SUCCESSFUL SELF-STUDY: THE ROLE OF COGNTIVE AND SOCIO-EMOTIONAL DEVELOPMENT

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EXCELLENCE

- Born or made?
- Talent or practice?

- Developmental trajectory?

THE DEBATE: INBORN

- Kant (1790/1952): Genius is inborn, can never be taught, and can only be imitated by inspired non-geniuses.
- Dryden (1693/1885): "*Genius must be born, and never can be taught*"
- Galton (1874): Only those with exemplary natural abilities rise to the top.

VERSUS: MADE

- Joshua Reynolds (18th century): "*You must have no dependence on your genius. If you have great talents, industry will improve them…*"
- De Candolle (1873): Environment is important.
  - Eminent scientists work best under particular political, economic, social, cultural and religious circumstances.
- Watson (1930): "*Give me a dozen healthy infants, well-formed, and my own specified world to bring them up in, and I'll guarantee to take any one at random and train him to become any type of specialist I might select*."

COGNITIVE PSYCHOLOGY

- Emphasis on expertise acquisition as the main factor underlying elite performance
- Simon & Chase (1973): "*10-year-rule*". A decade of intense work and apprenticeship is required to become an expert in chess.
- Ericsson et al. (2006): medicine, professional writing, music, art, math, sports.

EXPERTISE PERFORMANCE FRAMEWORK

- *Expertise is largely the result of a large amount of domain-specific knowledge, acquired through many thousands of hours deliberate practice where one is constantly striving to learn from feedback and push beyond his or her limits*
  - Colvin, 2010; Coyle, 2009; Ericsson et al., 1993; Syed, 2010.

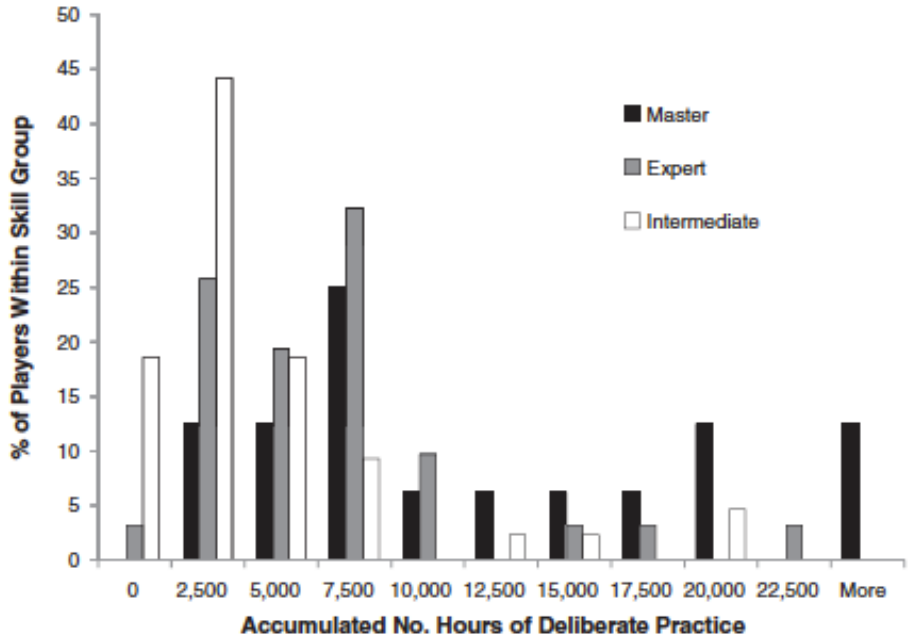
DELIBERATE PRACTICE

"Engagement in highly structured activities that are created specifically to improve performance in a domain through immediate feedback, that require a high level of concentration, and that are not inherently enjoyable."

- Ericsson et al. (1993)

DELIBERATE PRACTICE: IS THAT ALL IT TAKES TO BECOME AN EXPERT? (HAMBRICK ET AL., 2013)

- Practice distinguishes between levels:



DELIBERATE PRACTICE: IS THAT ALL IT TAKES TO BECOME AN EXPERT? (HAMBRICK ET AL., 2013)

- But… deliberate practice explained about 30% of the variation in performance.
- Impressive amount! Perhaps playing out any other personal characteristic?
- How about other personal and environmental factors?
  - Starting age? (e.g. Howard, 2012; Gobet et al., 2007)
  - General intelligence (e.g., Ruthsatz, 2012)
  - Motivation and the ability to persevere and persist are likely influenced by genetic factors, in interaction with environment
    - e.g., Ryen & Deci, 2000; Kaufman, 2009; Vinkhuyzen et al, 2009

PERSEVERANCE: GOAL-DIRECTED BEHAVIOR

Individual differences!

