Children’s physical, social-emotional and cognitive outcomes at 8-9 years: Do they share the same drivers?

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Growing Up in Ireland
Research Conference
Dublin, 29 November 2010
Growing Up in Australia: From an idea to reality

- **Late 1990s**: Recognition of need for national longitudinal study – lobbying, preparatory work
- **April 2000**: Funding announced by federal Govt - broad consultation on design and research questions
- **Feb 2001**: Consortium formed to bid for study
- **August 2001**: Proposal submitted
- **March 2002**: Contract signed
- **2002**: Staff appointed
- **2003**: Negotiations with HIC (Medicare), contract with data collection agency
- **Feb 2004**: Official launch
- **2004**: Wave 1 completed
Feb 2004: Launch at the Children’s Museum
Growing Up in Australia: The Longitudinal Study of Australian Children

MATTHEW GRAY AND ANN SANSON
Family Matters No.72 Summer 2005
The Longitudinal Study of Australian Children (LSAC)

- National coverage
- 10,000 children
- 2 age cohorts (0-1 and 4-5 yrs)
- Data waves every 2 years
- Close link between researchers, policy-makers and service-providers
- Multi-disciplinary
- Ecological model
- Holistic view of children
- Extensive multi-source data
- Data accessible to researchers

Questions:

• Do the same factors (measured at 4-5 and 6-7 years) underlie physical, social-emotional and learning outcomes (measured at 8-9 years)?
• Does each ‘layer’ in Bronfenbrenner’s ecological model predict each outcome?
• Do inner (more proximal) layers mediate the impact of outer (more distal) layers?
• Is the power of prediction from 4-5 years similar to prediction from 6-7 years?
• What predictors are common to all outcomes, and which are specific to one outcome?
• Implications?
Current evidence base:

- High co-occurrence of problems

- Evidence of ‘multifinality’: same risk and protective factors/processes underlie multiple problems


LSAC provides opportunity to examine assertions in earlier childhood, within one study, and with longitudinal data.
LSAC’s Conceptual Framework

• Ecological and holistic model of children’s development:
  ‘the acquisition and growth of the physical, cognitive, social and emotional competencies required to engage fully in family and society’ (Aber et al. 1997)

• Child’s current developmental status on:
  • Health
  • Physical development
  • Emotional wellbeing
  • Social development
  • Learning and academic competency
LSAC Outcome Index: Rationale and Purpose

- LSAC has complex data on multiple aspects of children’s development
- LSAC has multiple data users, not all experts
- Outcome Index designed to be simple, user-friendly summary of children’s development
- A tool for communicating otherwise complex findings for policy-makers, the media and general public

- Criteria for measures included in Outcome Index:
  - High response rate
  - Reliable
  - Provide a good coverage of domain of interest
  - Distribution giving good discrimination
1. Outcome variables standardised

2. Sub-domain scores calculated (mean of contributing variables) and standardised

3. Domain scores calculated (mean of contributing sub-domains) and standardised ($X=100$, $SD=10$)

4. Overall Outcome Index calculated (mean of domain scores)

**Also available:**
**Cut-off scores** to identify those doing well (top 15%) and poorly (bottom 15%)
**Categorical Positive and Negative Outcome Indices** – number of domains in which child scores above positive cut-off (0-3) or below negative cut-off (0-3)

Analytic approach

- Dependent variables: Physical, Social-Emotional and Learning Outcome Indices at Wave 3 (age 8-9 yrs).
- 3 hierarchical multiple regression analyses—5 steps:
  1. Community (macro-level)
  2. Education and childcare (exo/meso level)
  3. Family structure and demographics (meso/micro-level)
  4. Family functioning (micro-level)
  5. Child characteristics
- Predictors measured at Wave 1 (4-5 yrs) and 2 (6-7 yrs)
- Each predictor standardised (X=0, SD=1)
- Used SAS surveyreg procedure to account for study design.
- Weighted to adjust for non-response.
Community

• Community advantage/disadvantage (SEIFA index)

• Australian Remoteness Indicator for Areas, at postcode level (ARIA index)

• Neighbourhood belonging: civic engagement and positive feelings about neighbours (4 items)

Childcare & school

• Age started childcare

• Child's year level at school

• Additional formal care (besides preschool/school)

• Informal care - other types of care (e.g. grandparents)

• Teacher communication scale: teacher communicates with parent about child’s education (6 items)
W1 and W2 family demographic and structure predictors

- Equivalised family income
- Highest educational attainment of either parent
- Highest occupational prestige of either parent
- Paternal presence/absence and work status
- Maternal work status
- Two parent family
- Number of siblings in the home
- Maternal age
- Housing costs per week
- Length of time in current home
- Number of homes since birth
- Non-Australian born parent
Hostile parenting (shouting, anger)
Warm parenting (enjoy, show affection)
Consistent parenting (following through)
Inductive reasoning (explain, talk it over)
Argumentative relationship between parents
Contact with grandparents
Home activities index: Frequency of engaging in activities with child (drawing, singing)
Out of home activities: e.g. visiting libraries, attending sporting events
Mother’s psychological distress
Mother’s alcohol consumption
W1 and W2 Child–level predictors

