The Science Of Creativity:

Psychology And Neuroscience Insights For Better Ideas And How To Get Leaders To Listen

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idea to value.com
The community for creativity and innovation

What you will learn today:

1. The current trends in creativity levels
2. The scientific insights into how creativity actually works
3. The simple 5 activities you need to do to enhance your creativity, every single day

A completely new perspective on your own ability to create

Why does the CEO care about ideas?

in 2015	in 2020
1. Complex Problem Solving	1. Complex Problem Solving
2. Coordinating with Others	2. Critical Thinking
3. People Management	3. Creativity
4. Critical Thinking	4. People Management
5. Negotiation	5. Coordinating with Others
6. Quality Control	6. Emotional Intelligence
7. Service Orientation	7. Judgment and Decision Making
8. Judgment and Decision Making	8. Service Orientation
9. Active Listening	9. Negotiation
10. Creativity	10. Cognitive Flexibility

In 2010, IBM surveyed 1,500 CEOs from across the world, and they voted creativity to be their **most important** workplace capability to help them survive and grow

Source: 1. World Economic Forum report, The Future of Jobs 2. IBM Survey 2010

Who am I?

Official
Top 20
Innovation Blogs
★★★★★
2016

What most “creativity training” does:

- **Option 1:** Generate as many ideas as possible, because that’s what we can count as successful

- **Option 2:** Let’s get motivated by the success of other innovators

Here's the problem:

Creativity doesn't just happen in a two-hour period when you want it to…

…and it means nothing if it achieves nothing

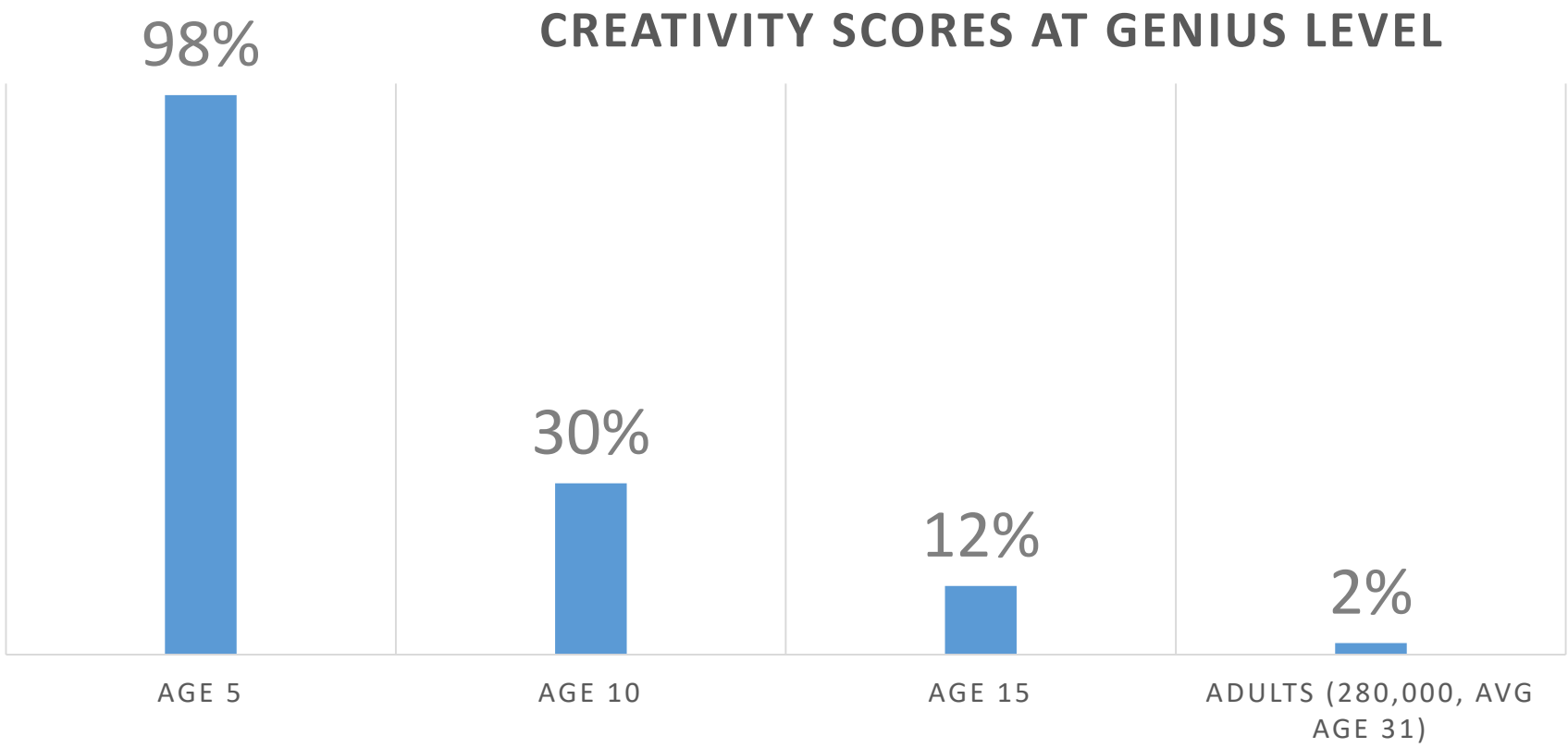
What do I care about?

