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The predictive power of early social, emotional and cognitive skills

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March 2017

E·S·R·C ECONOMIC & SOCIAL RESEARCH COUNCIL

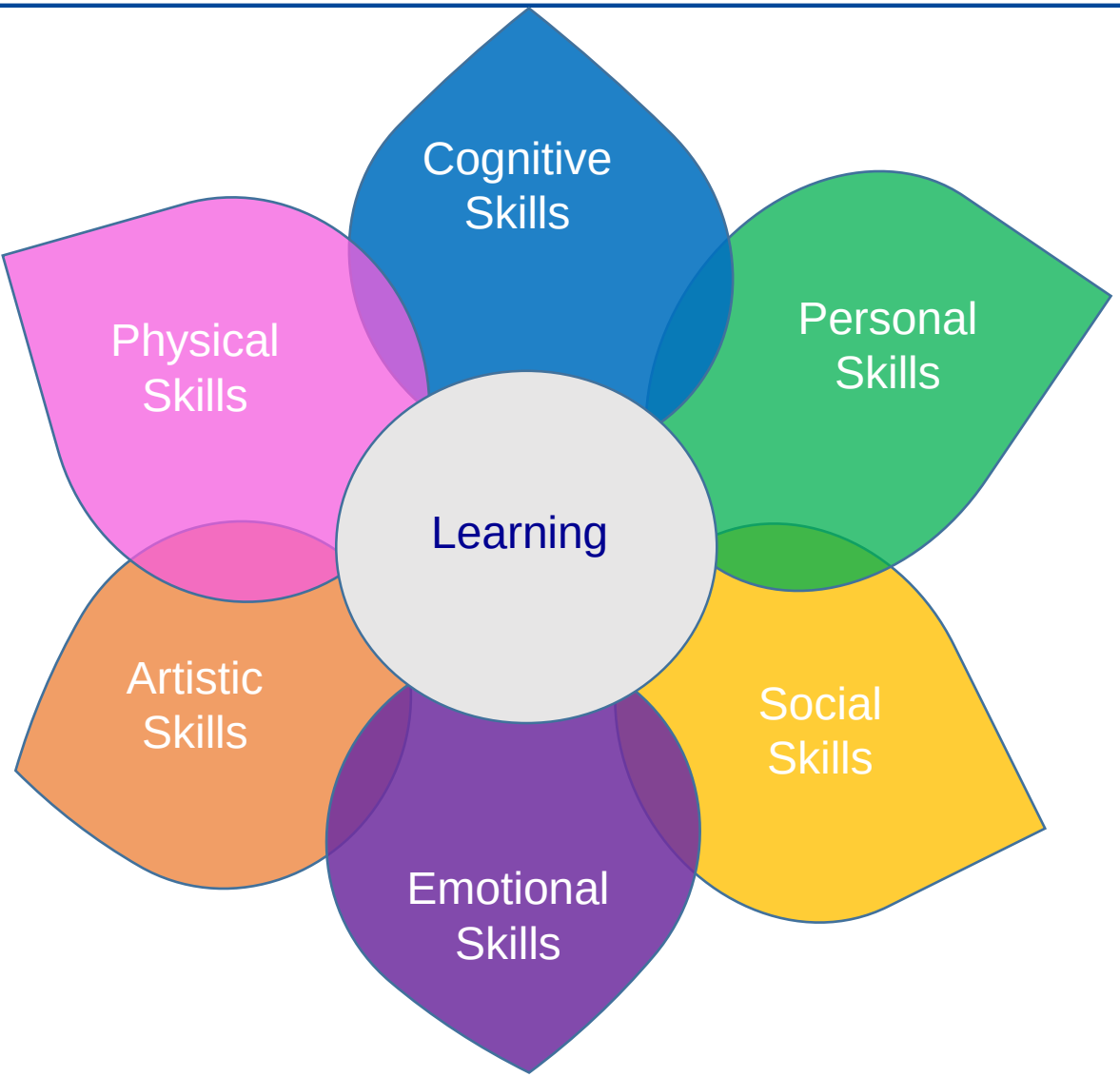
Outline of the presentation

- **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 skills?