- Healthy **diet**: Frequency of consuming healthy (e.g., fresh fruit) and unhealthy (e.g., cordial) foods
- Temperament
  - Approach/sociability
  - Persistence
  - Reactivity
- Gender
- Birth weight
- Gestational age
- Child speaks a **language other than English** at home
- Child is of **Aboriginal or Torres Strait Islander** descent
<table>
<thead>
<tr>
<th>Step</th>
<th>Domain</th>
<th>Physical</th>
<th>Soc/Emot</th>
<th>Learning</th>
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### W1 and W2 Macro-level predictors of 3 domains in Wave 3 – beta coefficients

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### W1 and W2 Childcare and School predictors of 3 domains in Wave 3 – beta coefficients

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F = significant in final model
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<td>.06*** F</td>
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F = significant in final model
### W1 and W2 Child predictors of 3 domains in Wave 3 – beta coefficients

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<td>Gestation age</td>
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<td>.08**</td>
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</table>
Yes: Variables contributing to at least 2 outcomes

Macro-level (community)
- Community (dis)advantage (largely mediated by later steps) (S/E, L)
- Neighbourhood belonging (partially mediated by steps 4 and 5) (S/E, P)

Exo/meso-level (childcare and school)
- Additional formal child care (all)

Meso/micro-level (family structure and demographics)
- Parental education (all, partially mediated by steps 4 and 5)
- Income (govt benefits, unemployed resident fathers, high mortgage costs)

Micro-level (family process)
- Argumentative inter-parent relationship (S/E, P)
- Maternal mental health (S/E, P)
- Out-of-home activities (S/E, L)

Child level
- Temperament: persistence (all)
- Temperament: reactivity (all)
- Gestational age (P, L)
No: Specific drivers of specific outcomes

Exo-level (childcare and school)
- Teacher-parent communication (6-7 years) – Social-Emotional
- Grade level (6-7 years) - -ve for Physical, +ve for Learning

Meso/micro-level (family structure and demographics)
- Mother working F/T – Social-Emotional (-ve)
- Measures of parental income - Physical
- Parental occupation – Learning
- Parental education – much stronger for Learning
- Maternal age - Learning
- Number of siblings – positive for Physical, negative for Learning

Micro-level (family process)
- Hostile parenting – Social-Emotional (strong effect)
- Consistent parenting – Social-Emotional
- Warm parenting – Learning (-ve)
- Contact with grandparents - Learning (-ve)
- Maternal depression – strongest for Physical and Social-Emotional
- Within-home activities - +ve for Social-Emot, -ve for Phys and Learning

Child level
- Diet – Physical
- Male – Social-Emotional
Prediction from Wave 1 versus Wave 2

Whether ‘exposure’ was at 4 years or 6 years generally made little difference:

- Similar amount of variance explained by steps 1-4 at each age
- Step 5: prediction of Social-Emotional is stronger from W2 (12%) than from W1 (6%)

For some variables, early exposure appeared to matter most:

- Additional formal childcare
- Housing costs for Social-Emotional and Physical

For some variables, later exposure appeared to matter most:

- Teacher communication for Social-Emotional
- Grandparent contact for Learning (-ve)
Limitations and areas for further investigation

Prediction was modest to moderate:
- only 12-13% of variance on Physical
- 30-38% of variance on Social-Emotional
- 20-22% of variance on Learning

➢ Selection of predictor variables – many others could be included
➢ Outcome Indices are composite measures – more differentiation may be possible with more fine-grained outcomes

For the future:
Explicit testing of mediational hypotheses
- e.g. is impact of poor neighbourhood and low income mediated through parenting and maternal depression?

Testing for non-linear and interactional effects
- e.g. do parental hostility and consistency interact with child reactivity, with synergistic effects on Social-Emotional?

Different predictors and pathways for different subgroups?
- E.g. ‘comorbid’ groups; Indigenous and recent migrant groups; children with specific conditions
Implications for prevention

- Set of factors that should be taken into consideration in any preventive or treatment intervention
  - From every level of the ecology of children’s lives
  - Multi-level, multi-component, multi-modal interventions
- Others which may be particularly salient for specific outcomes
  - Careful tailoring to specific needs
  - But co-occurrence of problems -> not too specific
- ‘Outer’ layers are partially mediated by ‘inner’ layers
  - Rigorous testing needed to determine where intervention has greater benefits relative to costs
- Need to build the ‘science’ of prevention
  - Multi-disciplinary, given that multiple layers need to be addressed
  - Multi-sectoral collaboration, to ensure policy and practice change
Thank you!