FACULTY OF HEALTH SCIENCES

WITS UNIVERSITY

HOW WE LEARN

and how we can be lifelong learners

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UUME
Unit for Undergraduate Medical Education

CHSE
CENTRE FOR HEALTH SCIENCE EDUCATION

FACULTY OF HEALTH SCIENCES

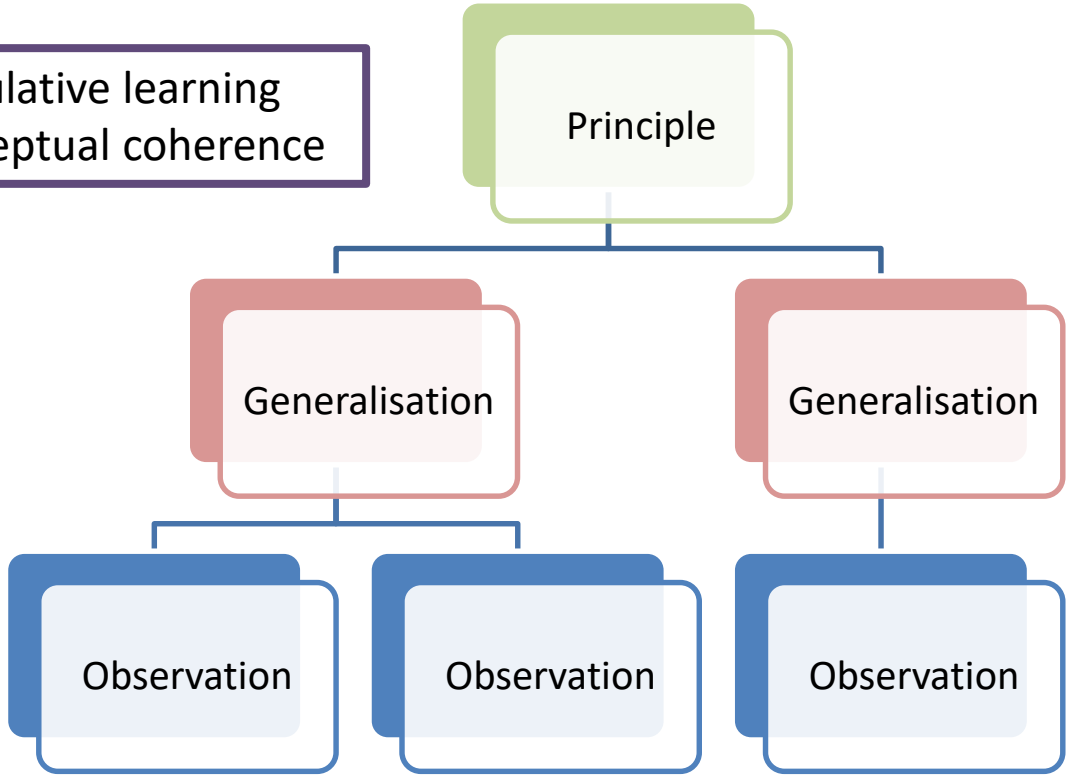
100 YEARS OF TEACHING EXCELLENCE
1919–2019

OBJECTIVES

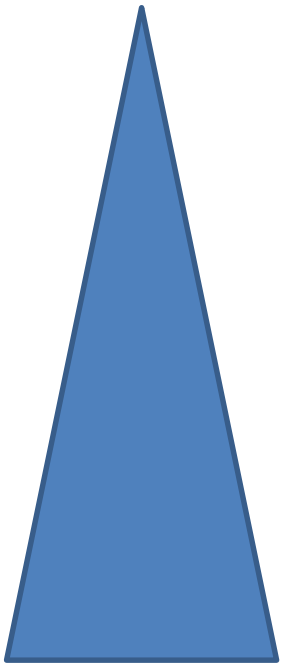
- By the end of this session you should be able to:
- Think differently about knowledge
- Think creatively about how you (personally) learn
- Think aspirationally about yourself as a teacher (original, imaginative, artistic, inventive)

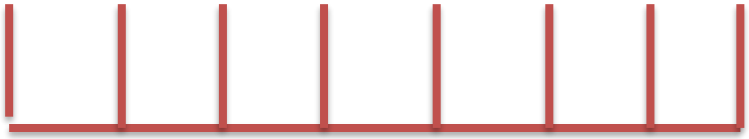
Hierarchical Knowledge Structure in Vertical Discourse

Maton: Cumulative learning
Muller: Conceptual coherence

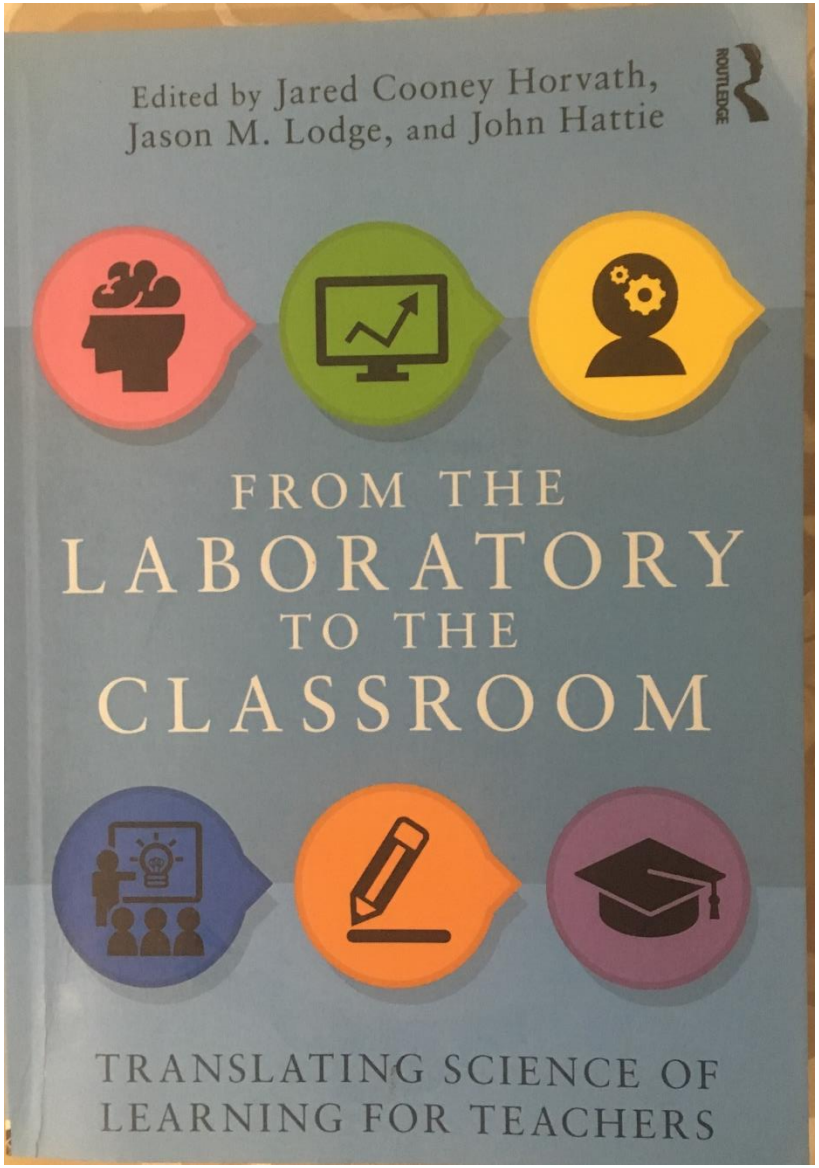


Science Learning vs Humanities



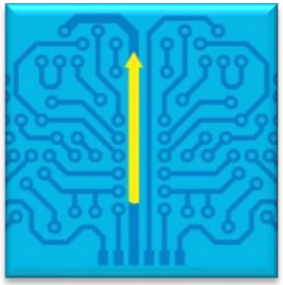


How do *you* learn?


Edited by Jared Cooney Horvath,
Jason M. Lodge, and John Hattie
ROUTLEDGE
FROM THE
LABORATORY
TO THE
CLASSROOM
TRANSLATING SCIENCE OF
LEARNING FOR TEACHERS

Memory

Attention

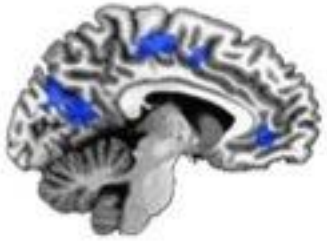


Plasticity

Cognitive reserve

Describe your mood when you do your *best* learning

Kandel found that any experience resulting in memory produces physical changes in the brain at the neuronal level, changes in structure and function of neurons.



