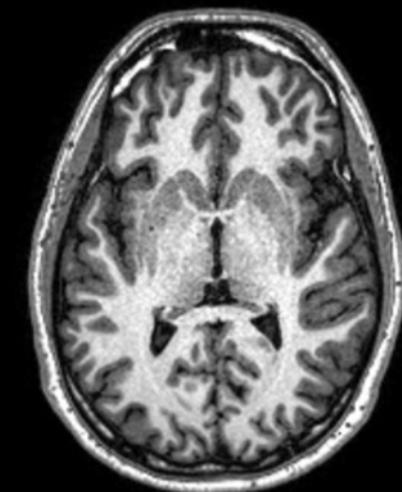
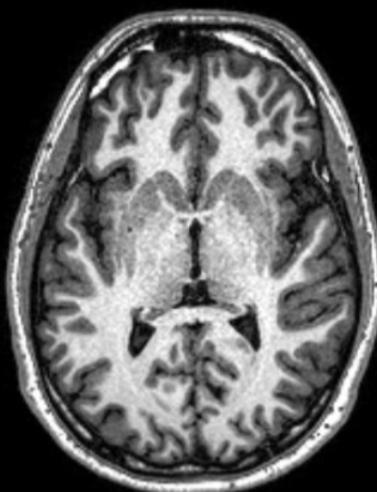


Creatively constructing meaning in the classroom... and beyond

Nathaniel Barr, PhD





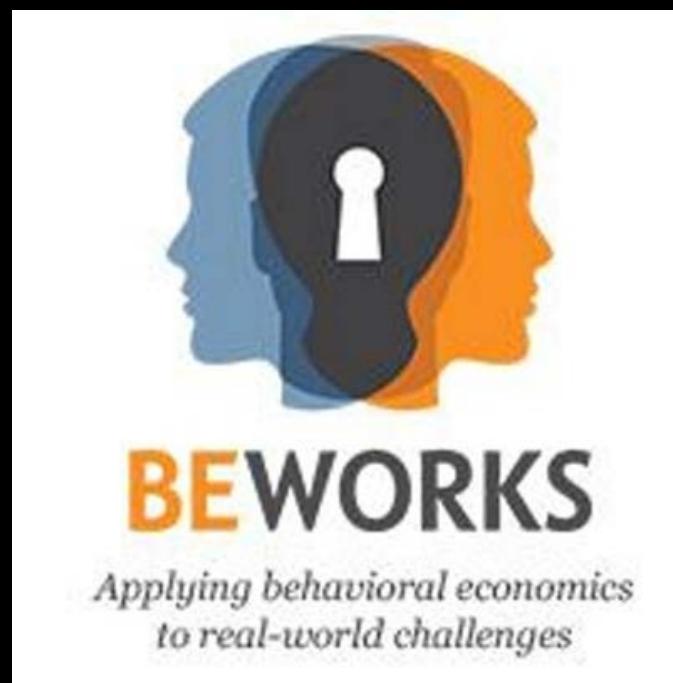
UNIVERSITY OF WATERLOO
FACULTY OF ARTS
Department of Psychology

Reasoning and Decision Making



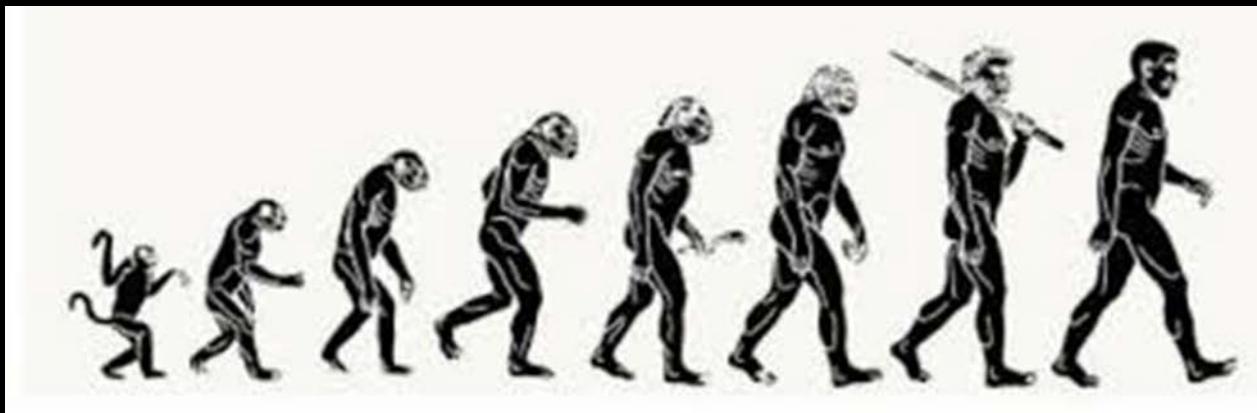
VISION AND ATTENTION LAB

Sheridan | Get Creative



“Humans are animals that specialize in thinking and knowing, and our extraordinary cognitive abilities have transformed every aspect of our lives. In contrast to our chimpanzee cousins and Stone Age ancestors, we are complex political, economic, scientific and artistic creatures, living in a vast range of habitats, many of which are our own creation.”

• Cecelia Hayes



Upper Paleolithic Revolution

“Unlike previous eras, when stasis dominated, innovation is now the essence of culture, with change being measured in millennia rather than hundreds of millennia. Known as the Upper Paleolithic Revolution, this collective archaeological signal is unmistakable evidence of the modern human mind at work.”

-Leakey, 1984

“From the first chipped stone to the first smelted iron took nearly 3 million years; from the first iron to the hydrogen bomb took only 3,000.”

-Ronald Wright

Anthropocene (E. Stoermer)

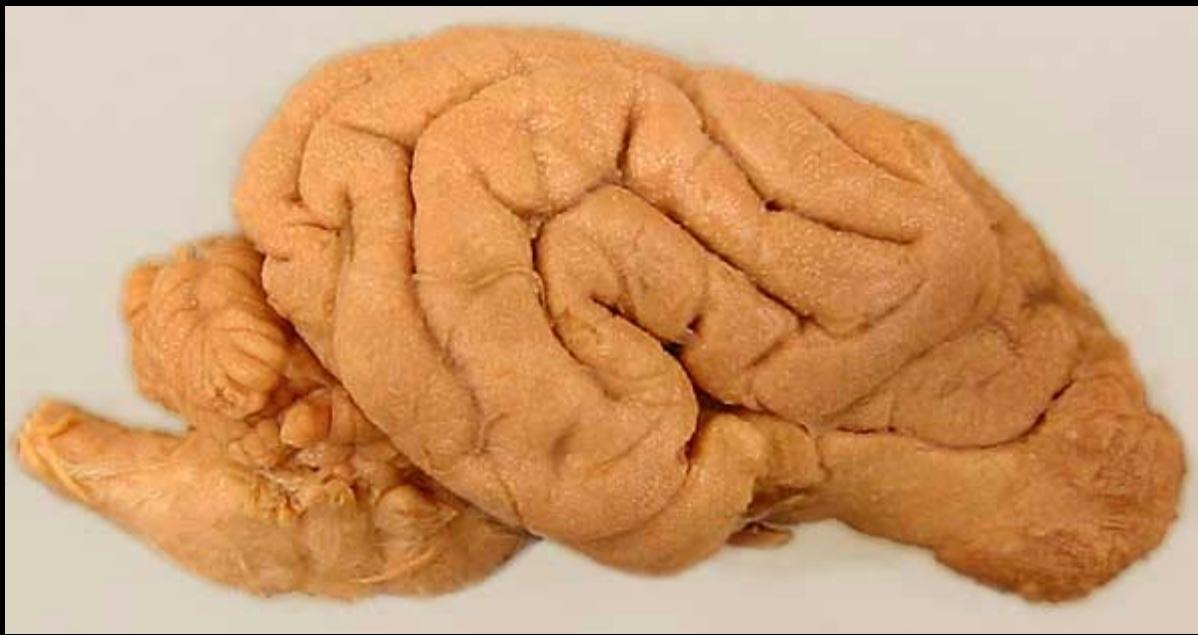
- A geologic chronological term that denotes the modern era in which humans have irrevocably altered the Earth

Why are we so creative?

