



catalyzing creativity

strategies to foster innovative thinking

mary vasseur finn, sr. ux designer

catalyzing creativity

1. the creative type?

- creative geniuses
- common myths about creativity
- stages of the creative process
- personality and creativity

2. measuring creativity

- creativity is a survival skill
- tests of creativity

3. creativity and social climate

- creativity in the workplace
- ten climate dimensions
- embracing failure

4. catalyzing creativity

- systematic tools
- bisociation
- biomimicry
- cognitive processes

5. courting the muses

- workspace
- “enclothed cognition”
- peculiar practices
- making connections
- mind the gap
- reflection and incubation

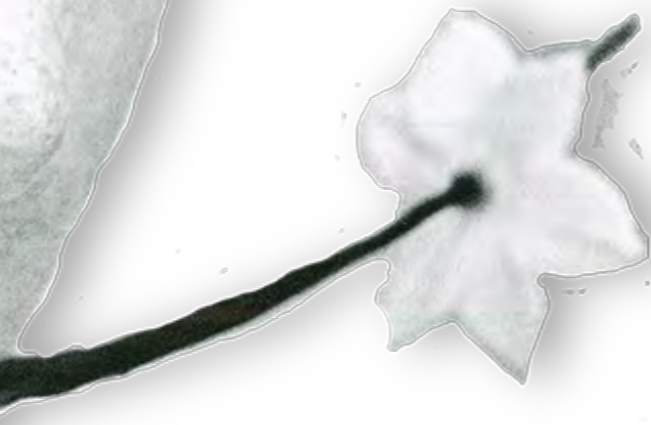
6. conclusion

1. the creative type?

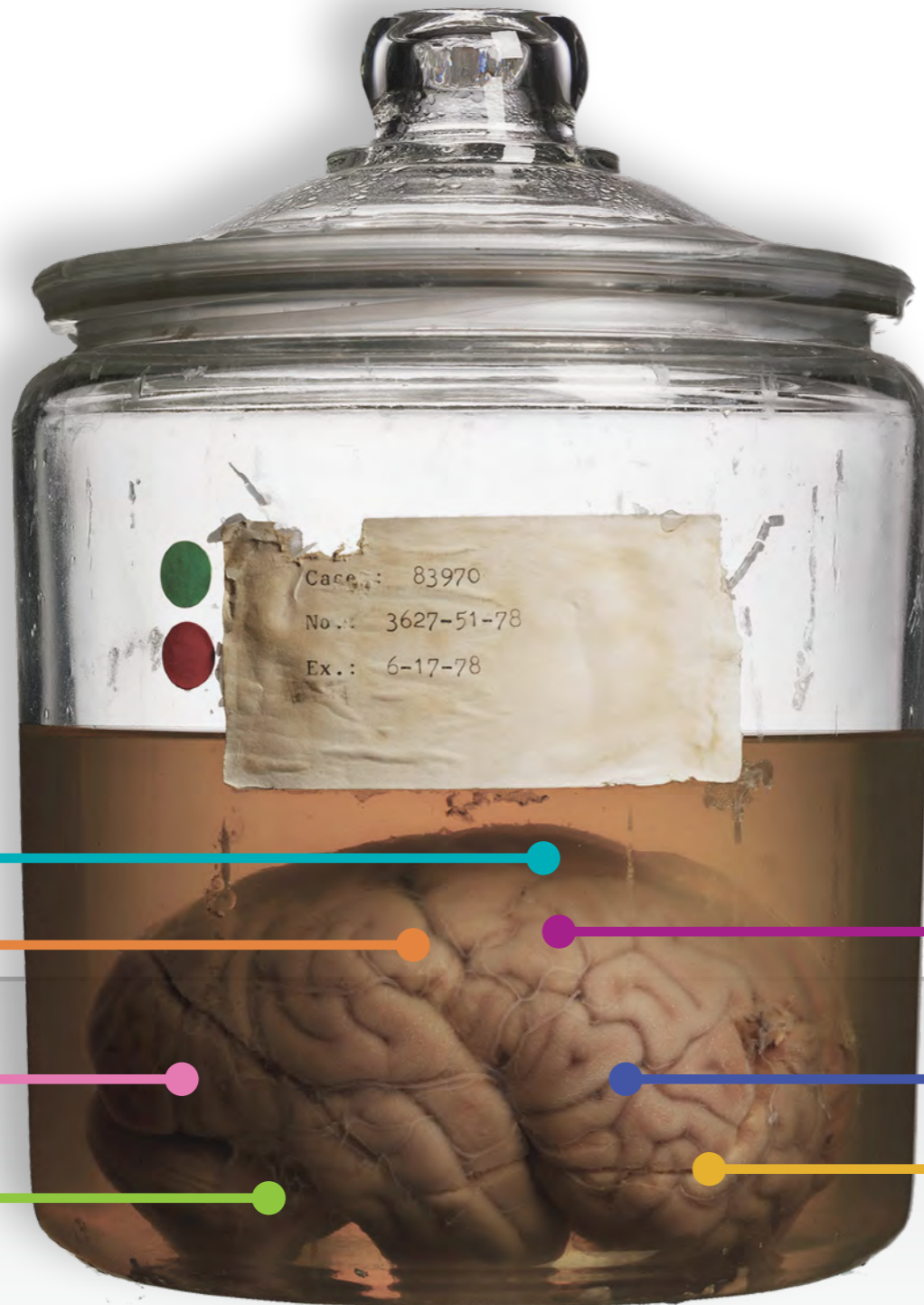
common myths about creativity



got
creativity?



creativity and intelligences



Howard Gardner, PhD, is best known for his theory of multiple intelligences, which says that humans have several different ways of processing information, and these ways are relatively independent of one another. The theory is a critique of the standard intelligence theory, as well as traditional measures like IQ tests that typically only account for linguistic, logical, and spatial abilities.

- logical-mathematical
- interpersonal
- musical
- kinesthetic
- intrapersonal
- spatial
- linguistic

creative geniuses



Cipher,
Thomas Jefferson



Light bulb,
Thomas Edison



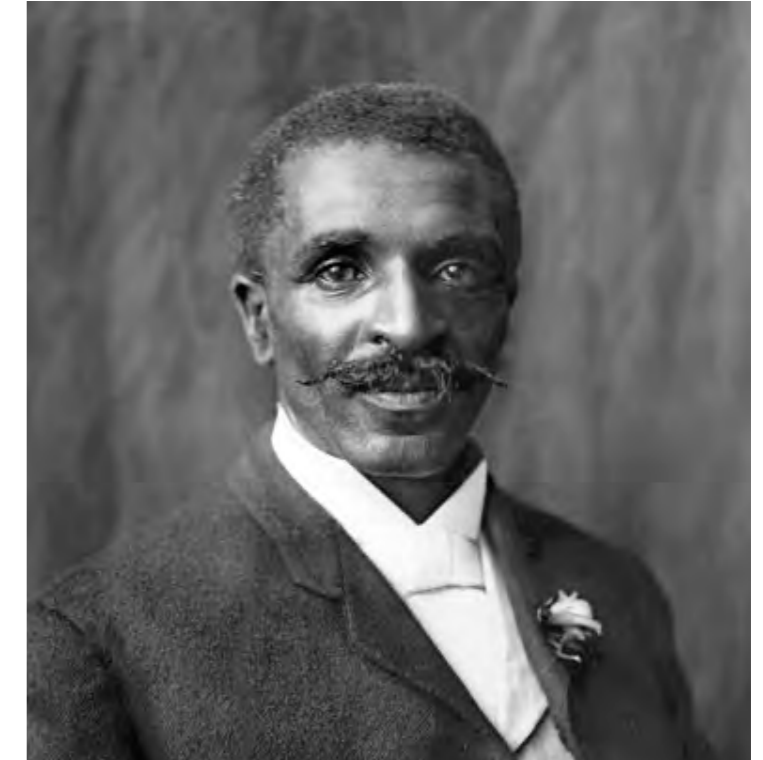
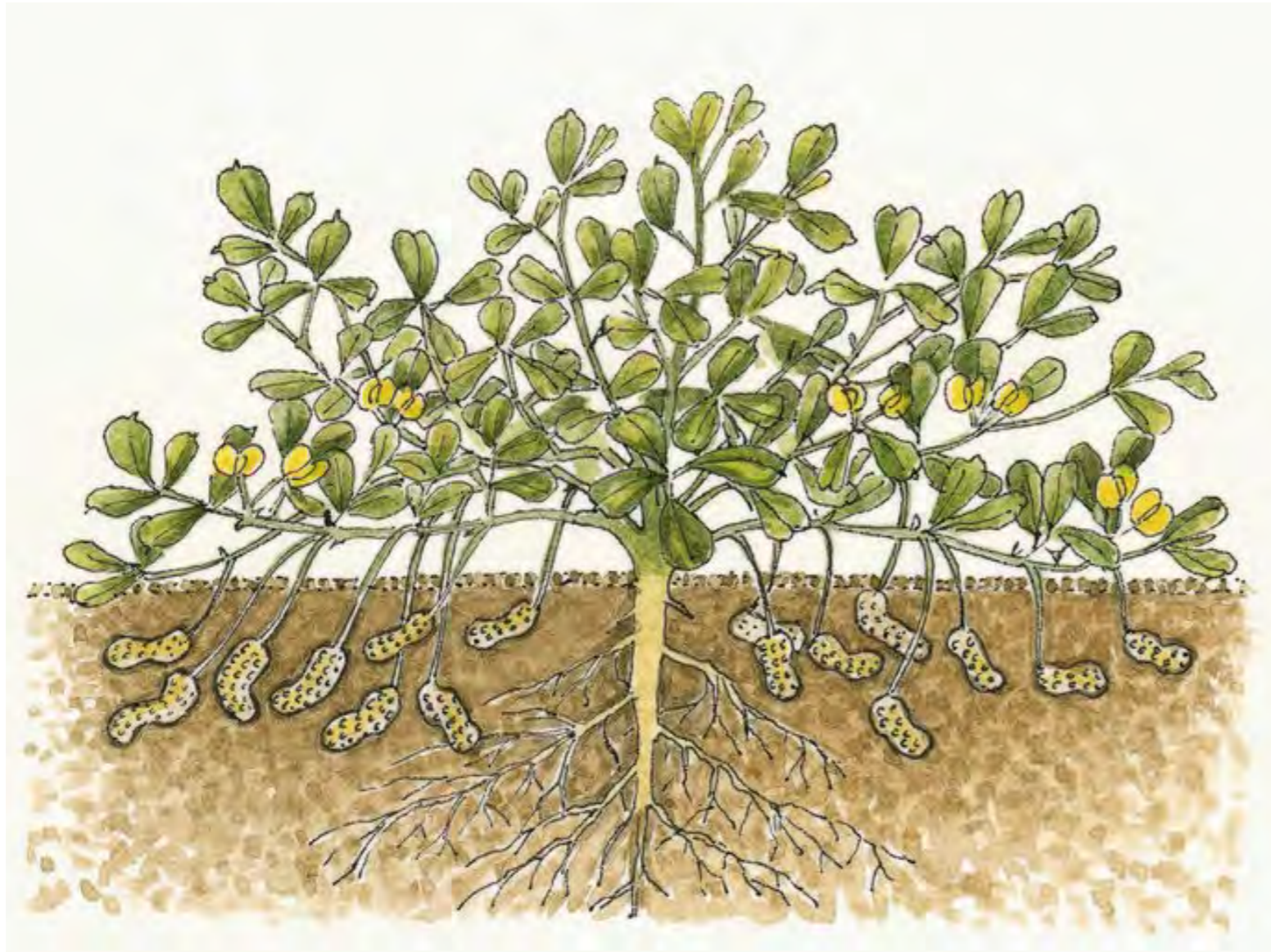
Bi-focals,
Benjamin Franklin



