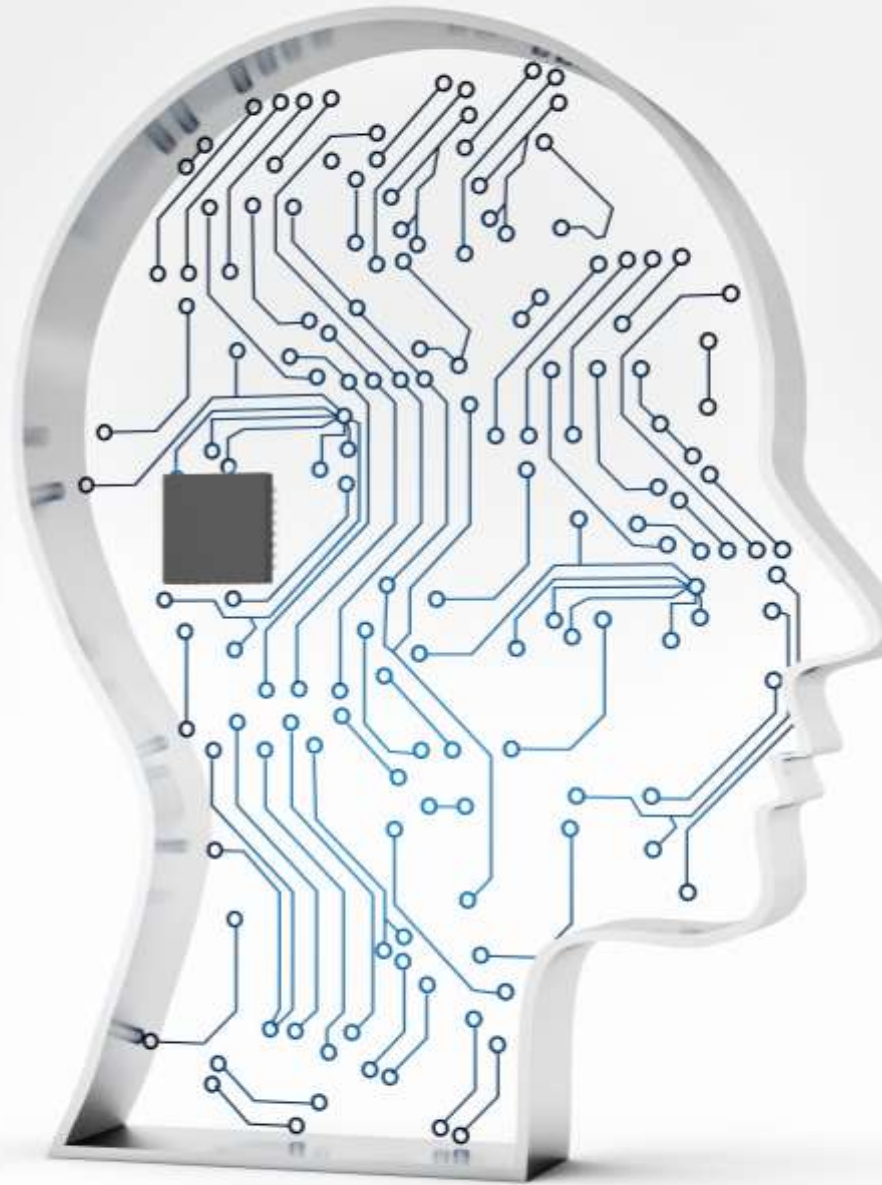




Innovation in Online Learning

Perspectives from Brain
Science

Srini Pillay, M.D.



Current innovation tools

- Content (Writing/Graphics/Media)
- Frameworks
- Synchronous and asynchronous
- Stories
- Multimedia
- Multisensory
- Q&A



Traditional goals in developing e-learning

- Enhance engagement
- Provide novel learning tools and frameworks
- Absorb and remember information effectively
- Apply learning effectively



Question

How do **YOU** prepare your brain differently to develop and realize your moonshots?

A silhouette of a person walking on a path towards a large 'GOAL' sign at sunset. The person is on the left, walking towards the right. The 'GOAL' sign is on the right, with the sun setting behind it, creating a bright glow. The sky is filled with orange and yellow clouds.

GOAL

A silhouette of a person walking up a set of stairs. The person is on the left, walking towards the right. The stairs are on the right, leading up to the right. The background is a light blue and white gradient.

Moving the target

What if your moonshots meant that you had new goals?

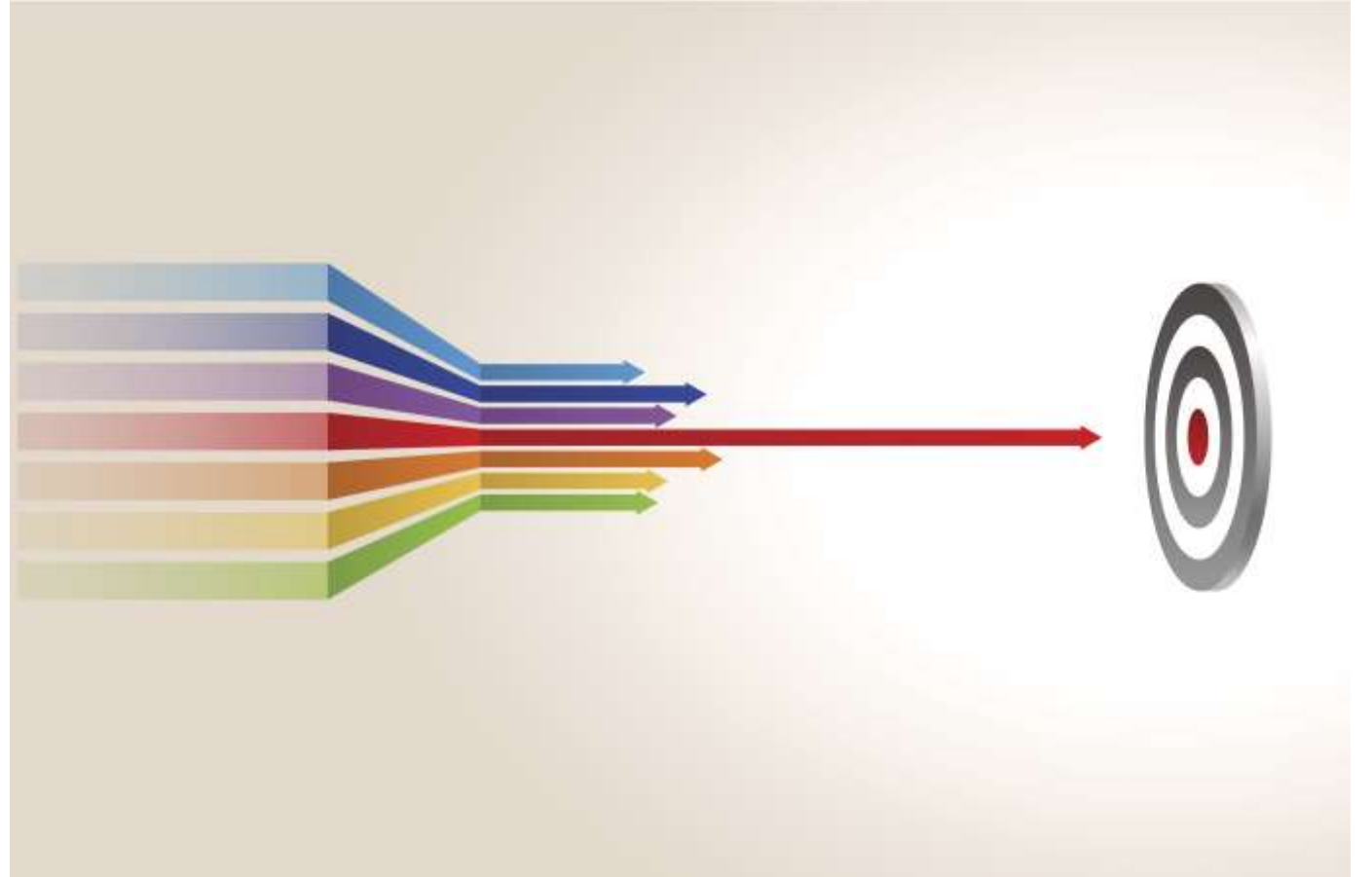


Challenges

- You are already cutting-edge:
 - Good to great
- Learning is compulsory:
 - Agency within confinement (Serenity prayer)
- Learners already have embedded limits:
 - How do you grow wings?

Goal of Talk

Mindset Shifts to
Enhance Innovation in
Online Learning Design



The Brain

- Decrease fear of creativity
(1) THE SCIENCE OF POSSIBILITY
- Make brain space for creativity
(2) COGNITIVE RHYTHM
- Targeting the creative brain
(3) ANALOGICAL THINKING





The Science of Possibility

From unconscious
fear to creativity



Reality

```
graph LR; Reality[Reality] --- A[Insufficient Time]; Reality --- B[Work with what we've got]; Reality --- C[Persist];
```

Insufficient Time

Work with what
we've got

Persist

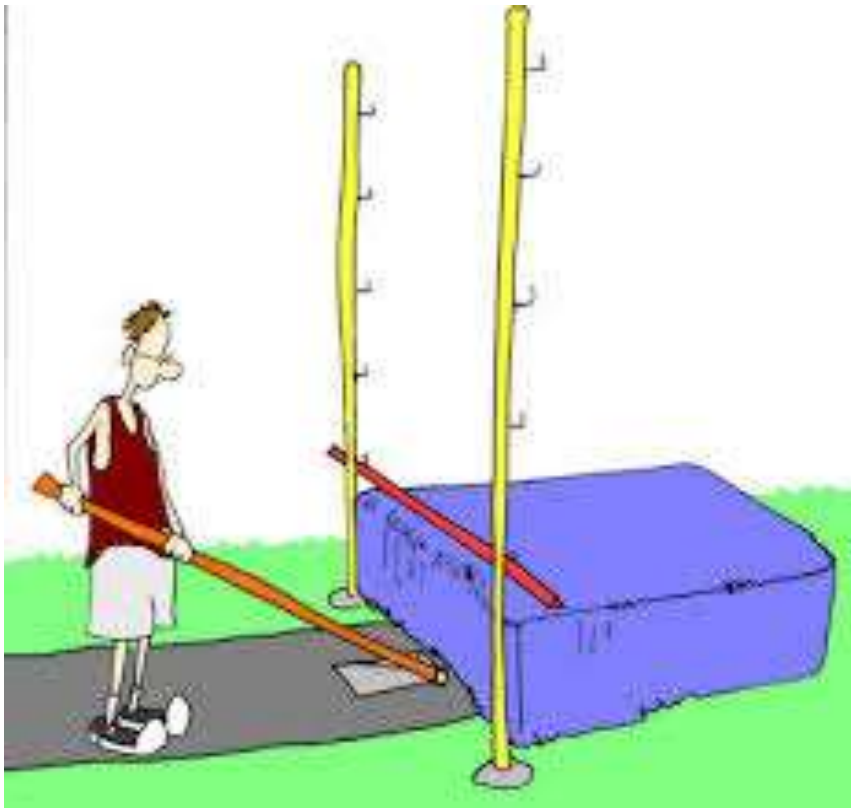
Possibility

```
graph LR; A[Possibility] --- B[Make Time]; A --- C[Use assets creatively]; A --- D[Inspire]
```

Make Time

Use assets
creatively

Inspire



Reality:
Self-Esteem Maintenance
(SEM)



Possibility

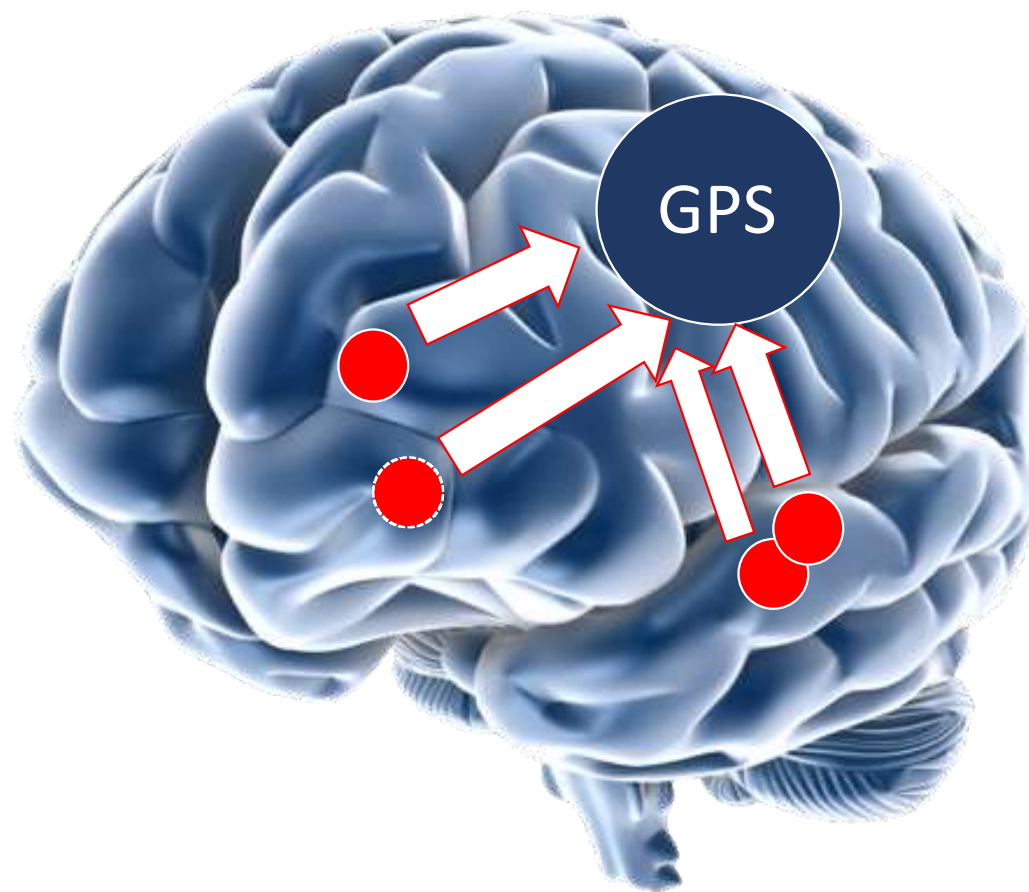
Self-Esteem Optimization
(SEO)



Specific
language of
possibility

- What might your most ambitious goal be:
 - If you **optimized** your e-learning strategy?
 - If you had **superior** e-learning products and offerings?
 - If you had **record-breaking** e-learning?
 - If you were to remain **the most competitive**?
 - If you created **the most comprehensive** e-learning strategy?
 - If your e-learning were to **stand out as being the most innovative**?

