

THE EARLY YEARS, EMOTIONAL DEVELOPMENT AND THE FUTURE OF WORK

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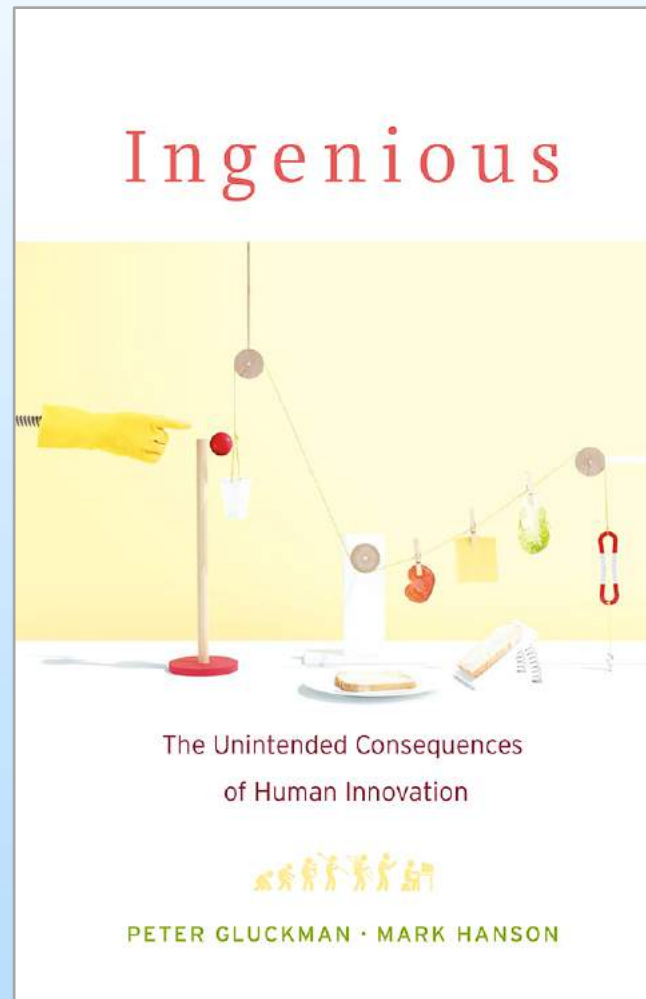
THE UNIVERSITY OF
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Innovation and society

- Increasing threats to societal resilience and social cohesion
- Primarily driven by accumulation of pervasive innovations, e.g.
 - » Fossil fuel-based energy systems → climate change
 - » Public health improvements → population growth → biodiversity loss, water and food insecurity
 - » Digitalization → impact on mental health; transformed ways of living



Has our capacity to progressively innovate started to bite back and harm us?