DMN regions
- medial prefrontal cortex
- posterior cingulate cortex

Executive Network
- dorsolateral prefrontal cortex

MIND WANDERING

FOCUS

AWARE

Salience Network
- dorsal anterior cingulate cortex
- insula

SHIFT

Executive Network
- dorsolateral prefrontal cortex
- parietal cortex

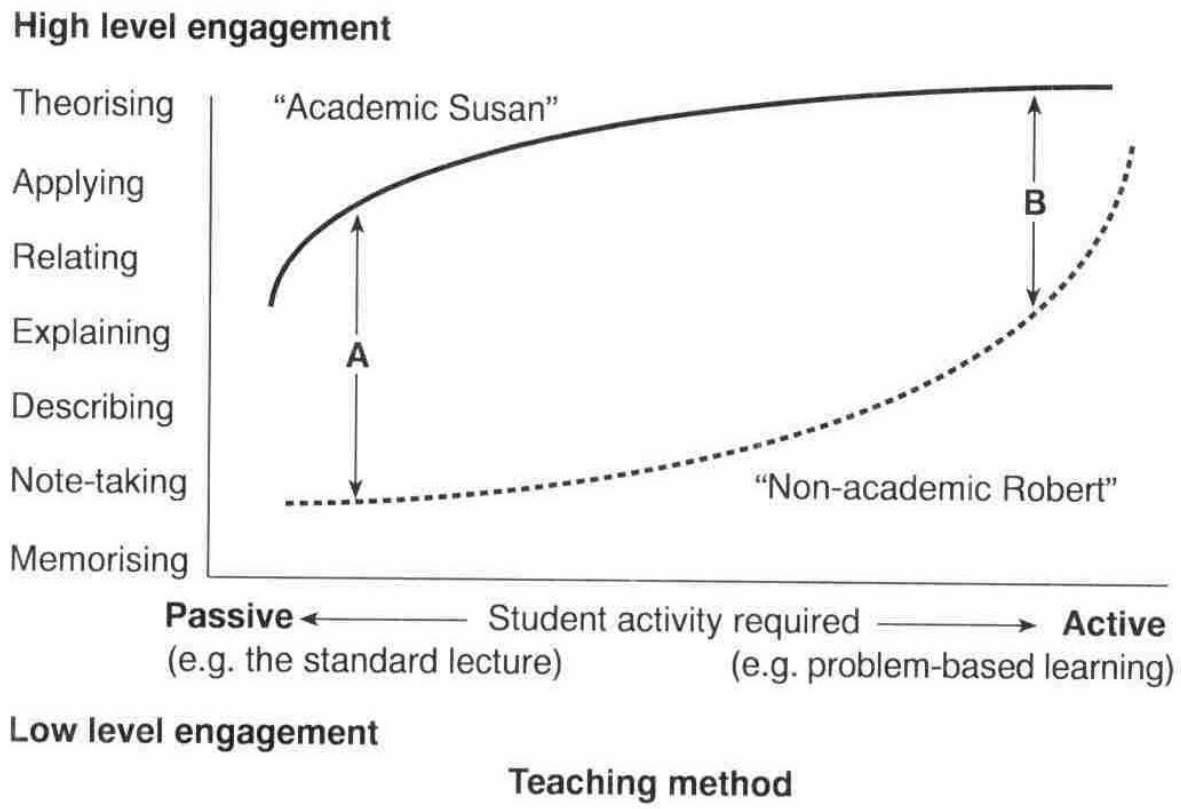
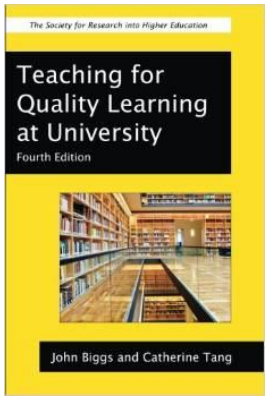
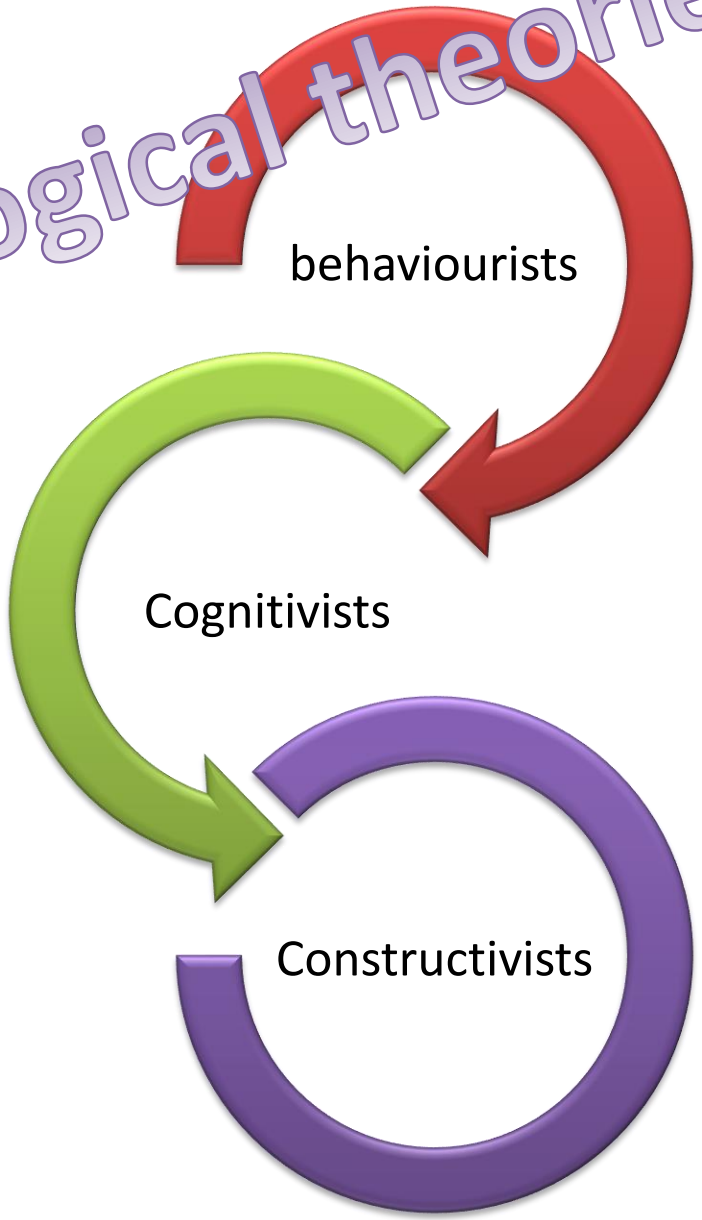


FIG. 1. Student orientation, teaching method, and level of engagement.