The
Possibility
Brain and
the Brain's
GPS





How do you develop a possibility
mindset?

The paradox of
certain questions



VIDEO

How would you do this?



Clarity

Abandon the “how”



Metaphors: The “how” comes after the whole bodied response



Psychological challenge

The Unconscious Revolution



Cornell University
ILR School

Cornell University ILR School
DigitalCommons@ILR

Articles and Chapters

ILR Collection

2010

The Bias Against Creativity: Why People Desire But Reject Creative Ideas

Jennifer S. Mueller

University of Pennsylvania, jennm@wharton.upenn.edu

Shimul Melwani

University of North Carolina at Chapel Hill, shimul_melwani@kenan-flagler.unc.edu

Jack A. Goncalo

Cornell University, jag97@cornell.edu

Commonest words the uncertainty of creativity is associated with

[Redacted]

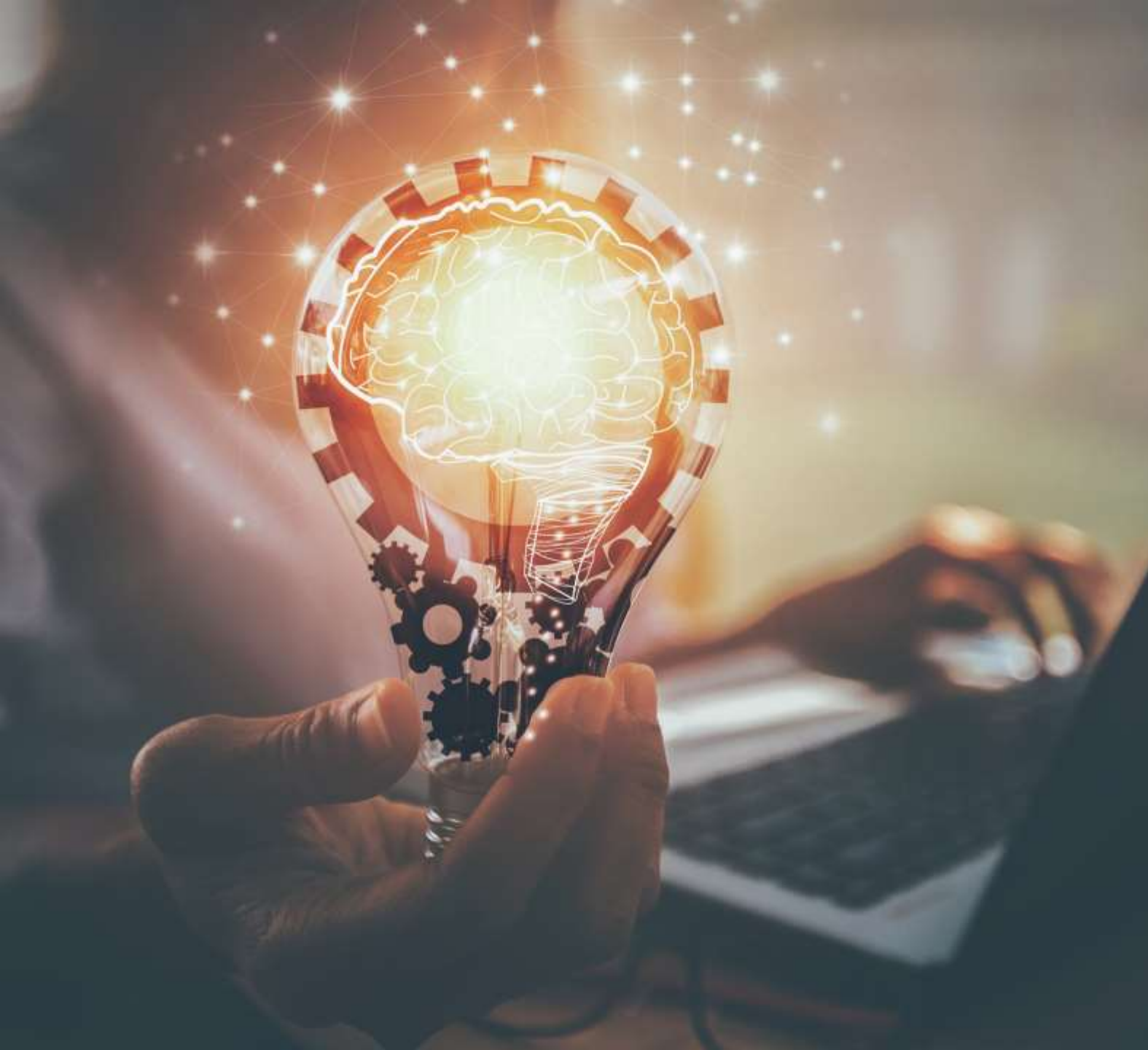
[Redacted]

[Redacted]



The Creative Challenge

Under uncertainty
we prefer
“knowing”



Potential
solution

Switch to possibility
mindset

OLD-Known



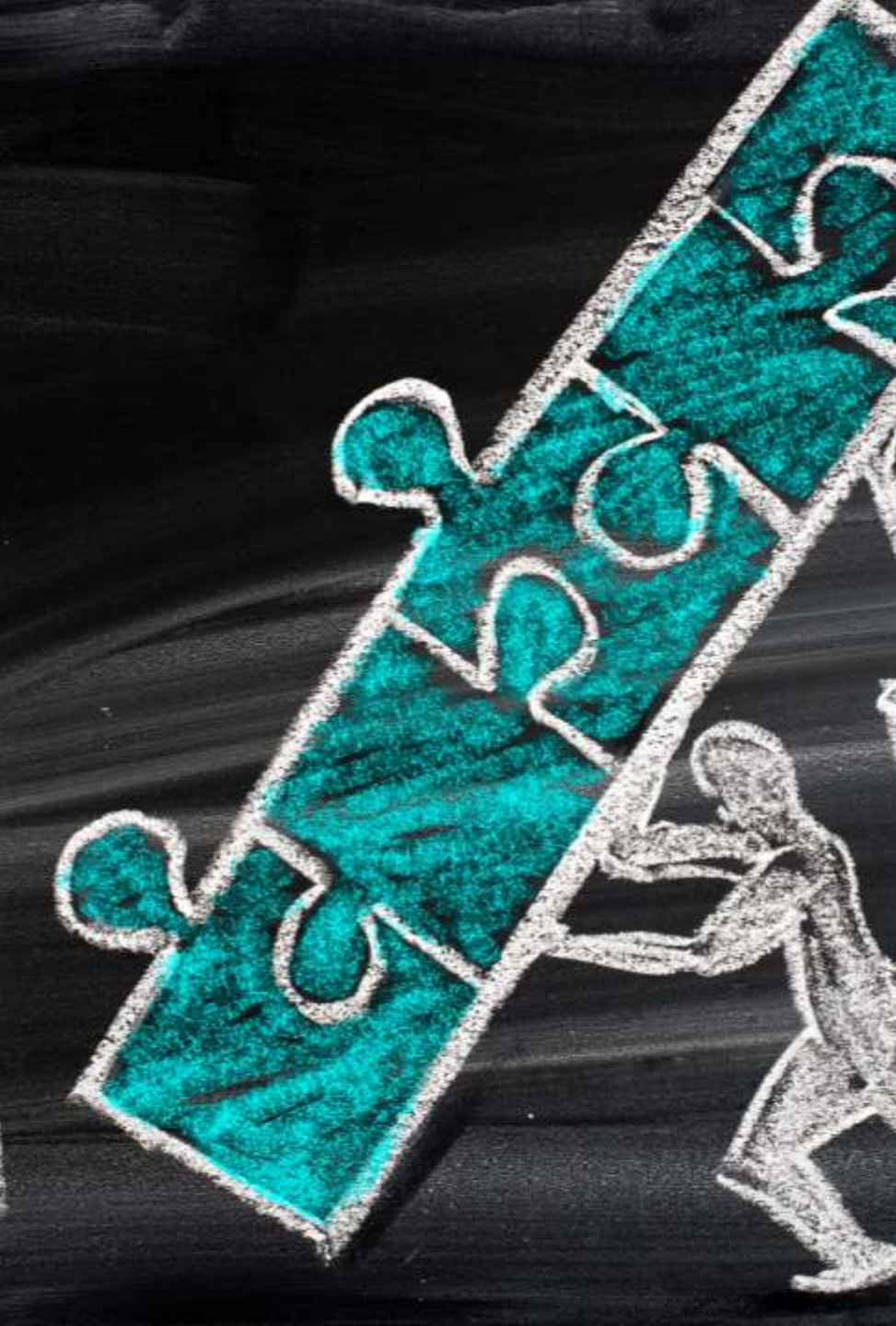
Current standards

- Content (Writing/Graphics/Media)
- Frameworks
- Synchronous and asynchronous
- Stories
- Multimedia
- Multisensory
- Q&A



NEW-Unknown





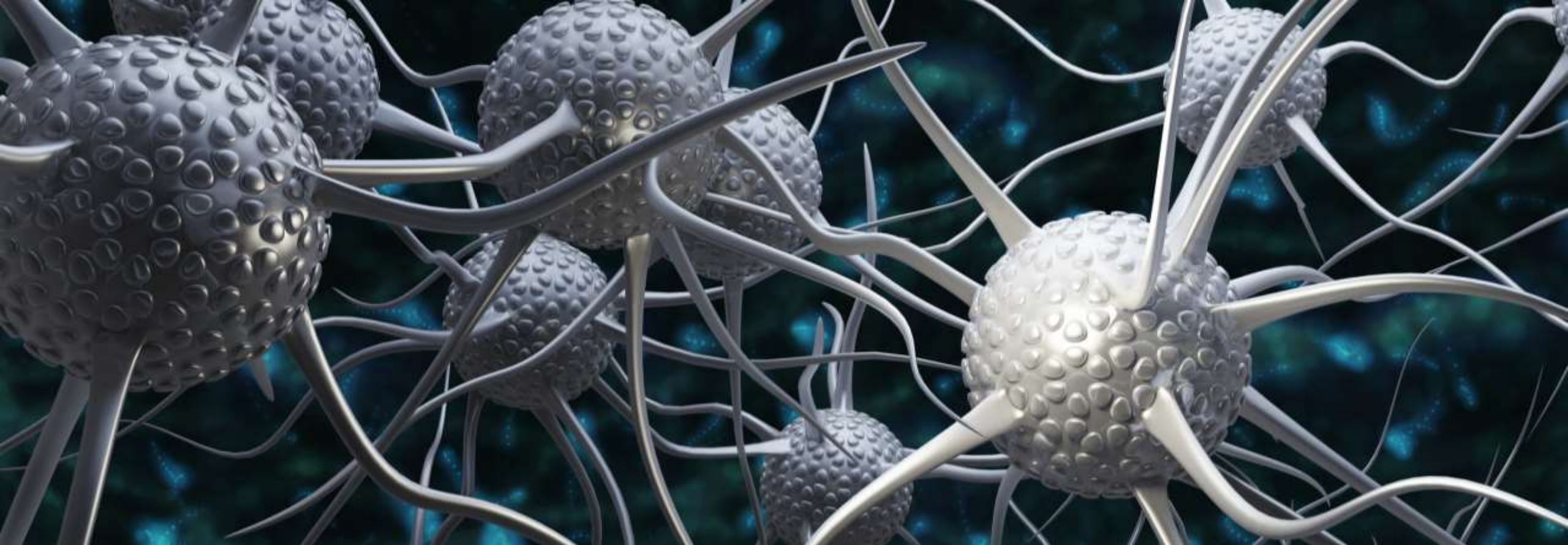
The Mindset of Possibility

- Dweck (2006): Growth Mindset
- Burnette et al. (2013): Meta-analysis
 - Correlates with better goal setting, orienting and monitoring
 - Especially strong correlation when feedback is “failure”
- Schroder et al. (2015): Better cognitive control

What is the possibility mindset?