“The oldest and still most popular explanation for the wide ranging disparity between human and nonhuman animals’ cognitive abilities is language...”

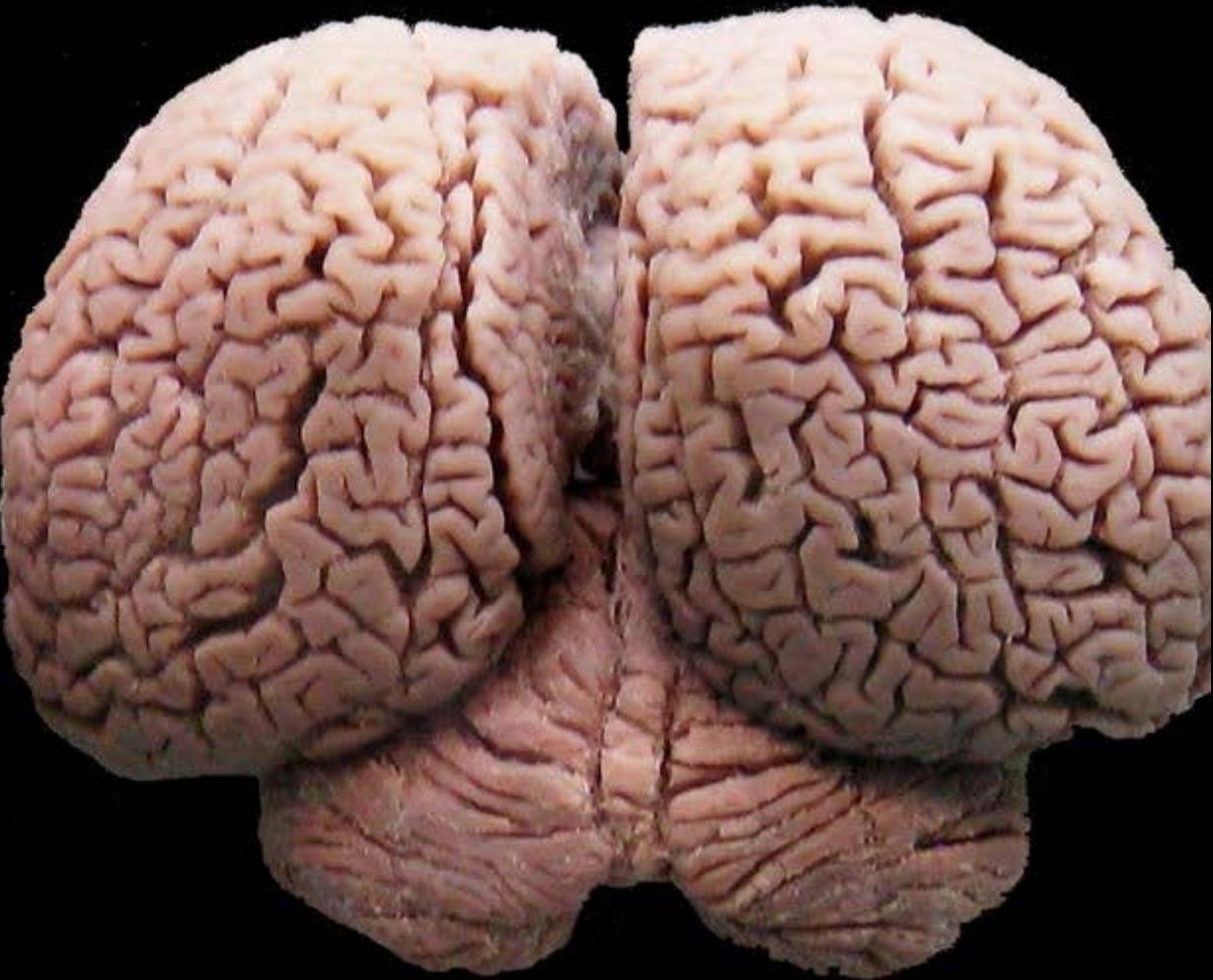
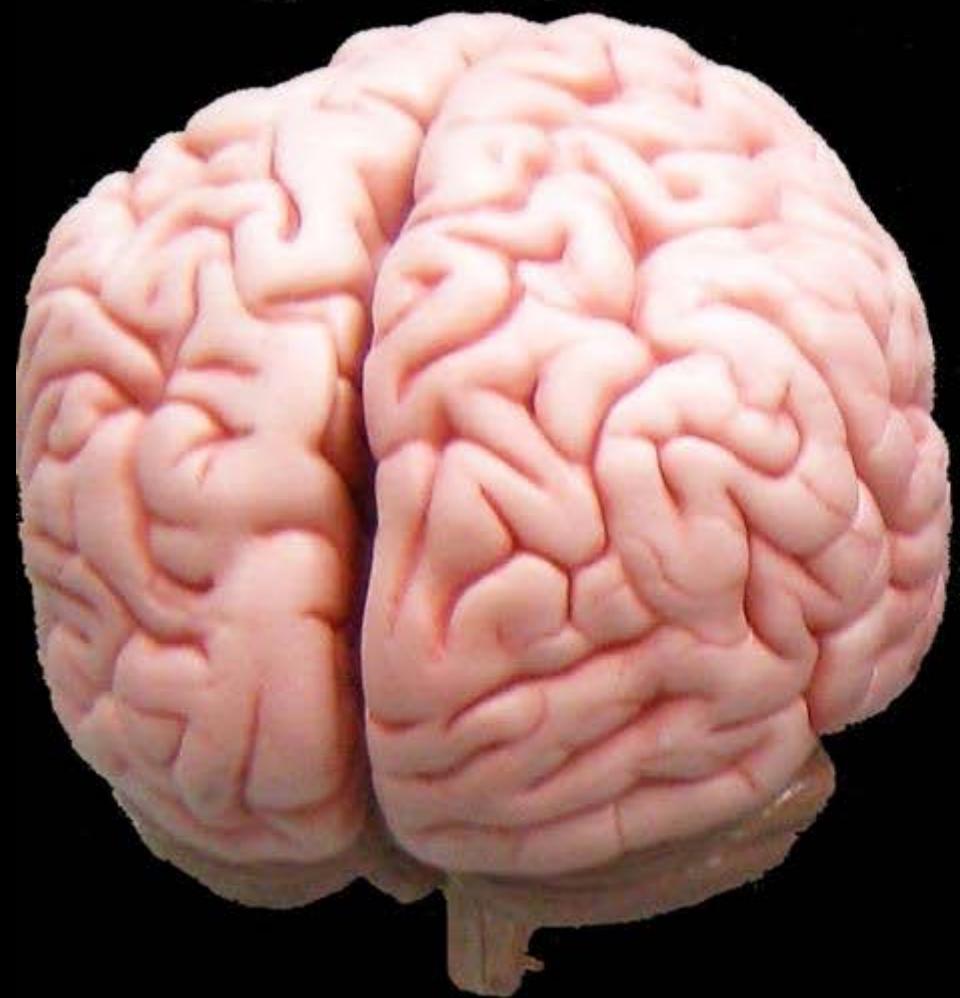
- Penn, Holyoak & Povinelli, 2008



