The predictive power of early social, emotional and cognitive skills

Ingrid Schoon, Bilal Nasim, Rukmen Sehmi and Rose Cook
UCL, Institute of Education

Center for Early Childhood Development, Education, and Policy Research (CEDEP)
Graduate School of Education
The University of Tokyo
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Outline of the presentation

- What childhood social, emotional and cognitive skills are important for later life outcomes?

- Focus on early social, emotional and cognitive skills measured between birth and age 6 (also using evidence between age 7 and 10 if skills had not been assessed earlier)

- Assessment of the association between early skills and a range of later outcomes (education, employment, health and wellbeing)

- Evidence from longitudinal cohort data (controlling for a range of observables, such as early cognition, parental background, gender, etc)
What are the skills that drive wellbeing and social progress?

- Need to develop ‘the whole child’ with a balanced set of cognitive, social and emotional skills (OECD, 2015)
- Holistic Approach (interconnected domains)
- Attention to generic as well as culture specific competencies
- Integrated structure: identifying core (higher order) competence domains which are characterised by more specific skills
- Importance of early years in laying the foundation for later development
Key Developmental Competences

- **Learning**
  - Process (remember, apply, understand, reflect, analyse, evaluate, create)
  - Knowledge (factual, conceptual)

- **Physical Skills**
  - Motor skills
  - Kinesthetic skills
  - Visual skills
  - Dexterity

- **Cognitive Skills**
  - Verbal skills
  - Non-verbal skills
  - Executive function
  - Metacognition

- **Personal Skills**
  - Self-regulation
  - Motivation, values
  - Self-awareness
  - Planning

- **Social Skills**
  - Taking perspective of the other: pro-social behaviour, agreeable, empathy
  - Approach: extraversion, assertiveness, leadership, trust

- **Emotional Skills**
  - Emotional stability
  - Assertiveness
  - Enthusiasm

- **Artistic Skills**
  - Creating
  - Responding
  - Presenting/performing
  - Openness
Can early skills predict later outcomes?

Institute of Education

Development over time
What is the evidence?

• Single study evaluations – often using observational cohort studies
  • focus on selected skills and distinct outcomes
  • few studies that examine simultaneously multiple skill sets, or assess associations across outcomes
  • Mostly association studies, do not establish causality

• Meta analytic reviews
  • summarize and synthesize findings across multiple studies
  • yield more reliable and precise estimation of impact than single evaluation studies
  • common metric known as effect size
  • can examine variation according to methodology of assessment, characteristics of target population, outcome
  • yet most reviews focus on a specific skill, population, or outcome

• ‘Review of review’ approach to summarize meta-analytic evidence
  • Maryland Scientific Evidence Scale to assess quality of evidence
### Existing Data Sources (some examples)

#### UK
- Avon Longitudinal Study of Parents and Children (ALSPAC)
- British Cohort Study (BCS70), 1970 Cohort
- Millennium Cohort Study (MCS)
- MRC National Survey of Health and Development (NSHD), 1946 Cohort
- National Child Development Study (NCDS), 1958 Cohort
- Twins Early Development Study (TEDS)

#### US and CANADA
- Colorado Adoption Project (CAP)
- Concordia Longitudinal Risk Project
- Fragile Families and Child Wellbeing Project
- Fullerton Longitudinal Study
- Hawaii Personality and Health Cohort
- Kauai Longitudinal Study
- National Longitudinal Survey of Children and Youth (NLSCY)
- Project Competence Longitudinal Study (PCLS)
- The Early Childhood Longitudinal Study–Kindergarten Cohort (ECLS-K)
- The Infant Health and Development Program (IHDP)

#### NEW ZEALAND and AUSTRALIA
- Christchurch Health and Development Study
- Dunedin Multidisciplinary Health and Development Study
- Mater-University of Queensland Study of Pregnancy (MUSP)
- 1970 Youth Transition Study
- The Longitudinal Study of Australian Children (LSAC)

#### EUROPE
- Growing Up In Ireland
- Cardiovascular Risk in Young Finns
- The Jyväskylä Longitudinal Study of Personality and Social Development (JYLS)
- Copenhagen Perinatal Cohort
- Individual Development and Adaptation Study (IDA), Sweden
- The Bielefeld Longitudinal Study of Adult Twins (BiLSAT), Germany
- The Swiss Survey of Children and Youth, COCON (Competence and Context)
• Key social, emotional and cognitive skills can be reliably assessed

• There is medium to strong evidence for the long-term predictive power of indicators of self-regulation, and also self-awareness (locus of control) for outcomes across domains. This effect is independent of cognitive ability.