Stephanie Louise Kwolek (1923 – 2014), worked for the DuPont company for over 40 years. After earning her B.A. in chemistry at Carnegie Mellon University, Kwolek took a temporary research position at DuPont, with the intention of saving money in order to pursue a career in medicine. One of the first women research chemists, she gained national recognition for her discovery of a liquid crystalline polymer solution. This led to her invention of Kevlar®, a synthetic material that is five times as strong as steel, is resistant to wear, corrosion and flames, and it is the main ingredient in the production of bulletproof vests.



creative geniuses



George Washington Carver (1860's–1943), while a professor at Tuskegee Institute, developed techniques to improve soils depleted by repeated plantings of cotton. The most popular of his 44 practical bulletins for farmers contained 105 food recipes using peanuts. He also developed and promoted many products made from peanuts, including dyes, cosmetics, plastics, paints, nitroglycerin, and even gasoline. He was also a pioneer in promoting environmentalism.

calling all
muses

**We are not
amused!**



*Queen Victoria
(1819–1901)*



practice, practice,
practice

Sonata No. 11
in C Major
K. 33

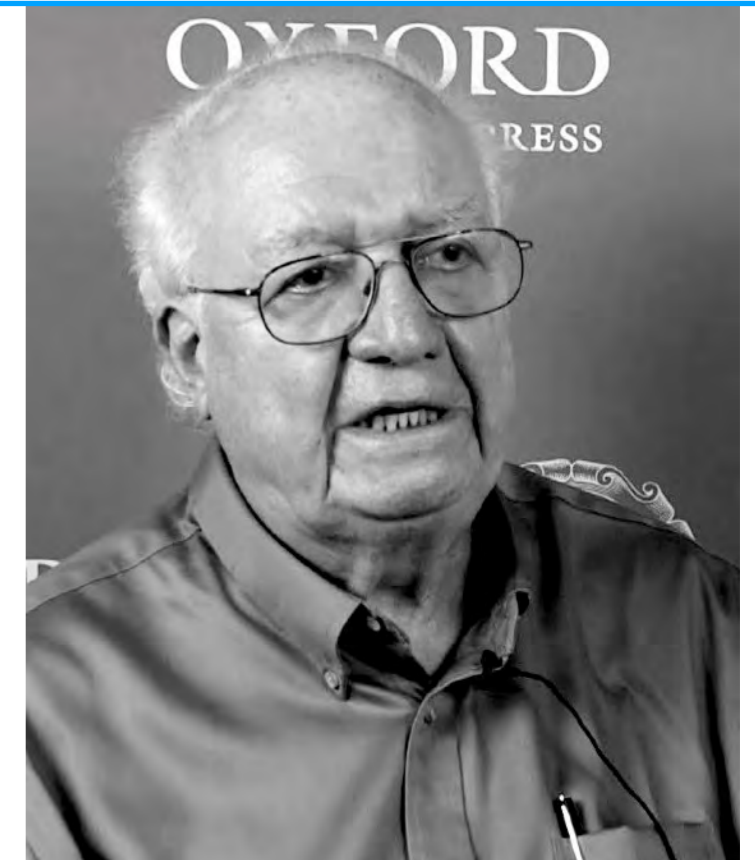
Allegro moderato

10

(mf)



creativity and mental illness

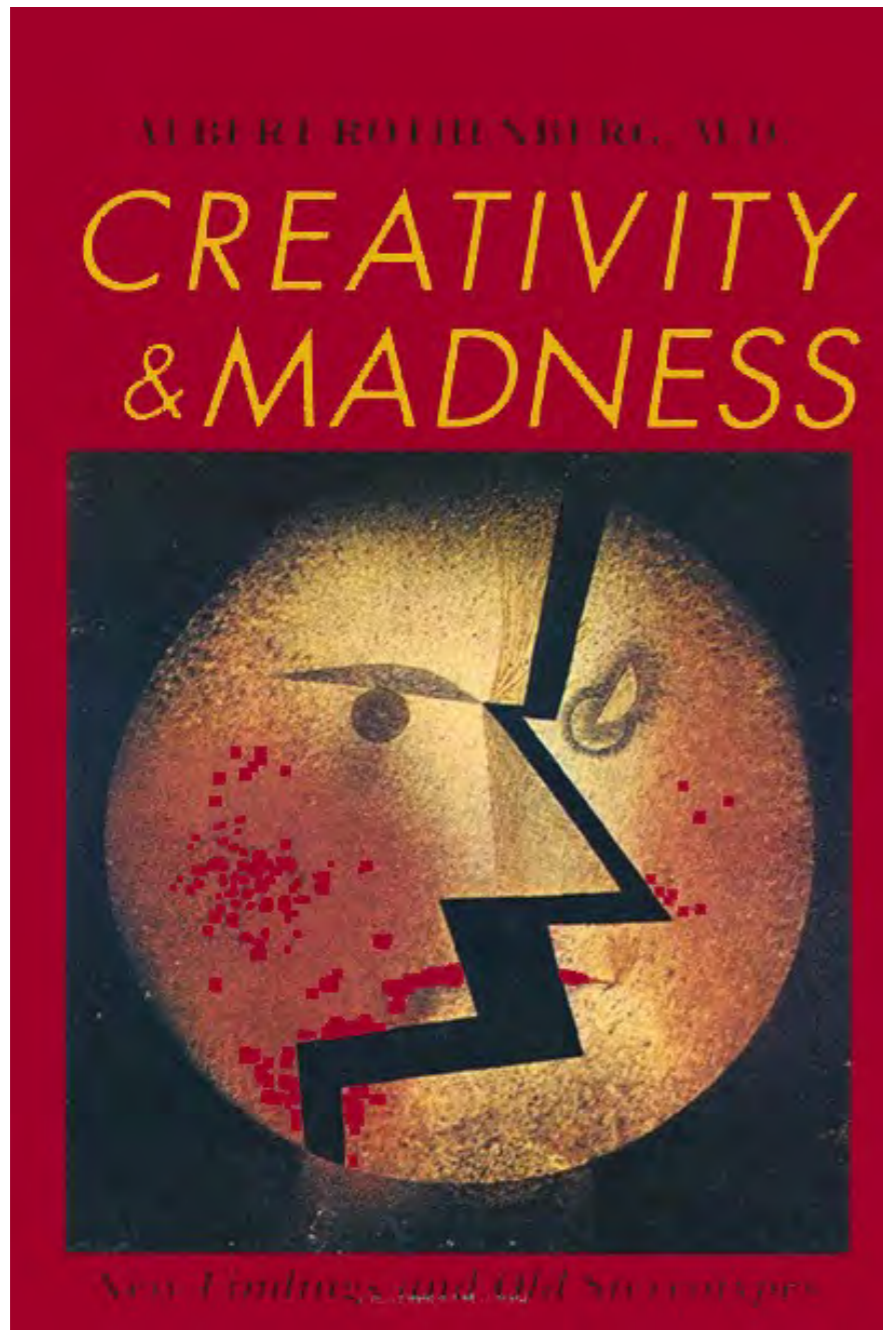


Albert Rothenberg, MD, Professor of Psychiatry at Harvard University (Harvard Medical School), has carried out long term research on the creative process in literature, art, science and psychotherapy. As Principal Investigator of the research project Studies in the Creative Process, Rothenberg also focused on the creative processes of Nobel laureates in physics, chemistry, medicine and physiology.