- **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 * Visual skills
- Kinesthetic skills * Dexterity

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

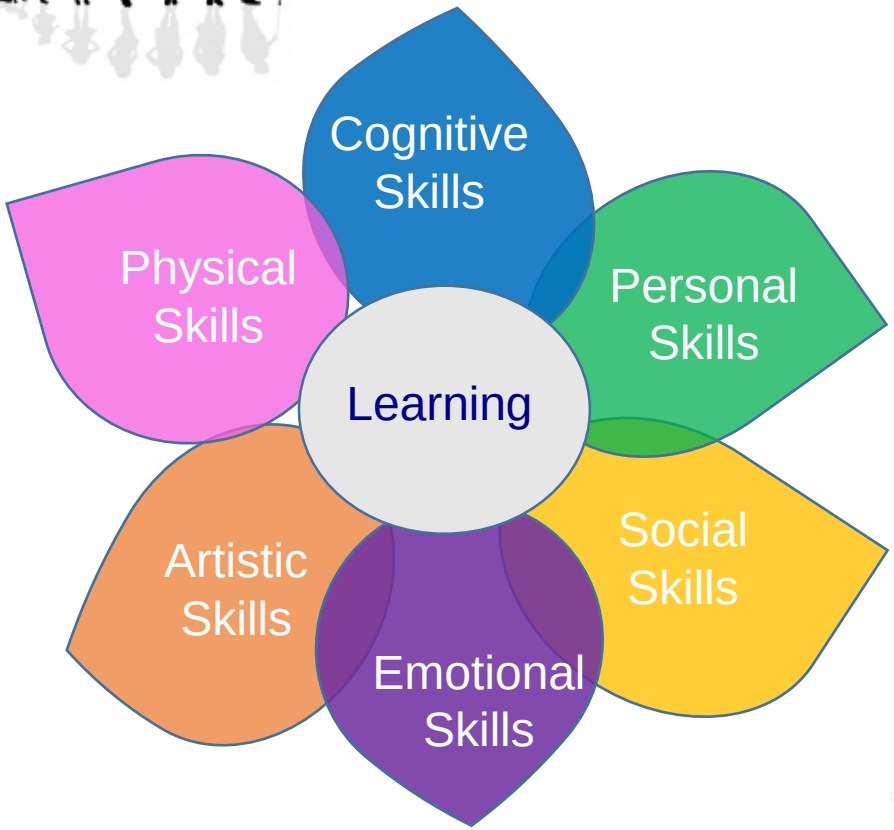
Personal Skills
- Self-regulation * Motivation, values
- Self-awareness * Planning

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

Emotional
- Emotional stability
- Enthusiasm

Artistic
- Creating * Responding
- Presenting/performing * Openess

Can early skills predict later outcomes?



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)
- The Minnesota Study of Risk and Adaptation from Birth to Adulthood
- The Montreal Longitudinal-Experimental Preschool Study (MLEPS)
- The NICHD Study of Early Child Care and Youth Development (SECCYD)

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 (**Co**mpetence and **Con**text)

Evidence from Literature Review

- 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 s**elf-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 from Literature Review: Limitations

- 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

	1970 Birth	1975 5	1980 10	1986 16	1996 26	2000 30	2004 34	2008 38	2012 42	2016 17
main respondent	mother	parents	cohort member / parents	cohort member /parents	cohort member	cohort member	cohort member	cohort member	cohort member	
secondary respondent	medical	medical	medical / school	medical / school			children			
survey instruments		4 separate instruments tests	6 different instruments tests	8 separate instruments tests	16-page postal questionnaire	Face-to-face and CAPI interview	6 different instruments	telephone survey	Face-to-face and CAPI interview	
linked data									Consent to data linkage	
response rate	17,198	13,135	14,875	11,622	9,003	11,261	9,665	8,874	9,841	