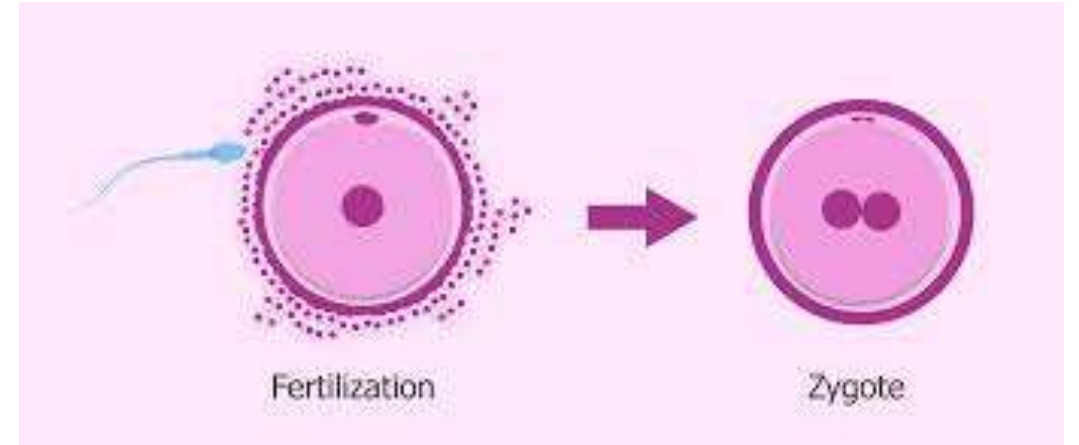
- We can re-imagine learning better than anyone at Harvard or edX
- We can lead the world in e-learning
- Our practical solutions will be born from a mind of endless possibility





Caveat

The neuroscience of learning



Possibility is a whole-bodied commitment



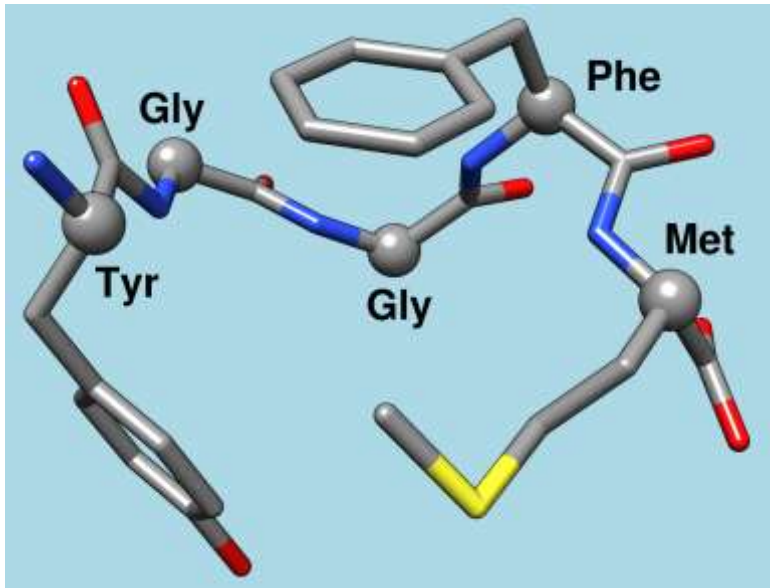
Creative chemistry

The Physiology of Possibility



The Possibility Mindset (Medoff et al., 2015)

- ENDOGENOUS OPIOIDS: CALMNESS
- DOPAMINE: REWARD



The Possibility Mindset (Placebo)

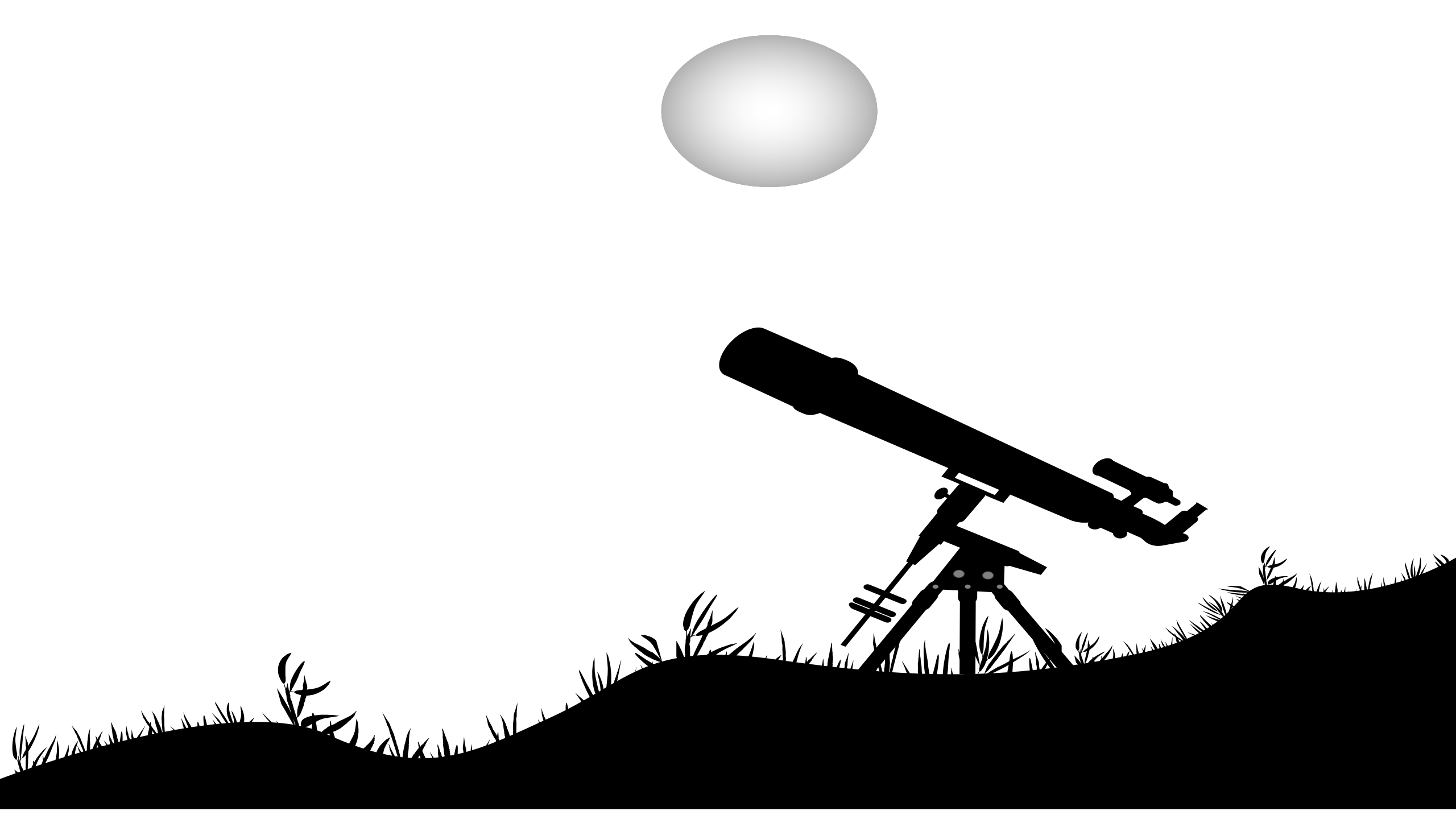
Freeman et al., 2015



The Possibility Mindset (Placebo)

Freeman et al., 2015






Often
confused
with...



Impossibility vs. Burnout




Impossibility	Burnout	Brain
Cannot be done	Have no energy to do it (May not realize this)	 <p>Circuits are blown - needs recharging</p>

Impossibility vs. Burnout

Impossibility vs. Being Lost




Impossibility	Being Lost	Brain
Cannot be done	Don't know which way to go	 <p>A diagram of a human brain with four colored lobes: Parietal (teal), Frontal (red), Temporal (green), and Occipital (purple). The text 'Competing forces' is overlaid on the brain. Four blue arrows point outwards from the brain, one from each lobe, indicating conflicting directions or forces.</p>

Impossibility vs. Being Lost

Impossibility vs. Giving Up



Impossibility	Giving up or Difficult	Brain
Cannot be done	Efforts are frustrated - hopeless	

Impossibility vs. Giving Up

Impossibility vs. Conditioning




Impossibility	Conditioning	Brain
Cannot be done	Habit prevents new change	 <p>Habit Pathways</p>

Impossibility vs. Conditioning

Impossibility
vs.
Depression or
Anxiety

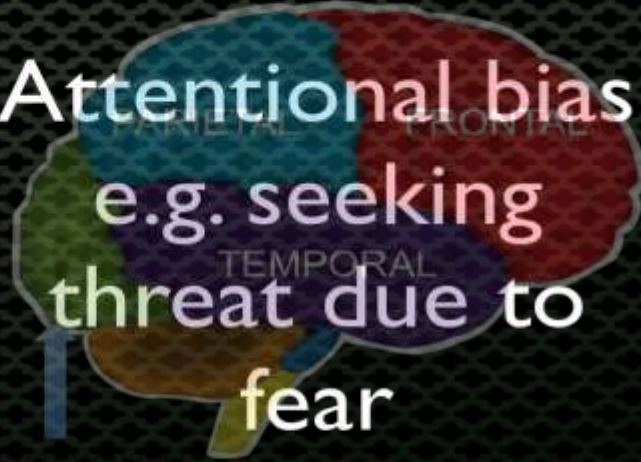


Impossibility	Depression or Anxiety	Brain
Cannot be done	Prevents new change	 <p>Mood disrupts thinking of solution</p>

Impossibility vs. Depression or Anxiety

Impossibility vs. Biased Attention




Impossibility	Biased Attention	Brain
Cannot be done	Life looks like what you are looking at	 <p>Attentional bias e.g. seeking threat due to fear</p>

Impossibility vs. Biased Attention

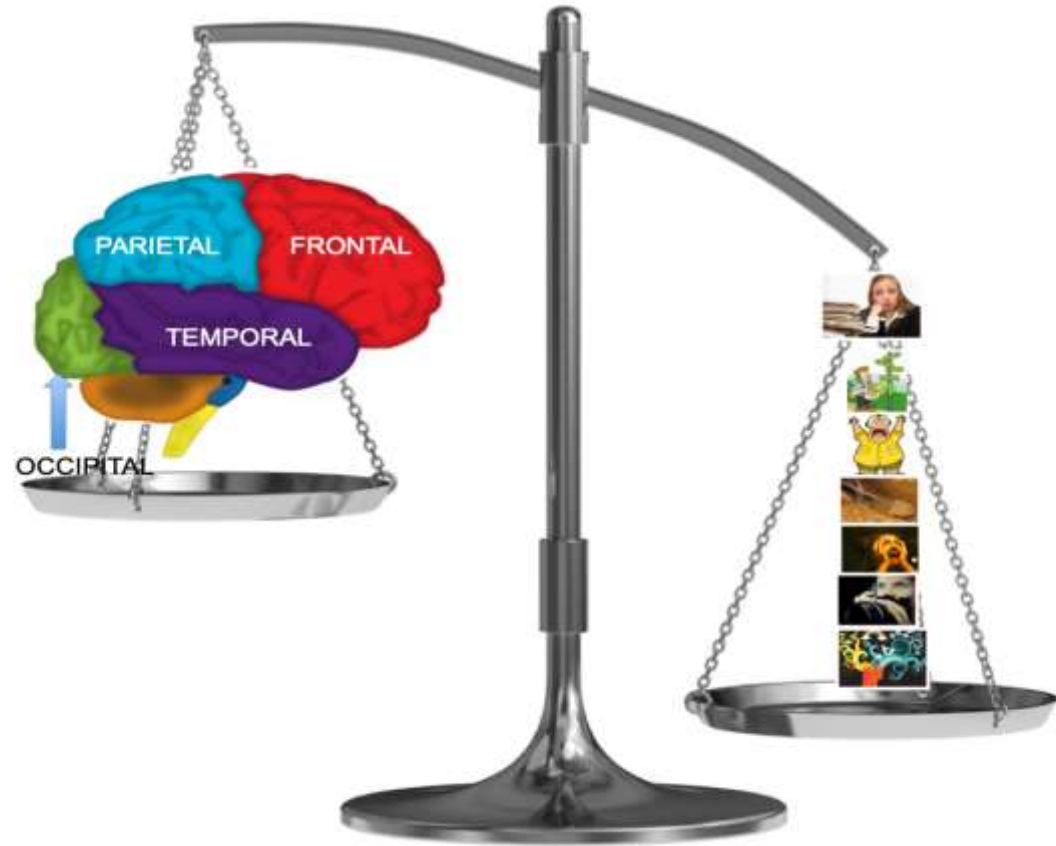
Impossibility vs. Difficulty Imagining



Impossibility	Difficulty Imagining	Brain
Cannot be done	Cannot imagine effectively	 <p>Imagination and movement areas are silent</p>

Impossibility vs. Difficulty Imagining

Brain Imbalance



Impossibility

= Brain vulnerability

Vulnerability	Solution
 Burnout	Treat cause e.g. Work overload
 Being Lost	Re-evaluate direction e.g. Resolve conflicts
 Giving Up	Time-out e.g. New direction
 Habit	New habit e.g. Repeated practice
 Mood	Treat mood e.g. Anxiolytic
 Attention	Redirect attention e.g. Optimism
 Imagination	Image exercises

Group results

- N = 26 (5:10 pm on 7/22)
- Top causes:
 - Feeling lost (N = 16)
 - Difficulty imagining (N = 16)
 - Burnout (N = 13)
 - Conditioning (N = 11)
 - Depression or Anxiety (N = 9)
 - Biased attention (N = 8)
 - Task difficulty (N = 5)

Solutions for possibility

- I don't know where I am going
 - WHY FINDING YOUR "I" IS MORE IMPORTANT THAN FINDING YOUR WHY
- I can't see a possible future
 - SPEND MORE TIME IN IMAGINATION
- Burnout
 - UNFOCUS





VIDEO

Example of possibility

Virgil Abloh
Artistic Director of Louis
Vuitton's menswear

Possibility





Questions for you (2 mins)

- What unlikely possibility can you imagine for e-learning?
- What e-learning outcome would make you the best in the world?
- What future in e-learning do you want to create?



Cognitive Rhythm

Making brain space
for clarity and
creativity and finding
your “I”

Usual “Go-To” solution: FOCUS



- To do lists
- Calendar reminders
- Noise-blocking headphones
- Tracking technology
- Medication



VIDEO

Limits of perception



Logical plans and skillful decision-making



Strategies

Unconscious

Unlock the Power
of the Unfocused Mind

TINKER

DABBLE

DOODLE

TRY

SRINI PILLAY, M.D.