Evidence


Spend 2 minutes writing down everything that is wrong with this picture

Creative ability decreasing as we age

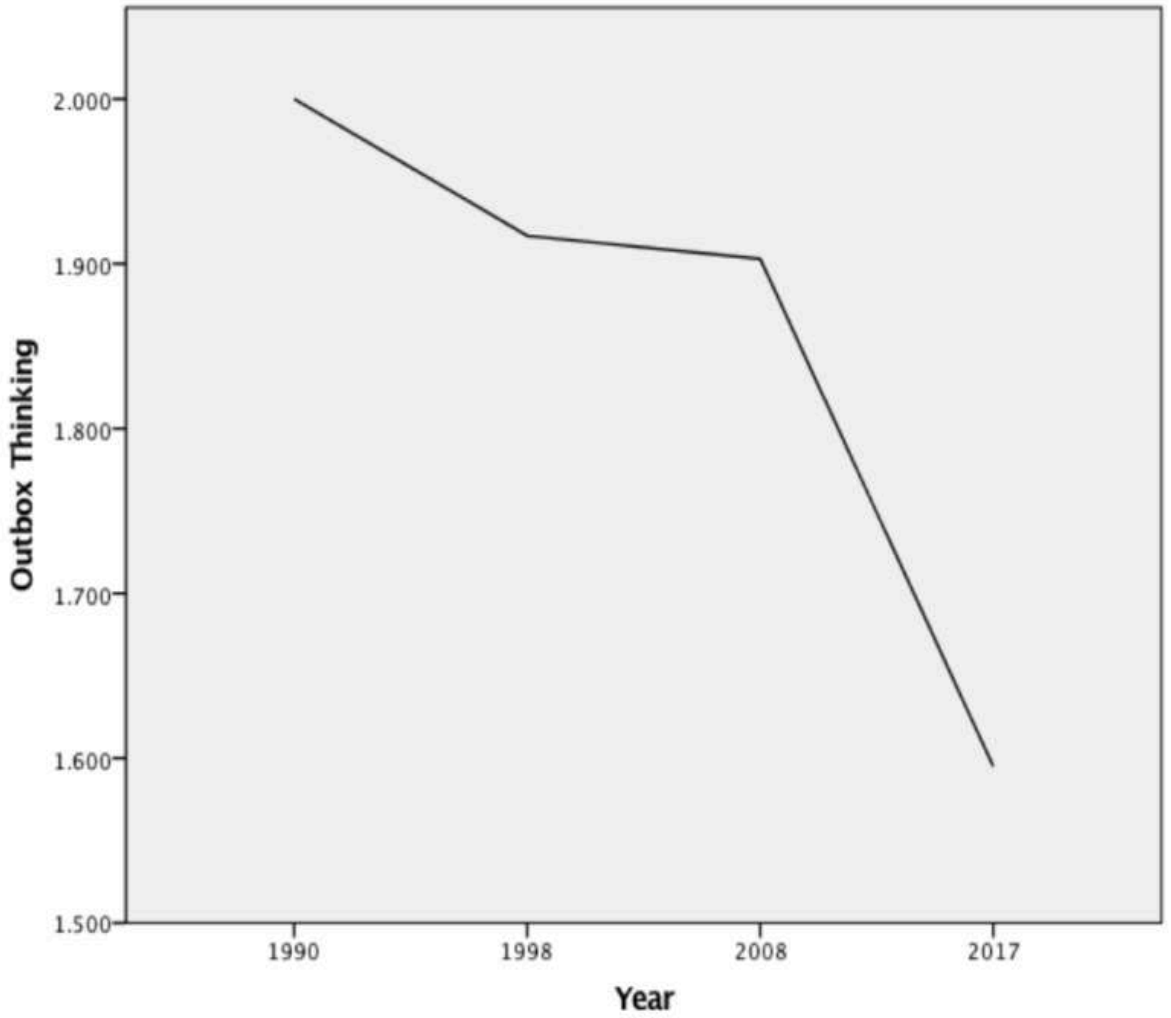
1968 longitudinal study of 1,600 children for NASA