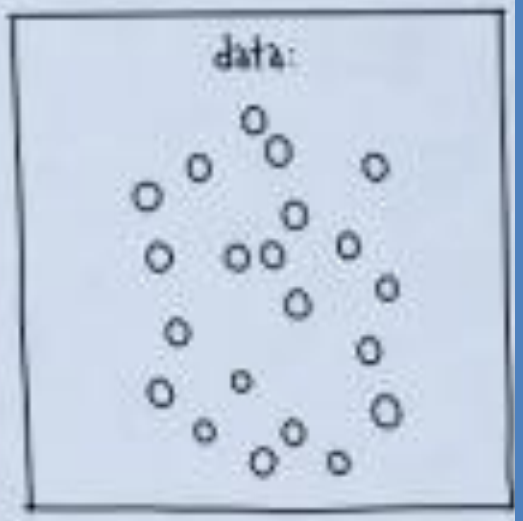


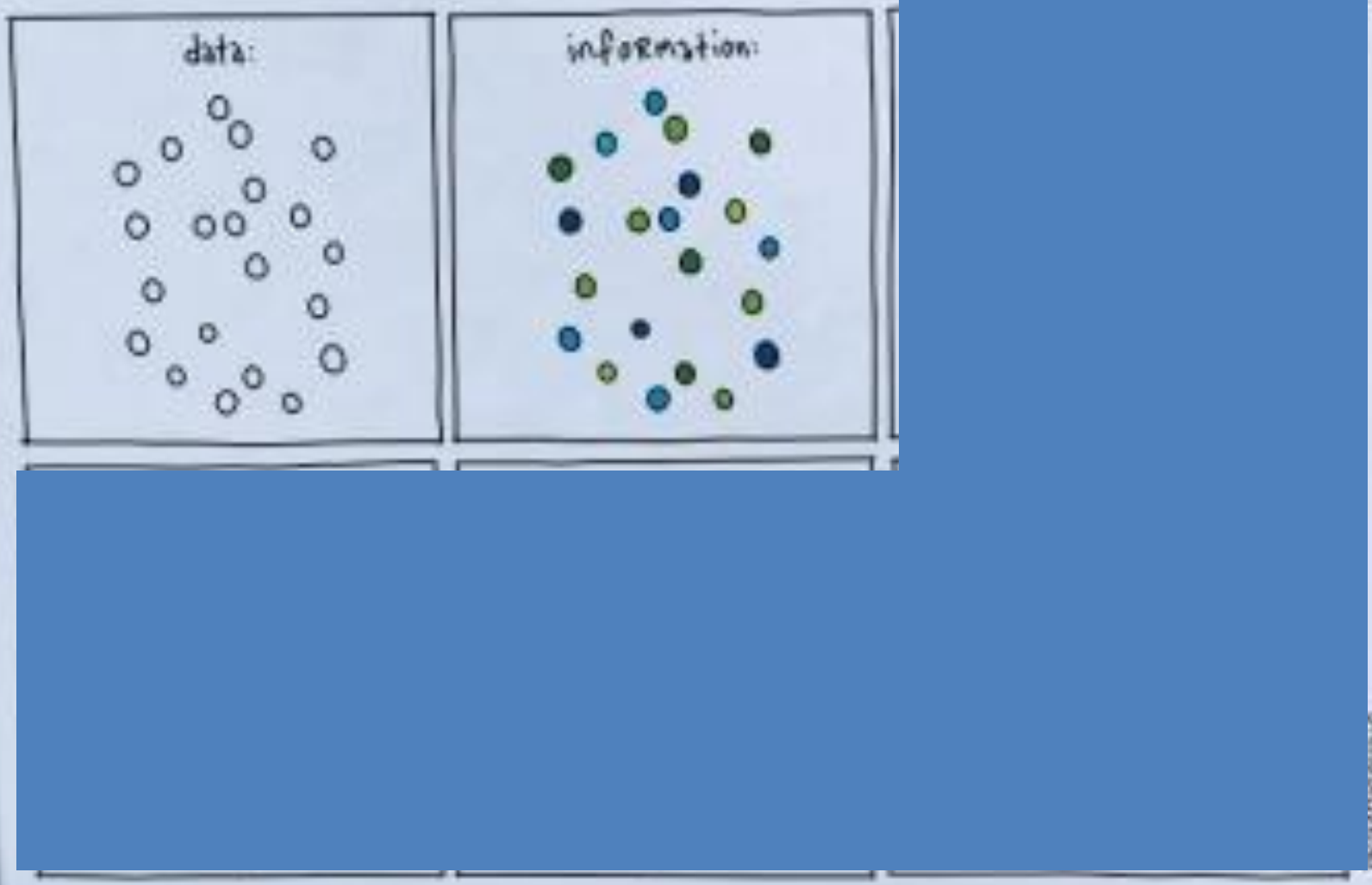
Psychological theories

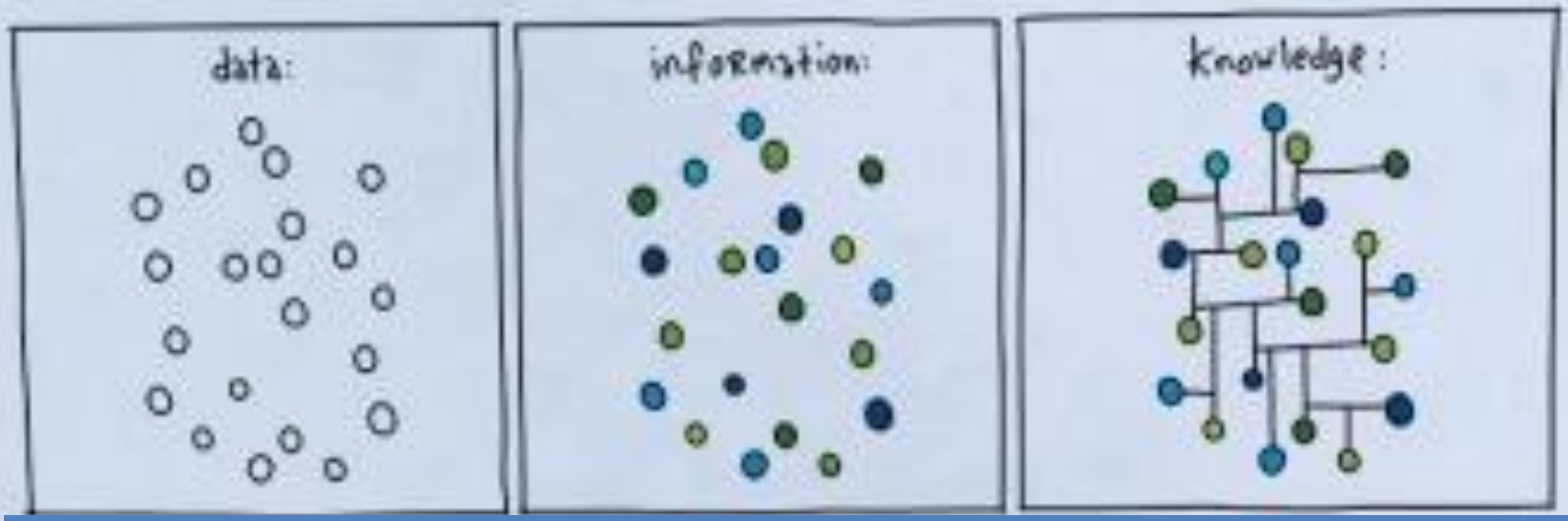


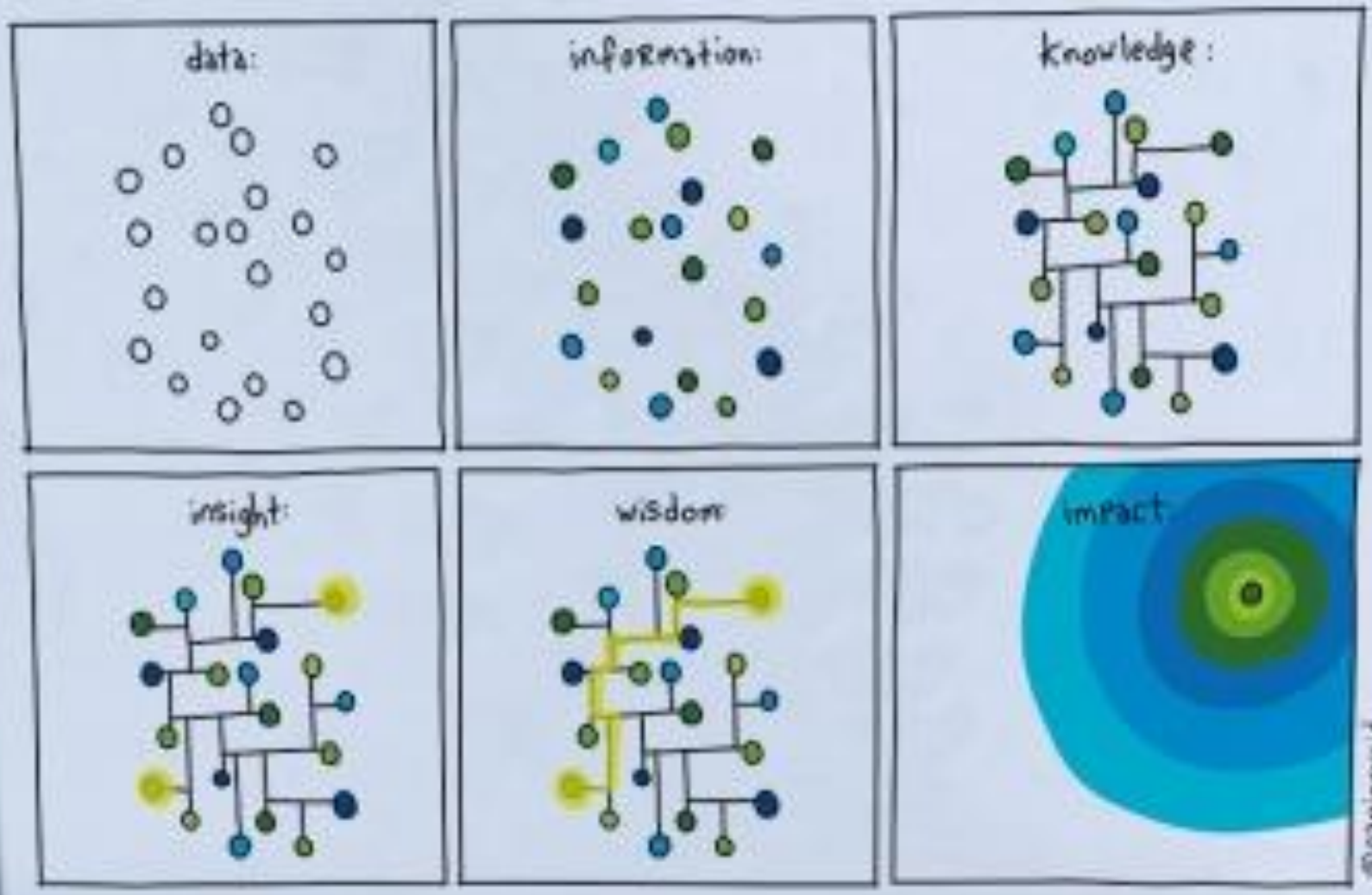

1+1
A

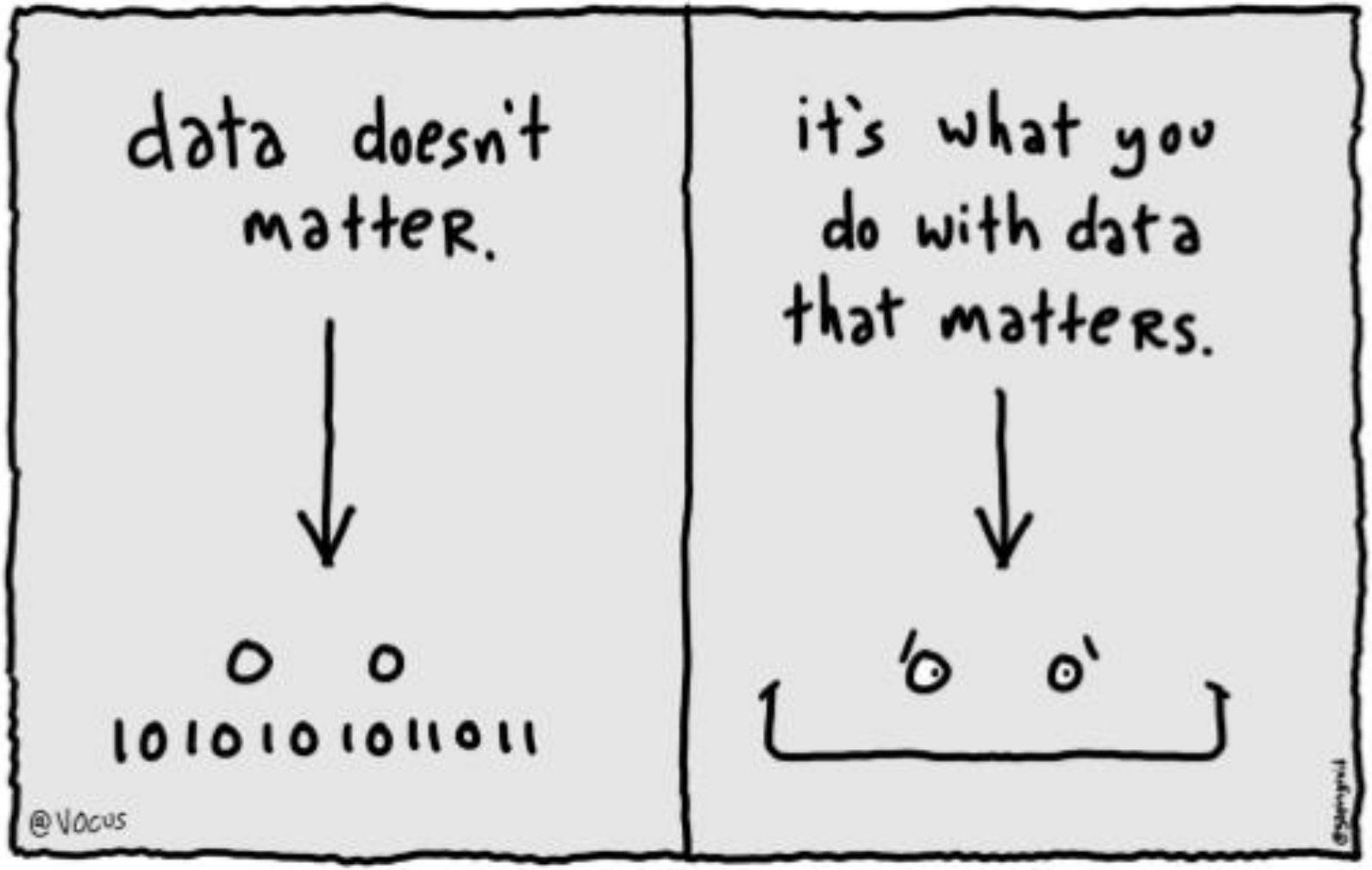
Give one word that you associate with "egg"


data:

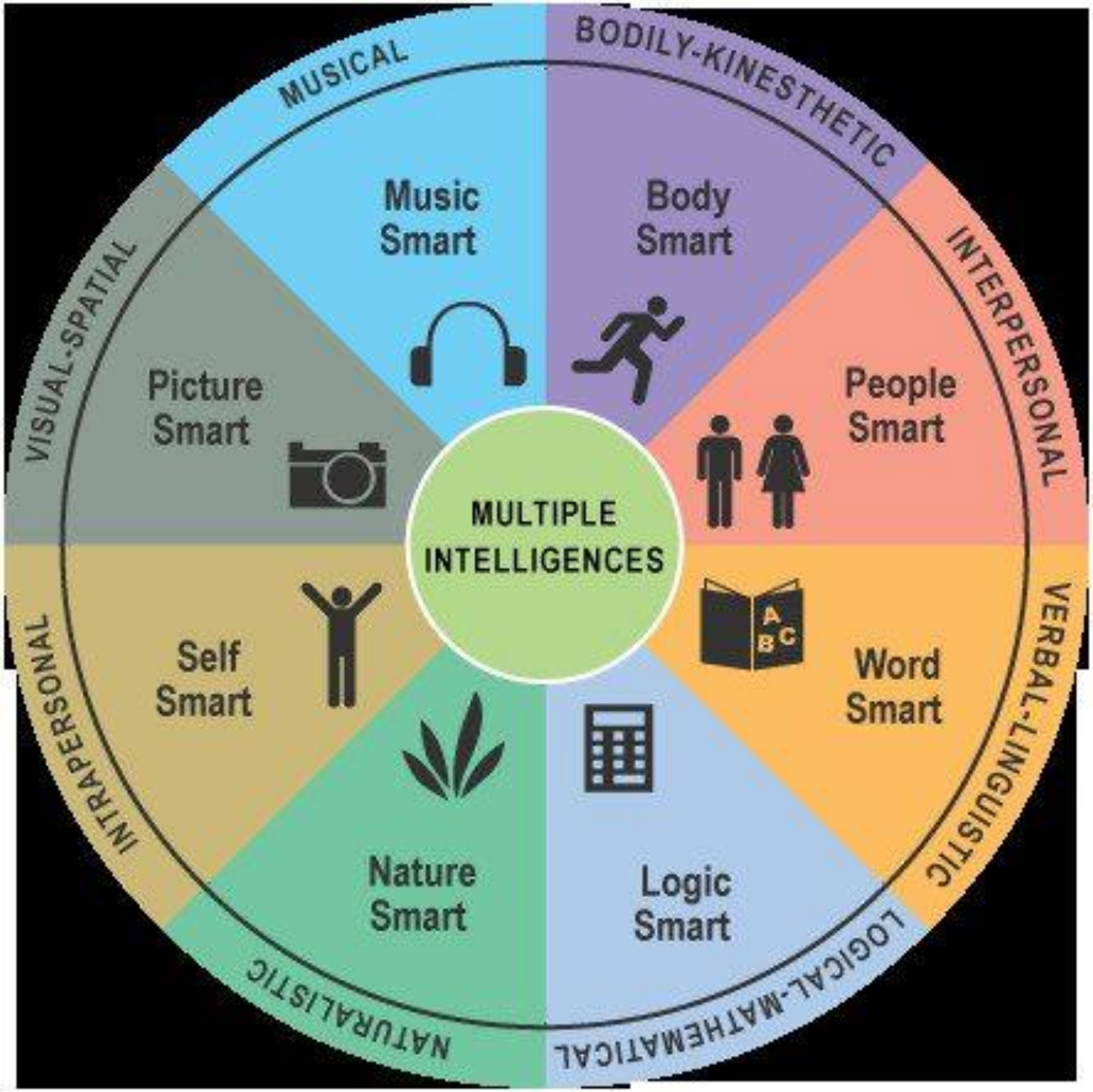

data:
information:


data:
information:
knowledge:

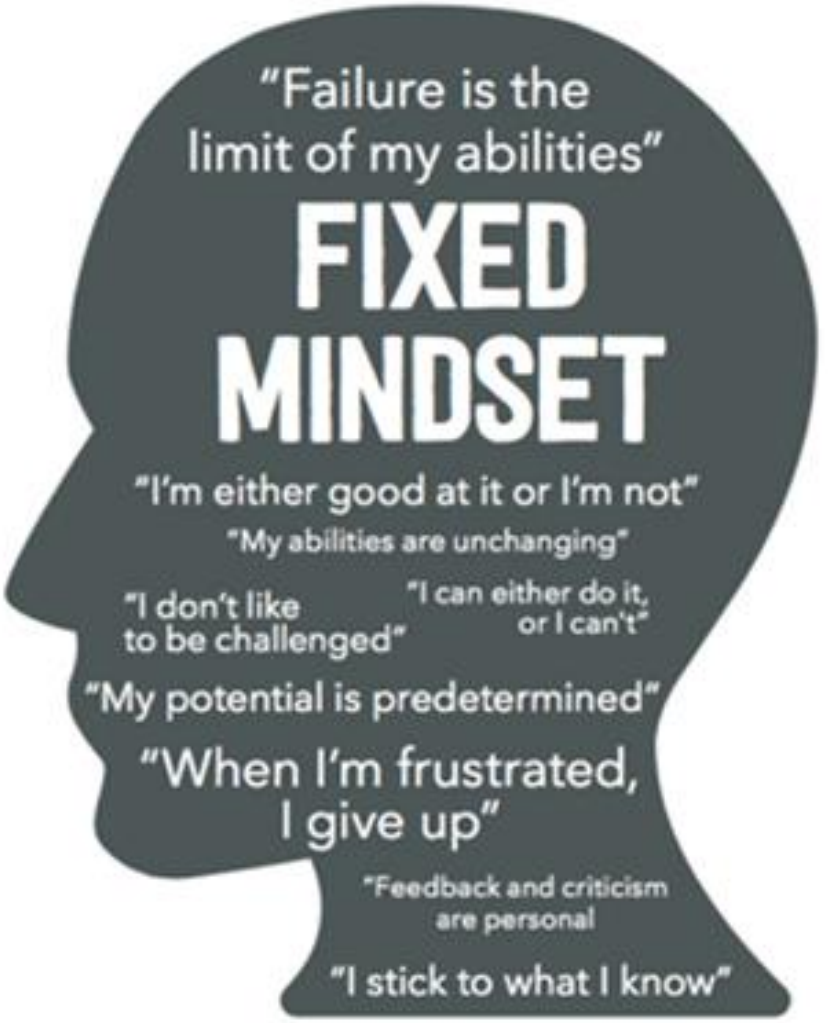

data:
information:
knowledge:
insight:
wisdom
impact



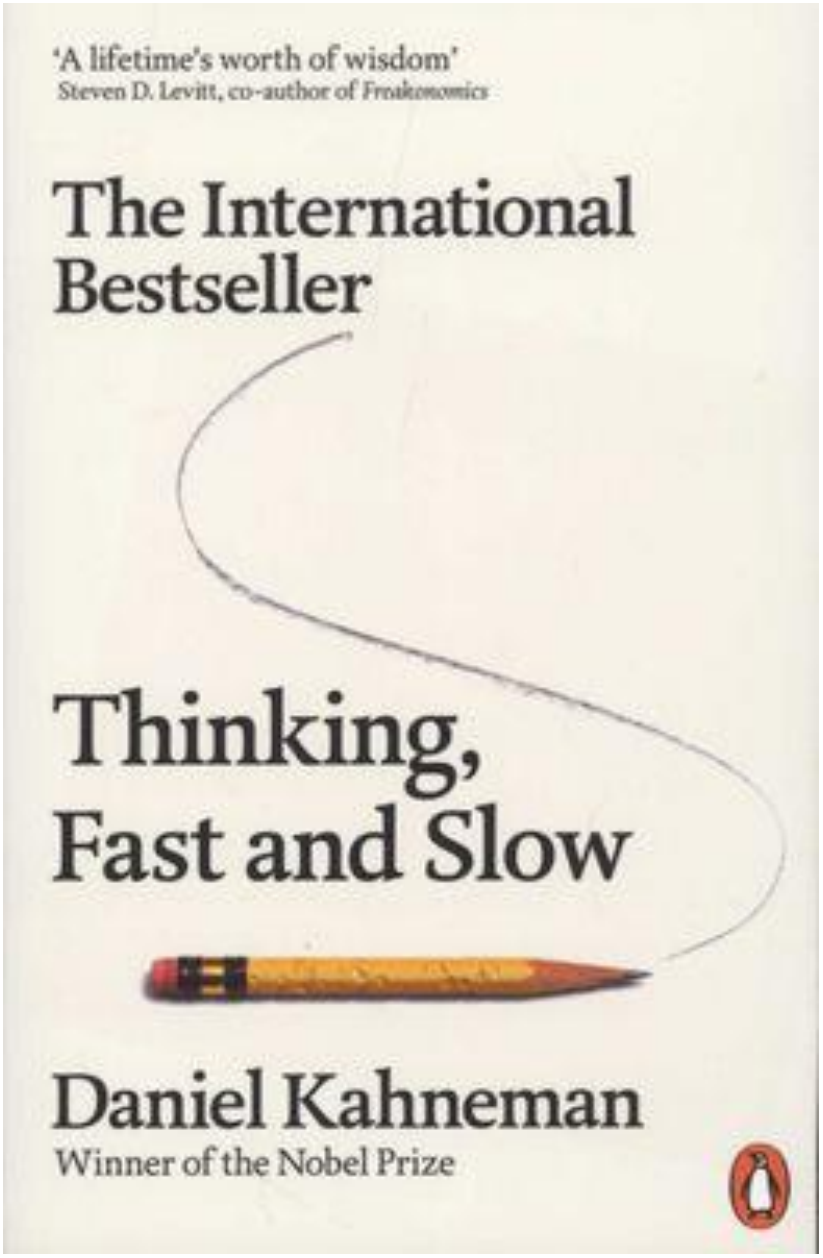
We help shift mindset so your people find joy, meaning and connection in what they do.


MUSICAL
BODILY-KINESTHETIC
INTERPERSONAL
VERBAL-LINGUISTIC
LOGICAL-MATHEMATICAL
NATURALISTIC
INTRAPERSONAL
VISUAL-SPATIAL
Music Smart
Body Smart
People Smart
Word Smart
Logic Smart
Nature Smart
Self Smart
Picture Smart
MULTIPLE INTELLIGENCES
A
B C

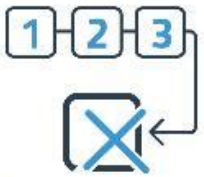

"Failure is an opportunity to grow"
GROWTH MINDSET
"I can learn to do anything I want"
"Challenges help me to grow"
"My effort and attitude determine my abilities"
"Feedback is constructive"
"I am inspired by the success of others"
"I like to try new things"

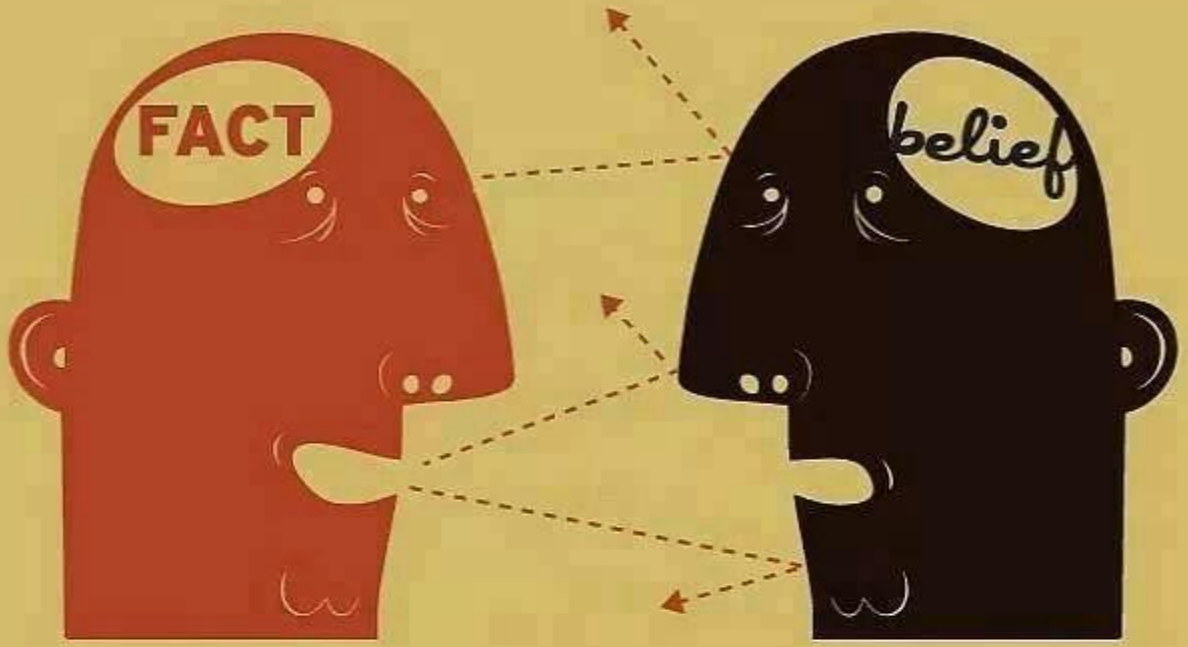

"Failure is the limit of my abilities"
FIXED MINDSET
"I'm either good at it or I'm not"
"My abilities are unchanging"
"I don't like to be challenged"
"I can either do it, or I can't"
"My potential is predetermined"
"When I'm frustrated, I give up"
"Feedback and criticism are personal"
"I stick to what I know"

Carol Dweck



Dual processing Theory

System 1	System 2
 Fast	 Slow
 Unconscious	 Conscious
 Automatic	 Effortful
 Everyday Decisions	 Complex Decisions
 Error prone	 Reliable



"At the heart of science is an essential balance between two seemingly contradictory attitudes: an openness to new ideas - no matter how bizarre or counterintuitive they may be - and the most ruthless skeptical scrutiny of all ideas, old and new. This is how deep truths are winnowed from deep nonsense."

- Carl Sagan

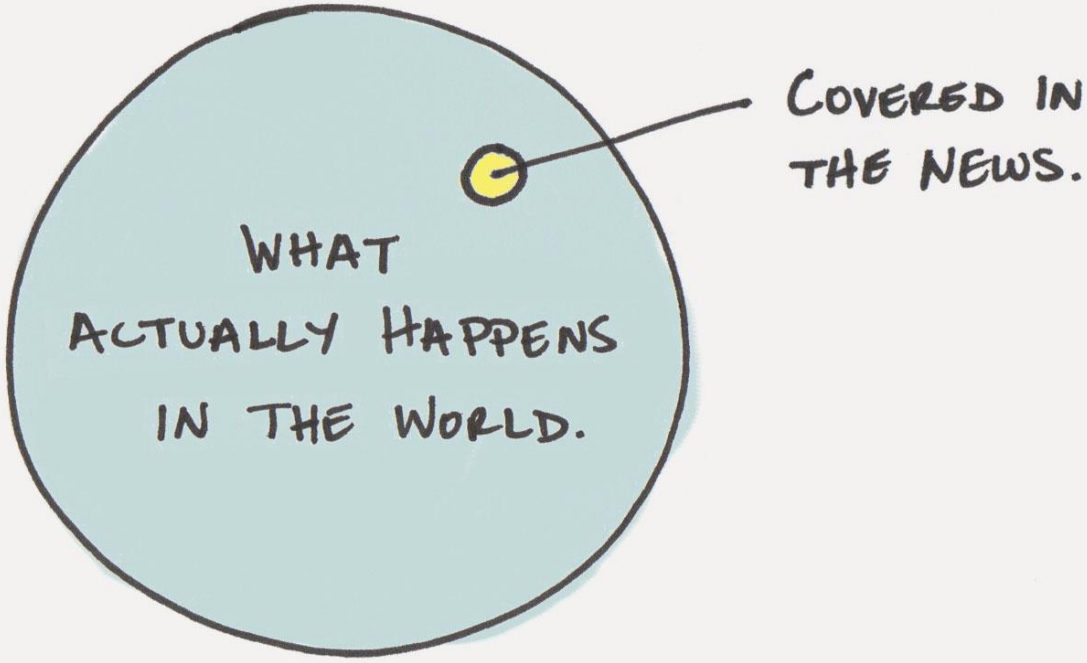
Confirmation Bias

Tendency to look for confirming evidence to support a diagnosis rather than look for discomfirming evidence to refute it

Absolutely!