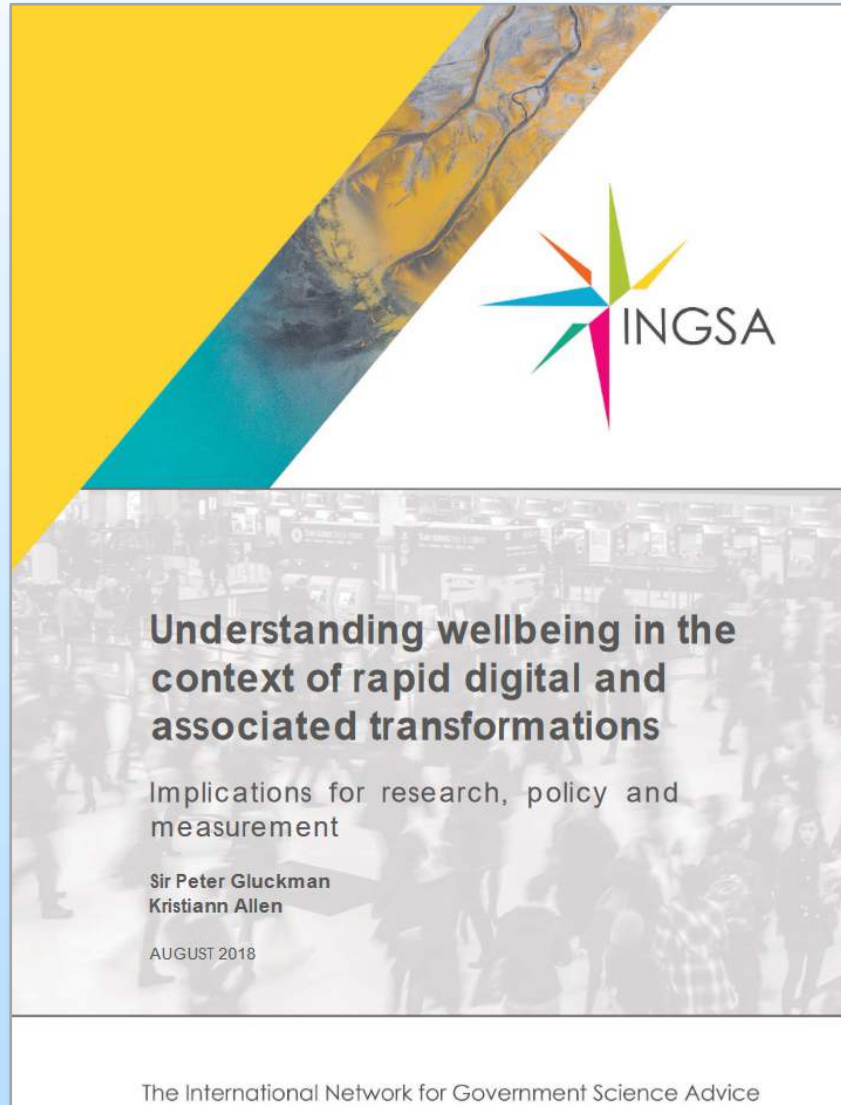
*Harvard University Press,
October 2019*

Humans are distinct in our capacity to innovate

- Large brains
- Manual dexterity
- Oral communication and writing → collective storage of knowledge
- We evolve through biological evolution (preservation of gene flow) **and** cultural evolution (seeking comfort, pleasure, power and resources)
- Cultural evolution includes social/societal innovation and technological dimensions. All have runaway characteristics – what are the constraints?