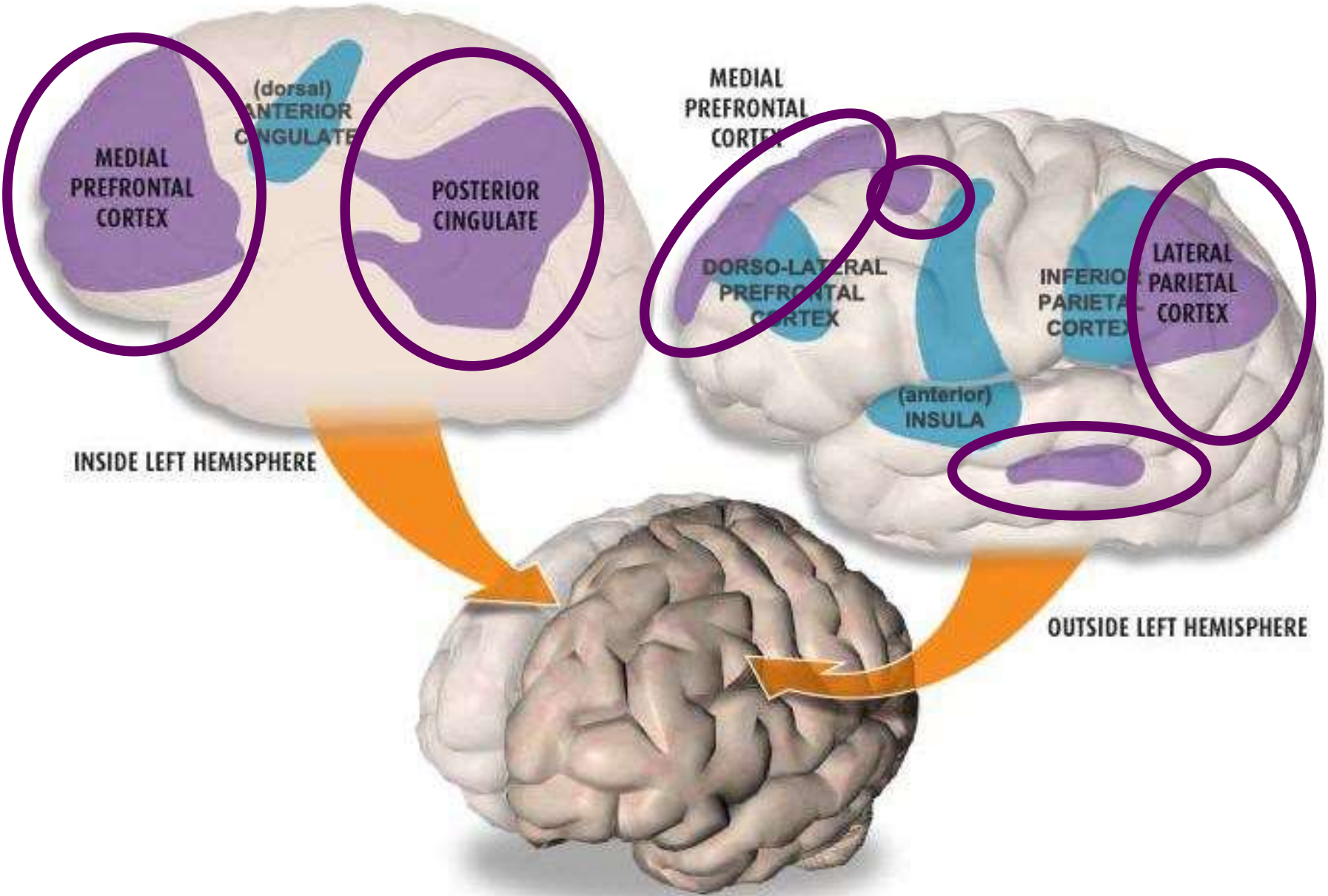
Creativity...

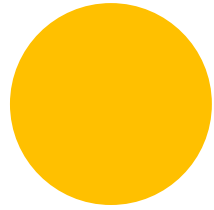
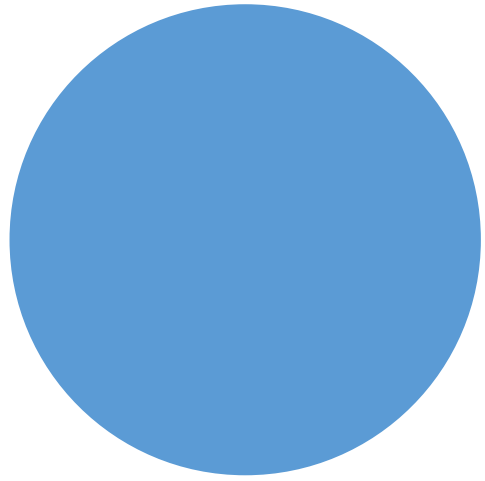
Is not about what you can see;
it's about who you can be

THE BRAIN IN NEUTRAL

When you switch off, a distinctive network of brain areas not involved in focused attention bursts into action