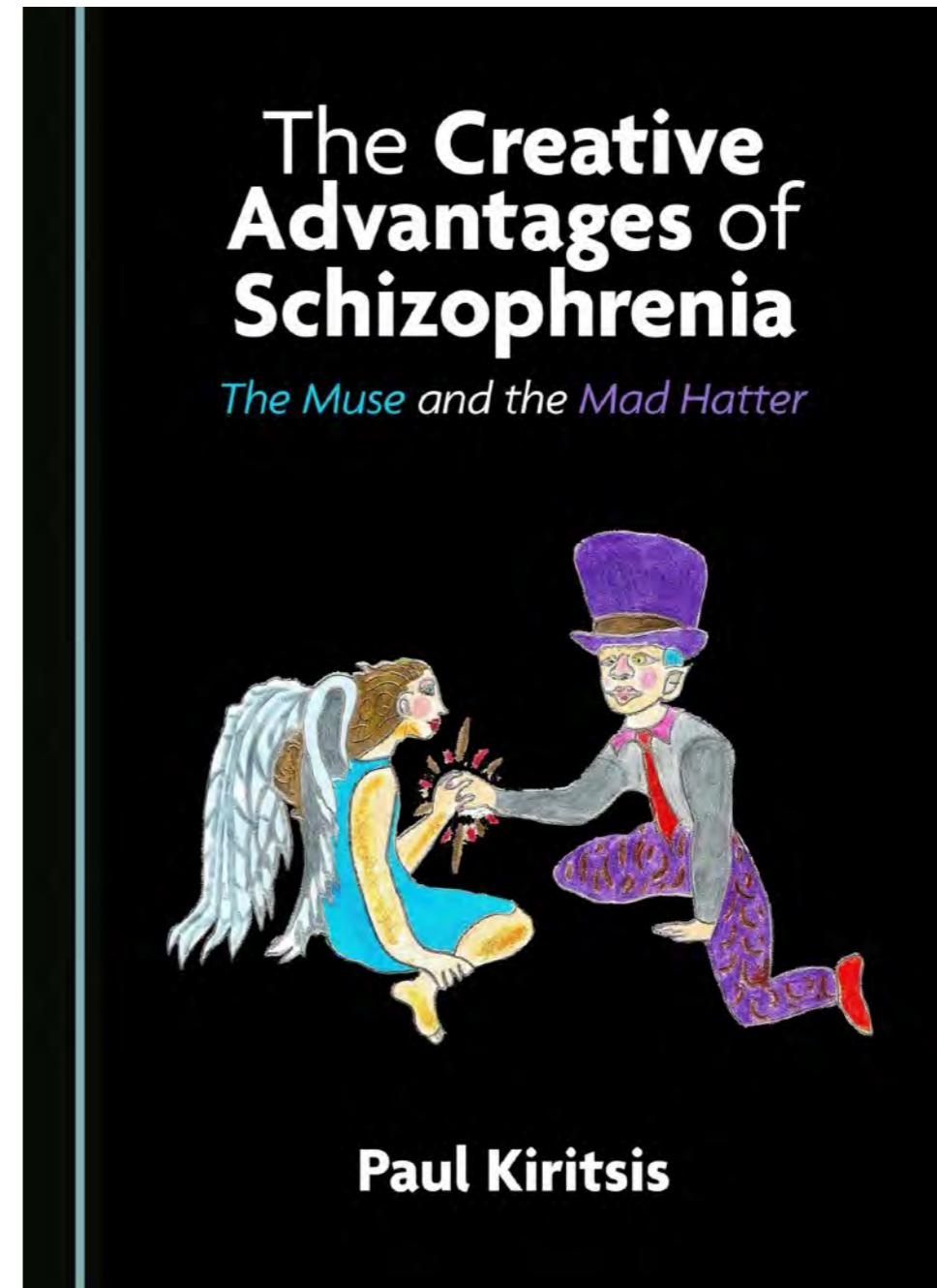


catalyzing creativity

creativity and mental illness



vs.



personality and creativity



openness
conscientiousness
extraversion
agreeableness
neuroticism



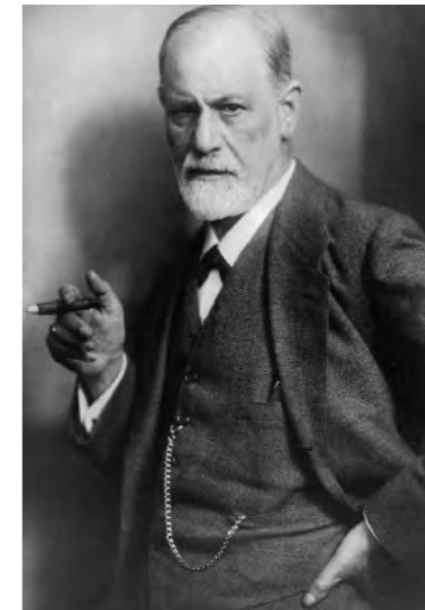
the creative process



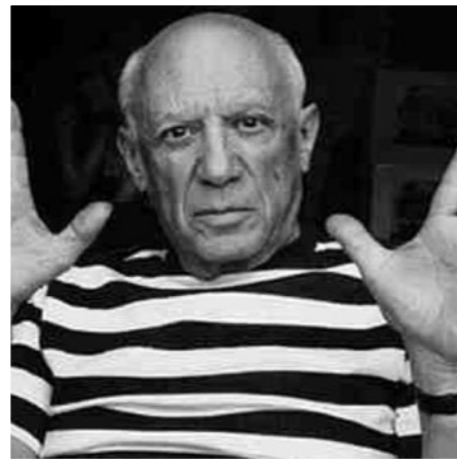
kinesthetic



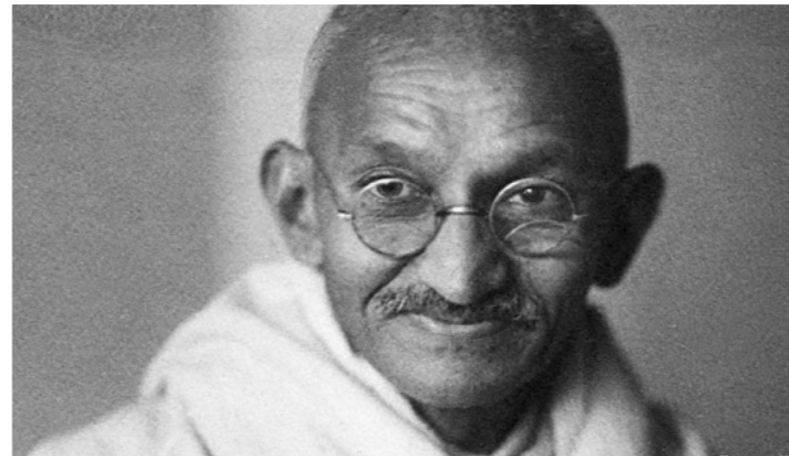
musical



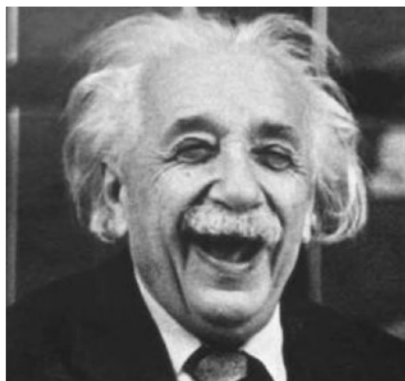
intrapersonal



spatial



interpersonal



logical-
mathematical

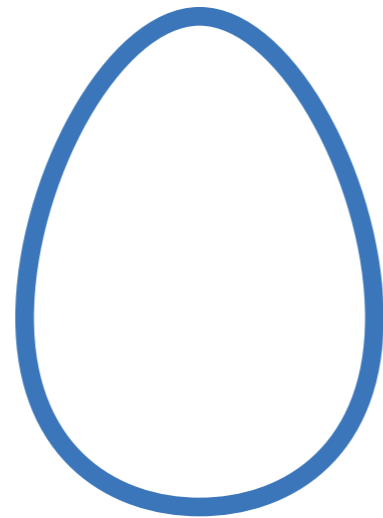


linguistic

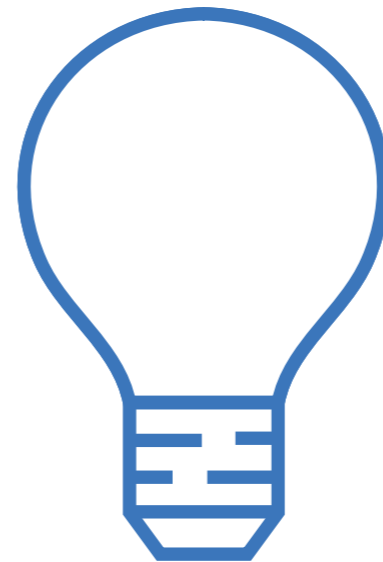
the creative process (cont'd)



1 preparation



2 incubation



3 illumination



4 verification

pop quiz!