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

Social and Emotional Skills (Age 5) Assessment Tools

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)**

Cognitive Skills (Age 5) – Assessment tools

➢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)

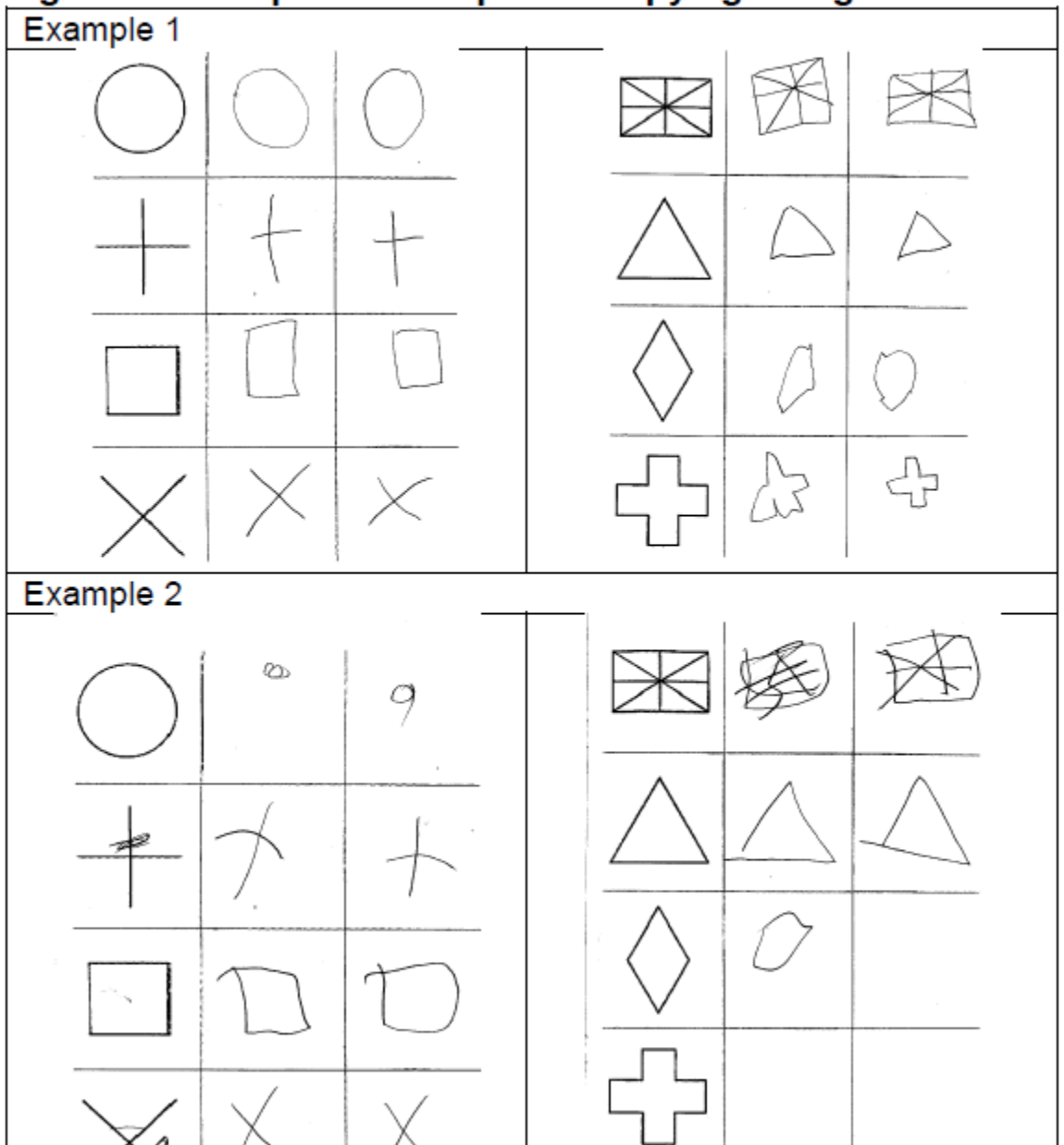
- assesses the cohort member's perceptual-motor ability, assuming that children must have reached a certain level of conceptual development in order to be able to recognise the principles governing different geometric forms, and to reproduce them