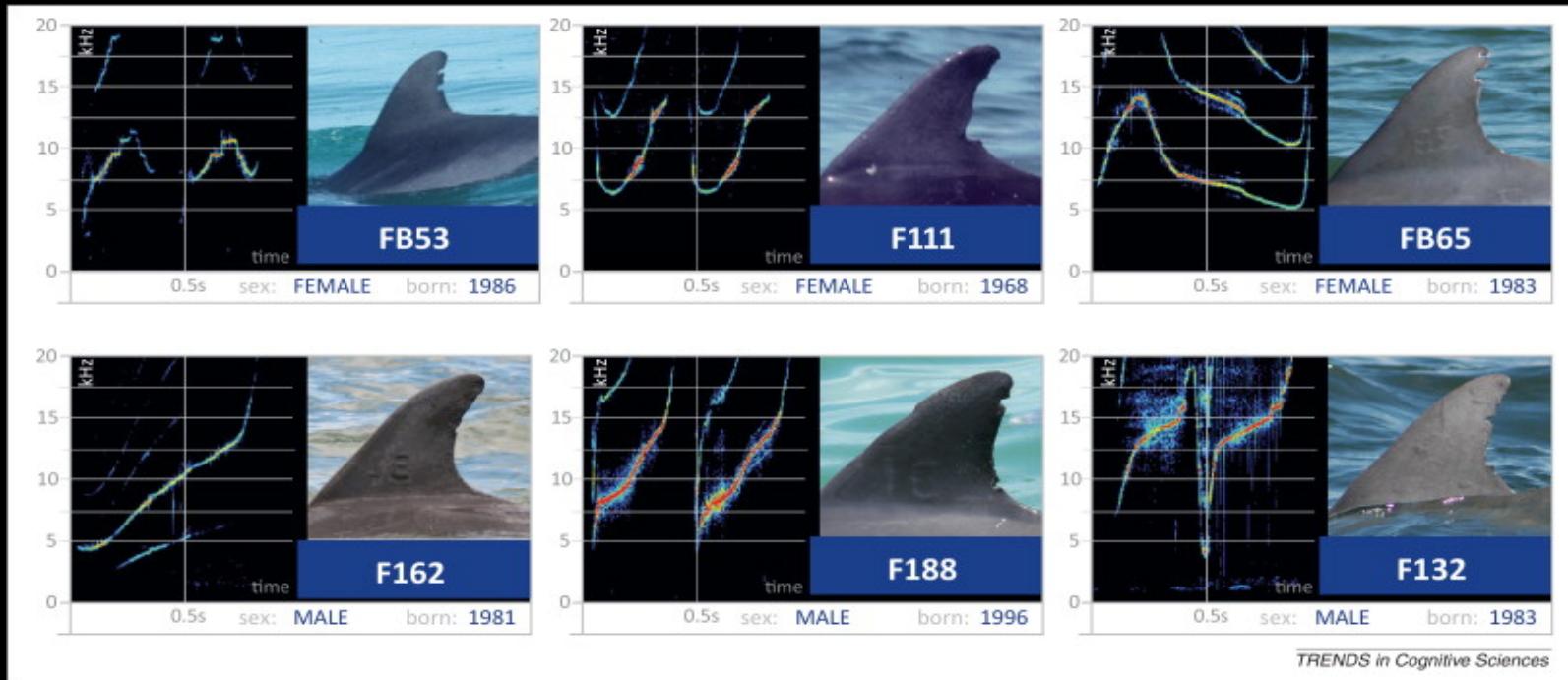




© Mark Olencki



Cognitive skills in bottlenose dolphin communication



Each dolphin develops its own distinctive frequency modulation pattern. Some animals achieve this by copying another individual's whistle and then modifying it to create a novel and unique modulation pattern. Others seem to create whistles without using a model. The identity information encoded in the invented modulation pattern is recognised by conspecifics and can be copied to address the inventor of the whistle.

What dolphins **CANNOT** do:

- Refer to objects in their environment
- Refer to abstract concepts
- Combine small meaningful elements into larger meaningful elements
- Organize communicative elements into a systematic grammar that can produce an infinite combination of meanings
- Refer to things in the past and the future
- Learn and store in memory the meanings of hundreds of thousands of concepts and map them onto specific combinations of vocal patterns

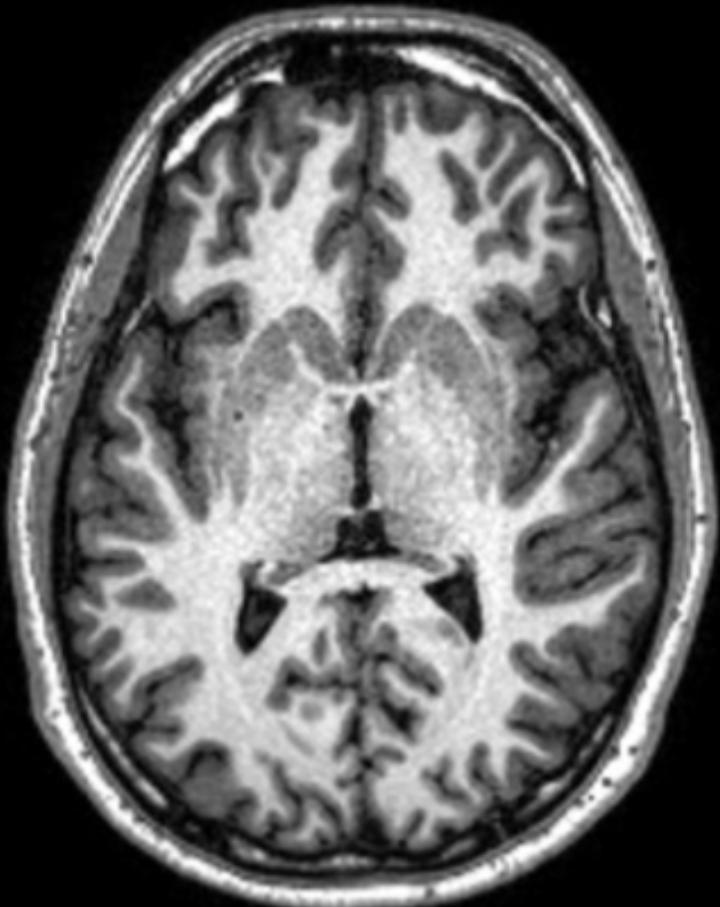
<http://www.dolphincommunicationproject.org/home.html>

“Dennett (1996, p. 17)...:

“Perhaps the kind of mind you get when you add language to it is so different from the kind of mind you can have without language that calling them both minds is a mistake.”

- Penn, Holyoak & Povinelli, 2008

Language as a uniquely human type of memory



“Memory is a gift of nature, the ability of living organisms to retain and to utilize acquired information or knowledge.”

• Tulving, 1995

“Owners of biological memory systems are capable of behaving more appropriately at a later time because of their experiences at an earlier time, a feat not possible for organisms without memory.”