Source: George Land, Breakpoint and Beyond: Mastering the Future Today, 1998

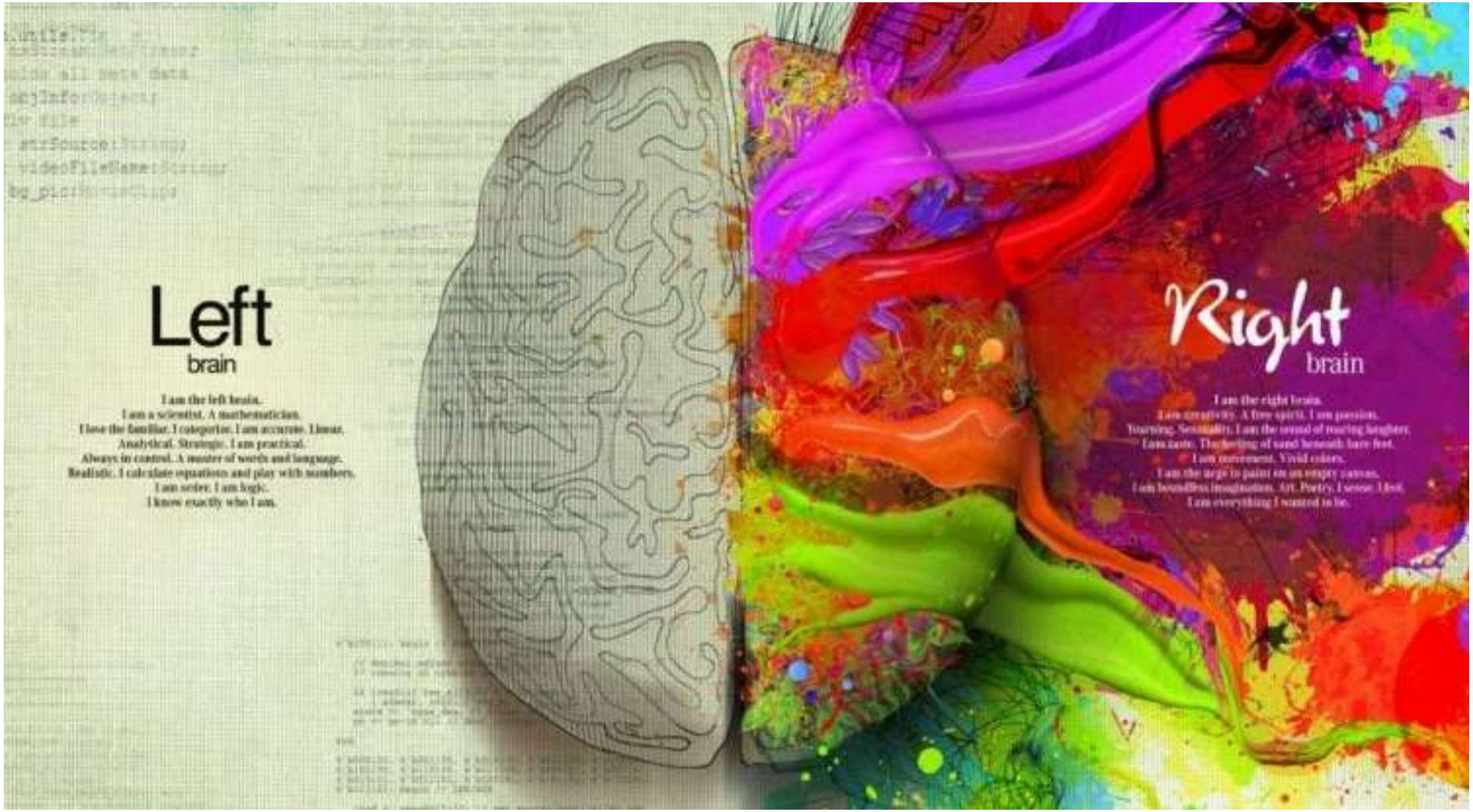
Creativity Tests and trends over time

Edward Paul Torrance
1915 – 2003



Source: Kyung Hee Kim: The Creativity Crisis updated, in review, 2017