Impacts of digitalization

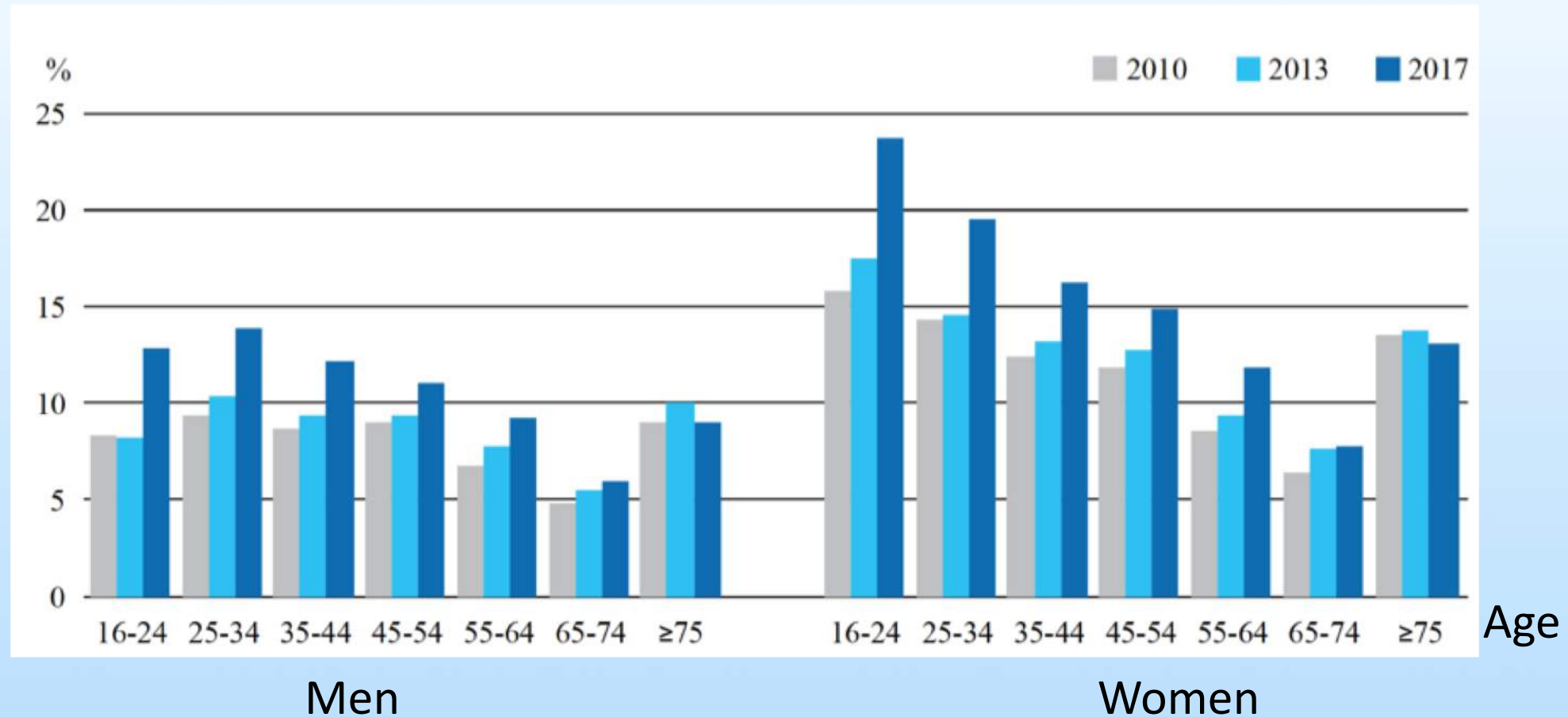


- The digital transformation has a broad range of impacts on the institutions of self, and of social and civic life
- Digitalization differs from previous disruptive transformations by its speed and pervasiveness
- It impacts on our existence in very fundamental ways

<https://www.ingsa.org/wp-content/uploads/2018/10/INGSA-Digital-Wellbeing-Sept18.pdf>

Mental health morbidity in the Danish population

Poor
mental
health



*Sundhedsstyrelsen (2018). Danskernes Sundhed:
Den Nationale Sundhedsprofil 2017.*

Possible explanations for poorer mental health

- Digital milieu changing how young people interact, the nature of their peer groups, and how they spend their time
- Drug and alcohol exposure
- Ambitions of (and expectations on) young people driven by social media
- Existential fears of climate change



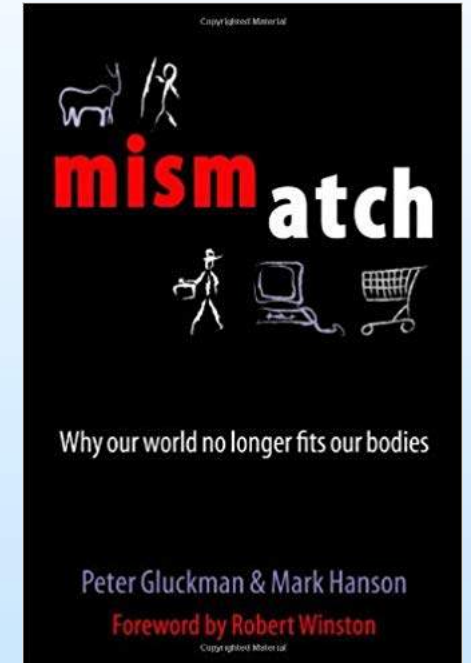
Possible explanations for poorer mental health

- Changing pattern of child rearing: loose-tight to tight-loose
- Adolescence is now loosely regulated, e.g. curriculum choices, access to cash and credit cards, smart phone use
- Reversal of the evolved child rearing pattern may have major impact on maturation of executive function in the brain, e.g. risk assessment and judgement skills
- Likely leads to increased risk-taking behaviours in adolescence



Possible explanations for poorer mental health

- Age of puberty has fallen
- Strong evidence linking lower age of puberty to psychosocial problems in adolescence
- This is due to a **mismatch** between physical/psychosexual maturation and brain maturation
- Executive function does not fully mature until 3rd decade of life
- Digital milieu further promotes risk-taking behaviours
- Are education school structures designed 60 years ago now redundant?