➢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)

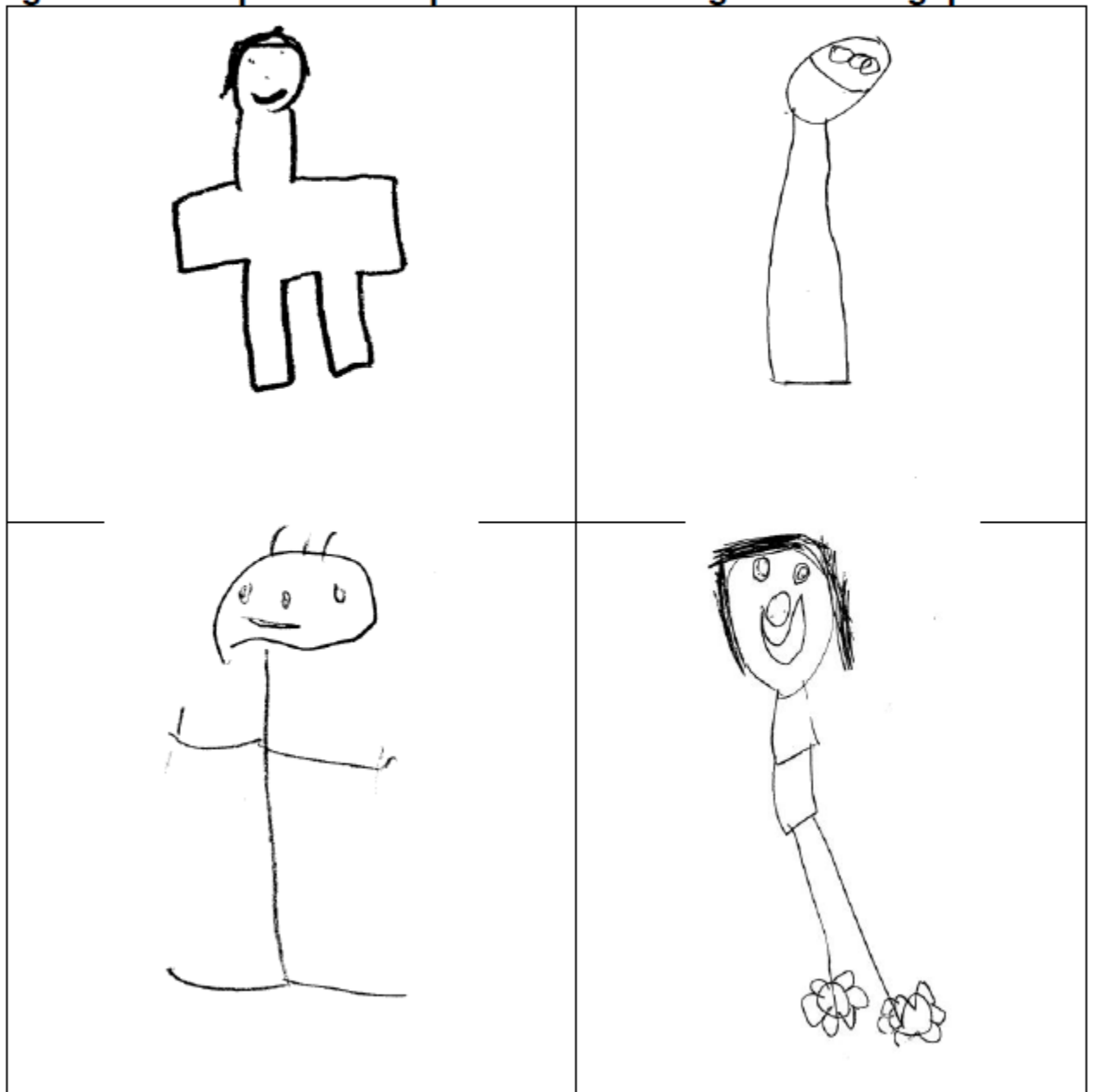
Age 5 Assessment Tools

Figure 1: Examples of completed Copying Designs task



Age 5 Assessment Tools

Figure 4: Examples of completed 'Human Figure Drawing' pictures



Data: Outcomes (Age 42)