Who is creative?



Creativity vs Skill & Talent

What is creativity?

Creation of something which is both ***original*** *and has* ***value***

Source: Mark A Runco et al, Creativity Research Journal, 2012

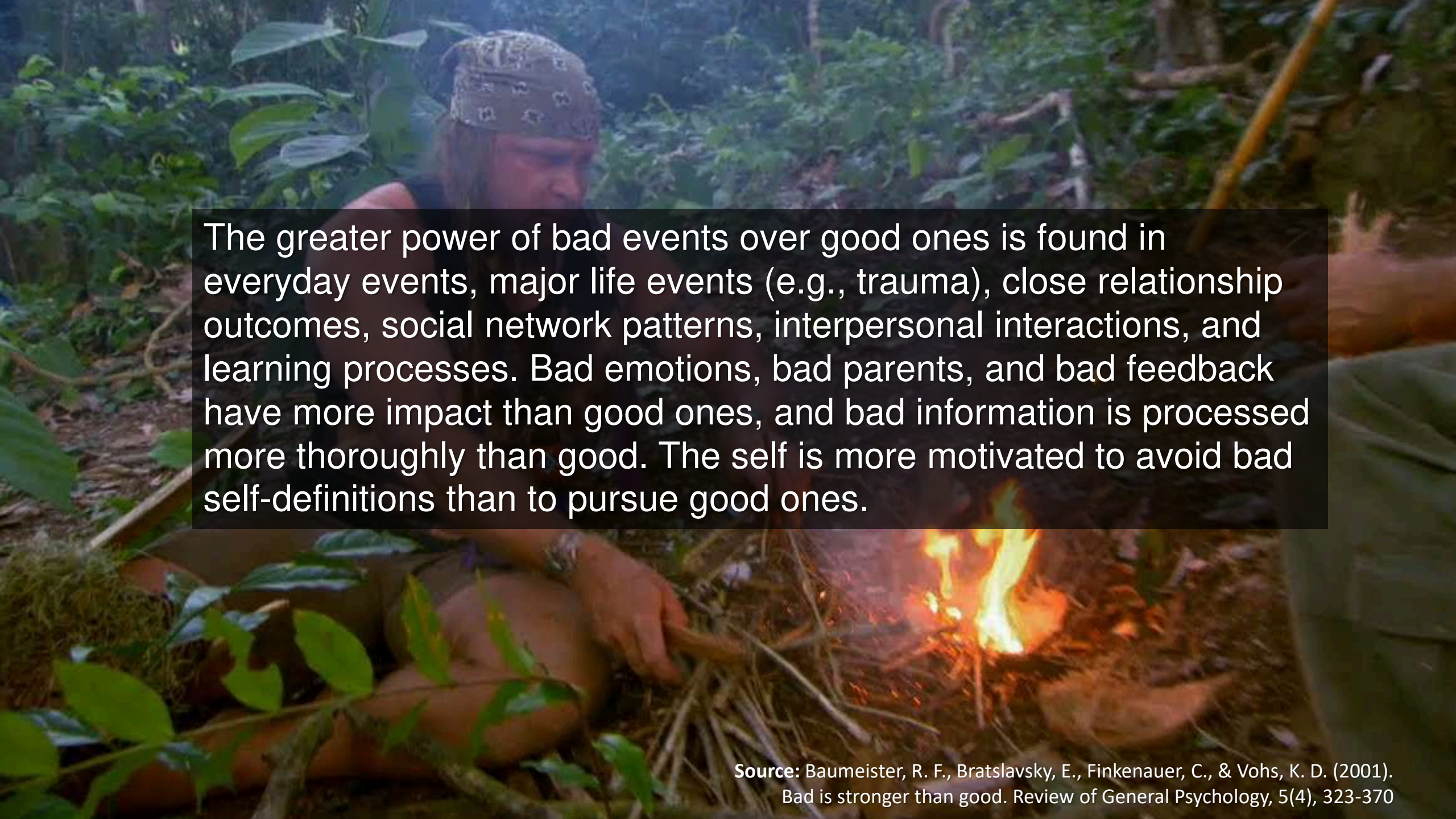
So, how does it really work?