Possible explanations for poorer mental health

- Youth suicide cannot be understood solely through traditional mental health diagnoses
- Reflects **deficiency in emotional self-control**, exacerbated by drugs & alcohol and the transition from parental control to peer-related influences



Ways to reduce mental health morbidity in young people

- How can we increase emotional self-control?
 - » Educational tools/games in early school years
- How can we enhance self-control and mental health in adolescence?
 - » Importance of critical thinking skills; role of AI-based learning
 - » Efficacy of online tools to deliver emotional intervention therapies?
- Focus on **prevention** at the earliest points of the life course – from pre-conception



Longitudinal and deep phenotyping of early neurodevelopment in Singaporean children

Family & maternal factors during pregnancy

- Family income
- Maternal mental health
- Parity
- Maternal age

Birth and neonatal health

- Gestational age (Full term or preterm)
- Sex
- Birthweight
- **MRI**

Infancy

- Breastfeeding duration
- Childcare

Toddler

- **Specialised assessments**
- **Bayley cognitive score**
- Childcare
- Screen time
- Literacy stimulation

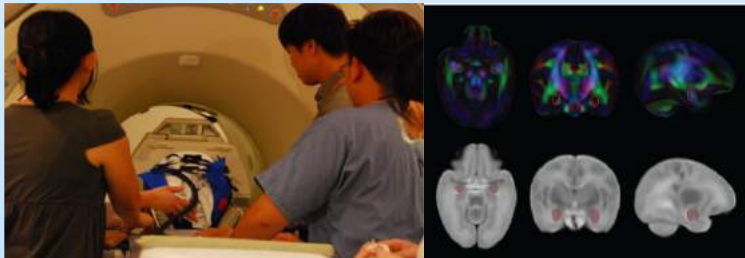
Preschool/Kindergarten

- **School readiness panel**
- **Emotional and behavioural profile**
- **Social skills & IQ**
- **Executive function**
- **MRI**

Primary school entry and beyond

- **Literacy and math descriptors**
- **Learning Support Programme (LSP)**

Clinic Visits at 6, 18, 24, 36, 48, 54, 72 & 84 months:
Neurodevelopmental and other detailed assessments