1. Name two common myths about the source of creative inspiration (3 pts)

2. In “The Big Five,” what three traits are associated with creatives? (2 pts)

BONUS: Which of the three is *negatively* correlated with creatives? (1 pt)

3. Name three words derived from the Greek word, *Muse* (1 pts)

BONUS: Who is purported to have said, “*We are not amused*”? (1 pt)



2. measuring creativity

creativity is a survival skill



Joy Paul Guilford (1897 – 1987) was an American psychologist best remembered for his psychometric study of human intelligence. He coined the terms *convergent thinking* and *divergent thinking* in 1956.



divergent thinking

problem-solving: the ability to see options alternatives



Cody Lundin **Dave Canterbury:**
Minimalist *Army Veteran*
Primitive Skills Expert *SRT Sniper, Hunter*

divergent thinking

a problem-solving survival skill

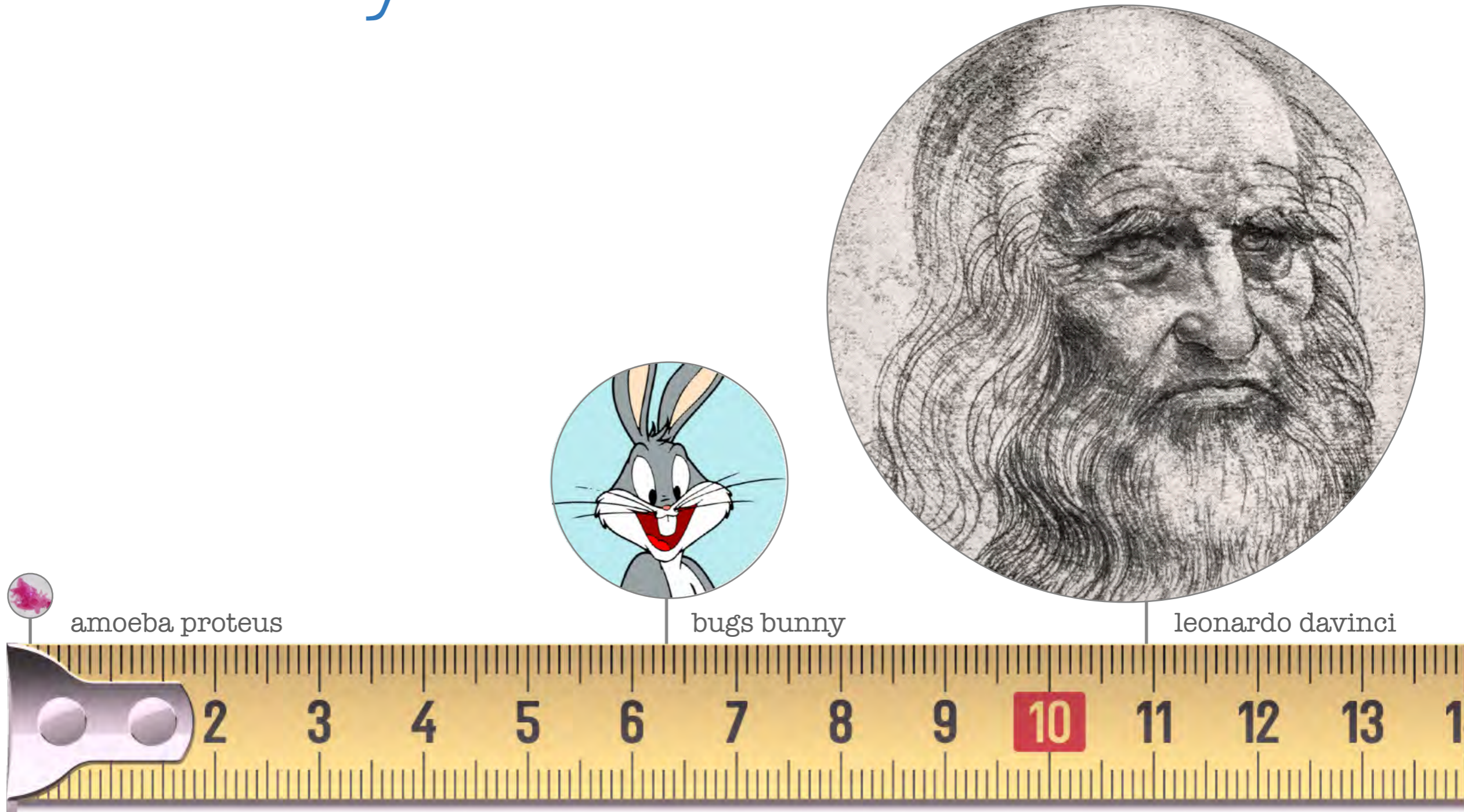


Bugs Bunny and Taz'

in Wild Turkey Surprise



creativity tests

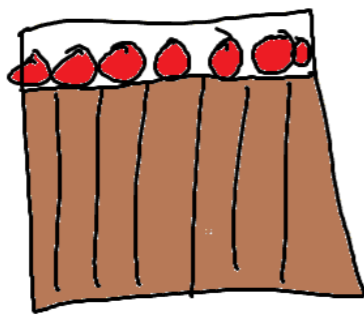


measuring creativity (cont'd)

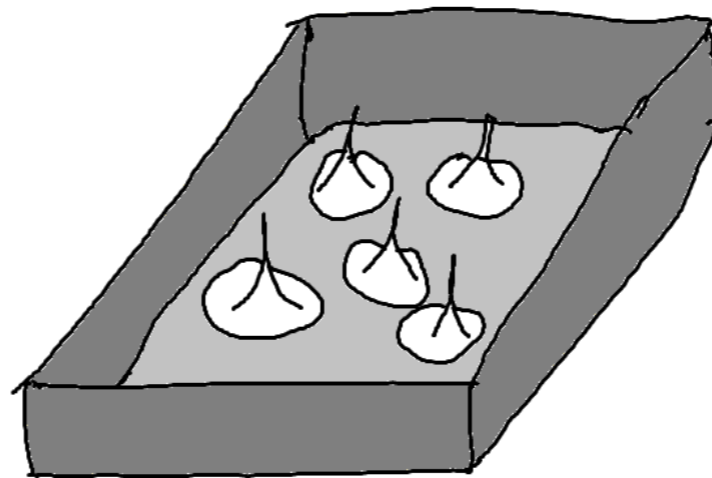
The Candle Problem

THE CANDLE PROBLEM

INSTRUCTIONS: PIN THE CANDLE TO THE WALL IN SUCH A WAY THAT WHEN IT IS LIT, NO WAX DRIPS ON THE FLOOR.



BOOK OF MATCHES



BOX OF TACKS



CANDLE

measuring creativity (cont'd)

The Alternative Uses Test

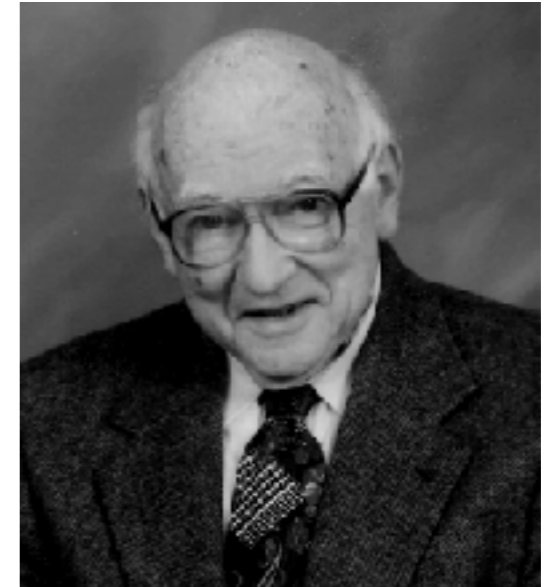
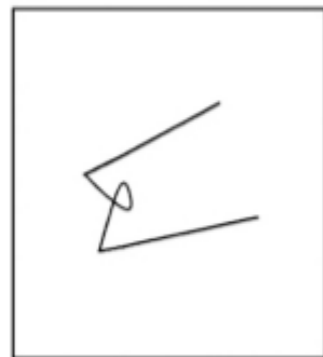


F – Fluency
O – Originality
F – Flexibility
E – Elaboration

- Hold papers together
- Thingy you use to push router restart button
- Cufflinks
- Earrings
- Trombone for Barbie
- Wrap earbuds when not in use
- Bookmark

measuring creativity (cont'd)

The Incomplete Figure Test



Ellis Paul Torrance (1915–2003) was an American psychologist from Milledgeville, Georgia. Torrance is best known for his research in creativity, and most particularly his development of the Torrance Tests of Creative Thinking.

measuring creativity (cont'd)

The Remote Associates Test

hunter

.....?.....ache

cabbage

measuring creativity (cont'd)

Let's try the RAT!

Square / Cardboard / Open : Box

Broken / Clear / Eye : Glass

Coin / Quick / Spoon : Silver

Room / Blood / Salts : Bath

Base / Complex / Sleep : Deep

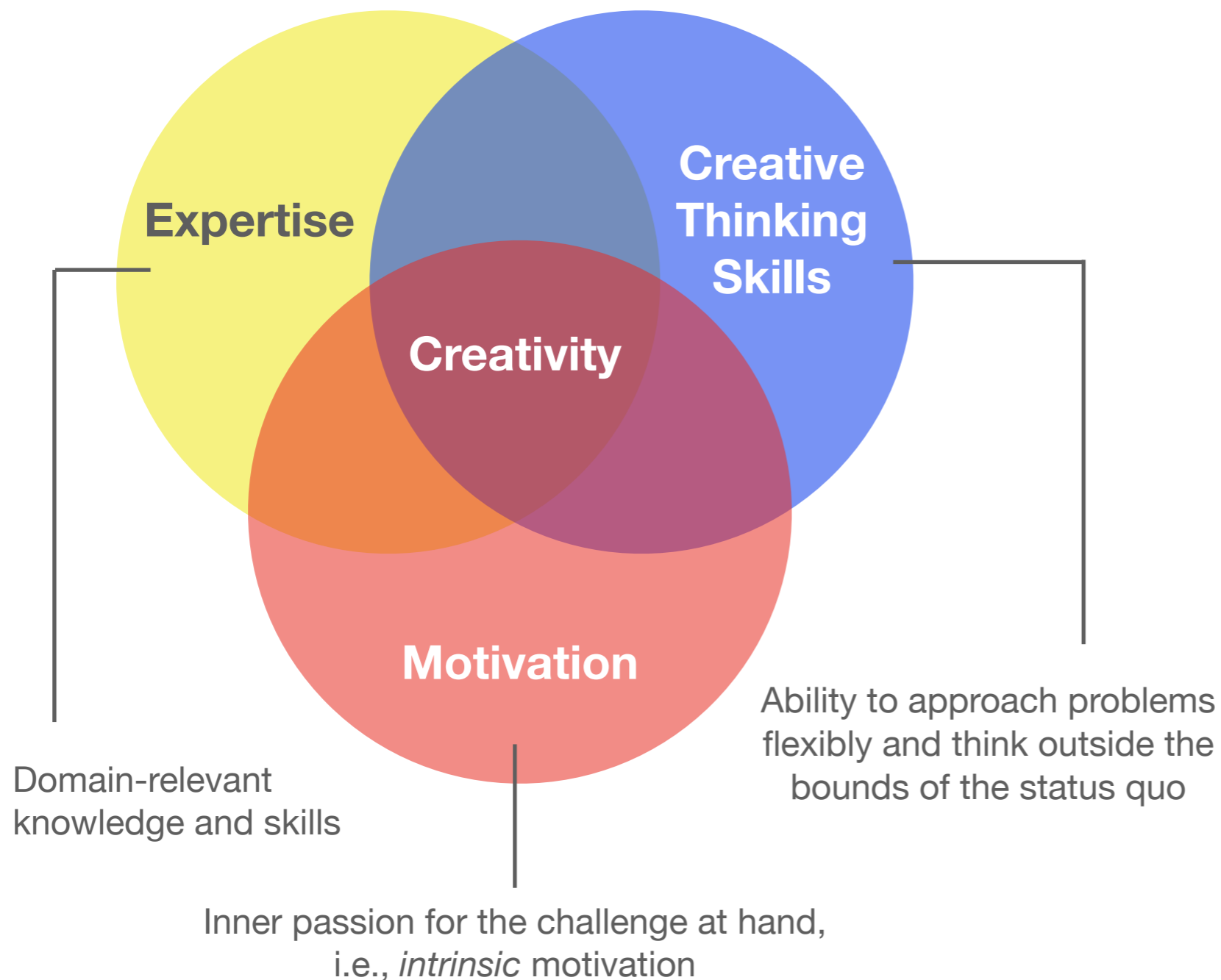
pop quiz!