Are some people born non-creative?

Study of 117 pairs of twins:

- 80% of IQ is determined by genetics
- Only 30% of creative ability is from genetics
- 70% of creative ability is determined by **nurture**

Source: Marvin Reznikov et al, Creative abilities in identical and fraternal twins, Behaviour Genetics, 1973



The greater power of bad events over good ones is found in everyday events, major life events (e.g., trauma), close relationship outcomes, social network patterns, interpersonal interactions, and learning processes. Bad emotions, bad parents, and bad feedback have more impact than good ones, and bad information is processed more thoroughly than good. The self is more motivated to avoid bad self-definitions than to pursue good ones.

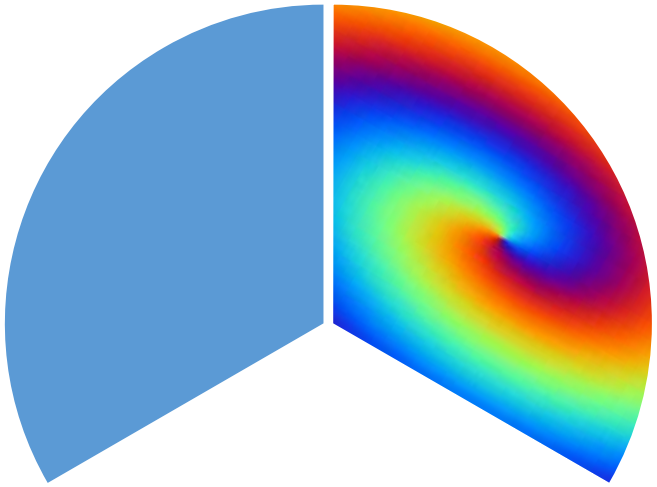
Source: Baumeister, R. F., Bratslavsky, E., Finkenauer, C., & Vohs, K. D. (2001). Bad is stronger than good. Review of General Psychology, 5(4), 323-370