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

Data: Controls

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)

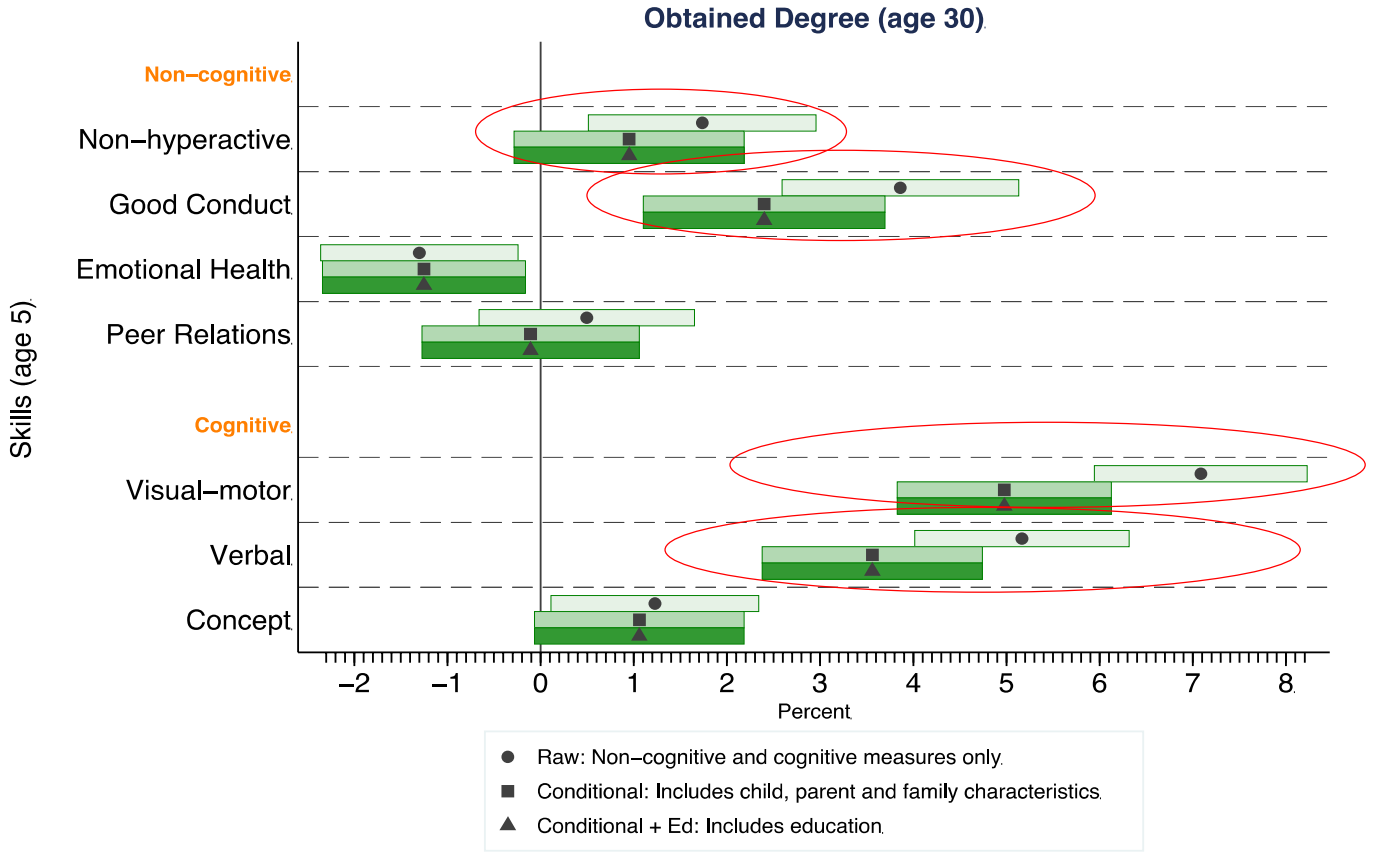
3. **Family:**
   - Gross income (Age 5)
   - Social housing tenure (Age 5)