● Default network ● Areas involved in focused visual attention

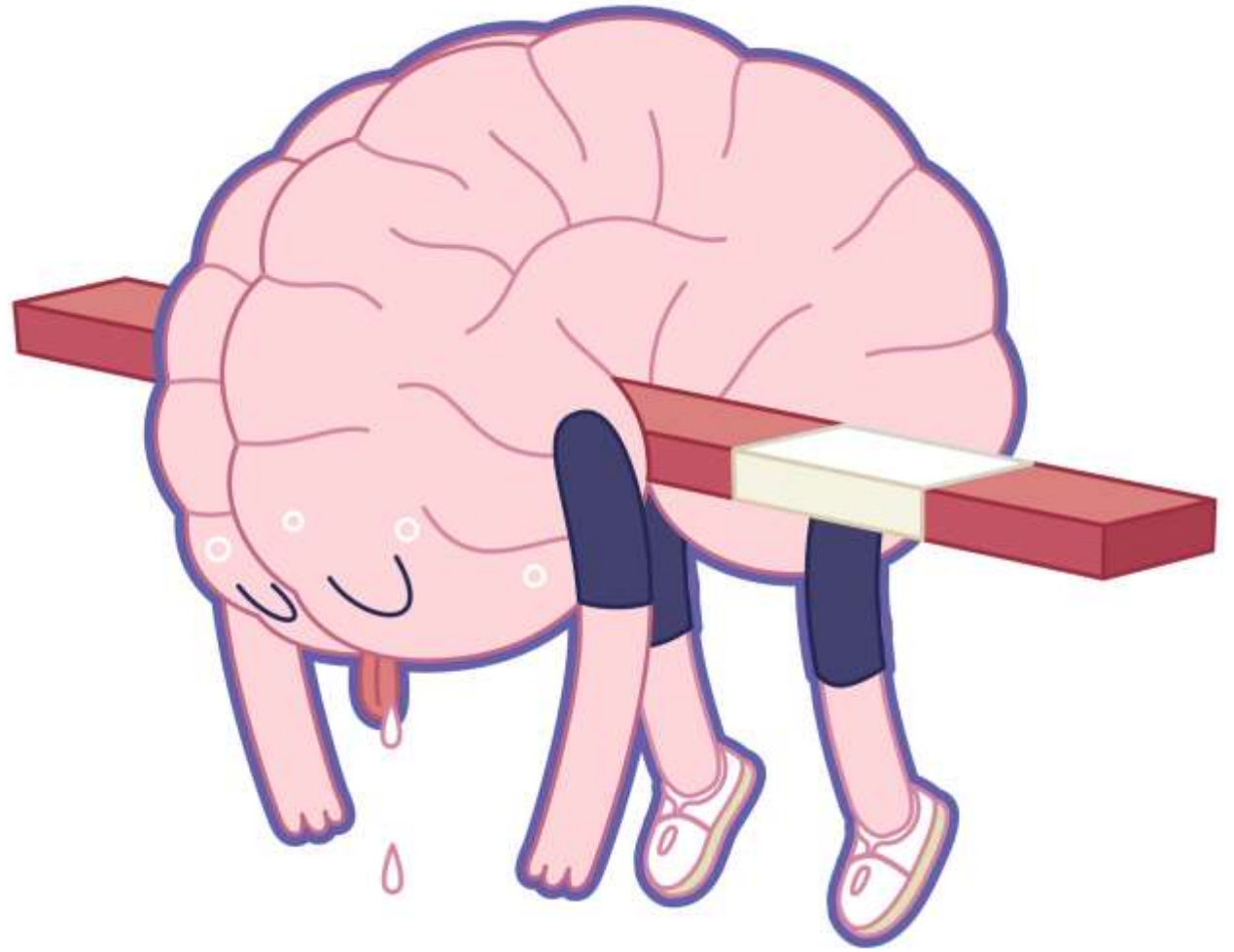




How Focus Disrupts Present Awareness



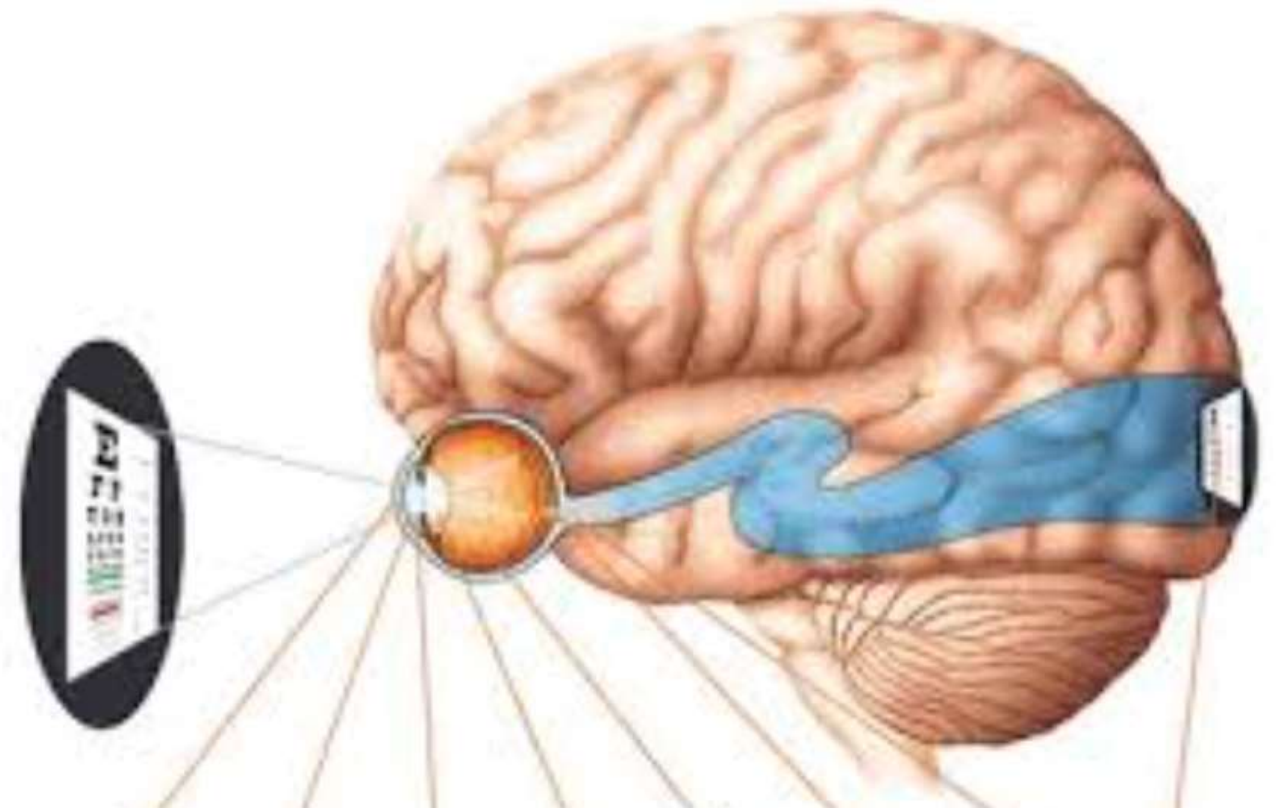
Fatigue



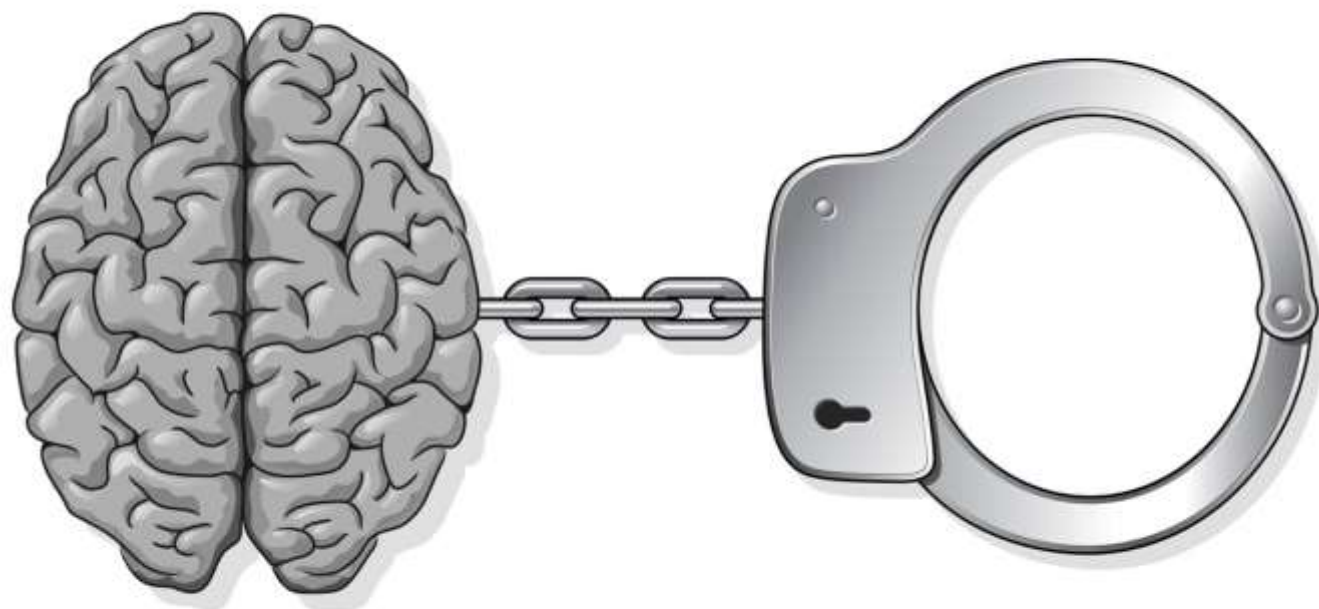
Tunnel Vision- Blind to Competition



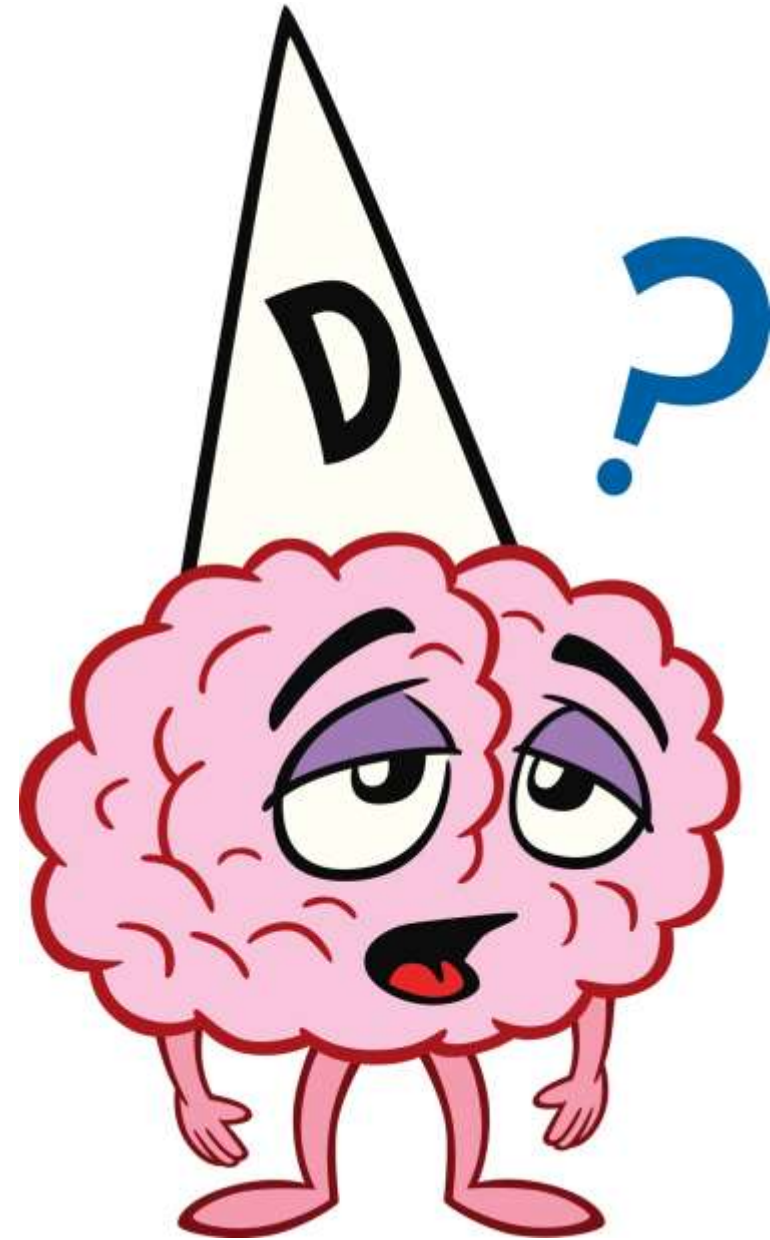
Blind to the
future



Trapped-No
connections



Sense of Self- Limited





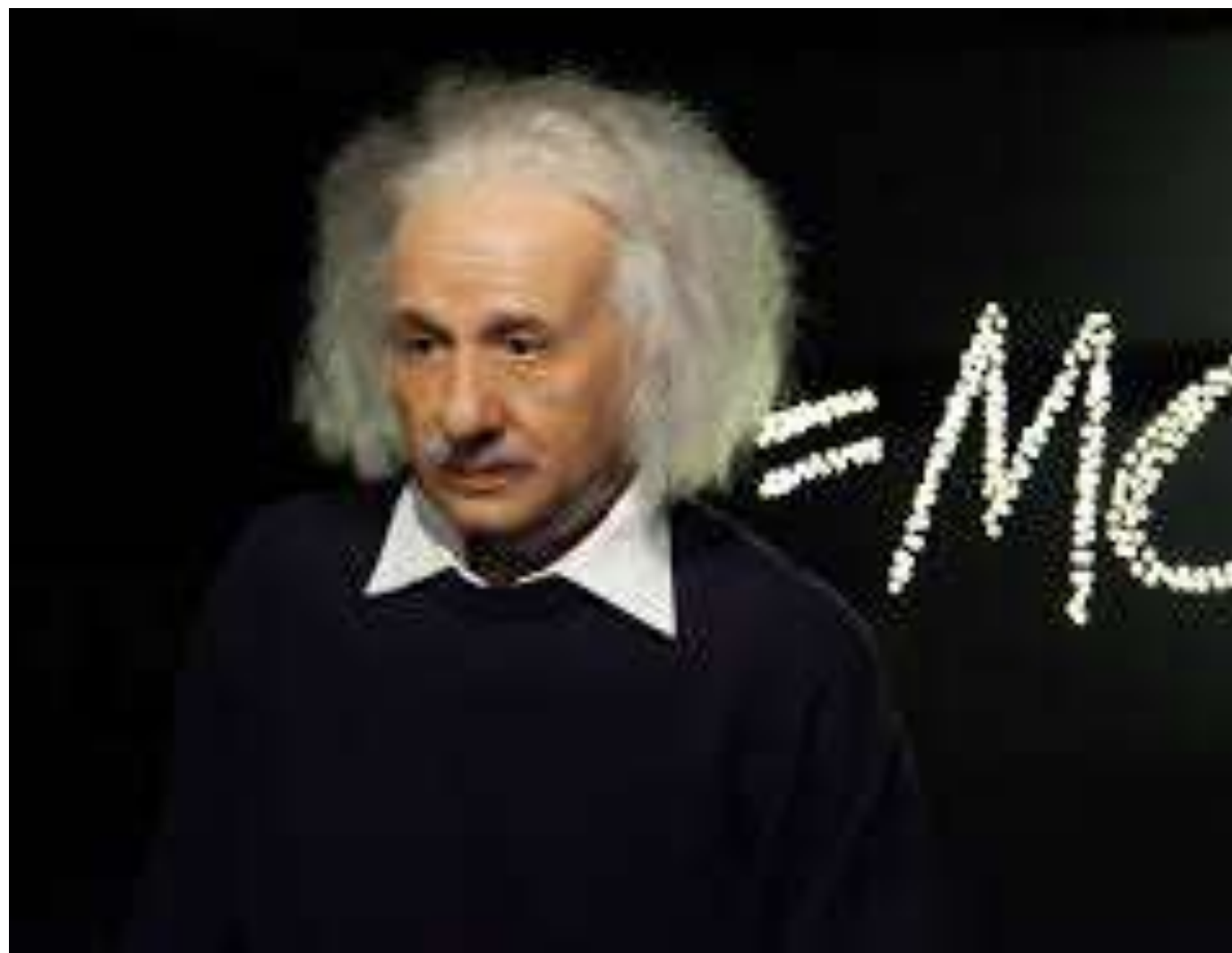
Focus

Unfocus

Human Intelligence: Focus and Unfocus

Einstein

My new discovery is the
result of musical
perception



Kary Banks Mullis

PCR while driving from Berkeley to
Mendocino



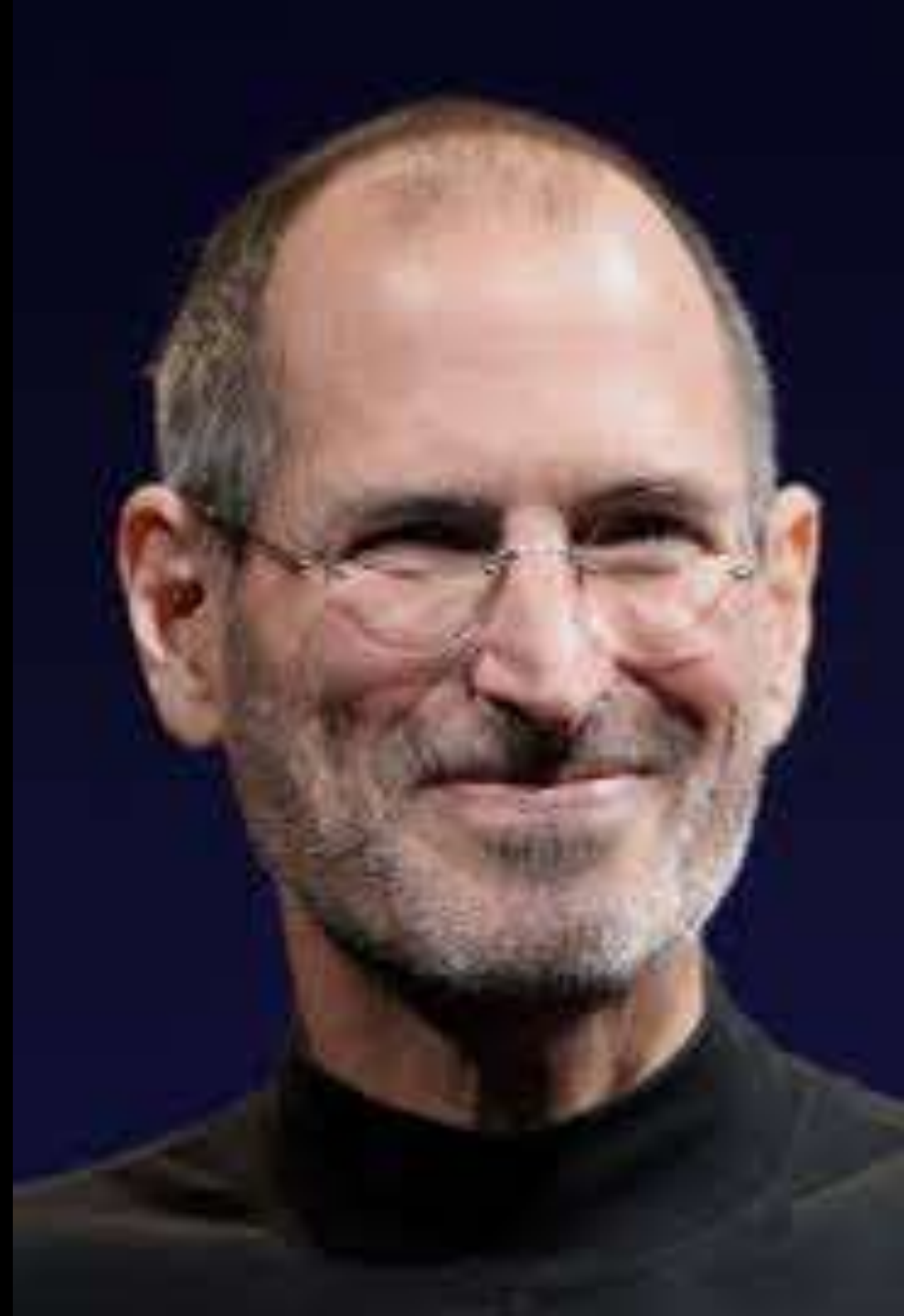
Bernard Arnaud

Focus groups do not
dominate the conversation
at LVMH



Steve Jobs

“...you can't connect the dots looking forward...So you have to trust that the dots will somehow connect in your future. You have to trust in something - your gut, destiny, life, karma, whatever...”





Steve Jobs

In 1974, he spent time at an ashram in India, meditating, ruminating, and walking around nearby villages. In 1976, he founded Apple.



Mark Zuckerberg

When Facebook hit a rough patch in 2008, founder Mark Zuckerberg followed Jobs's advice. He took time off to mull over the future of the company. After that he turned around his for- tune.



Bill Gates

Bill Gates still takes a secluded “think week” twice a year to ponder the future of technology. In one week in 1995, he was inspired to write a paper, “The Internet Tidal Wave,” that led Microsoft to develop its Internet browser and beat out its competitor, Netscape.



Doris Kearns Goodwin

Leadership in
Turbulent Times
(September, 2018)

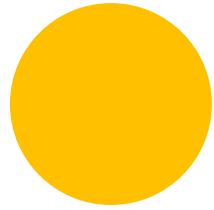
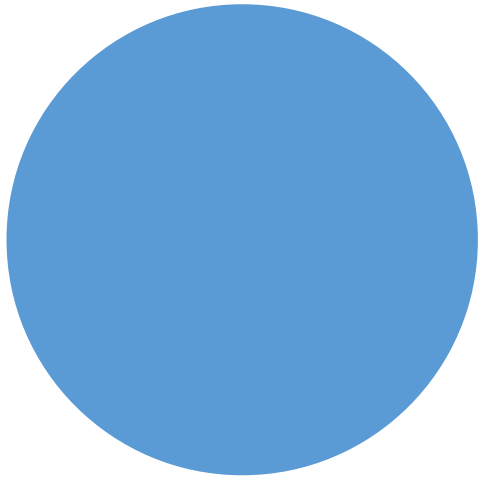
Lincoln, Teddy Roosevelt, FDR,
Lyndon Johnson

What leadership
qualities are most
underrated?