Croskerry, P. Acad Med 2003; 78:775-80.

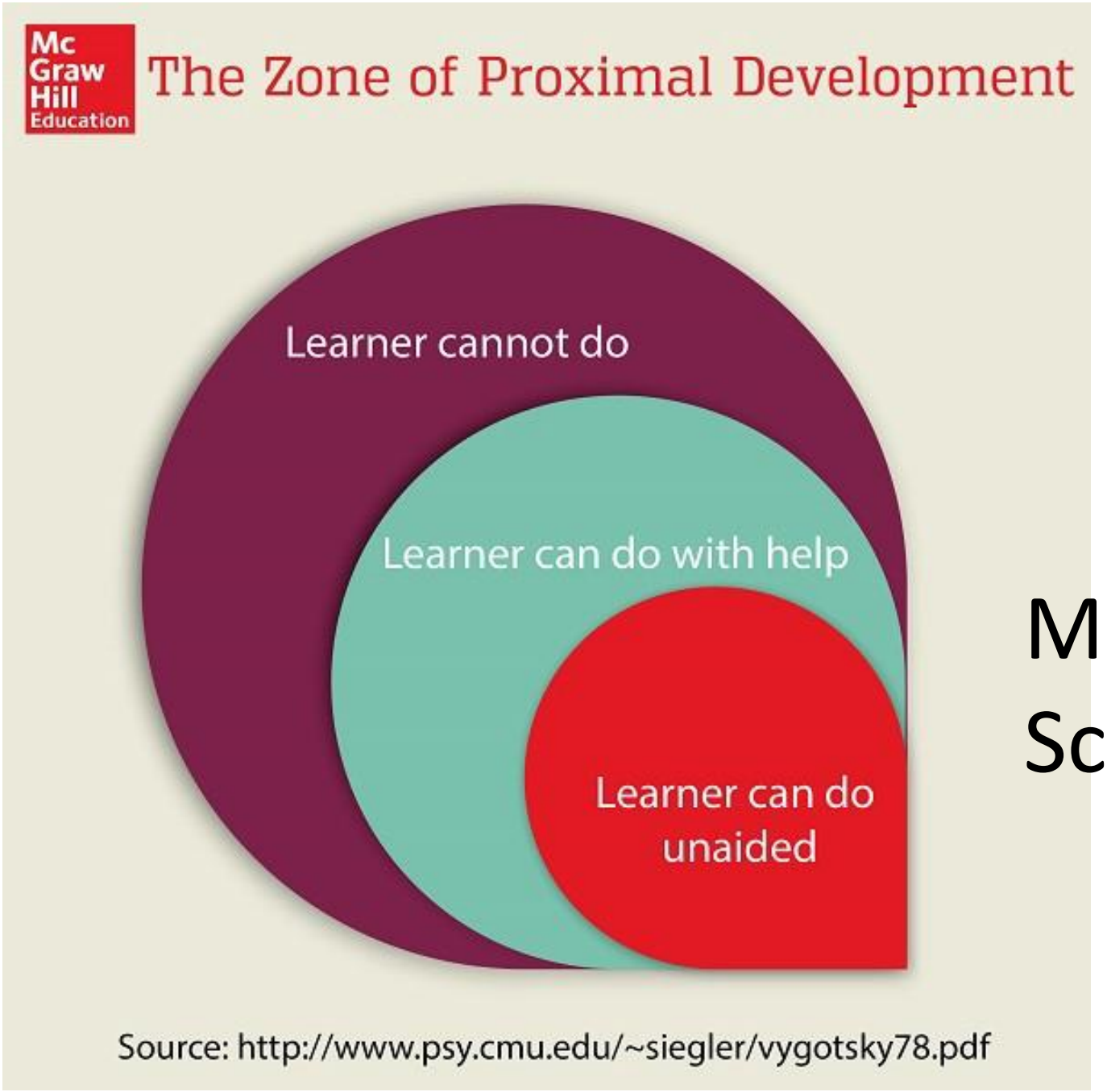
THE AVAILABILITY HEURISTIC



JamesClear.com

When current news influences your thinking and actions

Social Theories of Learning



Modelling
Scaffolding

CoPs

Communities of Practice

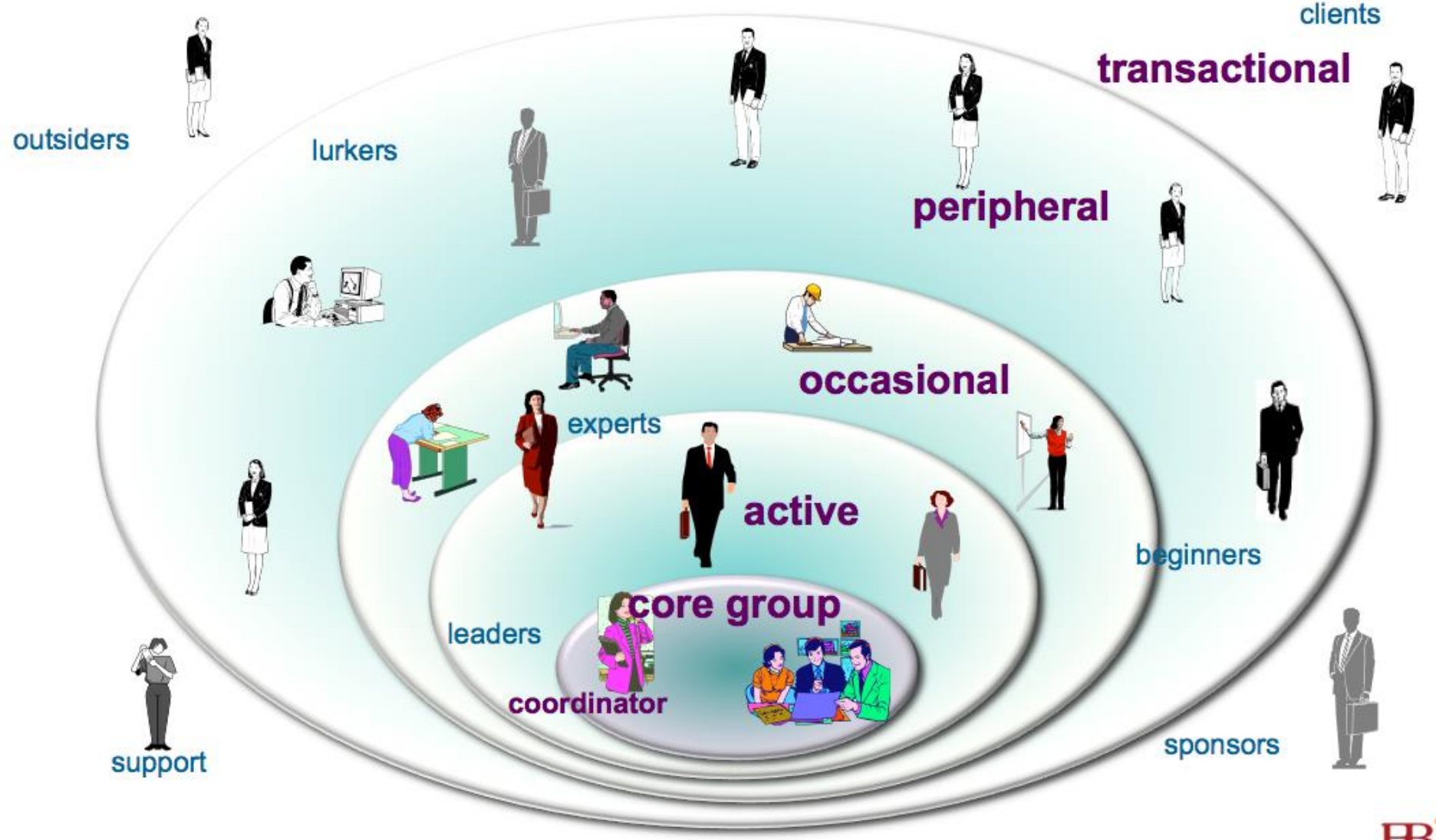
Domain

Practice

Community

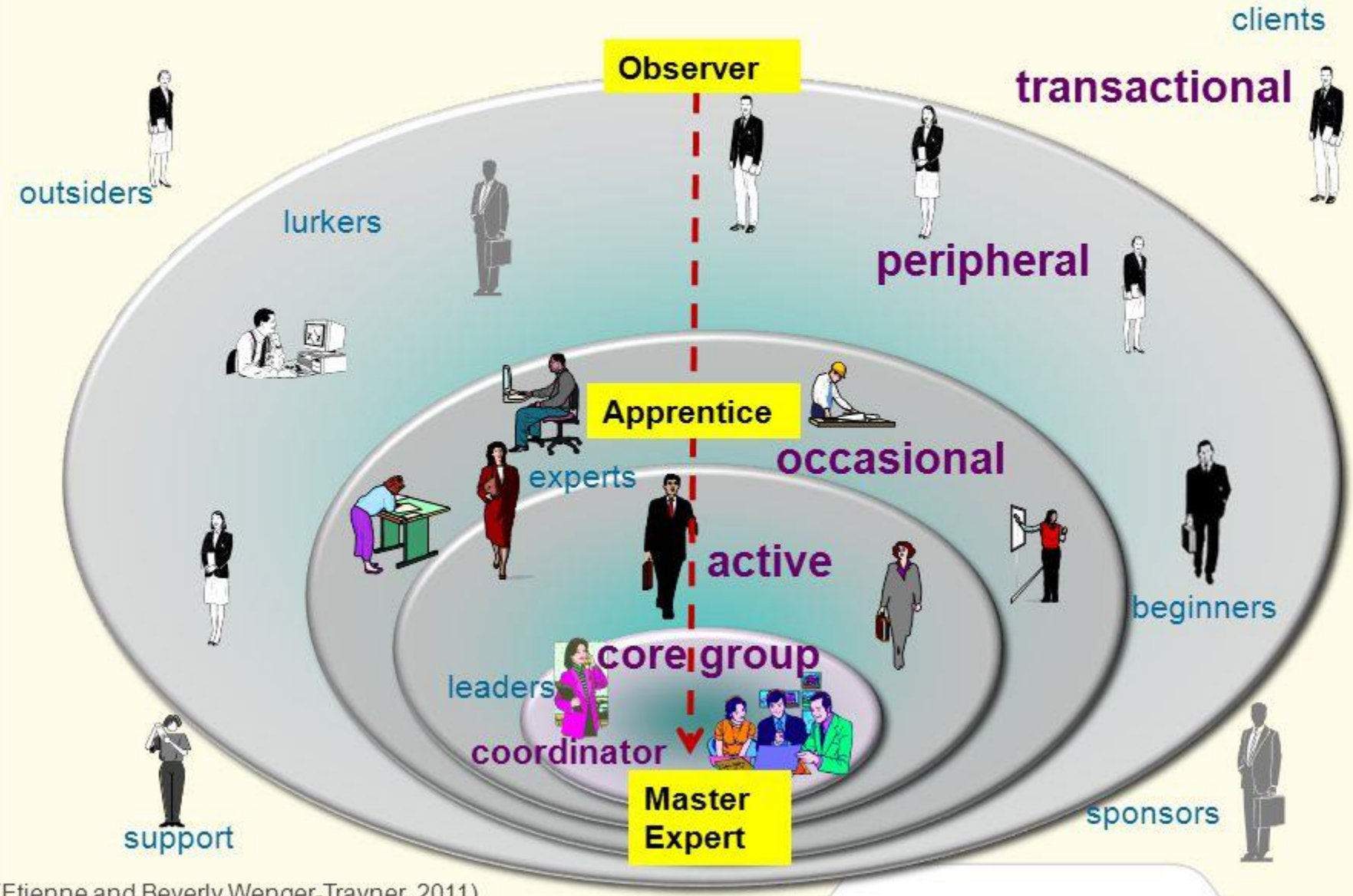
Levels of participation

Multiple ways to engage in social learning



Anglia Ruskin University
Cambridge Chelmsford Peterborough

Levels of participation

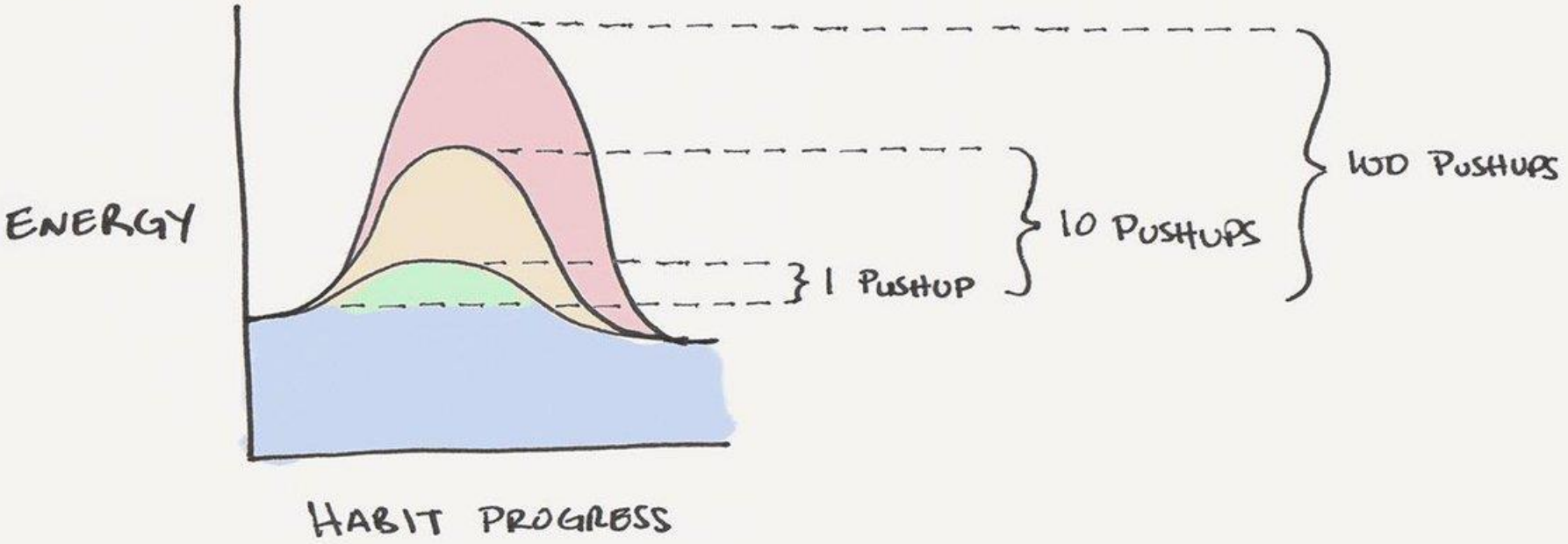


(Etienne and Beverly Wenger-Trayner, 2011)

What is your personal tip for encouraging lifelong learning?

THE ACTIVATION ENERGY OF NEW HABITS

JamesClear.com/chemistry-habits



Every habit has an activation energy that is required to get started.
The smaller the habit, the less energy you need to start.

Tips

- Don’t stop learning
- Don’t Cram
- Be reflective in your learning needs
- PUT IN EFFORT
- Visualise the goal
- Seek out learning
- Participate and collaborate
- Mentor others
- Yet or not yet
- Use all learning tools available (incl tech)
- Failure is expected – deal!
- ENJOY LEARNING

anchoring

The first thing you judge influences your judgment of all that follows.

sunk cost fallacy

You irrationally cling to things that have already cost you something.

confirmation bias

You look for ways to justify your existing beliefs.

dunning-kruger effect

The more you know, the less confident you're likely to be.

backfire effect

When your core beliefs are challenged, it can cause you to believe even more strongly.

barnum effect

You see personal specifics in vague statements by filling in the gaps.

declinism

You remember the past as better than it was, and expect the future to be worse than it will likely be.

framing effect

You allow yourself to be unduly influenced by context and delivery.