- Tulving, 1995

English Language Learning Magazine

CONTACT

November 2012

Cognition in Language Learning

WHAT YOU SHOULD KNOW ABOUT MEMORY
HOW GOOD TEACHERS USE IMAGERY

VOLUME 38, NUMBER 4, NOVEMBER, 2012

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Teachers of English as a Second Language Association of Ontario
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CONNECTION • COMMUNITY • EMPOWERMENT

MEMORY AND LANGUAGE LEARNING

By Kirsten M. Hummel

“One factor that is attracting increasing attention for its role in language learning is memory. Memory is important in any learning endeavour, and it may be particularly critical in learning a second language.

“teachers should be encouraged to devise additional ways to meet their students’ needs based on basic information about how memory functions”

“crucial to know something about how memory functions in order to understand its complex relationship with language learning”

Memory science and TESL

- Many findings from cognitive psychological literature of relevance:
 - Working memory span
 - Imagery
 - Mnemonic techniques (e.g., method of loci)
 - Generation effect
 - Production effect
 - Distributed practice
 - Encoding specificity principle
 - Testing effect
 - ...
 - DEEP MEANING

Digit span task:

numbers presented one at a time at a rate of
one per second and your job is to repeat the
digits back in order

“The highest digit span ever recorded
is 18 digits....
the span of the German mathematics professor
Rückle”

-Ericsson & Chase, 1982, *Exceptional Memory*

Let's try it, shall we?

Let's try it, shall we?

4
6
9
7
4
5
2
2
5
2
9
4
1
7
6
8
3
6

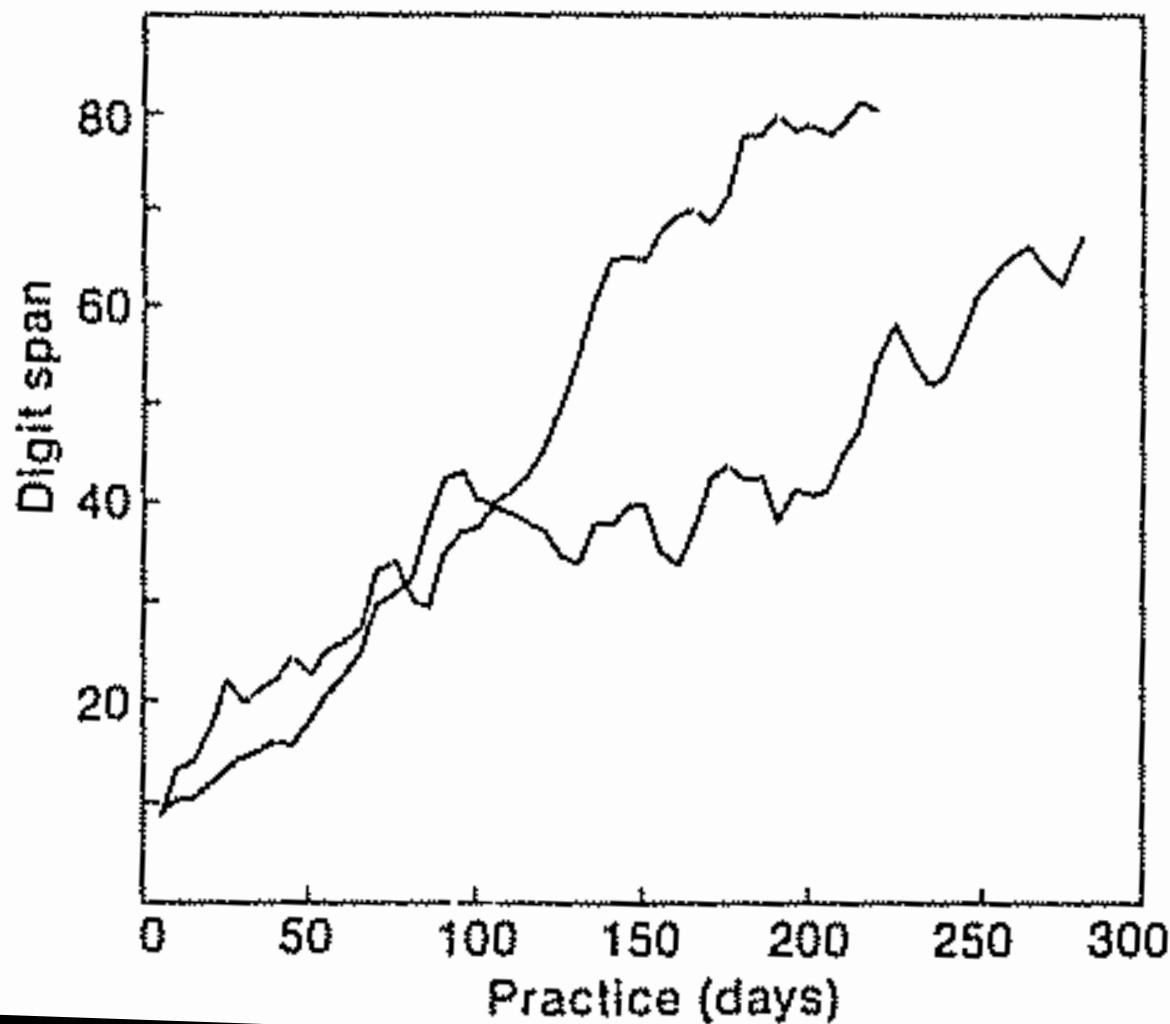
Training Study

- SF
- student with average memory abilities
- 3-5 days a week for 20 months (230 hours of lab testing)
- Self taught (i.e. no instruction from experimenters)