But our brain is lazy

Source: Thinking, Fast and Slow, Daniel Kahneman, 2011

The flow of ideas

Memories

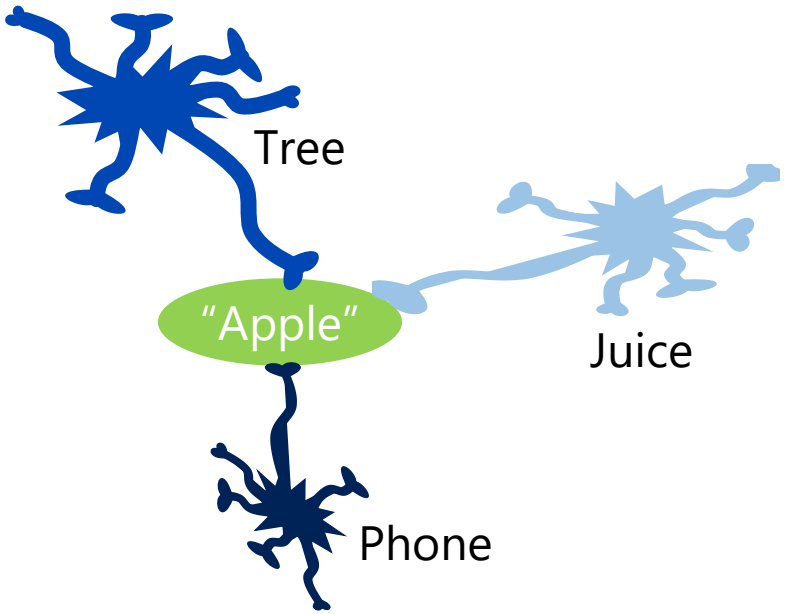


Special ideas

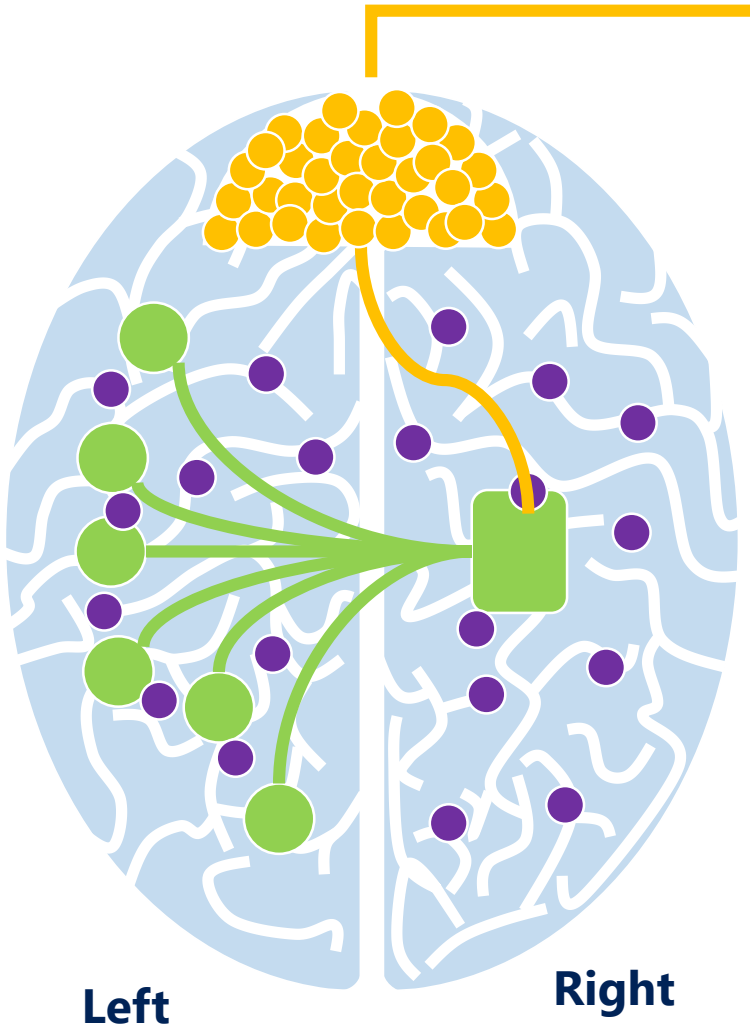
Ordinary ideas

How the whole brain is used in generating ideas

Memories and **concepts** are existing groups of neural connections from various parts of the brain