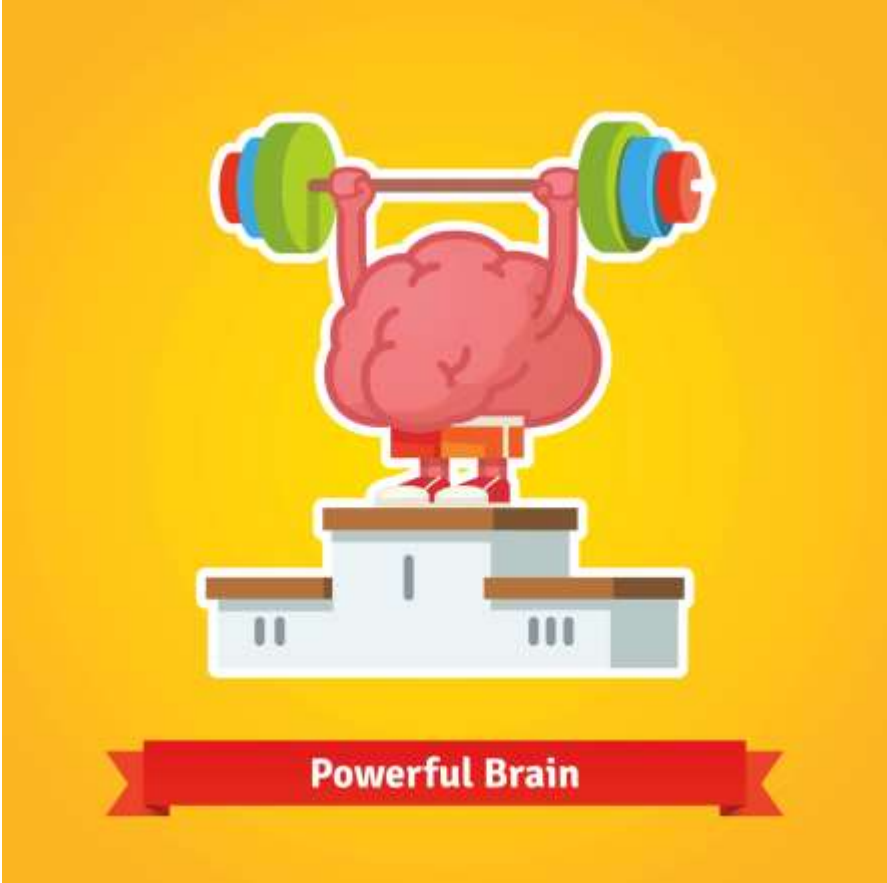
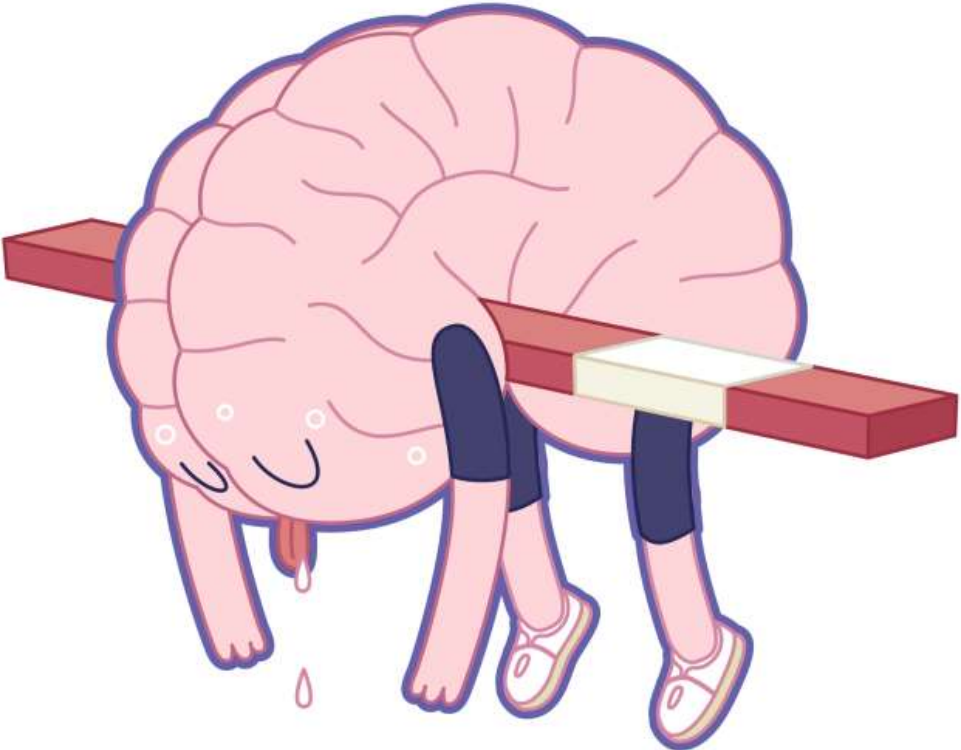
Replenish their energy and creativity



How unfocus
builds presence



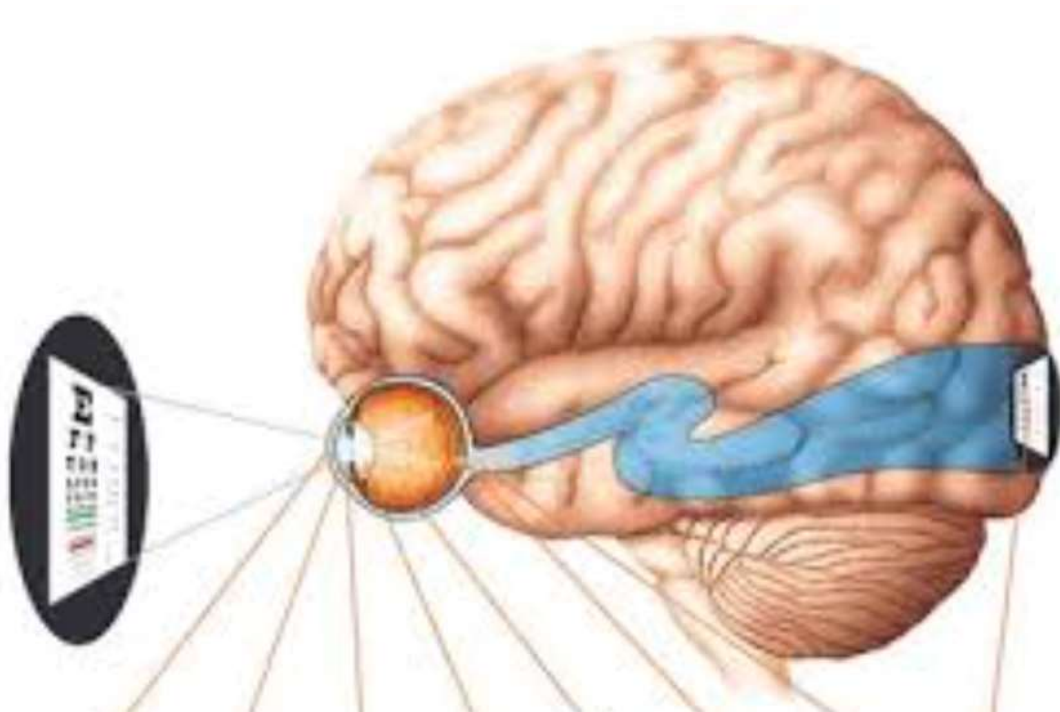
Fatigue-Energized



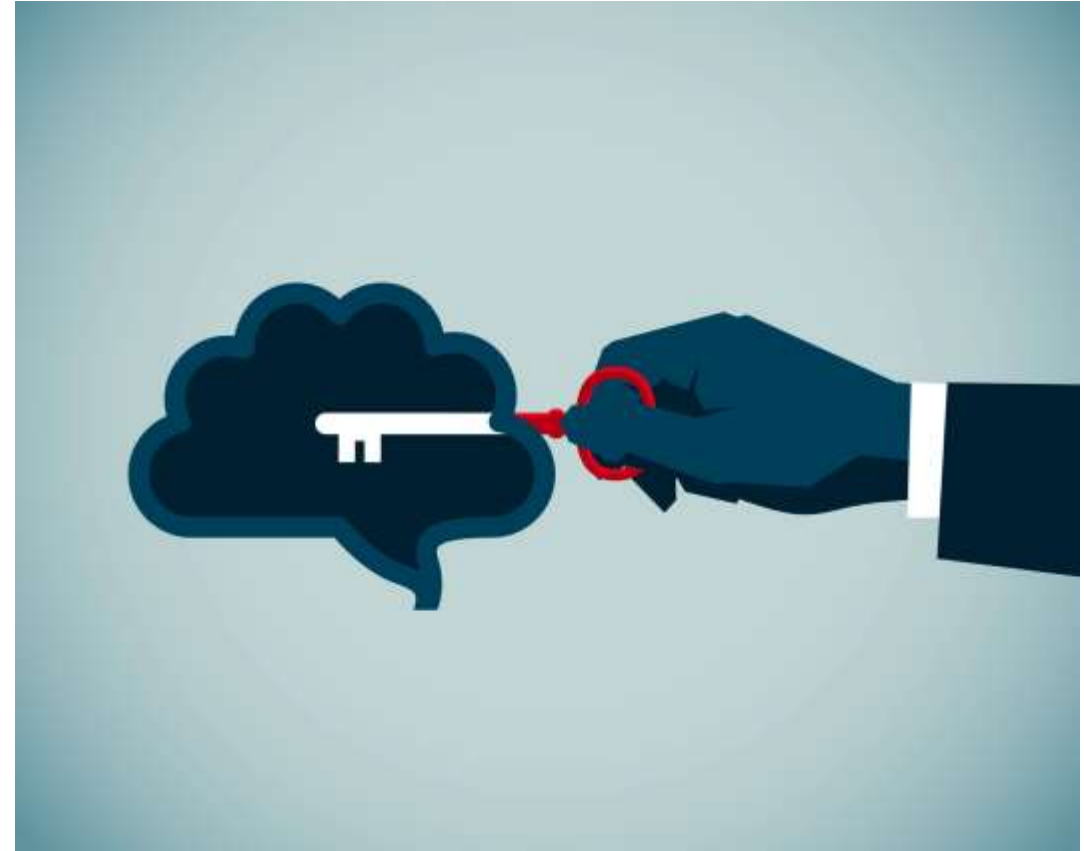
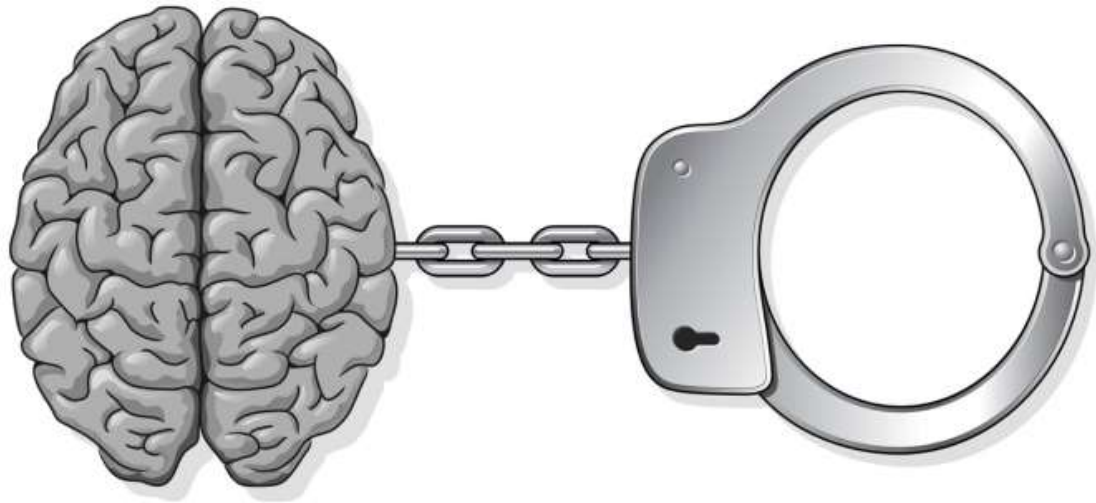
Tunnel Vision-Aware



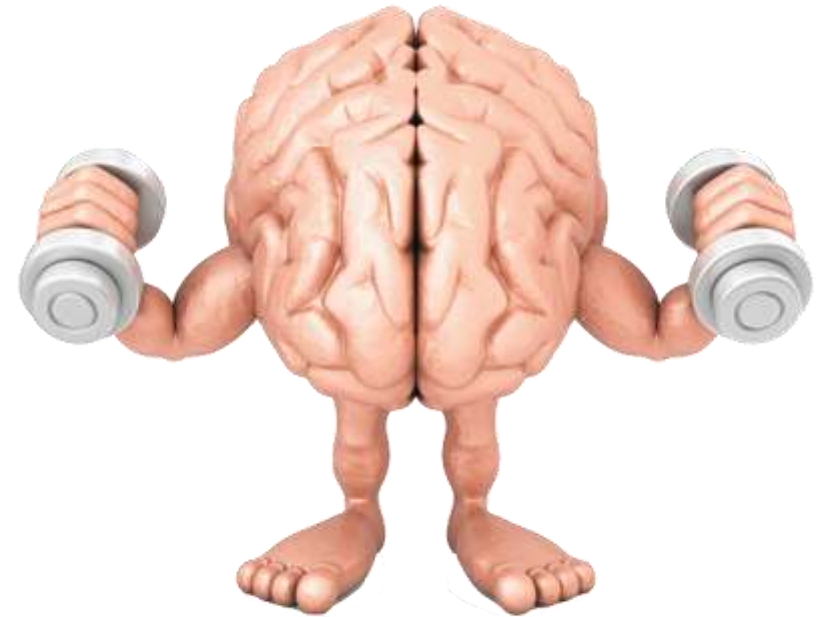
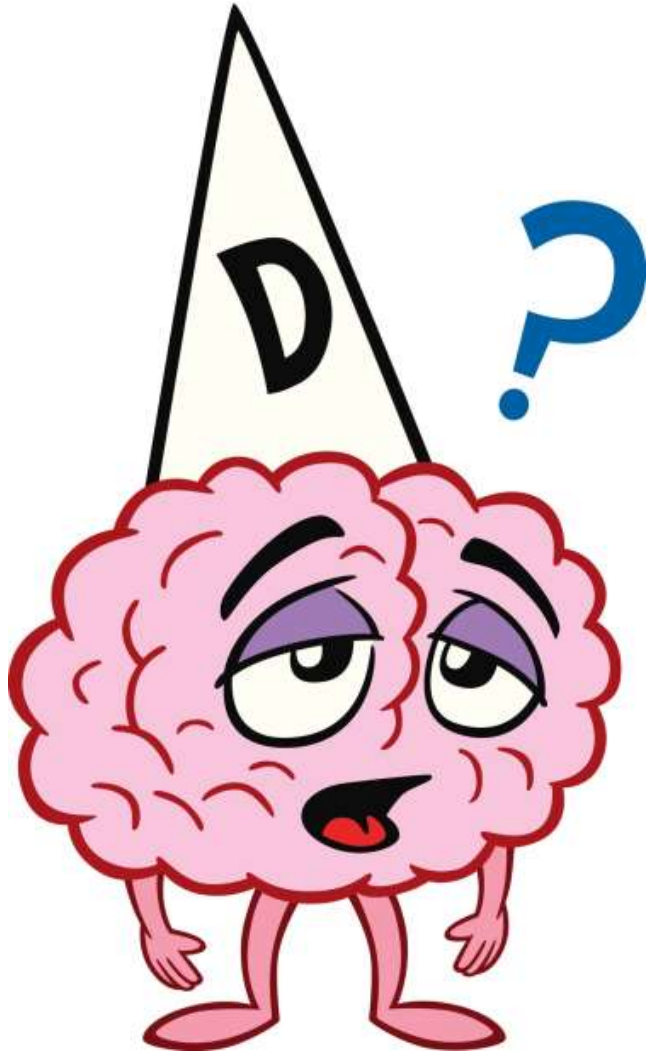
Blind to the future-Predictive



Trapped-Creative



Sense of Self-Limited to Complex



FOCUS



LinkedIn™

UNFOCUS



Unfocus incubation methods

- Napping
- Positive constructive
daydreaming
- Doodling
- Psychological
halloweenism