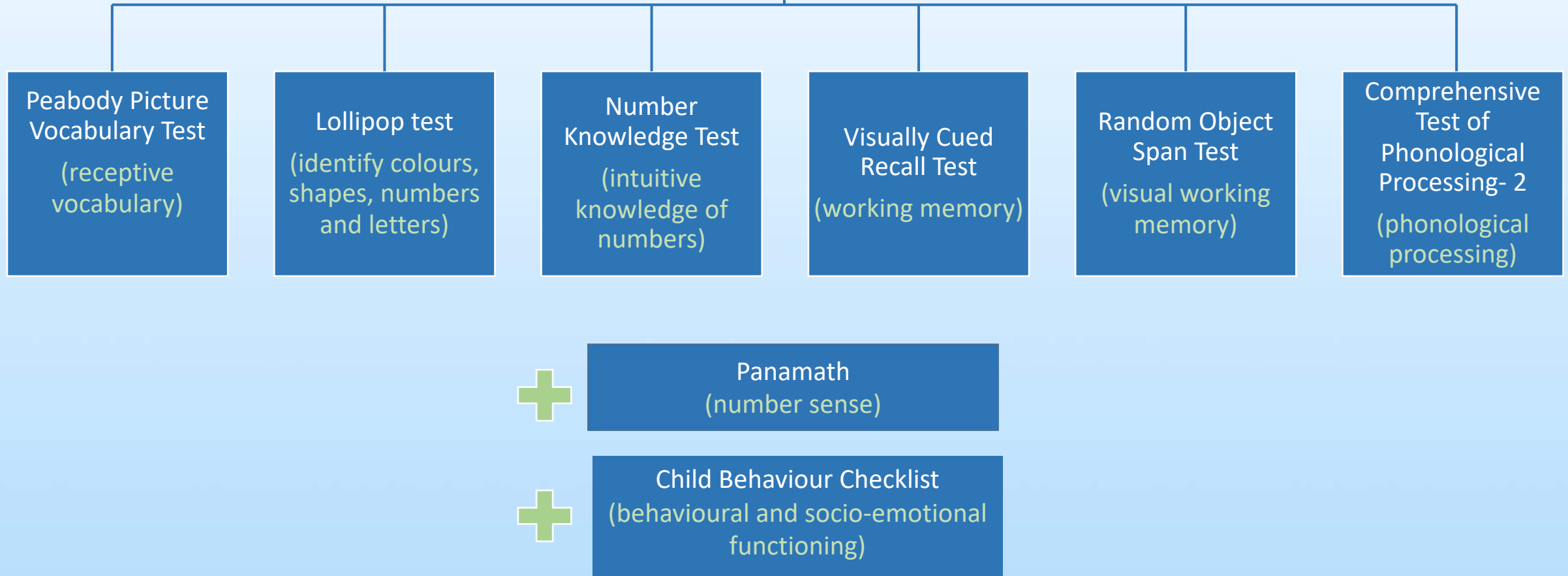
GUSTO findings

- Long-term consequences of maternal stress: Maternal mood at 28 weeks' gestation was biggest influence on infants' epigenetic state
- Maternal mental health affects infant's structural and functional brain development
 - » Limbic system – regulates emotions
 - » Observed in women with relatively normal mental health