SF was a runner



SF



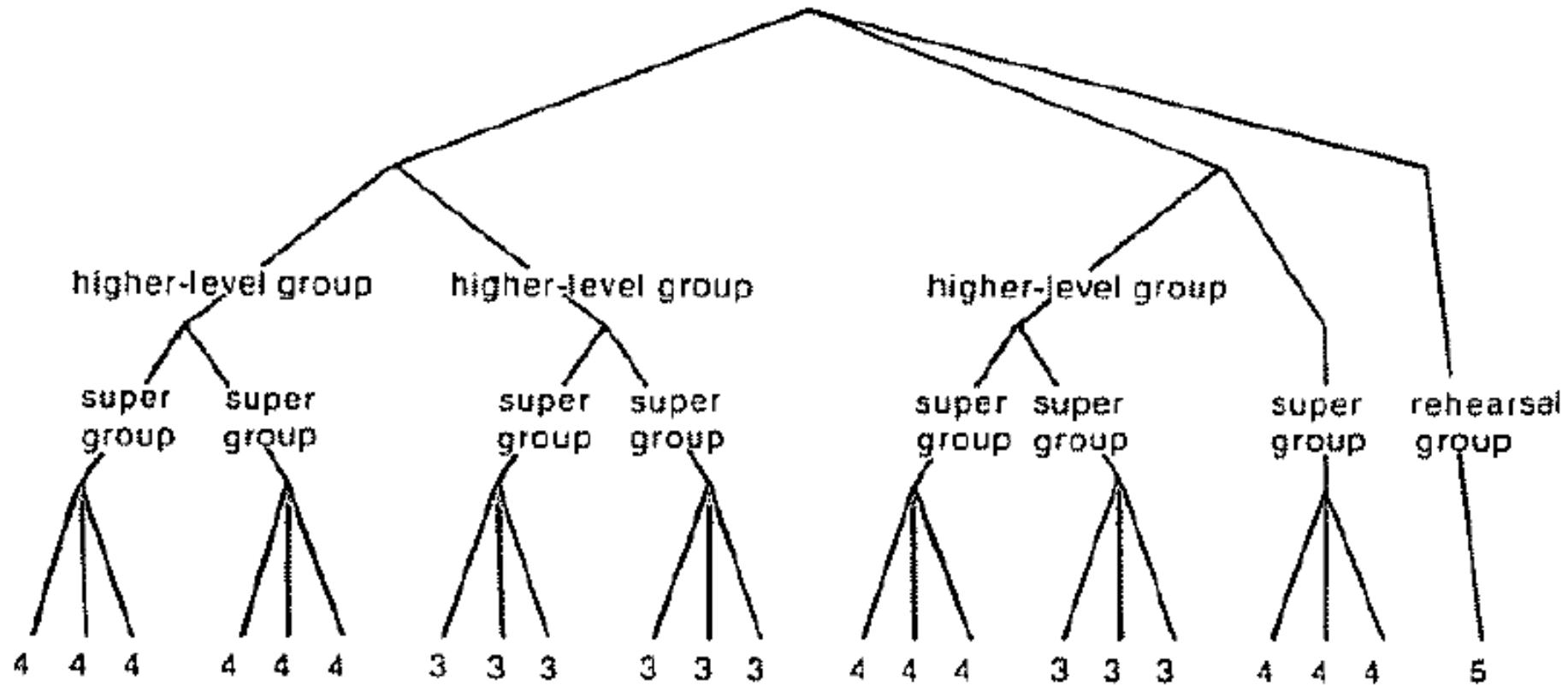


Figure 2. SF always grouped each sequence of digits in a specified order and arranged the groups hierarchically as shown here. Except for the group of 5 digits at the end that he rehearsed mentally, SF coded sequences of digits into groups of 3 or 4 digits, which, in turn, were combined into "super groups." These super groups were then combined into higher-level groups.

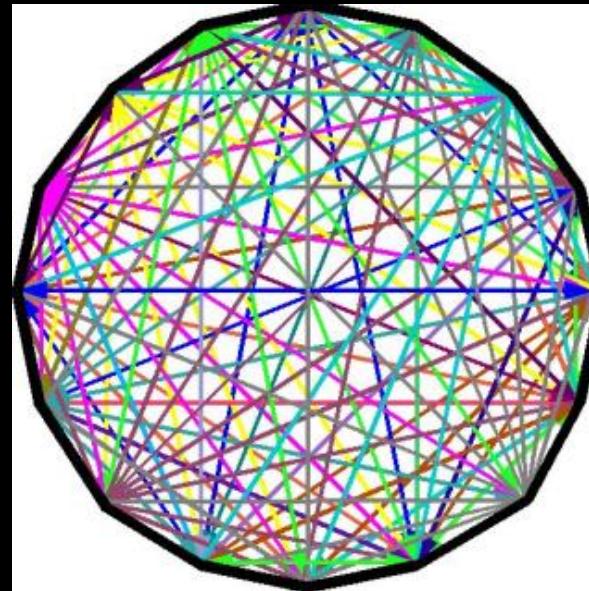
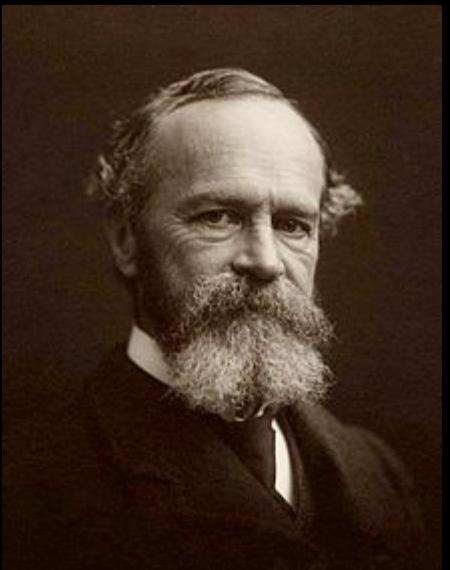
- Any guess as to the new record????
 - Held by Lance Tschirhart

456!!!!!!!!!!!! (over 7.5 min. to present)



"The one who thinks over his experiences most, and weaves them into systematic relations with each other, will be the one with the best memory."

- William James



Maintenance vs. Elaborative Rehearsal

- Maintenance Rehearsal
 - Repetition
 - Maintain or hold information without transferring it into deeper code
- Elaborative Rehearsal
 - Elaborate on meaning
 - Transfers information to deeper code
 - Provides richer multimodal codes
 - Makes memory more unique and thus easier to retrieve

Levels of processing

(Craik & Tulving, 1975)

- Case: Is the word in upper case? dog
- Rhyme: Does the following rhyme with mat? hat
- Generate: What is the opposite of go? stop

“We soon forget what we have
not deeply thought about.”

Self reference effect

- Memory is *especially* improved when content is processed in context of one's self

“the self appears to function as a superordinate schema that is deeply involved in the processing, interpretation, and memory of personal information”

- Rogers et al., 1977

Meaning and Memory in TESL classroom

- Need to connect to pre-existent knowledge
- Need deep processing
- Need to relate to the individual

Creatively constructing meaning

- An example of an assignment which can provide template for creatively constructing meaning in the classroom and beyond

Ruth Noller's Creativity Formula

- *Creativity (C) is a function (f) of Attitude (a) applied to Knowledge (K), Imagination (I), and Evaluation (E):*

$$C = f_a(K, I, E)$$

Ruth Noller's Creativity Formula

- *Attitude: Vision (V), Deliberate Practice (DP), and Intrinsic Motivation (IM):*

a = V,DP,IM

Instructions

- Prompts for each piece of formula
- Each one focuses on a different element of student's personal creativity formula
- Students are instructed to reflect on these elements and their potential to be creative in their own lives
- Class activities to supplement/discuss

Vision

- Your vision is the destination for your creativity and what you want your life to look like.
- career, hobbies, art, music
- could be broad fields of study or work, or highly specific examples of ways for students to express creativity

“Progress”

“Paleolithic hunters who learnt how to kill two mammoths instead of one had made progress. Those who learnt how to kill 200– by driving a whole herd over a cliff– had made too much. They lived high for a while, then starved.”

-Ronald Wright

Challenges of the present

“the future of everything we have accomplished since our intelligence evolved depends on the wisdom of our actions over the next few years”

“Earth has grown too small to forgive us any big mistakes”

-Ronald Wright, *A Short History of Progress*

CHANGE

- Change in society always provides new causes that we must strive to address through diverse mediums

- Arts
- Science/Technology
- Humanities
- Social Sciences
- Business
- Education

Knowledge

- Key to the ability to think creatively is having a rich store of knowledge available to combine, re-create and re-imagine concepts in novel ways to innovate in areas you care about to solve problems.
- Also essential are skills, both technical (e.g., programming, drawing, writing) and cognitive (e.g., paying attention, reasoning logically), that will allow you to work effectively.
- What areas would you consider yourself an expert in? What do you know a lot about? What would you benefit from learning more about? What skills do you currently have that are related to areas in which you hope to eventually innovate? Use your creativity to consider how two areas of knowledge or skills you possess that don't seem connected might actually be related. These need not be solely related to things you do at school and can include hobbies and other interests.

Paul Thagard

- Computational-Representational Understanding of Mind

“Thinking can best be understood in terms of representational structures in the mind and computational procedures that operate on those structures.”