Results: 1. Education

Obtained a degree by age 30

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



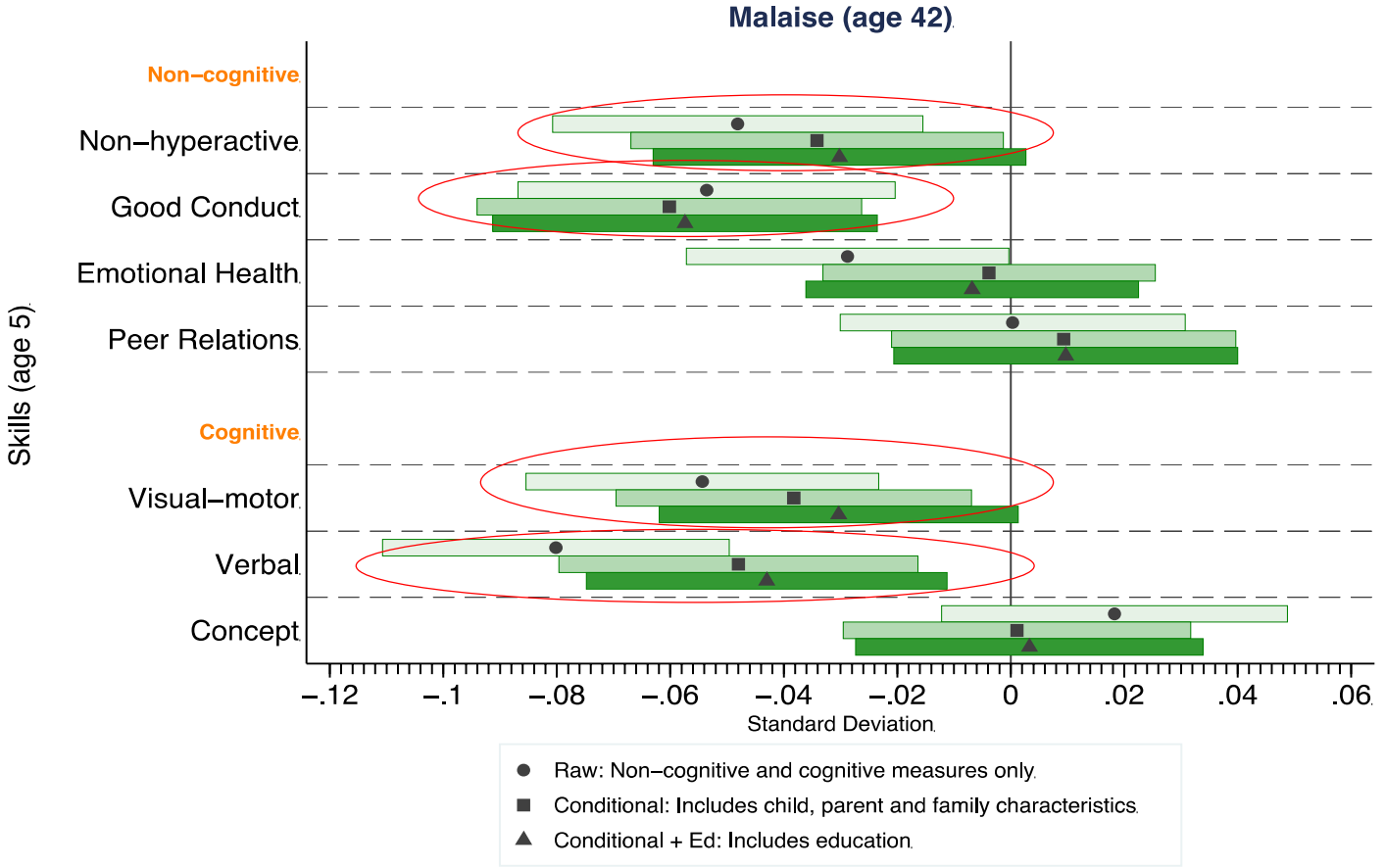
Notes:
1. Symbols represent coefficient estimates.
2. Shaded boxes represent 95% confidence intervals.