1. In the Dual Survival clip we saw earlier, Cody and Dave exercised their divergent-thinking, problem-solving skills. Name the creativity test that measures the specific skills we saw demonstrated. (3 pts)



3. creative climate

creativity in the workplace



Teresa Amabile is a Baker Foundation Professor at Harvard Business School. Her early research focused on individual creativity, then expanded to include individual productivity, team creativity, organizational innovation, and how the work environment influences creativity and motivation.





“One day’s happiness often predicts the next day’s creativity.”
— Teresa Amabile

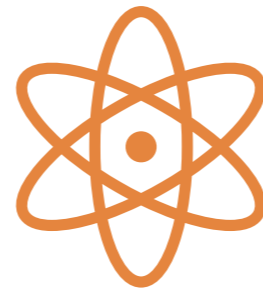


creative culture

creative climate



challenge



dynamism



idea time



conflict



freedom



playfulness

creative culture

creative climate



debate



idea support



openness



risk-taking

creative culture

failure *is* an option

Without vulnerability there is no creativity or innovation. Why? Because there is nothing more uncertain than the creative process, and **there is absolutely no innovation without failure.**

- — Brené Brown, *Dare to Lead*



creative culture

free to fail

Wow!!! You failed
AGAIN??! You are
AWESOME!!!



pop quiz!

1. Name five things that, when present, characterize a workplace with a creative climate (3 pts)



4. catalyzing creativity

ideation tools, strategies, and
cognitive processes

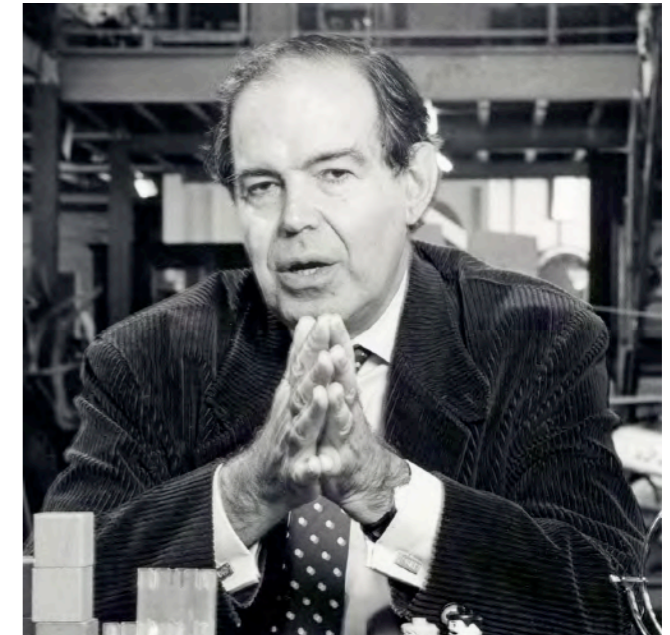
cognitive approaches

got lateral thinking?

lateral |'lædərəl

adjective

1. sideways, sidewise, sideward, edgewise, edgeways, oblique, horizontal



Edward Charles Francis Publius de Bono (born 19 May 1933) is a Maltese physician, psychologist, philosopher, author, inventor and consultant. Originating the term lateral thinking, he wrote the book *Six Thinking Hats* and is a proponent of the teaching of thinking as a subject in schools.

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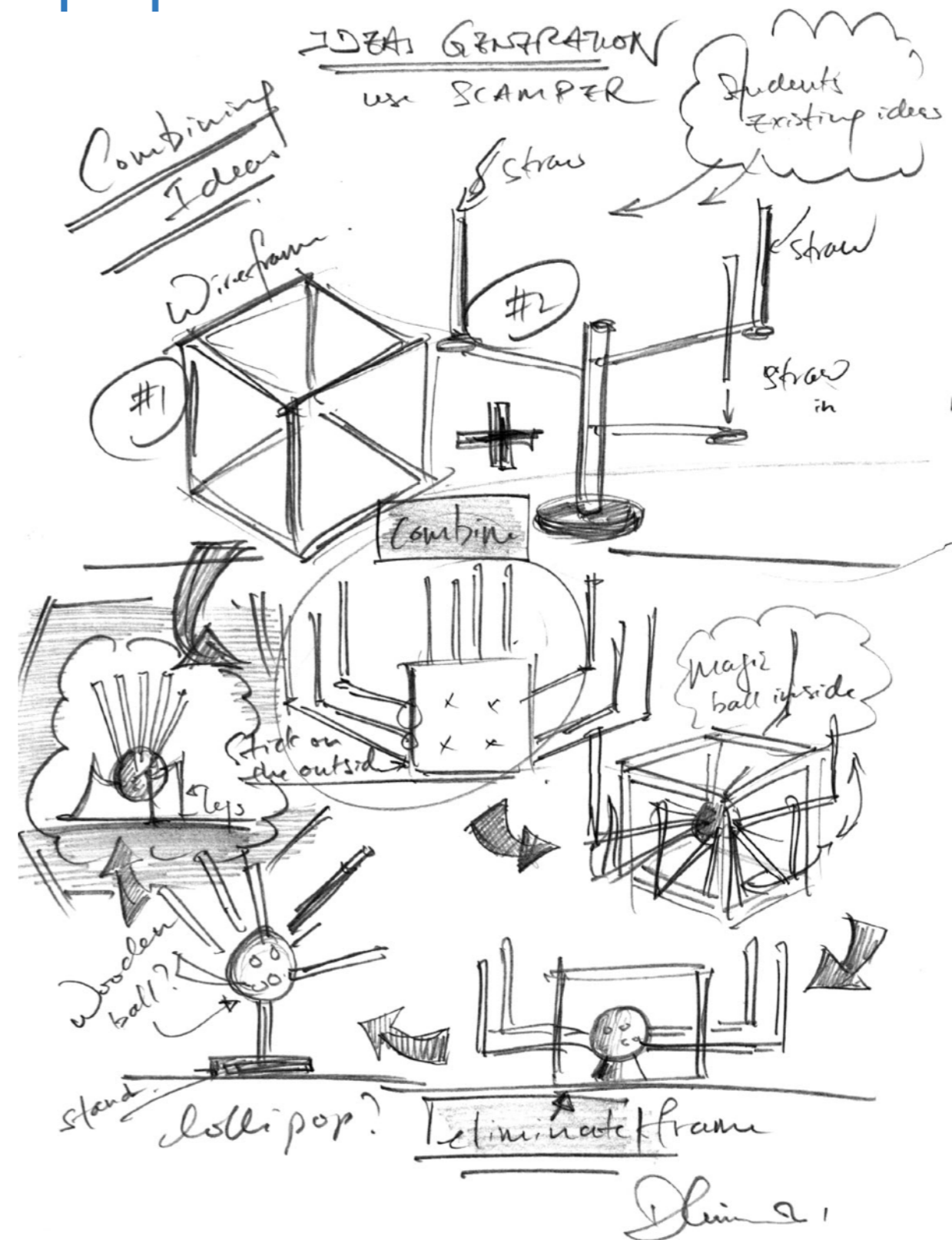