Mind: An Introduction to Cognitive Science
(MIT Press, 1996)

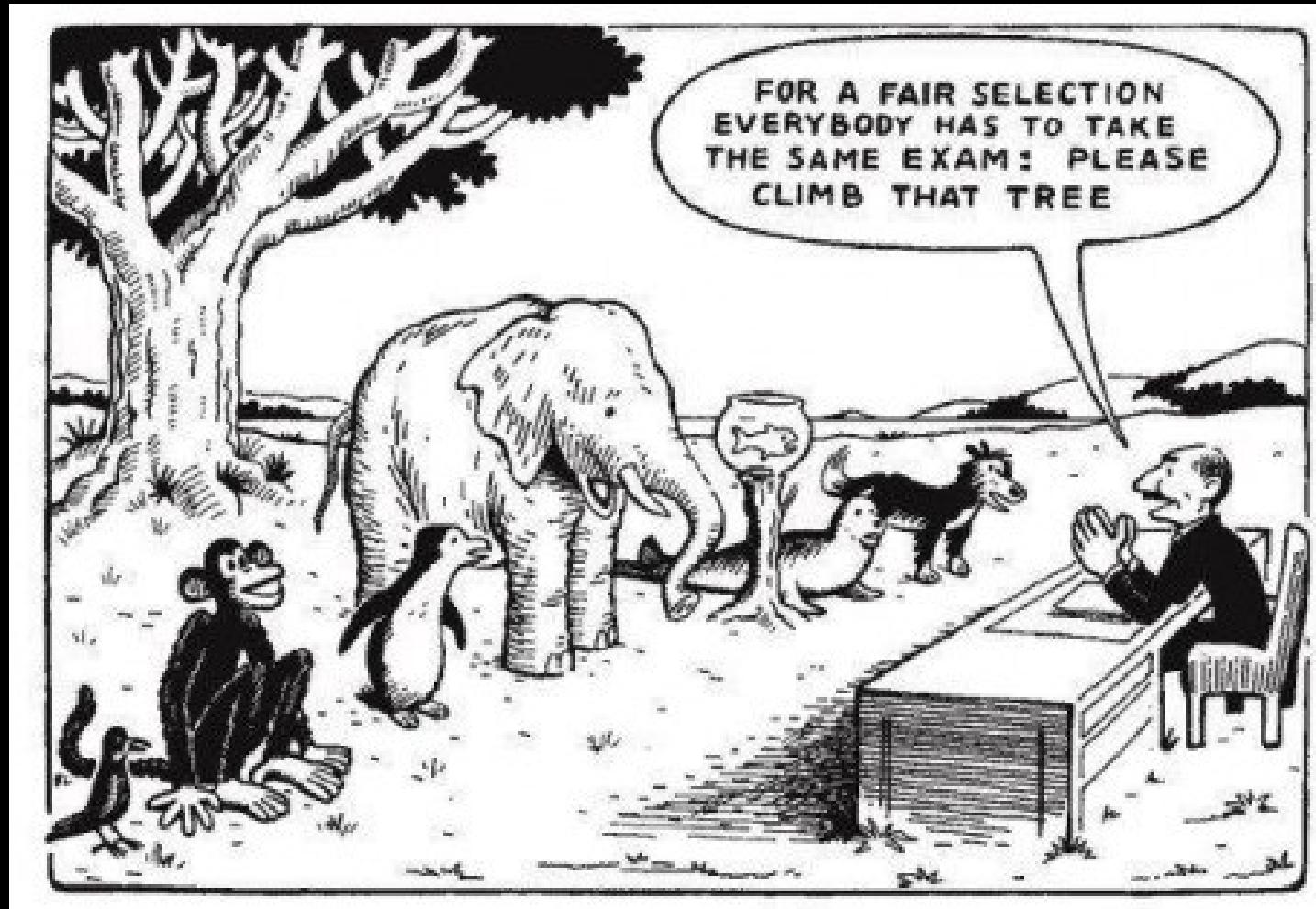
Structures:

- Math
- Science
- Art
- Music
- Technology
- Popular culture
- Agriculture
- Literature
- Specific social or environmental issues
- History
- Video games
- Anything!

Processes:

- Fast learner
- Able to focus attention
- Research skills
- Writing
- Creative
- Social
- Confident
- Public speaking
- Problem solving
- Decision making
- Logical
- Music
- Art
- Math
- Etc.

Diversity



Imagination/Evaluation

- People vary in the extent to which they tend to imagine relative to how much they evaluate.
- Some are more prone to generating many possibilities and not thinking through them fully, whereas others tend to think through every situation and choice thoroughly and consider less possibilities.
- How do you tend to think? Do you take too much/too little to day dream and mind wander? Are you constantly analyzing everything or do you try to not pass judgment? What are some things that you might have been too quick to judge? What are some things that you might be curious about but have not yet explored? Maybe it is a genre of music, field of study, or type of activity that you have not been open to. Are you well-balanced? How does this particular style seem helpful for you to be creative and innovative? How does your style seem counter-productive in your pursuit to be more creative? How can you maximize the use of your own cognitive style?

“Everyone knows what attention is. It is the taking possession by the mind, in clear and vivid form, of one out of what seem several simultaneously possible objects or trains of thought. Focalization, concentration, of consciousness are of its essence. It implies withdrawal from some things in order to deal effectively with others.”

William James, 1890

Principles of Psychology

“Its remote effects are too incalculable to be recorded. The practical and theoretical life of whole species, as well as of individual beings, results from the selection which the habitual direction of their attention involves.”

William James, 1890

Principles of Psychology

“Suffice it... that each of us literally chooses, by [our] ways of attending to things, what sort of a universe [we] shall appear to [ourselves] to inhabit.”

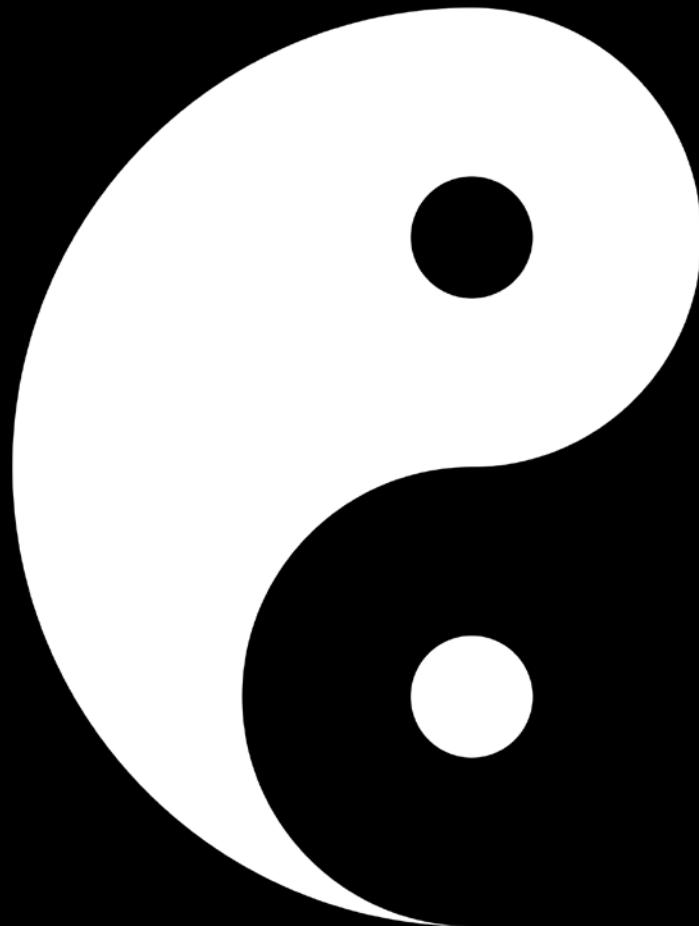
William James, 1890

Principles of Psychology

“The moment one gives close attention to any thing,
even a blade of grass it becomes a mysterious,
awesome, indescribably magnificent world in itself.”