just world hypothesis

Your preference for a just world makes you presume that it exists.

in-group bias

You unfairly favor those who belong to your groups.

fundamental attribution error

You judge others on their character, but yourself on the situation.

halo effect

How much you like someone, or how attractive they are, influences your other judgments of them.

placebo effect

If you believe you're taking medicine it can sometimes work, even if it's fake.

bystander effect

You presume someone else is going to do something in an emergency situation.

availability heuristic

Your judgments are influenced by what springs most easily to mind.

curse of knowledge

Once you understand something you presume it to be obvious to everyone.

belief bias

If a conclusion supports your existing beliefs, you'll rationalize anything that supports it.

self-serving bias

You believe your failures are due to external factors, yet you're personally responsible for your successes.

groupthink

You let the social dynamics of a group situation override the best outcomes.

negativity bias

You allow negative things to disproportionately influence your thinking.

optimism bias

You overestimate the likelihood of positive outcomes.

pessimism bias

You overestimate the likelihood of negative outcomes.

reactance

You'd rather do the opposite of what someone is trying to make you do.

spotlight effect

You overestimate how much people notice how you look and act.

Download this poster at www.yourbias.is

Anchoring Bias

- Also called “premature closure”
- the failure to continue considering reasonable alternatives after a primary diagnosis is reached

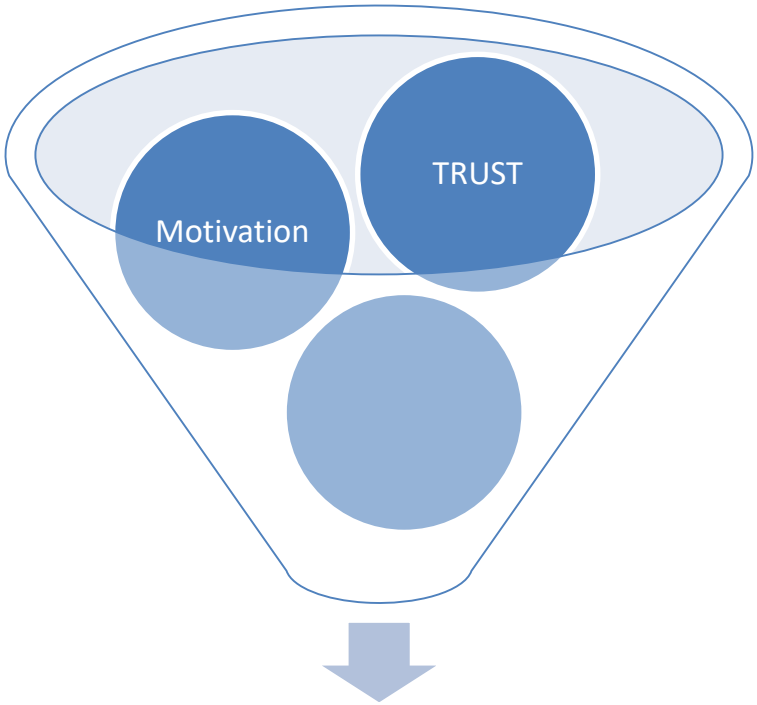
- (When the diagnosis is made, the thinking stops)

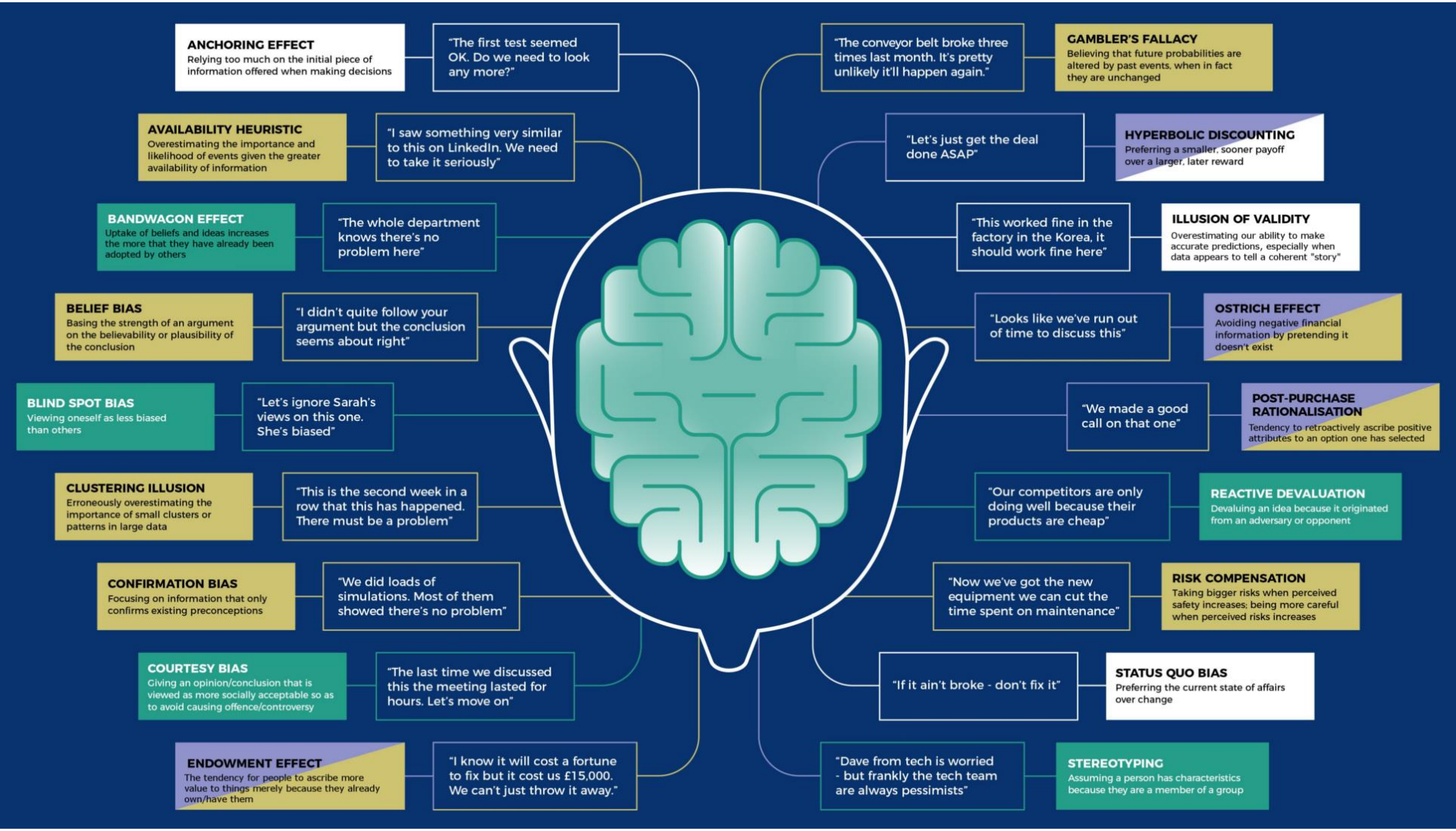
Croskerry, P. Acad Med 2003; 78:775-80.