catalyzing creativity

ideation tools and strategies

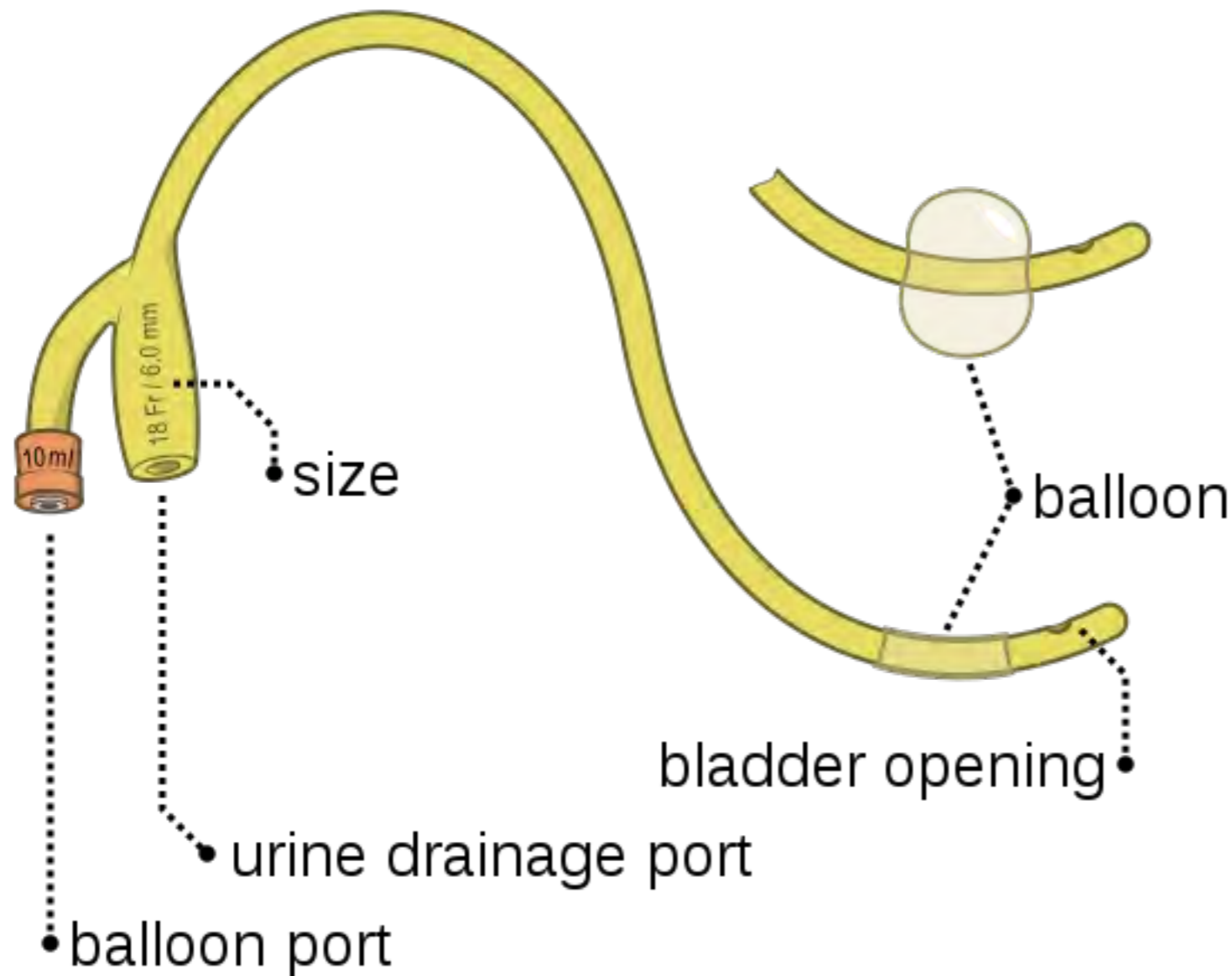
systematic approaches

- brainstorming
- reverse brainstorming
- forced associations
- attribute listing
- morphological matrix
- s.c.a.m.p.e.r.



ideation tools and strategies

borrowing & modifying



Benjamin Franklin was an American polymath and one of the Founding Fathers of the United States. Franklin was a leading writer, printer, political philosopher, politician, postmaster, scientist, inventor, humorist, civic activist, statesman, and diplomat.

As a scientist, he was a major figure in the American Enlightenment and the history of physics for his discoveries and theories regarding electricity. As an inventor, he is known for the lightning rod, bifocals, and the Franklin stove, among other inventions.

ideation tools and strategies

bisociation



Arthur Koestler, Nobel prizewinning author of *The Act of Creation*, proposed that creativity is primarily a form of connection-making. He coined it “bisociation” — combining two unrelated elements to generate something completely new.

ideation tools and strategies

bisociation (cont'd)



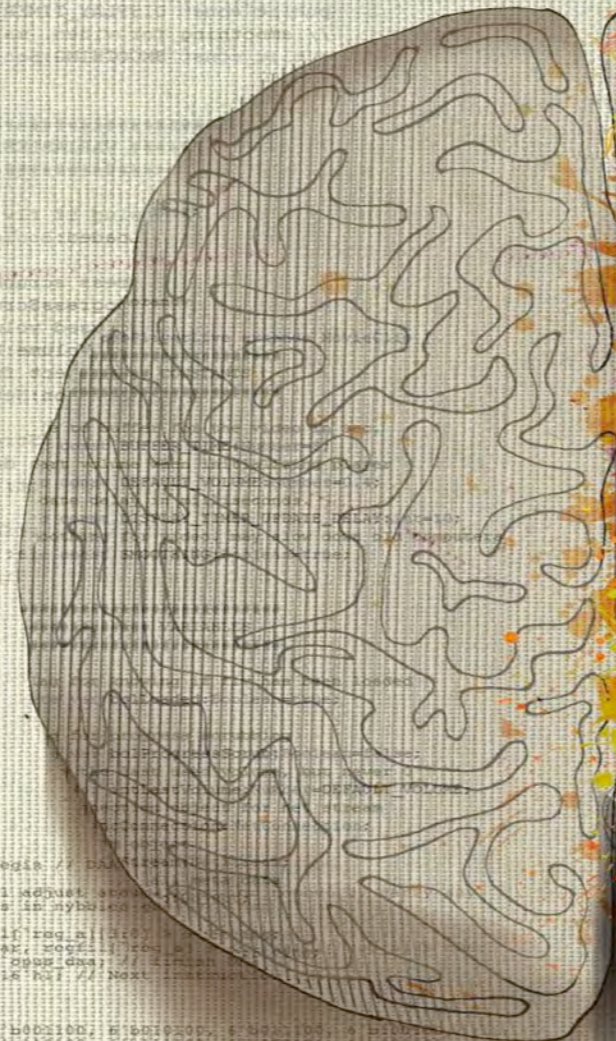
The Petal Drops rain collector

ideation tools and strategies

synectics

Left brain

I am the left brain.
I am a scientist. A mathematician.
I love the familiar. I categorize. I am accurate. Linear.
Analytical. Strategic. I am practical.
Always in control. A master of words and language.
Realistic. I calculate equations and play with numbers.
I am order. I am logic.
I know exactly who I am.



Right brain

I am the right brain.
I am creativity. A free spirit. I am passion.
Yearning. Sensuality. I am the sound of roaring laughter.
I am taste. The feeling of sand beneath bare feet.
I am movement. Vivid colors.
I am the urge to paint on an empty canvas.
I am boundless imagination. Art. Poetry. I sense. I feel.
I am everything I wanted to be.



ideation tools and strategies

synectics (cont'd)



ideation tools and strategies

biomimicry



Born in 1907, in a tiny town in Switzerland, **George de Mestral**, apparently an inventive boy, filed his first patent at the age of 12 for a toy airplane. In 1941, while on a hunting trip, he noticed that both his pants and his Irish Pointer's hair were covered with the burrs from a burdock plant.

Where most people would have just pulled them all off in irritation, de Mestral, ever-curious and inspired by science, *had* to look at the burrs under a microscope. He just *had* to know how they worked.

ideation tools and strategies

biomimicry (cont'd)

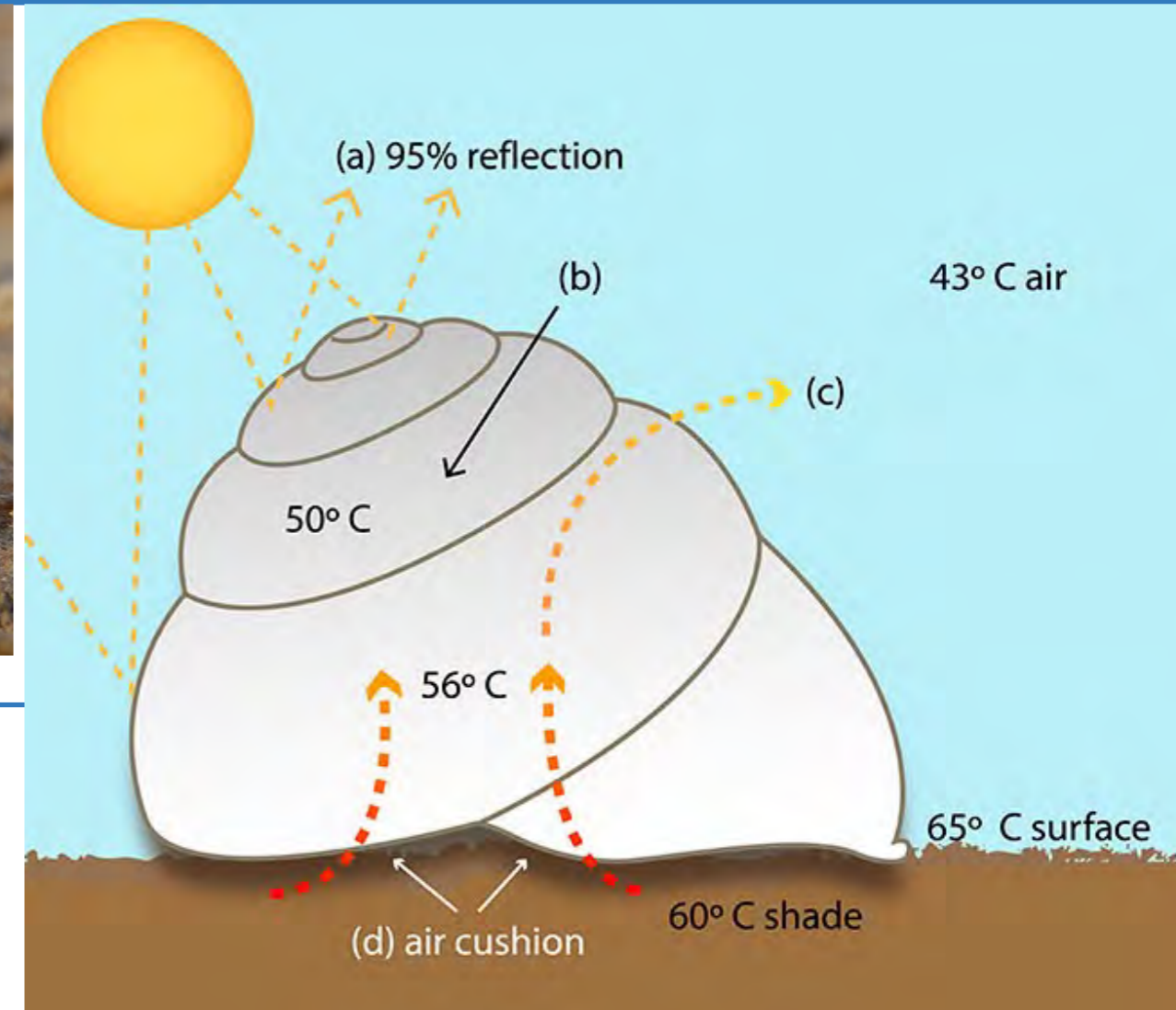


ideation tools and strategies

biomimicry (cont'd)