• There is less strong evidence regarding the role of emotional stability, motivation, and social skills. After controlling for cognitive ability their impact is small, yet remains significant. In particular, there are significant associations between childhood emotional stability and adult mental and physical health; and between interpersonal skills and later mental health, suggesting domain specific effects.

• Verbal skills are important predictors across domains (socio-economic attainment, mental and physical health, crime), while for numeric skills we only found evidence regarding educational achievement, socio-economic status and physical health. Executive function was primarily associated with educational attainment and behaviour in school.

Schoon et al., 2015
Gaps in the evidence base

- Less understanding of which particular combinations of different social, emotional or cognitive skills are important for later life

- Less evidence on early skills (measured before school entry) compared to skills measured during the school years
Evidence is constrained by the availability of high quality, large scale longitudinal data including appropriate measures and controls – reliant on a relatively small pool of longitudinal studies from a select number of developed countries.

Evidence depends on prevailing research interests and available knowledge.

There is no consensus regarding conceptualisation and assessment of skills.

Overlap between constructs (e.g. self-regulation and attention regulation)

- Need for harmonization of concepts and measures
  - Consensus about definitions of key skills
  - Attention to bias in measurement and response
  - Test development using new technologies

- Need to advance understanding of less studied topics (e.g. early indicators of motivation and self-determination)

- Need for longitudinal data on skill development – focus on early childhood and subsequent transitions
BCS 70 A study of every child born in one week in 1970

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<thead>
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<tbody>
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<td>Age</td>
<td>5</td>
<td>10</td>
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<td>34</td>
<td>38</td>
<td>42</td>
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<td>cohort member / parents</td>
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<td>Medical</td>
<td>School</td>
<td>4 separate instruments tests</td>
<td>6 different instruments tests</td>
<td>8 separate instruments tests</td>
<td>16-page postal questionnaire</td>
<td>Face-to-face and CAPI interview</td>
<td>6 different instruments tests</td>
<td>telephon survey</td>
<td>Face-to-face and CAPI interview</td>
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<td>Instruments</td>
<td>Consent to data linkage</td>
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<td>Linked</td>
<td>Data</td>
<td>17,198</td>
<td>13,135</td>
<td>14,875</td>
<td>11,622</td>
<td>9,003</td>
<td>11,261</td>
<td>9,665</td>
<td>8,874</td>
<td>9,841</td>
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</table>

We use data from the 1970 British Cohort Study (BCS70), a study that has followed a large, representative group of individuals born in 1970 since birth, and at regular intervals throughout their lives.

At age 5 parents provide rich information about the social and emotional development of the study children.

Also at age 5 cognitive skills are directly assessed, using measures of verbal and non-verbal skills.

The newest wave of the study provides information about their lives in multiple domains at age 42 – including well-being, socio-economic/labour market status, physical health and family life.
1. **Intrapersonal characteristics:**
   - Self control/regulation
     - good conduct (child is often disobedient, fights, lies, steals, destroys own or others’ belonging)
     - no hyperactivity (child is restless, fidgety, cannot settle to anything for more than a few moments, has twitches or tics)
   - Emotional stability (child often appears miserable, unhappy, tearful or distressed; often worried; tends to be fearful or afraid of new things and new situations)

2. **Social skills:**
   - Peer relations (not solitary, liked by others, does not bully others)

- Assessed through modified subscales of the Rutter inventory (Rutter et al., 1970)
Verbal skills (EPVT)
- English language development at age 5 was assessed using the English Picture Vocabulary Test (EPVT), an adaptation of the American Peabody Picture Vocabulary Test.
- It consists of 56 sets of four different pictures with a particular word associated with each set of four pictures. The child is asked to indicate the one picture that corresponds to the given word, and the test proceeds with words of increasing difficulty, until the child made five mistakes in a run of eight consecutive items.