Availability Bias

Judge things as being more likely if they readily come to mind

Croskerry, P. Acad Med 2003; 78:775-80.


TRUST
Motivation


ANCHORING EFFECT
Relying too much on the initial piece of information offered when making decisions
"The first test seemed OK. Do we need to look any more?"
AVAILABILITY HEURISTIC
Overestimating the importance and likelihood of events given the greater availability of information
"I saw something very similar to this on LinkedIn. We need to take it seriously"
BANDWAGON EFFECT
Uptake of beliefs and ideas increases the more that they have already been adopted by others
"The whole department knows there's no problem here"
BELIEF BIAS
Basing the strength of an argument on the believability or plausibility of the conclusion
"I didn't quite follow your argument but the conclusion seems about right"
BLIND SPOT BIAS
Viewing oneself as less biased than others
"Let's ignore Sarah's views on this one. She's biased"
CLUSTERING ILLUSION
Erroneously overestimating the importance of small clusters or patterns in large data
"This is the second week in a row that this has happened. There must be a problem"
CONFIRMATION BIAS
Focusing on information that only confirms existing preconceptions
"We did loads of simulations. Most of them showed there's no problem"
COURTESY BIAS
Giving an opinion/conclusion that is viewed as more socially acceptable so as to avoid causing offence/controversy
"The last time we discussed this the meeting lasted for hours. Let's move on"
ENDOWMENT EFFECT
The tendency for people to ascribe more value to things merely because they already own/have them
"I know it will cost a fortune to fix but it cost us £15,000. We can't just throw it away."
"The conveyor belt broke three times last month. It's pretty unlikely it'll happen again."
GAMBLER'S FALLACY
Believing that future probabilities are altered by past events, when in fact they are unchanged
"Let's just get the deal done ASAP"
HYPERBOLIC DISCOUNTING
Preferring a smaller, sooner payoff over a larger, later reward
"This worked fine in the factory in the Korea, it should work fine here"
ILLUSION OF VALIDITY
Overestimating our ability to make accurate predictions, especially when data appears to tell a coherent "story"
"Looks like we've run out of time to discuss this"
OSTRICH EFFECT
Avoiding negative financial information by pretending it doesn't exist
"We made a good call on that one"
POST-PURCHASE RATIONALISATION
Tendency to retroactively ascribe positive attributes to an option one has selected
"Our competitors are only doing well because their products are cheap"
REACTIVE DEVALUATION
Devaluing an idea because it originated from an adversary or opponent
"Now we've got the new equipment we can cut the time spent on maintenance"
RISK COMPENSATION
Taking bigger risks when perceived safety increases; being more careful when perceived risks increases
"If it ain't broke - don't fix it"
STATUS QUO BIAS
Preferring the current state of affairs over change
"Dave from tech is worried - but frankly the tech team are always pessimists"
STEREOTYPING
Assuming a person has characteristics because they are a member of a group

THE 2 SYSTEMS

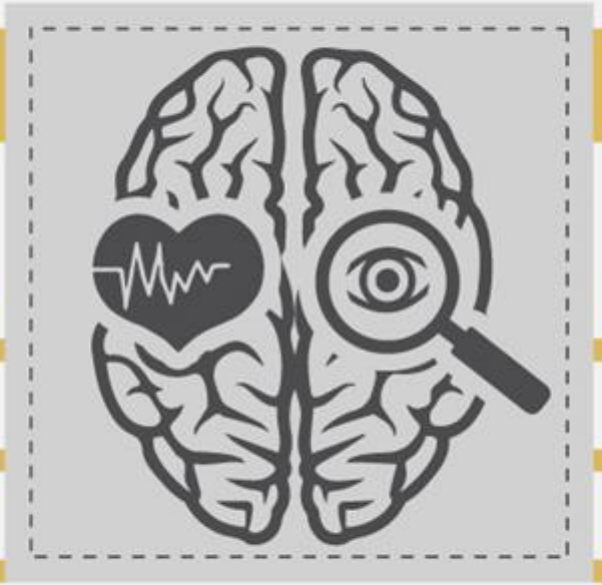
READINGRAPHICS
ACTIONABLE INSIGHTS IN ONE PAGE

System 1 (Fast Thinking)

Continuously scans our environment.

Fast but error-prone

Works automatically & effortlessly via shortcuts, **impulses and intuition.**



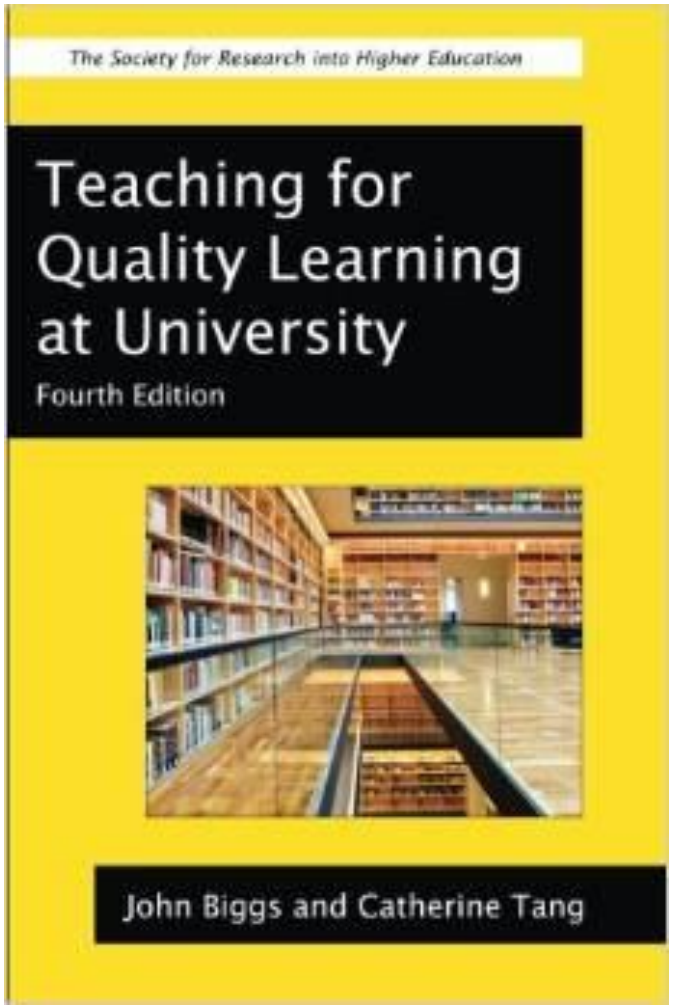
System 2 (Slow Thinking)

Used for specific problems, **only if necessary**

Takes effort to analyze, reason, solve complex problems, **exercise self-control**

Slow but reliable

Neuroplasticity



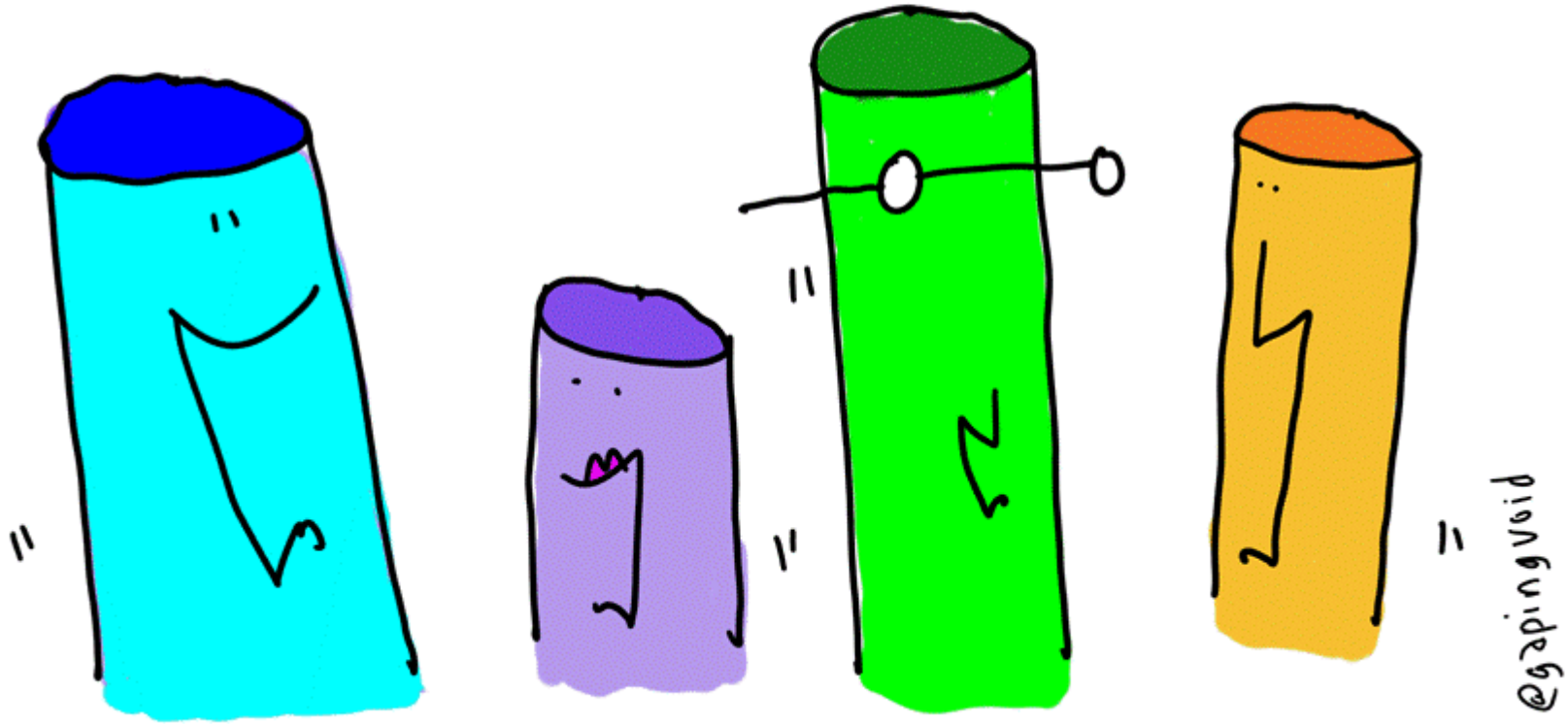
Learning is a result of student engagement