Napping



Optimal naps

- 5-15 minute naps: 1-3 hours of clarity
- 90 minute naps: improve creativity
- Avoid long naps-cardiac stress



Positive constructive daydreaming





Three kinds of daydreaming (Singer 1955)

Ode to Positive Constructive Daydreaming

McMillan et al. (2013)



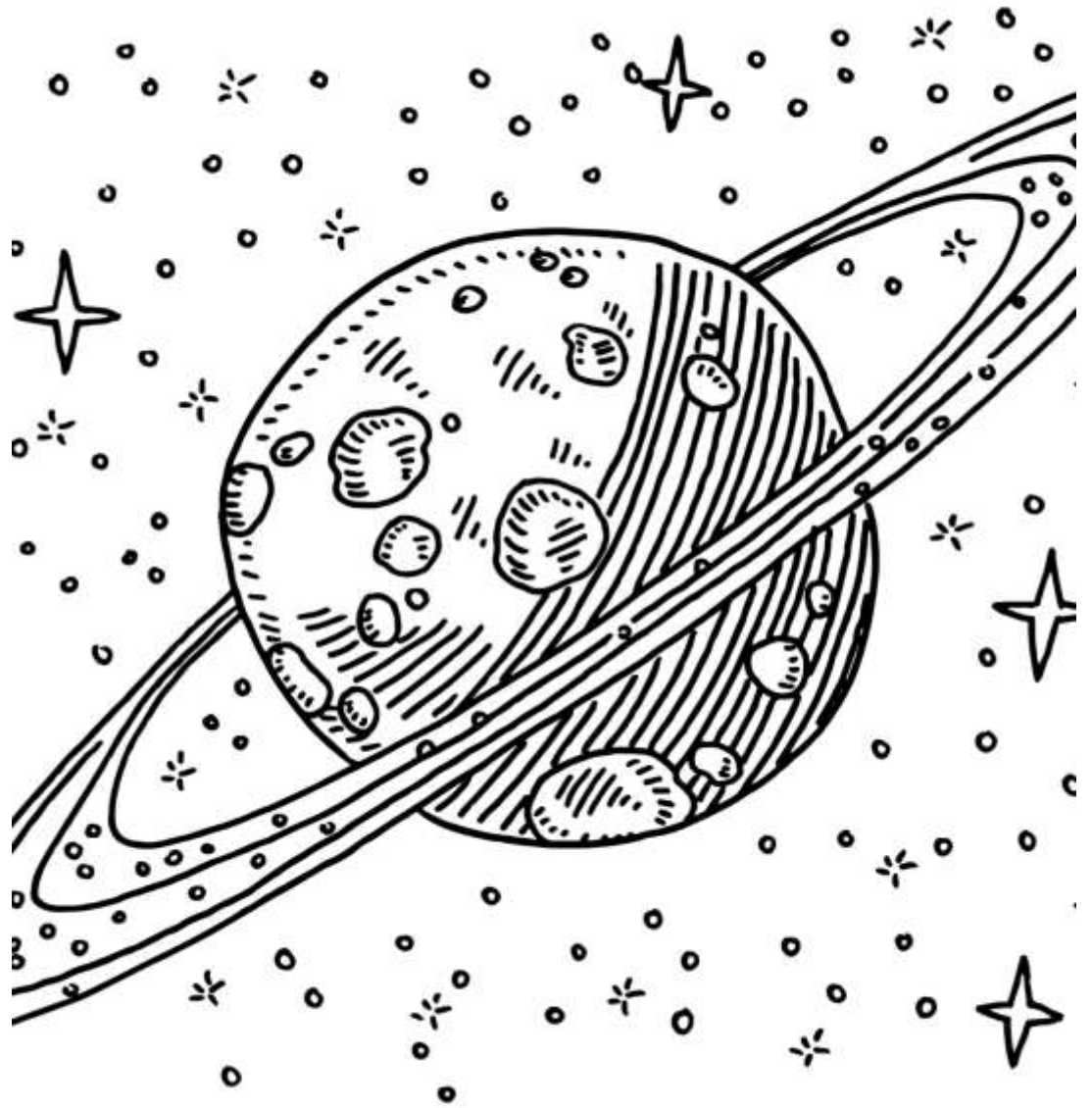
- Build this practice into your day
- Undemanding activity (walking, gardening, knitting)
- Volitional: playful, wishful imagery
- Perceptual decoupling-access internal thought streams and develop meta-awareness

Daydreaming: Application

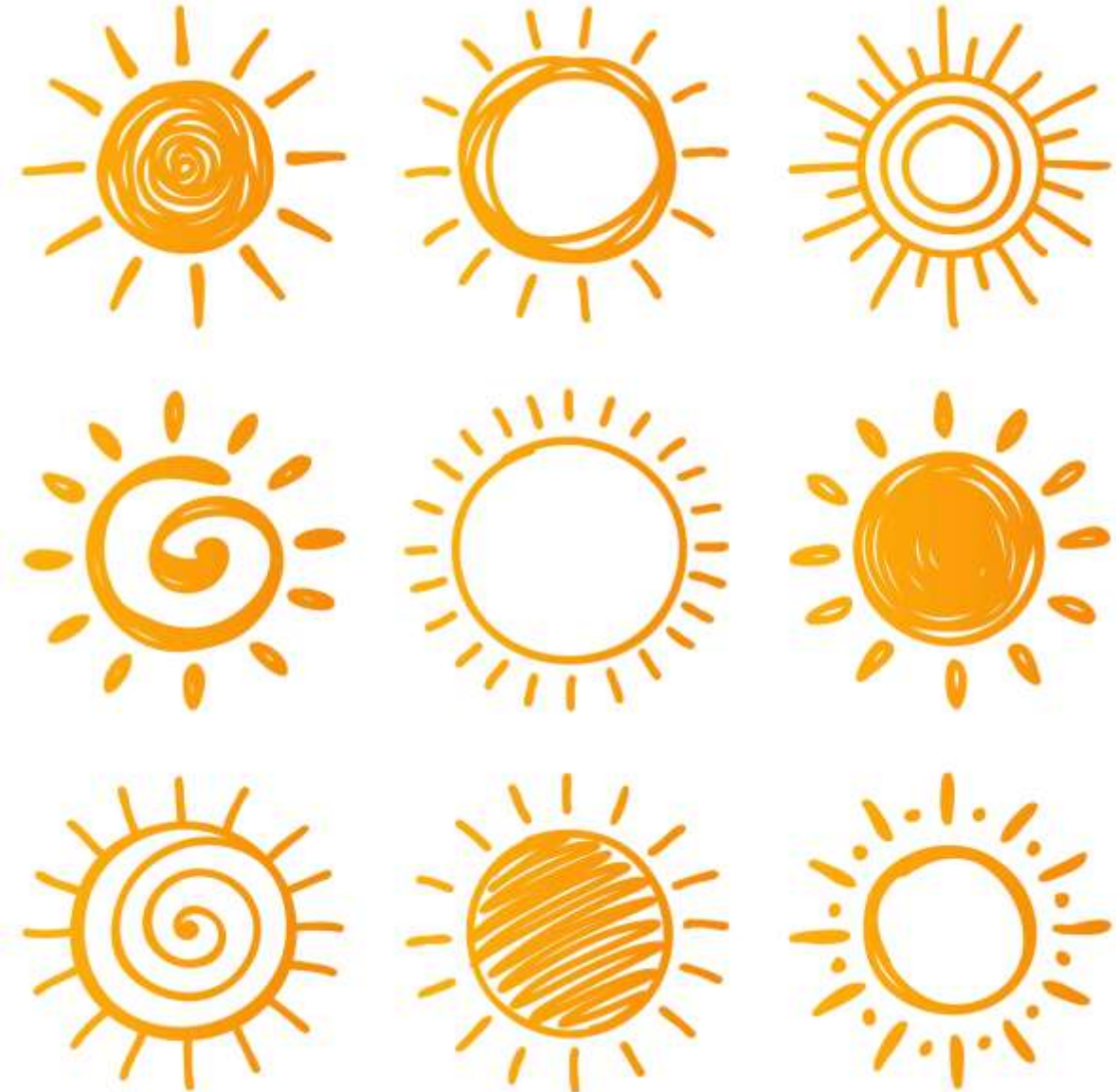


- Build in digital daydreaming into a “tinkertable”
- Create daydreaming space at home or at work
- Connect daydreaming habits with productivity measures

Doodling

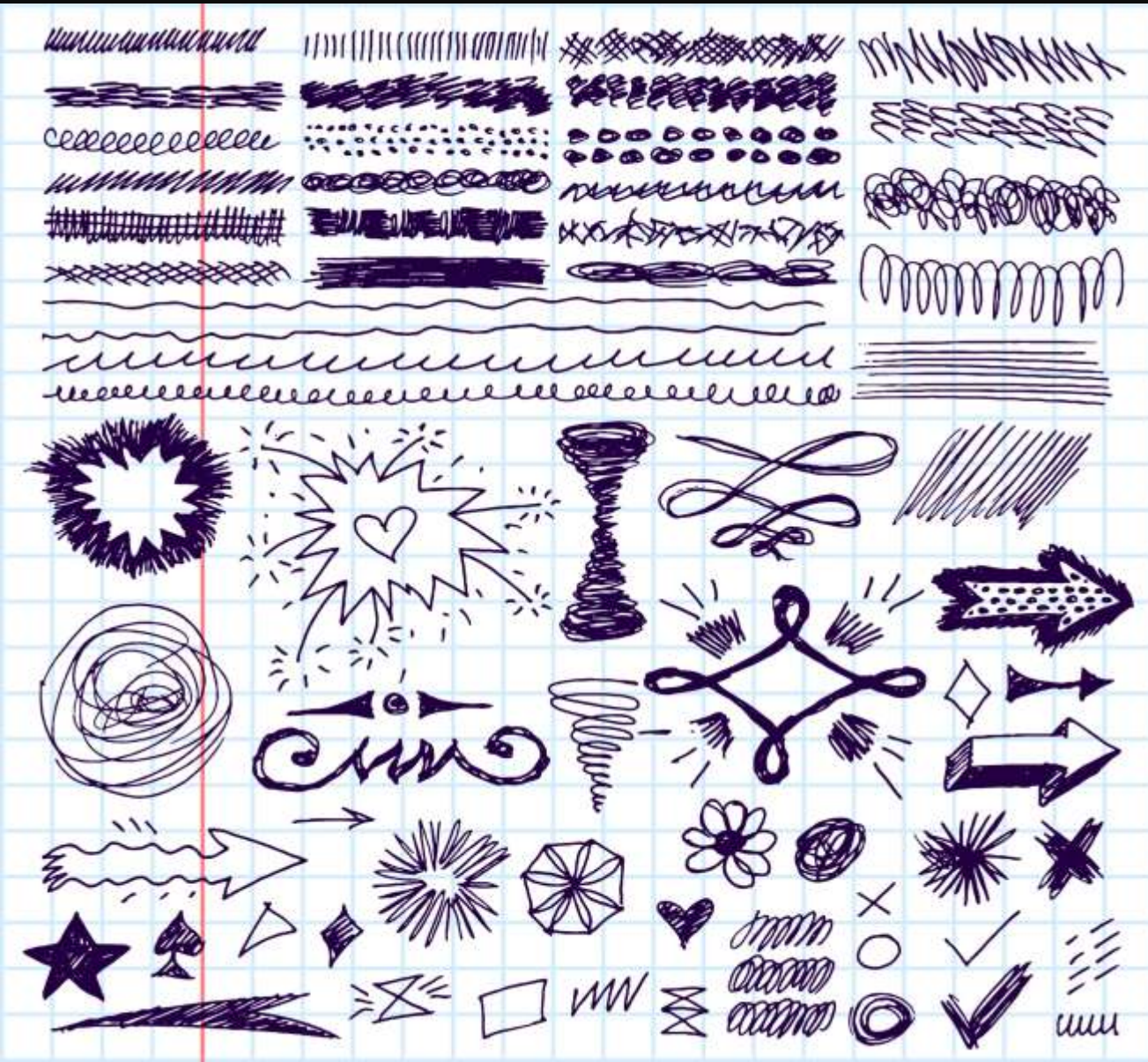


Andrade (2010): Doodling



- Doodling: 29% improvement in memory
- Seems more personalized: one recent study showed the contrary

Doodling: Application



- Encourage doodling when tasks are laborious to listen to
- Doodle when listening to podcasts or on conference calls to remember better
- Connect to productivity outcomes

Psychological Halloweenism

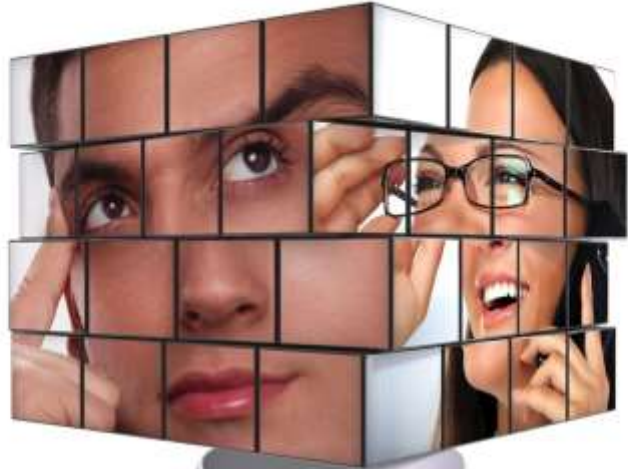


Duma and Dunbar (2016): Psychological Halloweenism



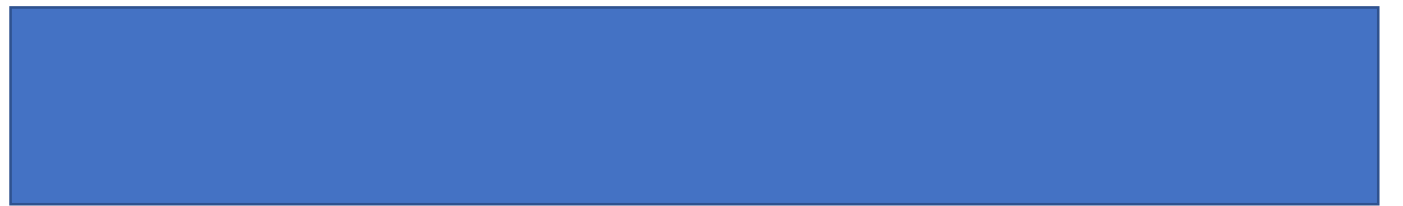
- N = 96
- Uses of objects task for divergent thinking
- Rigid librarian, Eccentric poet or nothing
- Improved creativity in the eccentric role ($p < .001$), even for the same subject

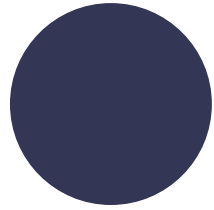
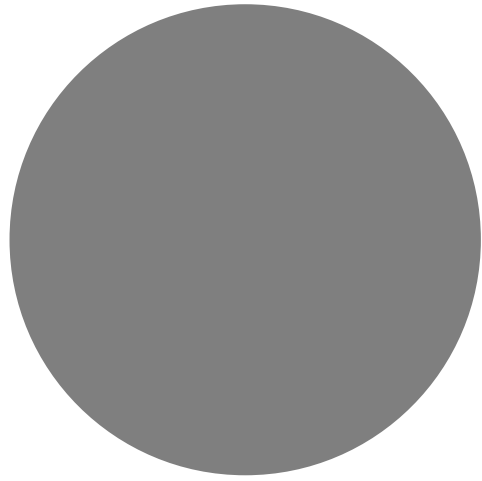
Psychological Halloweenism: Application



- On creative projects, elect to be an identified creative and step into that role
- Connect halloweenism to productivity outcomes

Client
example





Reflection: Psychological Halloweenism

Getting out of your
own way

Which
creative
might you
most be like?