Ideas are formed through new connections



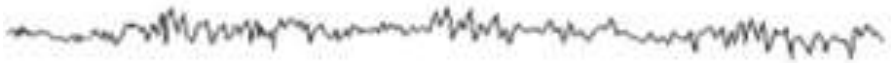
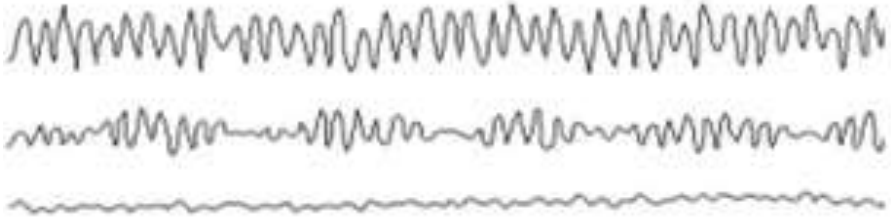
Conscious idea generation happens in Working Memory (the prefrontal cortex), and happens while concentrating on a challenge

Subconscious idea generation happens while we have stopped concentrating on a problem and the brain is not stressed. It is forming new connections between ideas all the time

Source: Brenda Milner et al, Cognitive Neuroscience and the Study of Memory, Neuron, 1998

Best ideas in the shower?

Best ideas in the shower?

Brain state	Frequency (Hz)	Mental state	Visualisation
Beta (β)	13 – 30	High activity, alert, stress	
Alpha (α)	8 – 13	Calm, relaxation	
Theta (θ)	4 – 8	Children, sleeping adults	
Delta (δ)	0.5 – 4	Infants, sleeping adults	

Convergent ideas

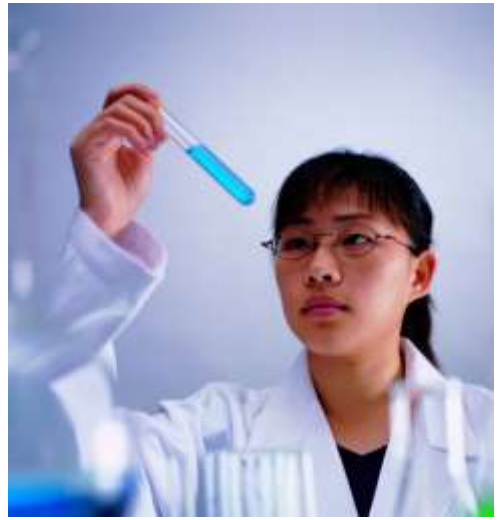
Divergent ideas

Source: Prof Vincent Walsh

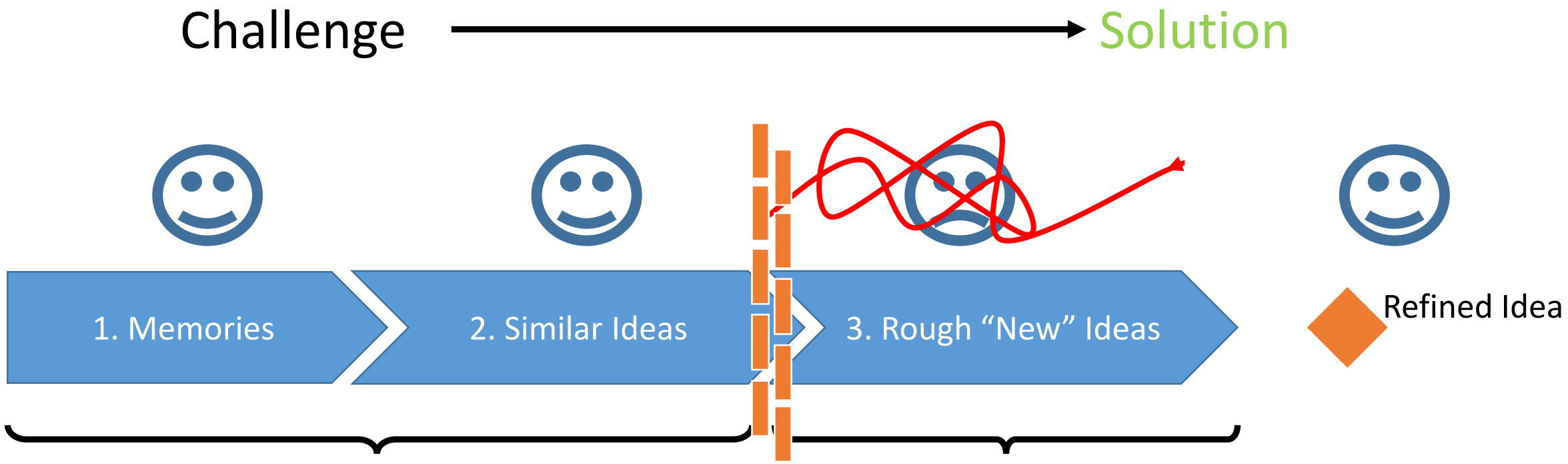
You're only aware of less than 1% of your brain activity, and most creativity happens in the other 99%