Desert snails *Sphincterochila prophetarum*, Wadi Hazaz, near Sde Boker, Negev, Israel



catalyzing creativity

ideation tools and strategies

biomimicry (cont'd)



Dr. Eiji Nakatsu, former Director of Technical Development and Test Operations in the organization that created the railway system, resolved several engineering problems using biomimicry.

The Shinkansen Electro Multiple Unit (EMU) train is part of a Japanese railway system that transports 40% of all railway passengers of the world — that's about 64 million people every day. Challenges of such a high-speed requirement included noise, vibration, and pressure waves occurring when the train passed through a tunnel.



cognitive approaches

janusian process



cognitive approaches

homospatial process

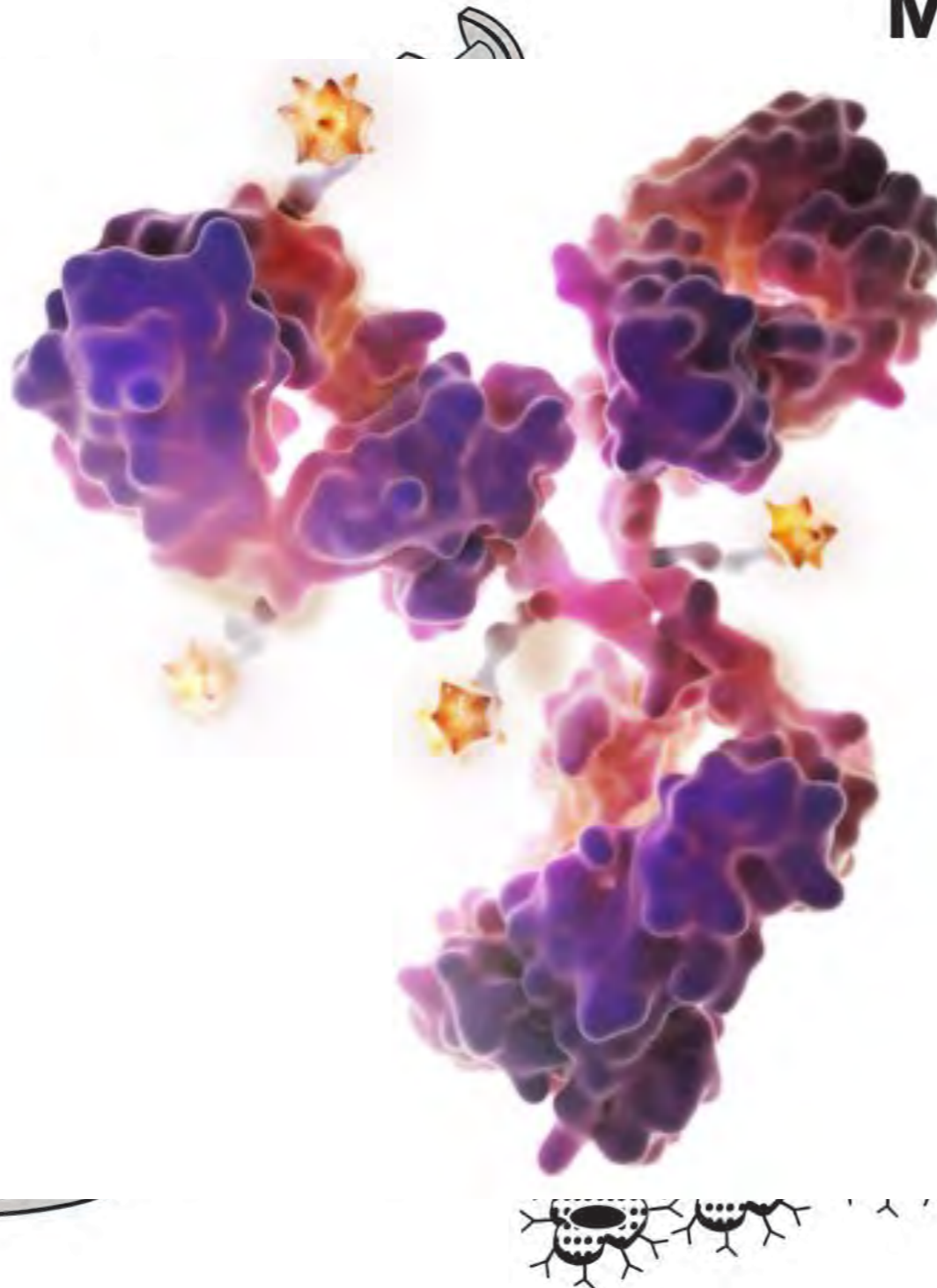


cognitive approaches

sep-con process

Monoclonal Antibody Production

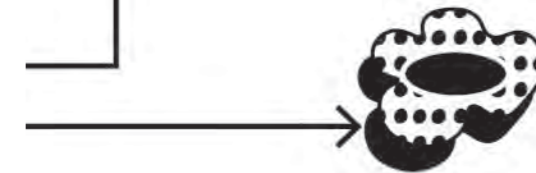
1 Immunization and production of polyclonal antibodies



Cells are isolated from tissue



monoclonal antibody



Hybridoma

5 Hybridoma screening and selection



7 Monoclonal antibodies isolated for cultivation



pop quiz!

1. The following is an example of what kind of ideation strategy:
(3 pts)



+



=



5. courting the muses

or, how to increase the chances of
getting yourself struck by lightning

courting the muses

workspace



strategies and tools

peculiar practices



strategies and tools

enclothed cognition



strategies and tools

tips from neuroscience



pop quiz!

1. Wearing a crazy hat to stimulate creative ideas is an example of what ideation strategy? (2 pt)

BIG CHEESE QUESTION: (5 pts)