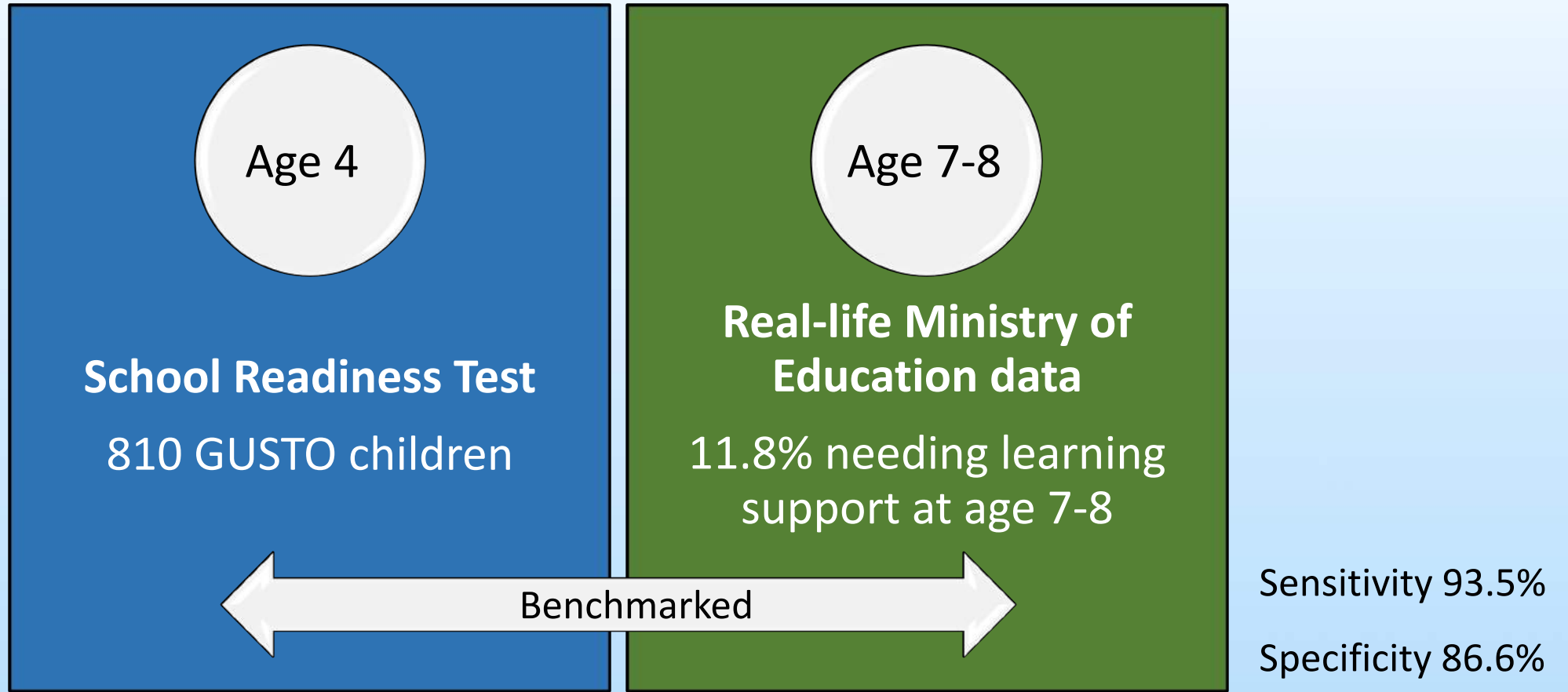


School Readiness Panel

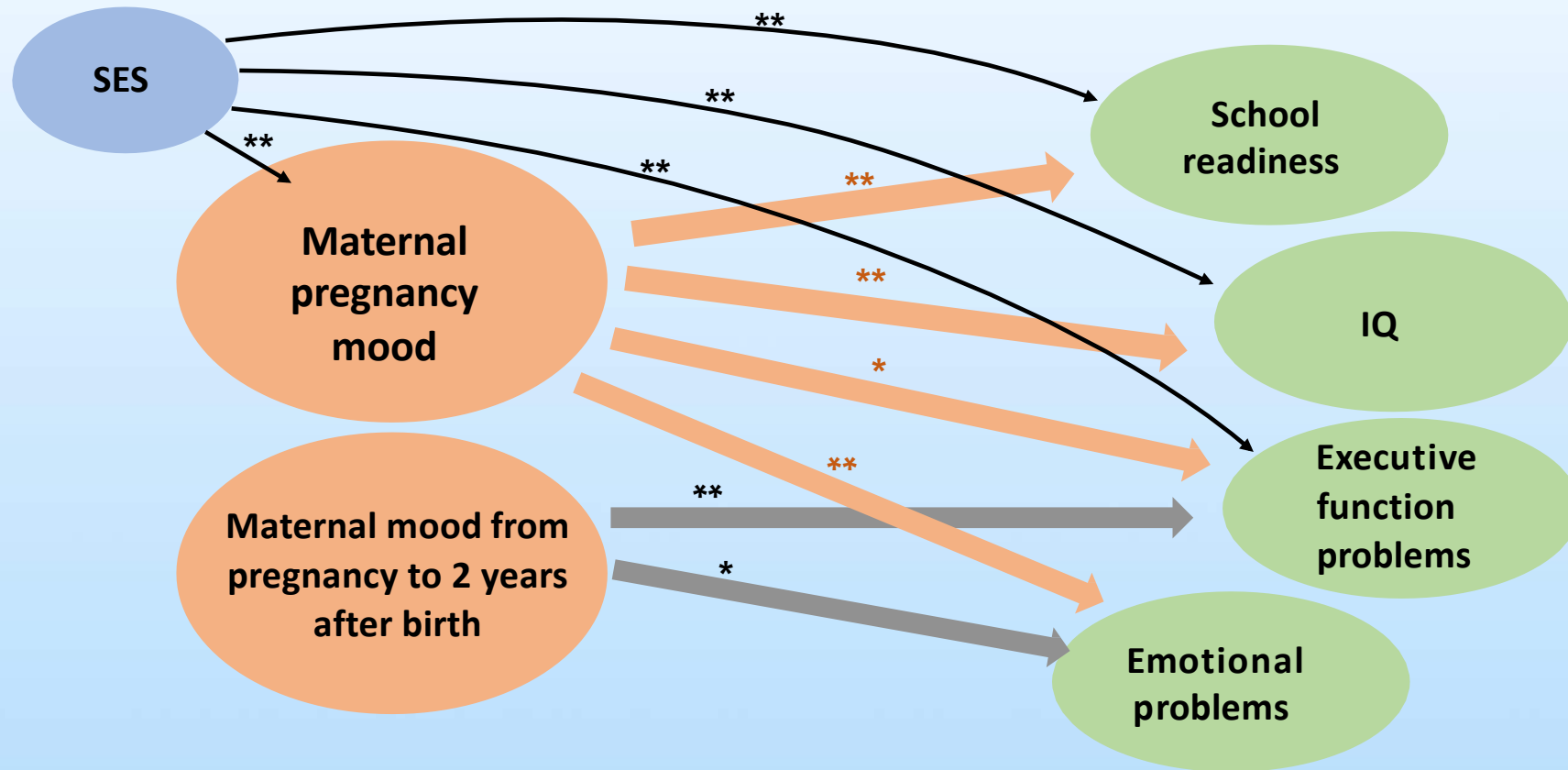
(810 children, age 4)