Four Stages of creativity

1. Preparation
2. Incubation
3. Inspiration
4. Verification



How the brain approaches challenges

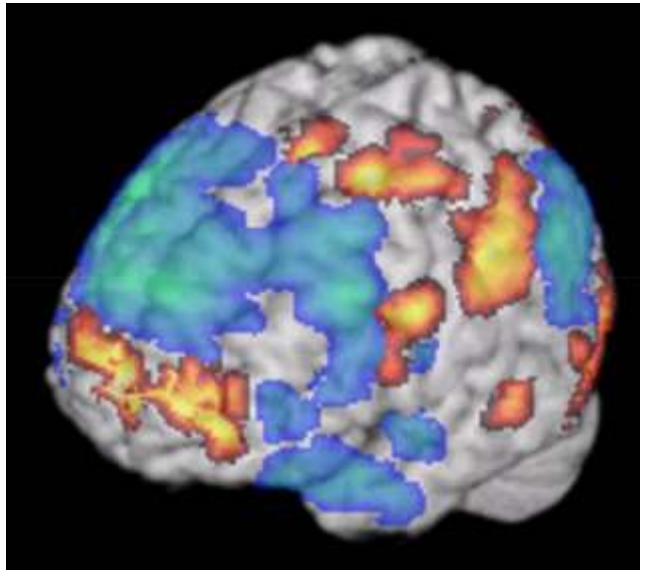


- Will work
- Boring

Comfort barrier

- Scary & Uncomfortable
- Imperfect & Failure
- Challenged
- **Need Refinement, Experiments & TIME**

Self inhibition



Source: Charles Limb, Neural Substrates of Spontaneous Musical Performance: An fMRI Study of Jazz Improvisation, PLoS, 2008

Cognitive biases affecting creativity

- Loss aversion
- Anti-Creativity bias
- Creative Stereotype bias
- Impostor Syndrome
- Mere exposure effect
- Ambiguity Effect
- Functional Fixedness
- Semmelweiss reflex
- Zero-risk bias
- Many, many more…

Source: Wikipedia, Mueller, J. S., Melwani, S., & Goncalo, J. A. (2011). The bias against creativity: Why people desire but reject creative ideas

How to get leaders to listen to your ideas

- Drip feed content over time
- Involve them in the development process
- Talk about benefits, not features
- Frame it as the journey to the right answer, not the final solution
- Distinguish failure from experimentation
- Help them understand their biases
- Read the room and strike at the opportune moment

Becoming even more creative

1. Unfocused time

vs

Low energy: Divergent

High focus: Convergent

2. Focus on challenges and ideas

vs

Actions

Activity

3. Variety and new experiences

1. More information which the brain can combine in new and unexpected ways

2. Short term creativity boost of 14%

Source: Simone Ritter, Creativity Research Journal, 2014

4. Creative projects

5. Regular deliberate creativity training

Challenge: how can we train ourselves to push past our comfort barrier?

Solution: Deep creativity training

- Requires regular, time limited activity
- Deliberate training, rather than just spending time
- Focus on challenge and improvement
- Open-ended with on correct answer
- Drip fed, to prevent “skimming” and preparation
- Based on proven creativity assessment techniques

Discussion and Q&A