in years
  - Area deprivation of school location (Oxford Index of Child Deprivation)
FIM Variables

- Number of hours TV on average
- How often reads with or to child
- How often tell stories to the child
- How often musical activities
- How often draw, paint or make things
- Help with reading (%)
- Help with writing (%)
- Help with maths (%)
FSM Variables

- Parental Psychological Distress (Kessler 6) (W2-4)
- Harshness of parenting (freq. smacking/shouting) (W2-4)
- Maternal Warmth (W2)
- Quality Parental Relationship
Analytical Approach

- Three models:
  - PERINC → COG
  - PERINC → SDQ
  - PERINC, COG & SDQ → EDUC

- Decompose total effect PERINC
- Direct effects COG/SDQ
- Indirect effects COG/SDQ
Statistical Approach

- EDUC – general linear model
- SDQ and COG:
  - Positive integers
  - Count data
  - Over-dispersion
  - Could use poisson:
    - conditional mean = conditional variance
    - Negative binomial (Sarma and Simpson 2006)
- Maximum likelihood
8,876 teacher interviews for 13,857 cases in wave 4

Random sample?
  - Scottish and NI more likely
  - Persistently low income less likely

Use inverse probability weight

Imputation of predictors (8211 cases)
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Mean COG, SDQ and EDUC by Years of Low Income

![Graph showing the mean COG, SDQ, and EDUC by years of low income](image_url)
## Correlations - Boys

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<td></td>
</tr>
<tr>
<td>Maternal Warmth W2</td>
<td>-0.50***</td>
<td></td>
<td>-0.49***</td>
<td></td>
</tr>
<tr>
<td>Years Maternal Distress</td>
<td>0.16***</td>
<td></td>
<td>0.37***</td>
<td></td>
</tr>
<tr>
<td>Parental Relationship Poor</td>
<td>0.13***</td>
<td></td>
<td>0.32***</td>
<td></td>
</tr>
<tr>
<td>Parental Relationship Moderate</td>
<td>0.10***</td>
<td></td>
<td>0.09***</td>
<td></td>
</tr>
</tbody>
</table>
Effects: FIM and FSM Variables
Total, Direct and Indirect Effects

<table>
<thead>
<tr>
<th>Yrs Low Income</th>
<th>Total Effect</th>
<th>Total Mediated</th>
<th>Indirect via COG</th>
<th>COG % Indirect</th>
<th>Indirect via SDQ</th>
<th>SDQ % Indirect</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.76</td>
<td>74%</td>
<td>0.48</td>
<td>63%</td>
<td>0.08</td>
<td>11%</td>
</tr>
<tr>
<td>2</td>
<td>1.49</td>
<td>74%</td>
<td>0.97</td>
<td>65%</td>
<td>0.13</td>
<td>9%</td>
</tr>
<tr>
<td>3</td>
<td>2.11</td>
<td>78%</td>
<td>1.48</td>
<td>70%</td>
<td>0.17</td>
<td>8%</td>
</tr>
<tr>
<td>4</td>
<td>2.56</td>
<td>78%</td>
<td>1.81</td>
<td>71%</td>
<td>0.19</td>
<td>7%</td>
</tr>
</tbody>
</table>

All Total and Indirect Effects Significant at P<0.001
Total, Direct and Indirect Effects

All Total and Indirect Effects Significant at P<0.001
Summary

- Persistent low income has significant negative effects on COG, SDQ and EDUC
- 75% of the effect of PERINC on EDUC is indirect through COG and SDQ
- The majority (85%) is mediated through COG
- Results robust to EDUC variable
- FIM variables explain <16% COG effect
- FSM variables explain 33% SDQ effect
- Need more/better measures of FIM & FSM
- FIM & FSM vars predict both COG & SDQ
• The greater role of COG but FIM & FSM processes are both important
• Parenting behaviours are important but strongly influenced by family economic position
• Need to insure families with young children have resources to participate
• Need to protect and supporting parental mental health
• Early intervention can contribute to equalising outcomes:
  • Sure-Start - UK
  • Perry Pre-school
  • Abecedarian Project
  • Early Head Start
  • Nurse-Family Partnership