Predicting primary school learning needs at age 4

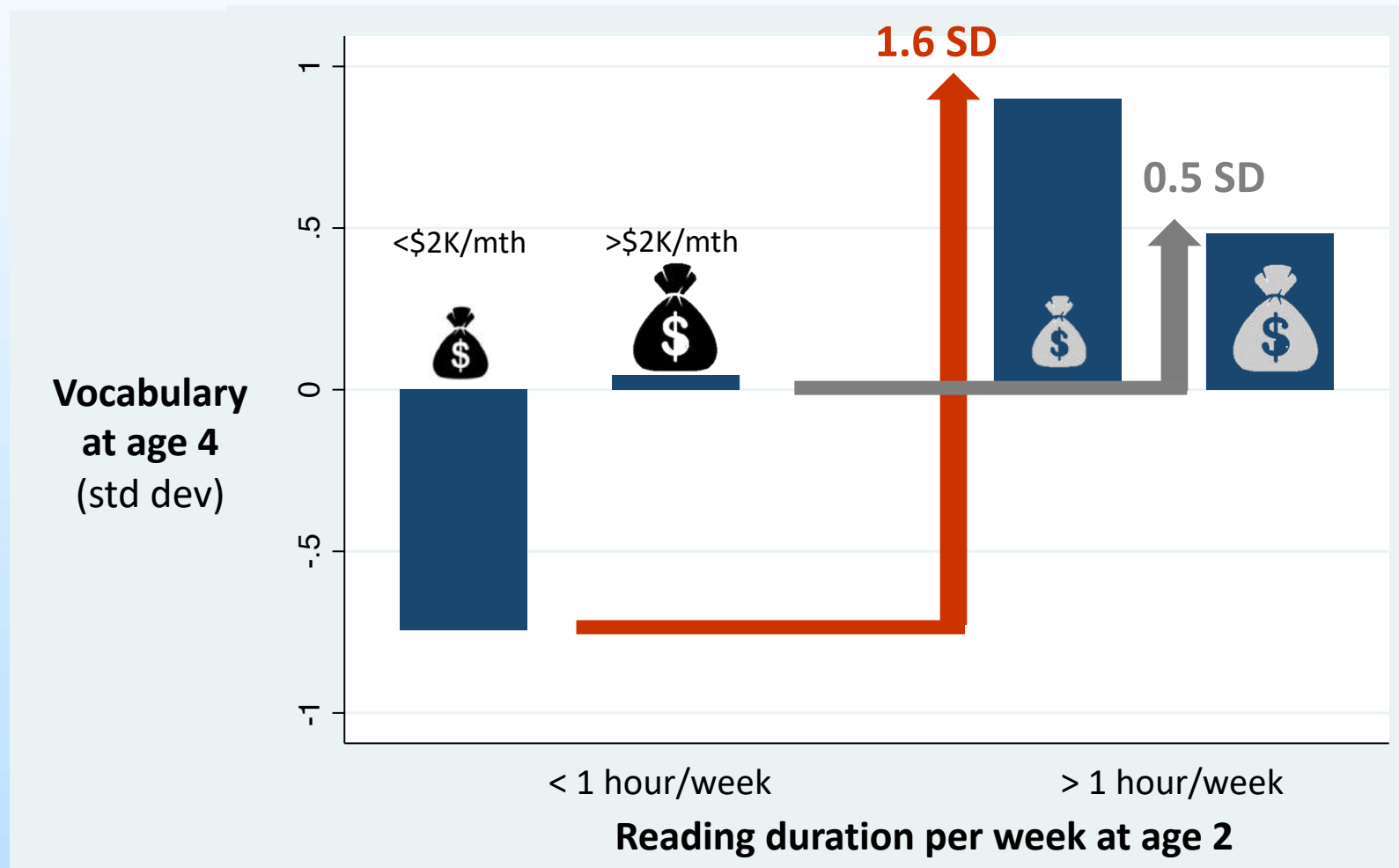


Antenatal maternal mood strongly mediates the association between socio-economic status and child neurodevelopment