• Henry Miller

Positive and negative in everything



Reflexive vs. Reflective Open-mindedness

Judgment and Decision Making, Vol. 10, No. 6, November 2015, pp. 549–563

On the reception and detection of pseudo-profound bullshit

Gordon Pennycook* James Allan Cheyne† Nathaniel Barr‡ Derek J. Koehler†
Jonathan A. Fugelsang†

Abstract

Although bullshit is common in everyday life and has attracted attention from philosophers, its reception (critical or ingenuous) has not, to our knowledge, been subject to empirical investigation. Here we focus on pseudo-profound bullshit, which consists of seemingly impressive assertions that are presented as true and meaningful but are actually vacuous. We presented participants with bullshit statements consisting of buzzwords randomly organized into statements with syntactic structure but no discernible meaning (e.g., “Wholeness quiets infinite phenomena”). Across multiple studies, the propensity to judge bullshit statements as profound was associated with a variety of conceptually relevant variables (e.g., intuitive cognitive style, supernatural belief). Parallel associations were less evident among profundity judgments for more conventionally profound (e.g., “A wet person does not fear the rain”) or mundane (e.g., “Newborn babies require constant attention”) statements. These results support the idea that some people are more receptive to this type of bullshit and that detecting it is not merely a matter of indiscriminate skepticism but rather a discernment of deceptive vagueness in otherwise impressive sounding claims. Our results also suggest that a bias toward accepting statements as true may be an important component of pseudo-profound bullshit receptivity.

Keywords: bullshit, bullshit detection, dual-process theories, analytic thinking, supernatural beliefs, religiosity, conspiratorial ideation, complementary and alternative medicine.

Deliberate Practice

- Part of building your creative capacity is an attitude of continual learning and deliberate practice in the areas in which you wish to innovate.
- Effective practice entails both good strategies and good time management.
- Are you engaging in effective learning strategies, like using the testing effect, or connecting what you are learning to what you know?
- Are you distributing your studying/practice well within your schedule? Are there impediments to your deliberate practice? Am you focusing on things that aren't connected to your long-term goals? Have you taken on too many responsibilities? What ways can you improve your strategies for learning or time management?

Importance of Time Management

“The bad news is time flies.
The good news is you’re the pilot.”

• Michael Altshuler



"HOW WE SPEND OUR DAYS IS, OF COURSE, HOW WE
SPEND OUR LIVES."

- ANNIE DILLARD

Importance of sleep

"When we are sleep deprived, our focus, attention, and vigilance drift, making it more difficult to receive information."

- Harvard Healthy Sleep

"Most adults are moderately to severely sleep deprived, and it affects their productivity, their work and their relationships. If we treated machines like we treat the human body, we would be accused of reckless endangerment."

- James Maas

Importance of exercise

- promotes neurogenesis (Bergland)

“results suggest that a single bout of exercise appears to have comparable and positive effects on both affective experience and cognitive performance, independent of participants’ age”

-Hogan et al., 2013

Importance of diet

“particular nutrients influence cognition by acting on molecular systems or cellular processes that are vital for maintaining cognitive function...”

-Fernando Gómez-Pinilla, 2010

Restorative effects of nature

- Nature has been shown to re-invigorate cognitive function
- Attention and executive function
- Memory
- Creativity

“How do our personalities and mental processes, our "states of consciousness", derive from a gray mass of tissue with the consistency of a soft-boiled egg? How can mere molecules constitute an idea or emotion?”

- Baroness Susan A. Greenfield

- Sleep
- Diet
- Exercise
- Nature

Motivation

- An important part of being an innovator is figuring out what we are living for and finding motivation. Whether they are causes you care about or people that support or inspire you, these parts of our lives can provide us with motivation to be the best we can be that are different from that associated with material wealth. Who are people, whether you know them or not, that inspire you and make you want to do the best you can? What causes do you care the most about? What makes you get out of bed in the morning? Do you feel like you lack motivation? If so, where might you find it?

Viktor Frankl

- Austrian neurologist/psychiatrist
- 1942- deported to Theresienstadt Ghetto
- 1944- taken to Auschwitz, then Kaufering, affiliated with Dachau concentration camp
- 1945- liberated by Americans
- Wife taken to Bergen-Belsen where she died
- Mother killed in gas chambers
- Brother died in forced labour camp

“success, like happiness, cannot be pursued; it must ensue, and it only does so as the unintended side effect of one's personal dedication to a **cause greater than oneself** or as the by-product of one's surrender to a **person other than oneself**”

- Viktor E. Frankl, *Man's Search for Meaning*

Anthropocene (E. Stoermer)

- A geologic chronological term that denotes the modern era in which humans have irrevocably altered the Earth

Causes

- People are hungry
- People are oppressed
- People are at war
- People are not receiving education
- Animals are going extinct
- Climate is changing
- Water/air being polluted

HACKING CREATIVITY

Welcome to the largest empirical study of creative style in history. By taking this short survey, you'll contribute to our understanding of creativity and discover which creative habits you share with 500 global innovators. This is not a test of how creative you are, but rather a profile of how you create.



Dr. Andy Walshe is a leader in all aspects associated with the management and delivery of elite performance via both personal and organizational strategies. [Read more about Dr. Andy Walshe](#)

There is no one formula for creative success.

David Kelley:

How to build your creative confidence

TED2012 · 11:46 · Filmed Mar 2012

34 subtitle languages ?

View interactive transcript



Share this idea

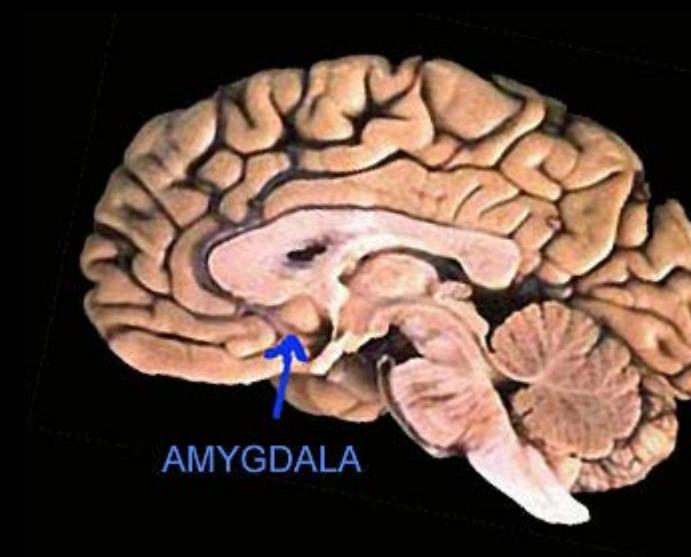


4,121,222 Total views

TED Ideas worth spreading

Amygdala

- Brain region responsive to fear/threat



Attachment-security priming attenuates amygdala activation to social and linguistic threat

Luke Norman,¹ Natalia Lawrence,² Andrew Iles,² Abdelmalek Benattayallah,³ and Anke Karl^{✉²}

- Using functional magnetic resonance imaging, the present study examined the effects of trait and primed attachment security on amygdala reactivity to threatening stimuli

Attachment-security priming attenuates amygdala activation to social and linguistic threat