SARAH (5)

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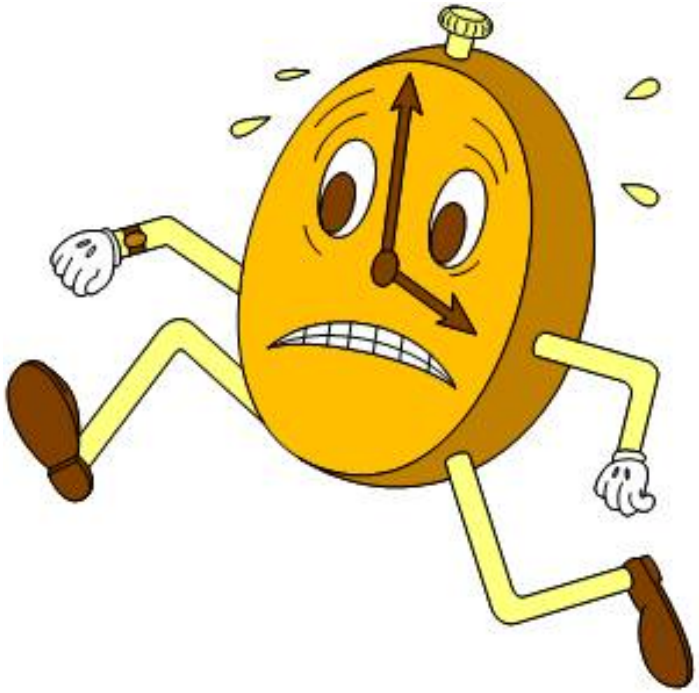
- Sort toys
- Know where each toy belongs
- Really clean up the toys (and don’t start to play again)
- Check if she really cleaned up all the toys

JESSE (14)

JESSE (14)

- Gets up at 7.15AM
- Shower
- Dress
- Bag
- Breakfast
- Make lunch
- Brush teeth

JESSE (14)



EXECUTIVE FUNCTION (1)

- Umbrella term for various cognitive processes that subserve goal-directed behavior.
  - Miller & Cohen, 2001; see also Luria, 1966, Shallice, 1982

- Resist impulses
- Efficient planning
- Flexible switching
- Actively use memory
- Monitor own behavior