2. Name three peculiar practices of creatives, and the people who were famous for them (5 pts)



courting the muses

mind the gap



mind the gap

making connections

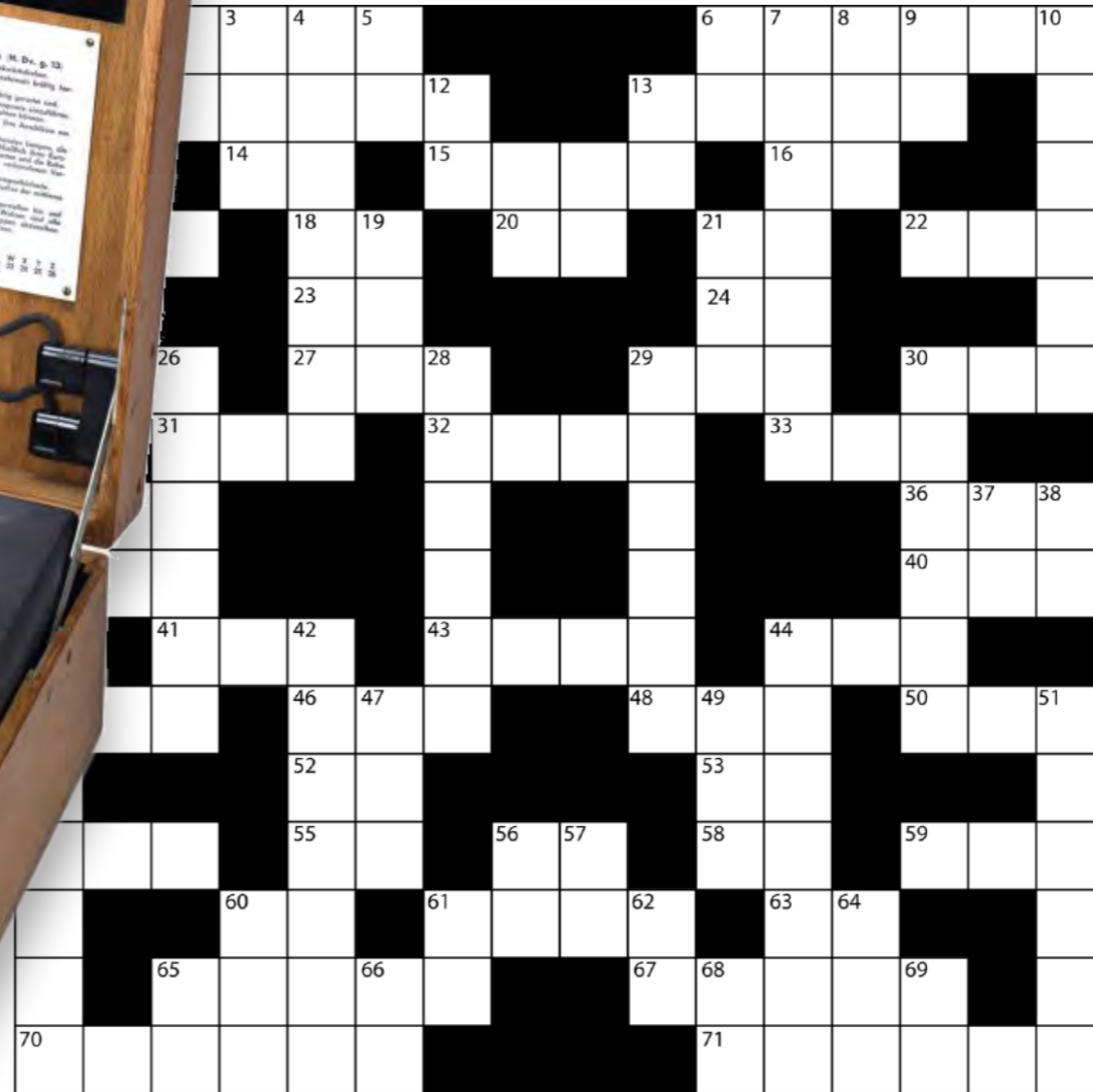


Picasso said of this piece: “Guess how I made the bull’s head? One day, in a pile of objects all jumbled up together, I found an old bicycle seat right next to a rusty set of handlebars. In a flash, they joined together in my head. The idea of the Bull’s Head came to me before I had a chance to think. All I did was weld them together... [but] if you were only to see the bull’s head and not the bicycle seat and handlebars that form it, the sculpture would lose some of its impact.”

Bull's Head, Pablo Picasso.

mind the gap

making connections



mind the gap

incubation



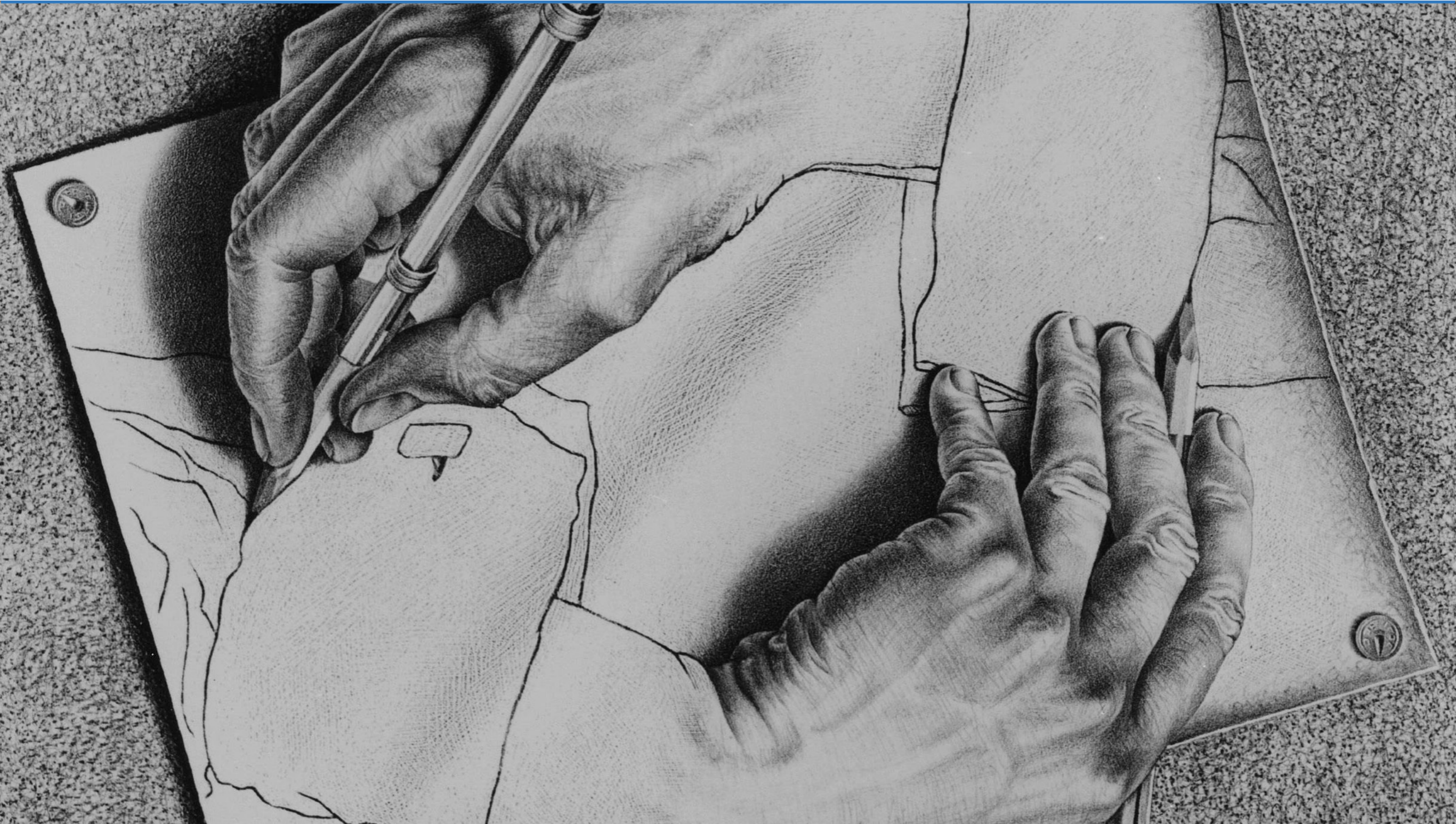
mind the gap

tangled hierarchy



mind the gap

tangled hierarchy



mind the gap

nonsense

Why,
sometimes I've
believed as many
as six impossible
things before
breakfast!

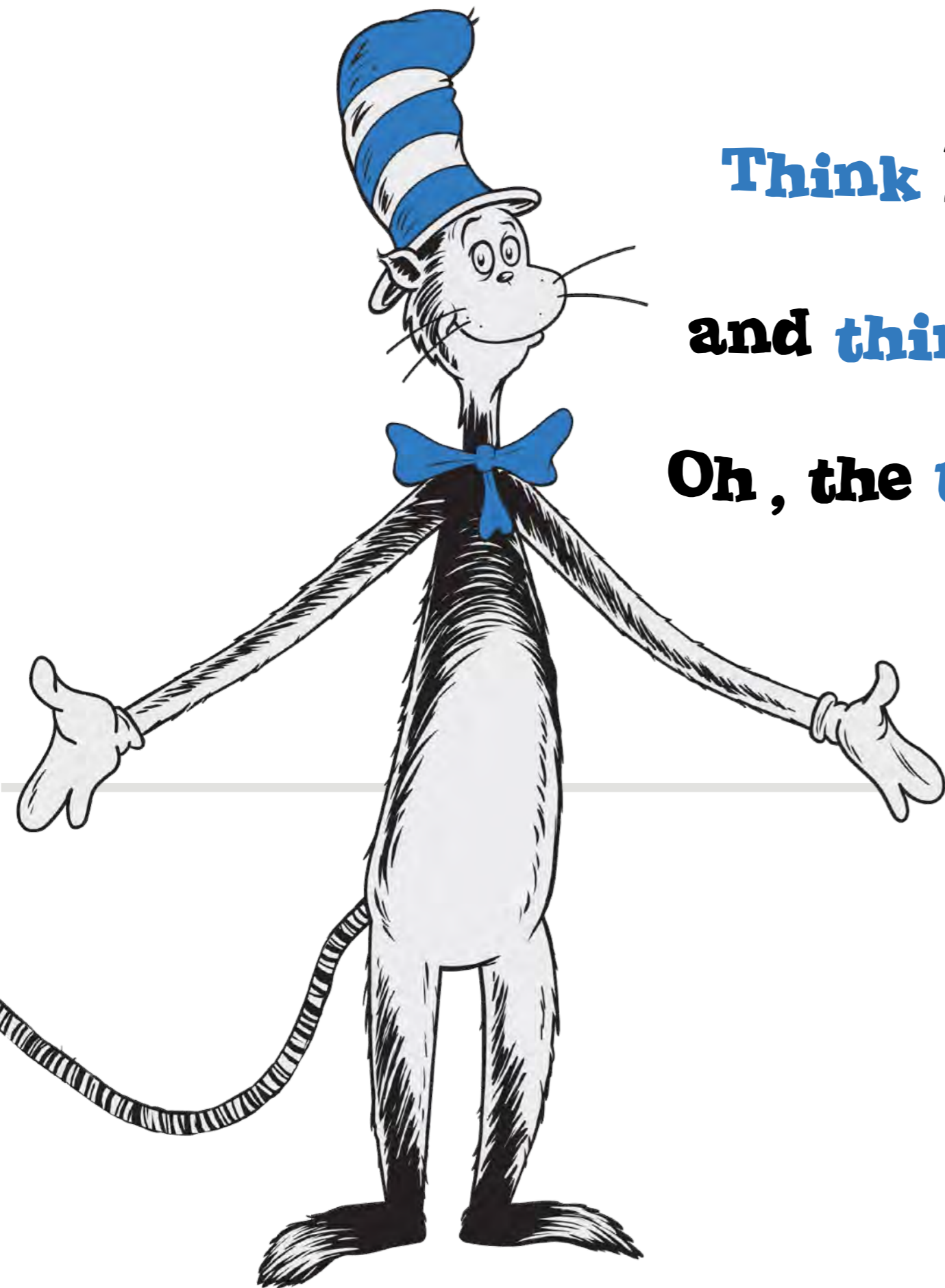


mind the gap

parables



6. conclusion



Think left and **think right**
and think low and **think high**.
Oh, the thinks you can **think** up
if only you try!

