

Subject: Re: is this a road map
From: Joscha Bach <[REDACTED]>
Sent: Monday, January 19, 2015 7:07:46 PM
To: Jeffrey Epstein <jeevacation@gmail.com>

[I think] it is a partial map of the territory, while the road is mostly orthogonal. Some of the regions are even emergent.

> • Fluid intelligence (Gf) includes the broad ability to reason, form concepts, and solve problems using unfamiliar information or novel procedures.

General cognition. Mental representation, with universal problem solving based on associative and symbolic operations: Ability to form stable reliable associative patterns, identify regularities in them, manipulate conceptual representations, traverse spaces of mental simulations, direct and maintain attention, learn a natural language and use it to structure thought and imagination; strikes me as the hardest and most comprehensive part.

> • Crystallized intelligence (Gc) includes the breadth and depth of a person's acquired knowledge, the ability to communicate one's knowledge, and the ability to reason using previously learned experiences or procedures.

Using the tools mentioned above to abstract knowledge from interaction with an environment, or from analysis of relevant data

> • Quantitative reasoning (Gq) is the ability to comprehend quantitative concepts and relationships and to manipulate numerical symbols.

Numerosity, ability to abstract and use language to control and structure abstract associations (i.e. dynamic mathematical concepts), and to learn and perform operations/simulations in that domain. Your numeral synesthesia may be a special case of a superior interface to these operations, and contribute to your genius.

Btw, you probably know this classic story of a guy turned mathematician after being hit on the head?
<http://nypost.com/2014/04/20/how-a-brain-injury-turned-a-college-dropout-into-a-genius/>

> • Reading and writing ability (Grw) includes basic reading and writing skills.

Borrows visual processing (including learning of visual grammars), general cognition and language, along with tool use, to do something we have not been evolved for.

> • Short-term memory (Gsm) is the ability to apprehend and hold information in immediate awareness, and then use it within a few seconds.

Cache memory and registers for general cognition.

> • Long-term storage and retrieval (Glr) is the ability to store information and fluently retrieve it later in the process of thinking.

Stable, abstract knowledge, prerequisite for frames, objects, trajectories, expectations, planning, and generally crystallized intelligence stuff.

The next bullet points refer to specific sensory processing chains (which tie into general cognition).

> • Visual processing (Gv) is the ability to perceive, analyze, synthesize, and think with visual patterns, including the ability to store and recall visual representations.

> • Auditory processing (Ga) is the ability to analyze, synthesize, and discriminate auditory stimuli, including the ability to process and discriminate speech sounds that may be presented under distorted conditions.

> • Processing speed (Gs) is the ability to perform automatic cognitive tasks, particularly when measured under pressure to maintain focused attention.

I don't think that some people have faster neurons, but some people might have neurons that are a bit less noisy, and thus require less error correction and thus offer additional resources for resolving knowledge (in that case, one might possibly expect greater sensory acuity, too). A possible explanation for the superior abilities of some people to identify patterns might involve a slightly larger set of pointers for symbolic operations, which allows more fine grained retrieval of memory content, and more fine grained formation of conceptual knowledge, too.

> • Decision/reaction time/speed (Gt) reflects the immediacy with which an individual can react to stimuli or a task (typically measured in seconds or fractions of seconds; it is not to be confused with Gs, which typically is measured in intervals of 2–3 minutes). See Mental chronometry.

In addition to the previous two points, perhaps a better ability to harness mental resources (setting up the cerebellum for reaction tasks etc.)

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Suggested road map for building AI, incomplete and not entirely in discrete ordering, as they are not entirely independent:

- Sensory processing and learning, abstracted into suitably general mental representations
- Top-down processing, attentional processing
- Categorization, accommodation and assimilation
- Time, space, motion
- Conflicting and counterfactual representations and collapse them as needed
- Grammatical abstraction (esp. visual grammars)
- Declarative abstraction, episodic abstraction, situative framing
- Anticipation, and visual imagination
- Symbolic operations, syllogistic reasoning, rule abstraction
- Intrinsic motivation, motivational learning
- Planning, goal-directed action
- Natural language: linguistic labels, grammar, construction and deconstruction of utterances, creation of mental simulations
- Mechanical and intentional world models, Theory of Mind
- Autonomous learning and supervised training to acquire content and skills

I consider motor control and embodied cognition as optional and mostly emergent over the previous items. But if the system cannot use a body when offered one, it is not generally intelligent enough. For testing of general motor skill learning, 3D computer games might be sufficient.