EDUCATION SETTINGS

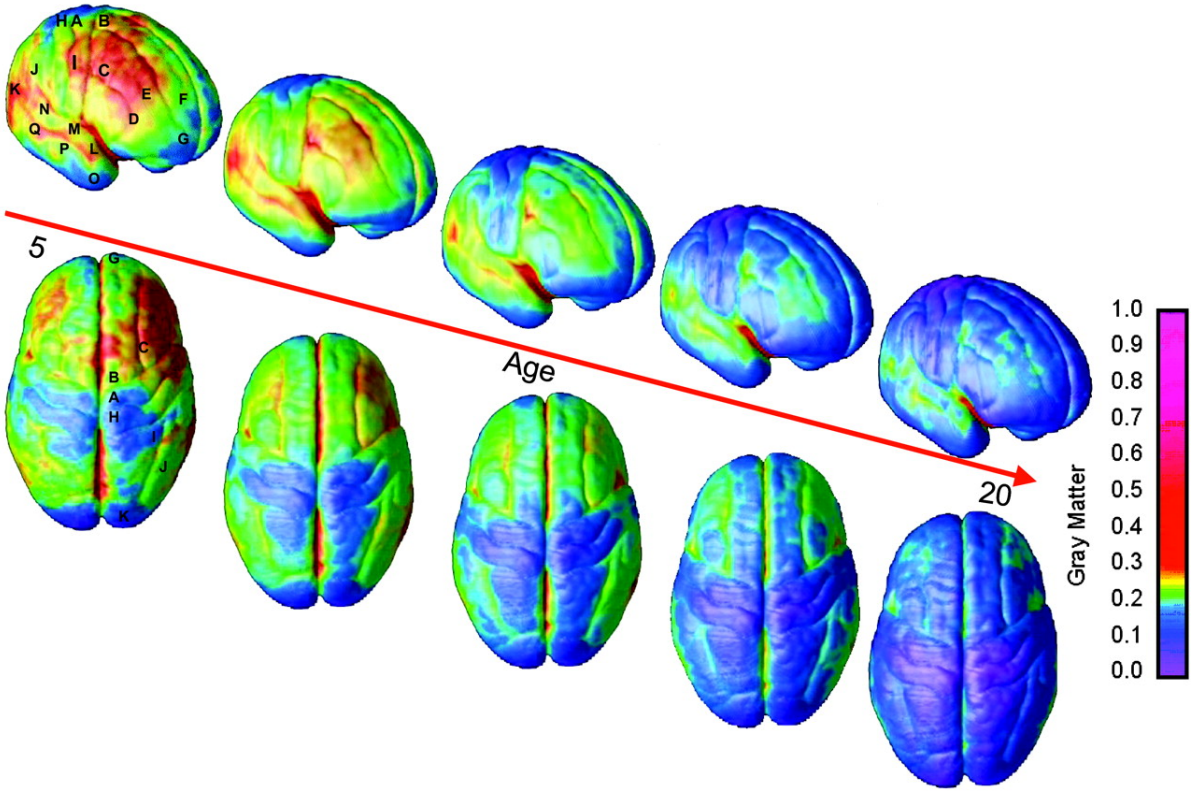
- Direct learning of skills
- Capacity to reason about abstract ideas
- Behavioral control:
  - Sitting at a desk
  - Avoiding distractions
  - Doing homework
  - Flexibly adjust to changing circumstances

EXECUTIVE FUNCTION (2)

- Maturation of different executive function processes mature at different rates, reaching adult levels at different ages.
  - Huizinga, Dolan, & Van der Molen (2006); Welsh et al. (1991)

- Related to differential structural and functional maturation of the prefrontal cortex and frontal-striatal circuits.
  - Amso & Casey (2006); Casey et al. (2005)

PREFRONTAL CORTEX DEVELOPMENT



Gogtay et al. (2004)

ADOLESCENCE (1)

- Determination of developmental outcome and educational success:

- Recent neurocognitive theories on adolescent development focus on interplay between socio-emotional factors and cognitive factors
  - Dahl & Spears (2004), Dahl & Crone (2012)

ADOLESCENCE (3)

- Contradiction: ability ‘to know’, but not ‘do’
- Related to great physical, but also socio-emotional and cognitive changes
  - Crone (2009), Dahl & Gunnar (2009), Steinberg et al. (2008)

- Important changes in social environment:
  - Engagement in risk-taking behavior
  - Rebelling against authority figures
  - Strong focus on peer interactions

ADOLESCENCE (4)

- Adolescents are under unique social and emotional pressures (Steinberg, 2005):
  - Peer expectations
  - Increased desires
  - Increased motivations

- *Thus: adolescent's reasoning and decision making is not just a reflection of their cognitive ability. Also of their emotional, social and physical state*.

ADOLESCENCE:

- Upsurge of affective processing
- Increase in peer pressure

- Cognitive system
- Iterative, more protracted development

- *Precarious balance between socio-emotional factors and cognitive factors.*
  - Dahl & Spear (2004), Dahl & Crone (2012)

Socio-emo factors

Cognitive factors

Adolescence

Immature cognitive system = vulnerable system.

Could fail under ‘hot’ (emotional impulses and peer pressure) and demanding (educational) situations.

BACK TO DELIBERATE PRACTICE: IS IT ENOUGH?

- 30% of variance explained by deliberate practice

- And…
- Starting age
- Familial link
- General intelligence
- Perseverance / persistence / goal directed behavior
- Cognitive development
- Socio-emotional development

Anticipate!

DELIBERATE PRACTICE AND GOAL-DIRECTED BEHAVIOR

- Establish development-appropriate goals
- Establish goals that involve measurable skill mastery (rather than time-on-task or quantity of work completed).
- Redirect the student when he uses strategies that allow him/her to complete work without applying significant attention to what he/she is learning.
- Practice monitoring the student's own performance against standards; focus not only on the skill development, but on developing the accuracy of his self-monitoring and self-direction.

TO BE CONTINUED…

Discussion!