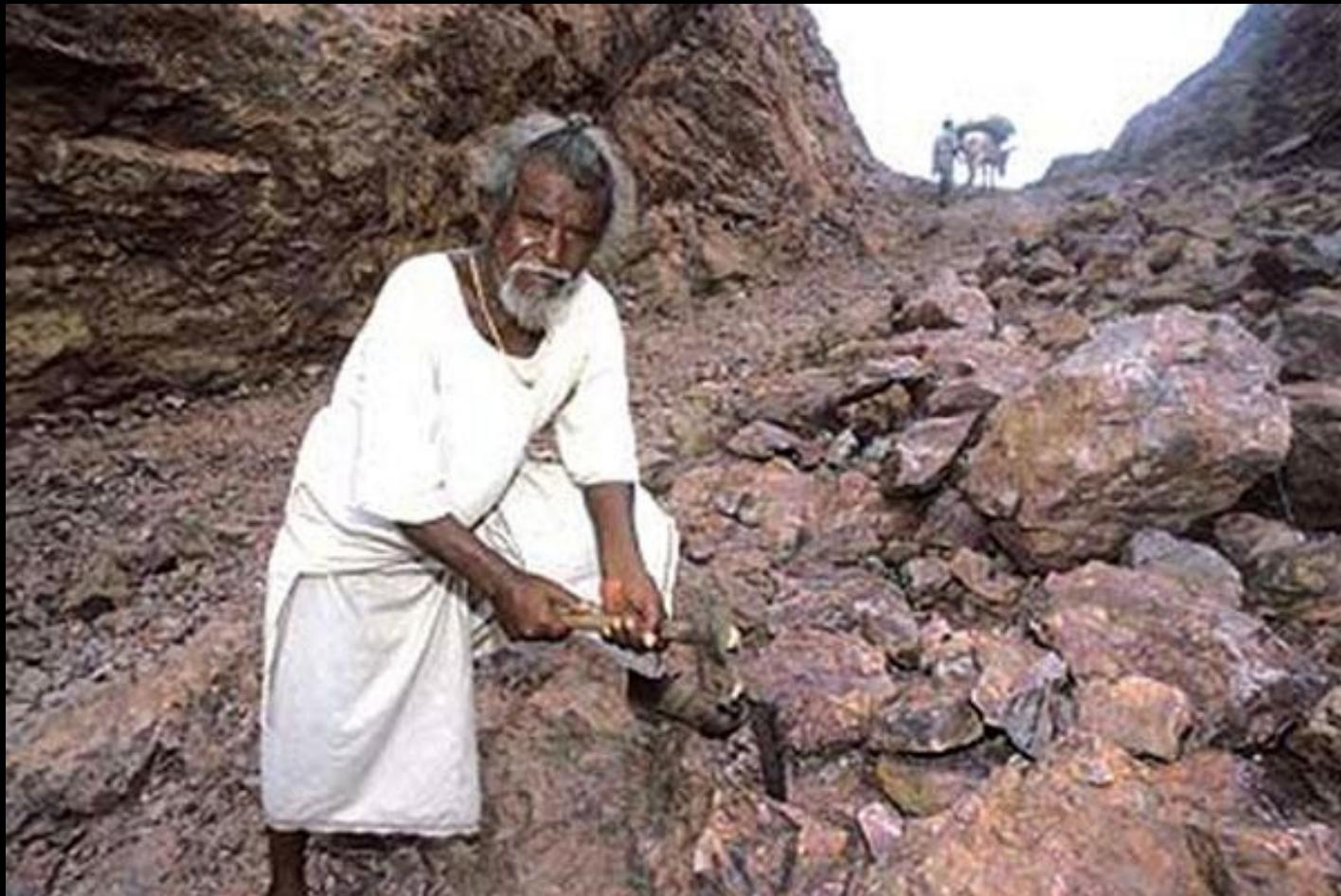
[Luke Norman](#),¹ [Natalia Lawrence](#),² [Andrew Illes](#),² [Abdelmalek Benattayallah](#),³ and [Anke Karl](#)^{✉2}

- participants who received attachment-security priming showed attenuated amygdala activation

(pictures depicting people engaging in caregiving behaviours and enjoying close attachment relationships (e.g. hugging loved ones)).

“Owners of biological memory systems are capable of behaving more appropriately at a later time because of their experiences at an earlier time, a feat not possible for organisms without memory.”

- Tulving, 1995





?

“Above all, I have been a sentient being, a thinking animal, on this beautiful planet, and that in itself has been an enormous privilege and adventure.”

• Oliver Sacks

Advantages of this assignment (and other meaningful ones like it)

In the classroom:

- Exploits principles of memory
- deep meaning = better learning

Beyond the classroom:

- Allows reflection on vision and steps to get there
- Deep meaning= better life

“Life is never made unbearable by circumstances,
but only by lack of meaning and purpose.”

• Viktor E. Frankl, *Man's Search for Meaning*

“A man who becomes conscious of the responsibility he bears toward a human being who affectionately waits for him, or to an unfinished work, will never be able to throw away his life. He knows the "why" for his existence, and will be able to bear almost any "how".”

•—Viktor E. Frankl, *Man's Search for Meaning*

“When you are in the middle of a story it isn't a story at all, but only a confusion; a dark roaring, a blindness, a wreckage of shattered glass and splintered wood; like a house in a whirlwind, or else a boat crushed by the icebergs or swept over the rapids, and all aboard powerless to stop it. It's only afterwards that it becomes anything like a story at all. When you are telling it, to yourself or to someone else.”

• Margaret Atwood, *Alias Grace*

“The limits of my language mean the limits of my world.”

• Ludwig Wittgenstein

 **Dalai Lama** 
@DalaiLama



A genuine change must first come from within the individual, only then can he or she attempt to make a significant contribution to humanity.

RETWEETS FAVORITES
10,352 2,475



2:24 AM - 22 Jun 2012

Anthropocene (E. Stoermer)

- A geologic chronological term that denotes the modern era in which humans have irrevocably altered the Earth

“I am still convinced that it is love that makes the world go round, and somehow this kind of love can be a powerful force for social change.

I’m not talking about a weak love. I’m not talking about emotional bosh here. I’m not talking about some sentimental quality. I’m not talking about an affectionate response.”

• -Dr. Martin Luther King (1964)

“Love is the only way to grasp another human being in the innermost core of his personality. No one can become fully aware of the very essence of another human being unless he loves him.

By his love he is enabled to see the essential traits and features in the beloved person; and even more, he sees that which is potential in him, which is not yet actualized but yet ought to be actualized. Furthermore, by his love, the loving person enables the beloved person to actualize these potentialities.

By making him aware of what he can be and of what he should become, he makes these potentialities come true.”

• Viktor E. Frankl, *Man's Search for Meaning*

“The urge to form partnerships, to link up in collaborative arrangement, is perhaps the oldest, strongest, and most fundamental force in nature. There are no solitary, free-living creatures: every form of life is dependent on other forms.”

- Lewis Thomas 1980

we are all related to and respect,
everything in life

mitakuye oyasion (Lakota)

Nogomaq (Algonquian)

Gakine-awiiya (Anishinaabe)

Ea Nigade Qusdi Idaddavhn (Cherokee)

“It’s not about how to achieve your dreams, it’s about how to lead your life. If you lead your life the right way, the karma will take care of itself, the dreams will come to you.”

•Randy Pausch, *The Last Lecture*

“It’s not about how to [be creative], it’s about how to lead your life. If you lead your life the right way, the [creativity] will take care of itself, the [ideas] will come to you.”

Creatively constructing meaning in the classroom... and beyond

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