Results: 2. Mental well-being

Malaise at 42

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.



Notes:
1. Symbols represent coefficient estimates.
2. Shaded boxes represent 95% confidence intervals.

Findings –Cognitive skills

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

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

	Education/ Labour Market/ Socio-Economic	Mental Health & Well-being	Physical Health & Health Behaviours	Other
Self—regulation (non hyper-activity)	GCSE (+)	Well-being (+) Malaise (-)		Political Interest (+) Partnership (+)
Self—regulation (good conduct)	GCSE (+); Degree (+) Employment (+); Top Job (+) Job Satisfaction (+) Social Housing (-)	Life Satisfaction (+) Malaise (-) Well-being (+)	Smoking (-) Drinking (-) Self-rated Health (+)	Political Interest (+)
Social skills			*Drinking (+)*	Parenthood (+)

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?

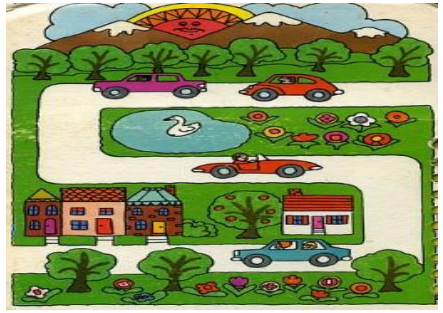
3. Understanding the context and processes of skill development

- 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



Implication for ECEC Policy - 2

- 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

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References

- Gutman, L.M., Joshi, H., Parsonage, M. & Schoon, I. (2015). *Children of the new century: Mental health findings from the Millennium Cohort Study.* London, Centre for Mental Health. http://www.centreformentalhealth.org.uk/children-of-the-new-century
- Gutman, L.M. & Schoon, I. (2013). *The impact of non-cognitive skills on outcomes for young people. A literature review*. Education Endowment Foundation in collaboration with the Cabinet Office. http://educationendowmentfoundation.org.uk/uploads/pdf/Non-cognitive_skills_literature_review.pdf
- Gutman, L.M. & Schoon, I. (2015). Preventive interventions for children and adolescents: A review of meta-analytic evidence. *European Psychologist, 20(4), 231-241.*
- Schoon, I. (2006). *Risk and Resilience: Adaptations to changing times*. Cambridge: Cambridge University Press
- Schoon, I. (2012). Temporal and contextual dimensions to individual positive development: A developmental-contextual systems model of resilience. In: M.Ungar (Ed). The social Ecology of resilience: culture, context, resources, and meaning. New York: Springer (pp.143-156)
- Schoon, I. (2017). Making it against the odds: diverse strategies and successful adaptation. In A. C. Peterson, S. H. Koller, F. Motti-Stefanidi, & S. Verma (Eds.), *Positive youth development in global contexts of social and economic change*. New York: Routledge.
- Schoon, I., Jones, E., Cheng, H., & Maughan, B. (2013). Wellbeing of children: Early Influences. Report for the Nuffield Foundation http://www.nuffieldfoundation.org/sites/default/files/files/Wellbeing_children_early_influences_v_FINAL.pdf
- Schoon, I., Nasim, B., Shemi, R. & Cook, R. (2015) The impact of early life skills on later outcomes. Report for the OECD (Early Childhood Education and Care)