Copy-a-design test to indicate visual-motor ability (Osborn, 1994)
- assesses the cohort member’s perceptual-motor ability, assuming that children must have reached a certain level of conceptual development in order to be able to recognise the principles governing different geometric forms, and to reproduce them.

Draw-a-Man test to indicate conceptual maturity (Goodenough, 1926)
- The test has a good reliability of .94 (Osborn et al., 1984) and correlates with conventional IQ tests such as Binet and Wechsler (Scott, 1981); (r averaging between .4 and .5)
# Age 5 Assessment Tools

**Figure 1: Examples of completed Copying Designs task**

<table>
<thead>
<tr>
<th>Example 1</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1" alt="Example 1 Grid" /></td>
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</table>

<table>
<thead>
<tr>
<th>Example 2</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image2" alt="Example 2 Grid" /></td>
</tr>
</tbody>
</table>
Age 5 Assessment Tools

Figure 4: Examples of completed ‘Human Figure Drawing’ pictures
1. Mental well-being:
   - Life satisfaction
   - Well-being
   - Malaise

1. Education:
   - Has a degree

2. Socio-economic status:
   - Net family income
   - Net wealth
   - In social housing

4. Labour market:
   - In top job
   - In employment
   - Hourly pay
   - Job satisfaction

5. Physical health:
   - Self-rated health
   - Obesity

6. Health behaviours:
   - Exercise
   - Smoking
   - Drinking

7. Other:
   - Interest in politics
1. **Child:**
   - Birth-weight (Birth)
   - Gender (Birth)
   - Ethnicity
   - Older siblings (Age 5)
   - Education (Age 30)

2. **Parent:**
   - Mother/Father Education (Birth)
   - Mother Age (Birth)
   - Mother Mental health (Age 5)
   - Mother/Father Employment (Age 5)

3. **Family:**
   - Gross income (Age 5)
   - Social housing tenure (Age 5)
Socio-emotional and cognitive skills measured at age 5 are both associated with later academic attainment. We observe a significant association with indicators of visual-motor and verbal ability as well as conceptual maturity—and also with good conduct and self-control (non-hyperactive).

- Socio-emotional competencies measured at age 5 matter for later academic attainment, in addition and above the influence of early cognitive skill.
Early socio-emotional and cognitive skills measured at age 5 significantly predict later adult mental health. There is a significant association with indicators of visual-motor and verbal ability – and also with good conduct and self-control (non-hyperactive).

- Socio-emotional competencies measured at age 5 matter for later adult mental health, in addition and above the influence of early cognitive skills.
### Findings – Cognitive skills

<table>
<thead>
<tr>
<th>Cognitive skills</th>
<th>Education/ Labour Market/ Socio-Economic</th>
<th>Mental Health &amp; Well-being</th>
<th>Physical Health &amp; Health Behaviours</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Visual motor skills</strong></td>
<td>GCSE (+); Degree (+); Employment (+); Top Job (+); Income (+); Wage (+); Wealth (+); Social Housing (-)</td>
<td>Malaise (-); Life Satisfaction (+)</td>
<td>Self-rated Health (+); Obesity (-); Exercise (-); Smoking (-)</td>
<td>Partnership (+)</td>
</tr>
<tr>
<td><strong>Verbal skills</strong></td>
<td>GCSE (+); Degree (+); Employment (+); Top Job (+); Wage (+); Income (+); Social Housing (-)</td>
<td>Well-being (+); Malaise (-); Life Satisfaction (+)</td>
<td>Self-rated Health (+); Drinking (-)</td>
<td>Partnership (+); Political Interest (+); Parenthood (-)</td>
</tr>
<tr>
<td><strong>Conceptual maturity</strong></td>
<td>Employment (+); Social Housing (-)</td>
<td></td>
<td></td>
<td>Political Interest (+)</td>
</tr>
</tbody>
</table>