- Maternal mood is an important target for prevention and intervention

The benefits of 10 mins of extra reading a day

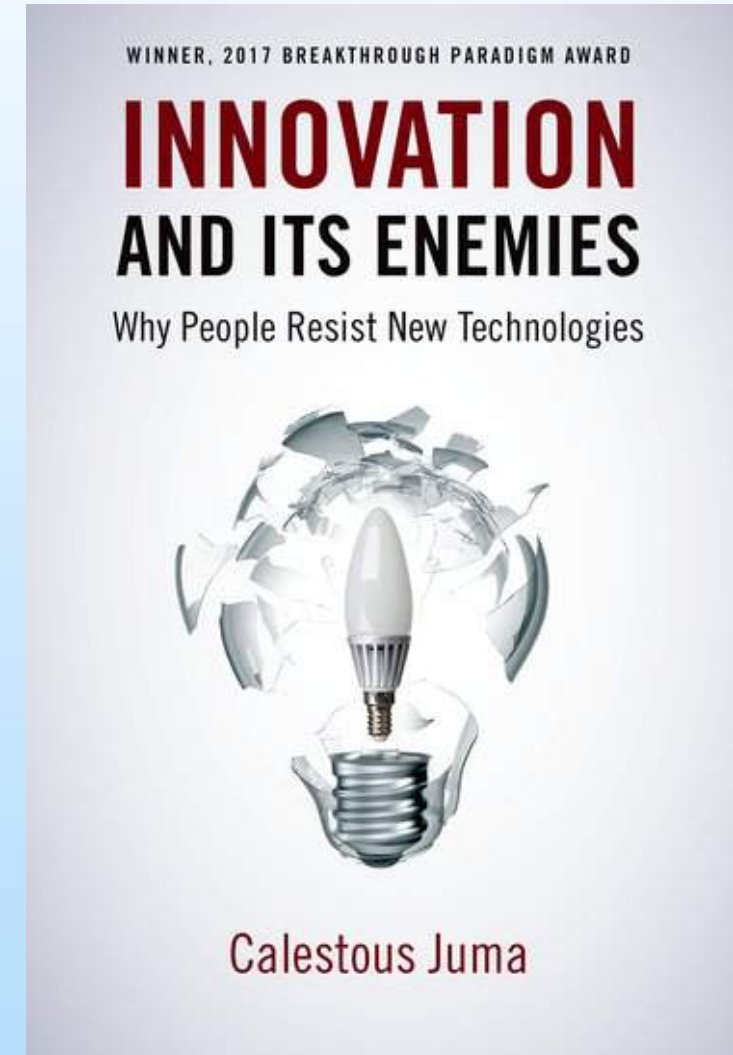


- Considerable improvement in vocabulary in lower SES group

A world of constant change

- Societies have difficulty with rapid change; can take a generation to adjust
- Risks in today's changing world tend to be minimized by the policy community and private sector
- Drive towards productivity at the expense of well-being
- Rapid transitions pose a threat to social cohesion and individual mental health

Oxford University Press, July 2016



The future of work and the changing and aging workforce

- As one set of needed skills disappears, people will have to gain new skills
- Brain plasticity declines with age, yet working lifespan is increasing
- What are the implications of retraining for older people?
- Neuroscience and educational research needed



How can we address these threats?

- Enhance resilience at the societal and individual level
- Develop improved regulatory processes that can cope with ongoing technological change
- Promote psychological resilience at the earliest ages



- Education (both formal and parental) needs to enhance resilience by focusing on critical thinking and emotional competencies
- Early childhood education/experience needs more active consideration by policy sector

How can we address these threats?

- Our actions as a technologically innovative species have placed stress on individuals and societies – our environment is now biting back
- Solutions will be multi-dimensional; environments from conception to adolescence will be critical – and so will new paradigms for education to prepare individuals for constant change