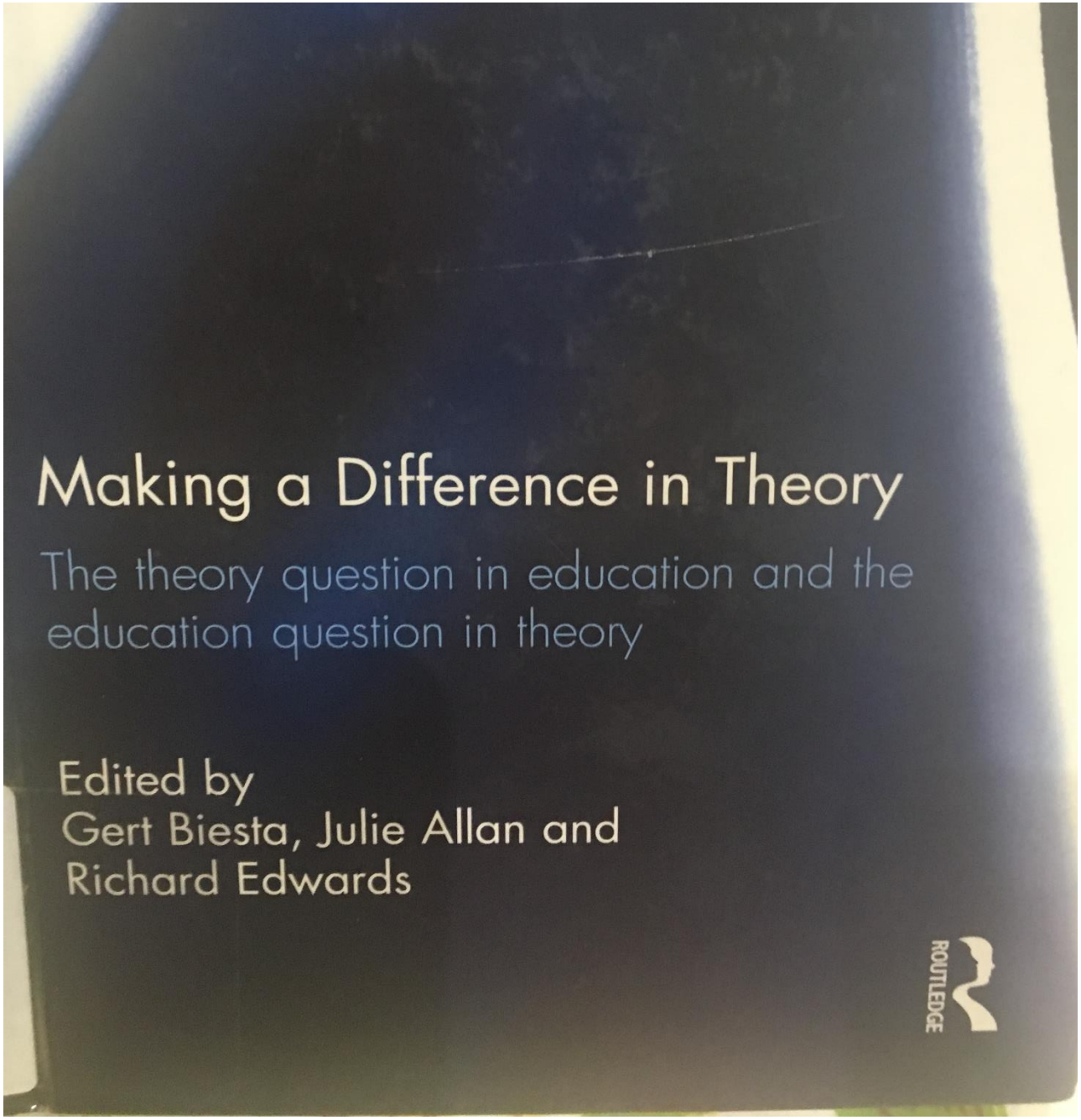
Learning is a function of teaching

Learning is a function of individual differences between students

getting all the silos

to talk to each other...

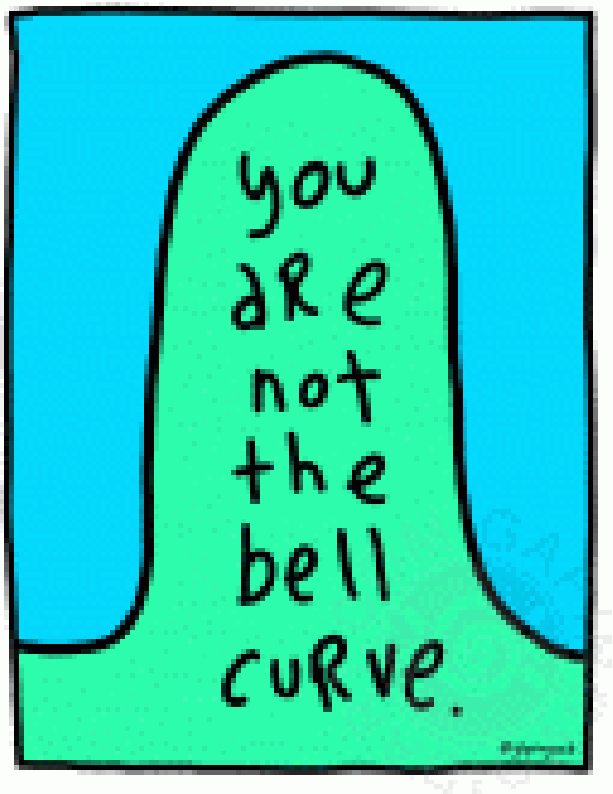


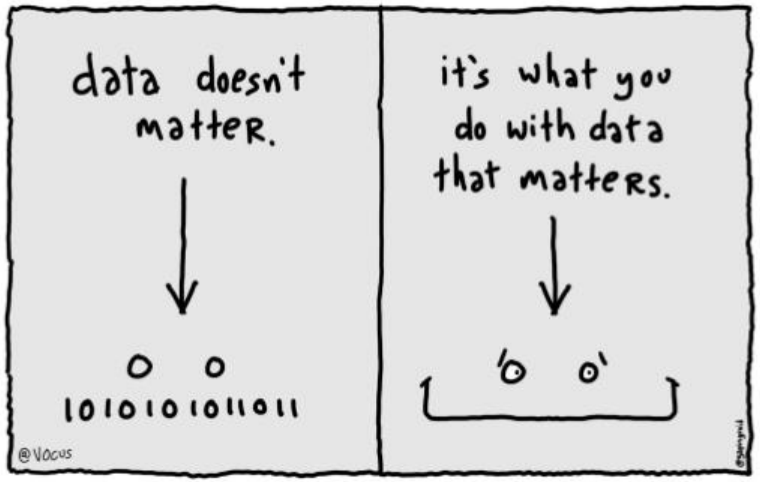

Making a Difference in Theory
The theory question in education and the education question in theory
Edited by
Gert Biesta, Julie Allan and
Richard Edwards
ROUTLEDGE

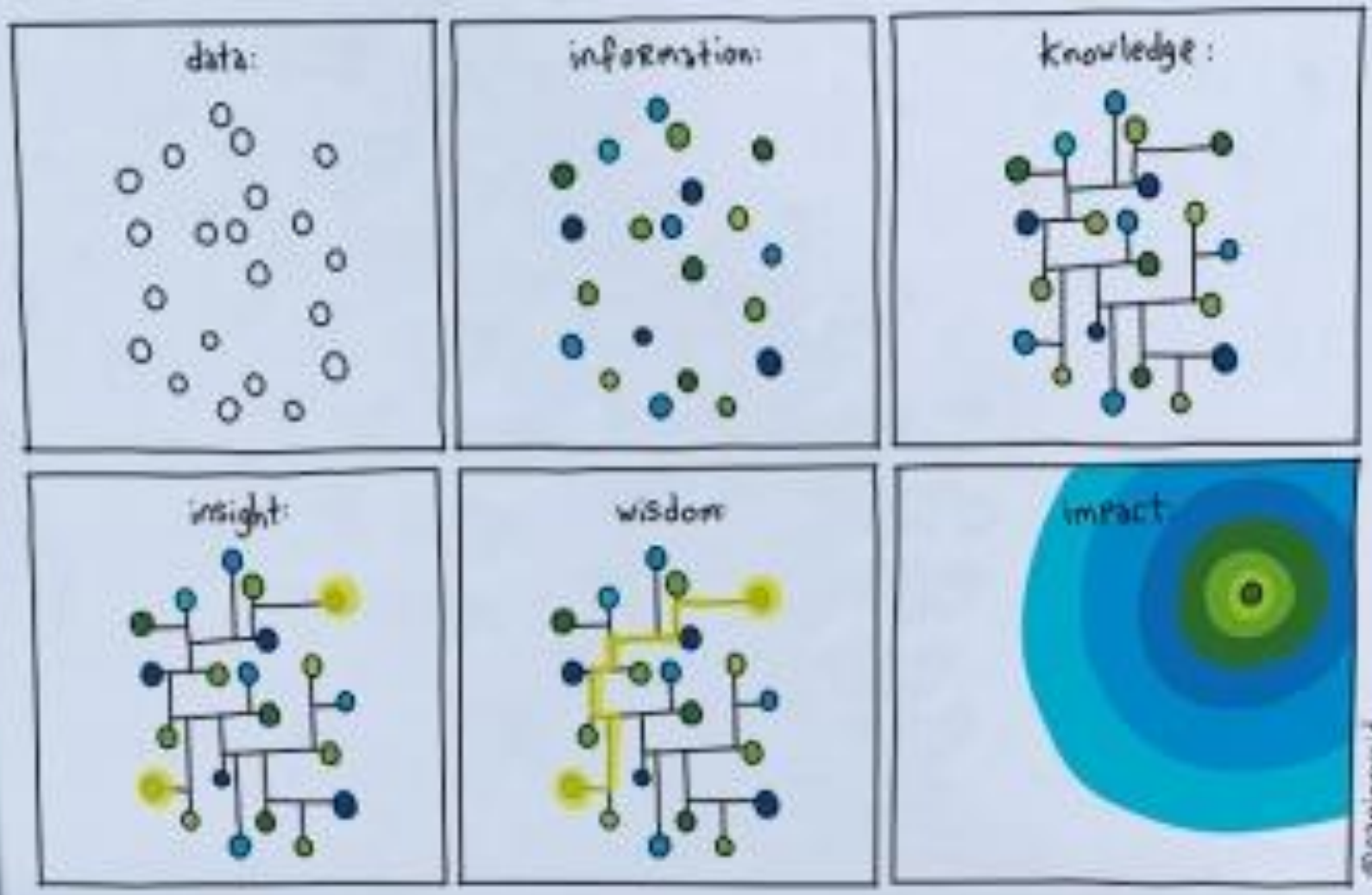
Introduction (5 min)

- Will discuss Biological, Psychological and Sociological theories of learning
- Humanities vs sciences learning

- Throughout – looking at self-learning and one-on-one teaching in clinical context (PG/ Registrars)


you are not the bell curve.


data doesn't matter.
1010101011011
@Vocus
it's what you do with data that matters.


data:
information:
knowledge:
insight:
wisdom
impact

Discussion (10 minutes)

- Describe an AHA moment when you realised you had learnt something?
  - How did you make the learning useful to you?
  - What was the context – ward/ by self/ who was around you?

- Polleverywhere word cloud – in two words…

Biological theories (10 minutes)

- Accessing prior knowledge
- Memory
- Attention
- Plasticity
- Cognitive reserve

- End with 2 good habits

Habits for life-long learning:

Discussion (5 minutes)

- Kahneman Q – 2 Q as poll everywhere
- Do two questions and then discuss why people answered as they did

Psychological theories (5 min)

- Kahneman
  - Slow and fast thinking
  - Intrinsic bias
  - Psychological theories of memory (cognitive load)

Ranking Q (2 min) on context

Sociological theories (8 min)

- Vygotsky
- CoP

Habits for life long learning

- End with habits to take home from (Psychological and sociological)