If so, how would you
think and act
differently?





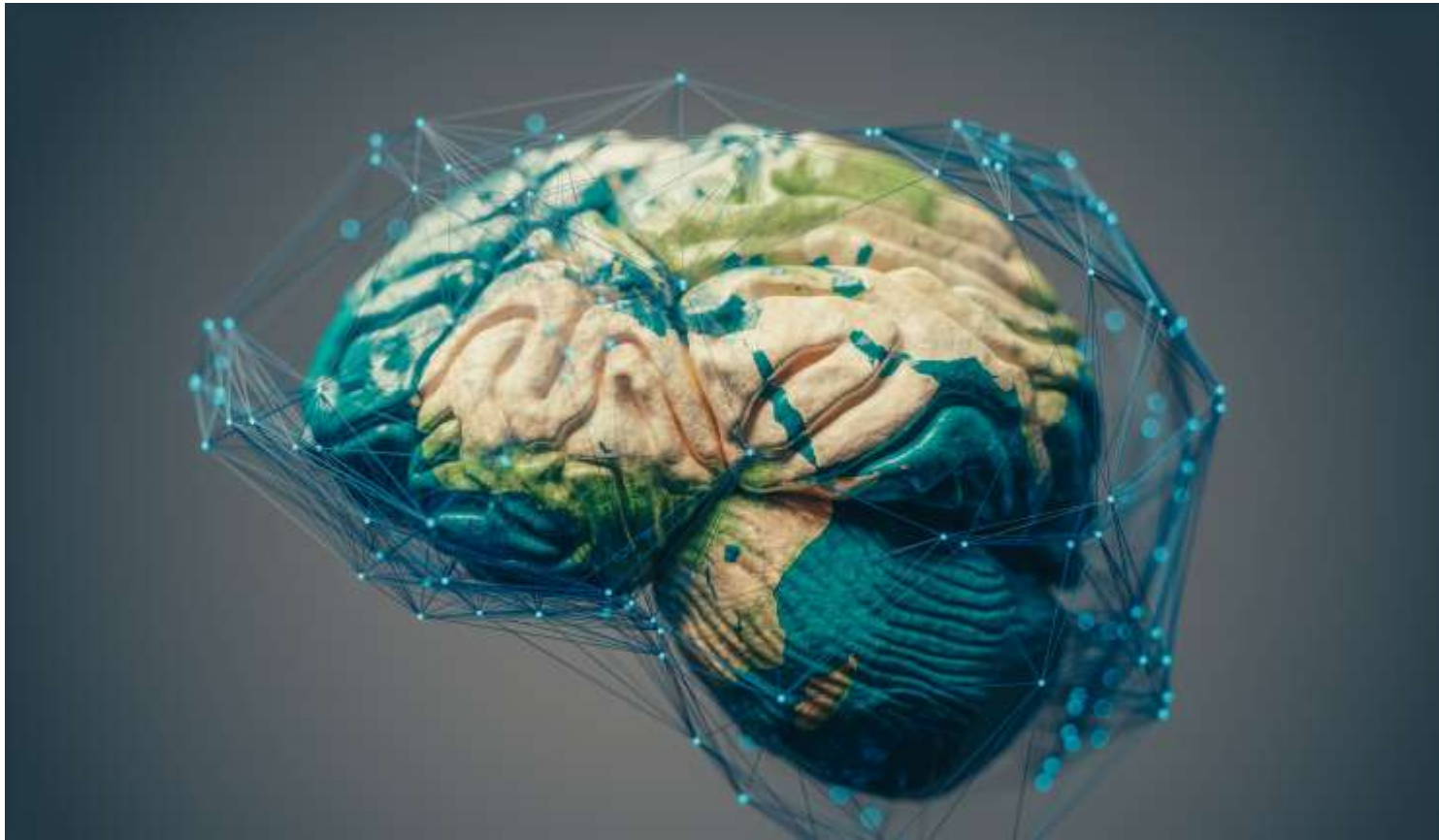
Questions for you (2 mins)

- How will you prioritize brain refueling?
- How will you build unfocus time into design time?
- How will you measure your idea generation?



Targeting your creative brain

Analogical thinking
and beyond



The use of analogies
to enhance your
creativity

Definition

Cognitive Processing Model
(Richland and Morrison,
2010)

- Identify and map correspondences
- Draw inferences about higher-order similarity relationships

Mapping ideas



Analogies

Examples from Business

Ford

- Bill Klann saw through the superficial differences between slaughtering animals and assembling cars
 - Model T production, exploded productivity and enabled the company to cut the price of the car from \$575 to \$280
 - Ford doubled its market share in mere years.





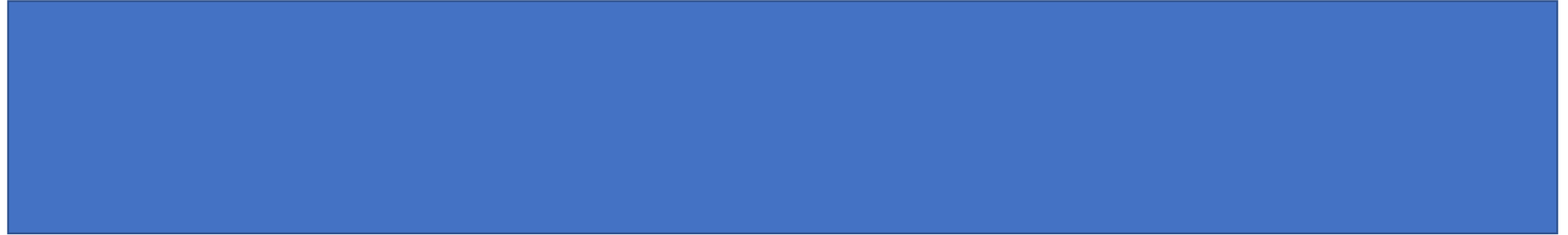
VIDEO

Analogical thinking

Semantic distance

The actual and conceptual difference
between the two ideas





Semantic distance

I want my e-learning to be as engaging as...

- My closest relationship
 - Loving: Build in rewards
 - Trust: Instant feedback and response
 - Available: Monthly meetings
- A bar of chocolate when I am hungry
 - Delicious: Sublime vs. beautiful
 - Instant satisfaction: Interactive with AI feedback (NLP, Facial analysis)

Community

**Choose
comparisons
that strike you**

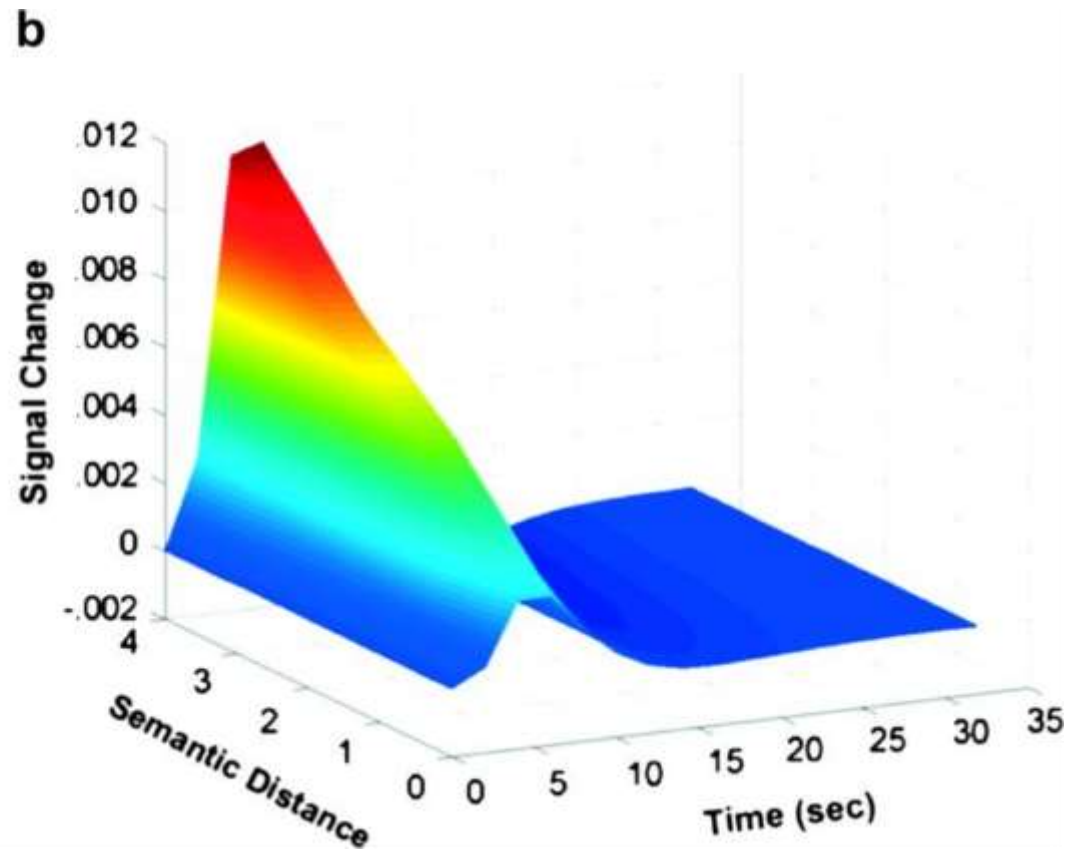
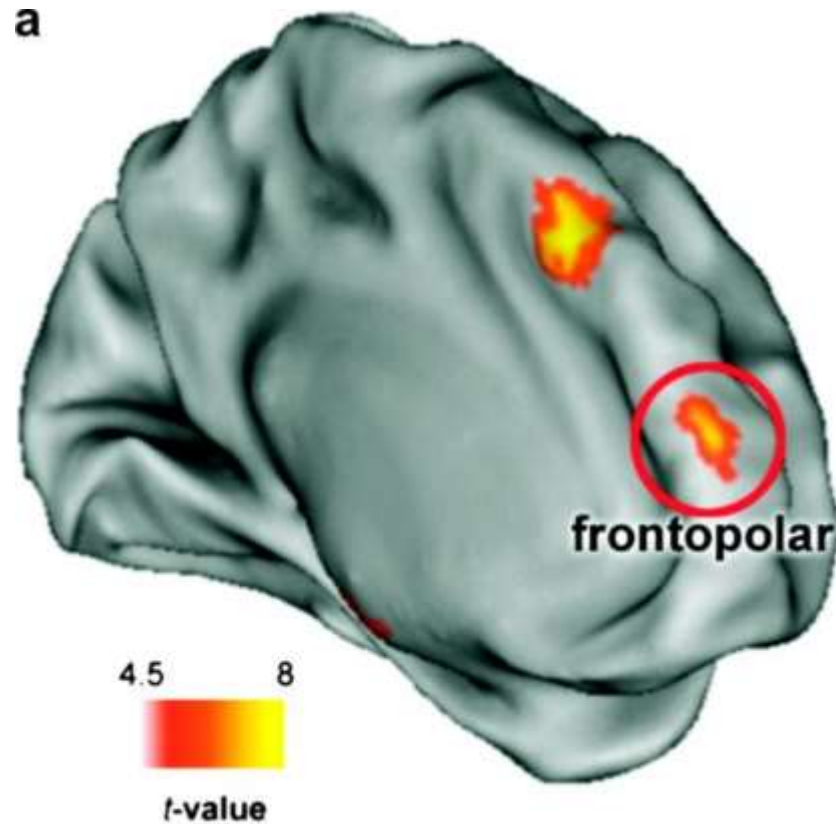
**Obvious or
not so
obvious**

Semantic distance and the brain

Analogical thinking



Main Brain-Based Finding (Green, 2010)



Conclusions

- Frontopolar cortex :analogical mapping
- Increased F-P activation with increased semantic distance

Intermediate
semantic
distance is best
for flexible and
original ideas

Practical Application
(Gonçalves , et al., 2013)



E-Learning

- Teach a dog new tricks
 - Create “outdoor” modules
- Phototropic plant that grows toward the sun
 - Student builds their own “responsive” path

Caveat

Analogy should not
distract you from first
principles

I don't think inside
the box, I don't think
outside the box
either. I don't even
know where the box
is.

- me



VIDEO

Beyond Analogical Reasoning:
Fundamental Principles

What are the
fundamental
truths of
learning?

- That we obstruct our greatest capacities
- That “unfocus” is as important as focus
- That it deepens if it is embodied
- That it is innate to our culture

Innovation in e-learning

- Raise the bar on possibility: Embodied possibility questions
- Refuel your brain often: Schedule unfocus
- Use analogies but ask yourself: What do I truly believe?: And where do I want to explore, even if nobody has done this before?





THANK
YOU