Cognitive skills are not homogenous – dimensionality important, especially regarding verbal and non-verbal capabilities

➢ **Need to assess both verbal and non-verbal skills**
## Findings – Interpersonal and social skills

<table>
<thead>
<tr>
<th>Self—regulation (non hyper-activity)</th>
<th>Education/Labour Market/Socio-Economic</th>
<th>Mental Health &amp; Well-being</th>
<th>Physical Health &amp; Health Behaviours</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>GCSE (+)</td>
<td>Well-being (+)</td>
<td></td>
<td></td>
<td>Political Interest (+) Partnership (+)</td>
</tr>
<tr>
<td>Malaise (-)</td>
<td></td>
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</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Self—regulation (good conduct)</th>
<th>GCSE (+); Degree (+) Employment (+); Top Job (+) Job Satisfaction (+) Social Housing (-)</th>
<th>Life Satisfaction (+) Malaise (-) Well-being (+)</th>
<th>Smoking (-) Drinking (-) Self-rated Health (+)</th>
<th>Political Interest (+)</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Social skills</th>
<th></th>
<th></th>
<th></th>
<th>Drinking (+) Parenthood (+)</th>
</tr>
</thead>
</table>
Summary – Data Analysis

- Childhood social and emotional skills matter for a very wide range of adult outcomes, independent of early cognitive skills
  - Self-control (good conduct and low hyperactivity) is important across domains – especially regarding mental and physical health outcomes
  - Among early cognitive skills verbal and visual motor abilities are also important across domains – influencing mental, physical and labour market outcomes
- The combination of receptive language and visual motor skills with self control appears to be crucial regarding outcomes across multiple domains
- BUT!
  - Analysis restricted by data available in the data set
  - Other skills may also matter that are not measured at age 5 in the BCS
What have we learned?

1. There is no silver bullet

- More than one skill is necessary to promote successful development

- Importance of combined skill set, comprising cognitive as well as social and emotional skills

- Different skill sets interact, shape and reinforce each other (for example, cognitive ability and self-regulation work together to explain academic attainment as well as health and wellbeing)
What have we learned?

2. Inconsistency in Terminology and Assessment

- **Some** early social, emotional and cognitive skills can be reliably measured before age 6 and they predict later outcomes
  - Yet, some skills are better measured than others, some skills are not salient on the current research agenda, and for some skills there is no evidence regarding their long-term predictive power

- Furthermore, terms are not used consistently: differently named assessment instruments assess the same underlying skill (e.g. extraversion and outgoing; self control and delay of gratification), and similarly named assessments measure different skills

- Need to derive consensus in defining key concepts (integrative taxonomy)
- Need to develop a consistent set of age appropriate assessments
- Need for a better understanding of processes in skill development
What have we learned?

3. Understanding the context and processes of skill development

• **The context** of skill development
  • Growing up in a less privileged family is associated with lower levels of cognitive ability - pointing to the critical importance of the *living environment* encountered by small children and their families.
  • **Maternal mental health** is a very strong correlate, highlighting the significance of a stable and supportive home environment, and the need to also support parents.

• Developmental pathways
  • Developmental precursors of skills manifest by age 5 include gross- and fine motor development, early attachment styles, and attention regulation (executive function)
  • Biological foundations
  • Sensitive periods and different speeds in maturation
  ➢ The underlying developmental processes are not yet fully understood, and more research into the developmental antecedents and progression of skill development is needed.
Implication for ECEC Policy - 1

Developmental Focus

Child competencies develop and change over time

- Pre/post-natal (biological risk)
  - Early health screening, nutrition, parental mental health
  - Regular health visits

- Pre-school period
  - Access to high quality care
  - Cognitive stimulation, effective parenting
  - Opportunities to exercise, play

- School-age
  - Good quality school experience
  - Stable and supportive home environment
  - Neighbourhood factors – support from the wider community
• Need for a systematic and integrated approach to policy development and implementation
• Pedagogical framework focusing on children’s holistic development
• Sustainability – long-term focus
• Scaffolding for life-long learning and engagement
Thank you

Ingrid Schoon
UCL Institute of Education
I.Schoon@ucl.ac.uk


