

Creativity: An Antidote to Care Worker Burnout?

Vineeth John, MD.
November 18th, 2022



Housekeeping Information



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newengland@mhttcnetwork.org.

Acknowledgment

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At the time of this publication, Miriam E. Delphin-Rittmon, Ph.D., served as Assistant Secretary for Mental Health and Substance Use in the U.S. Department of Health and Human Services and the Administrator of the Substance Abuse and Mental Health Services Administration.

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Presented 2022

The MHTTC Network uses affirming, respectful and recovery-oriented language in all activities. That language is:

STRENGTHS-BASED
AND HOPEFUL

INCLUSIVE AND
ACCEPTING OF
DIVERSE CULTURES,
GENDERS,
PERSPECTIVES,
AND EXPERIENCES

HEALING-CENTERED AND
TRAUMA-RESPONSIVE

INVITING TO INDIVIDUALS
PARTICIPATING IN THEIR
OWN JOURNEYS

PERSON-FIRST AND
FREE OF LABELS

NON-JUDGMENTAL AND
AVOIDING ASSUMPTIONS

RESPECTFUL, CLEAR
AND UNDERSTANDABLE

CONSISTENT WITH
OUR ACTIONS,
POLICIES, AND PRODUCTS

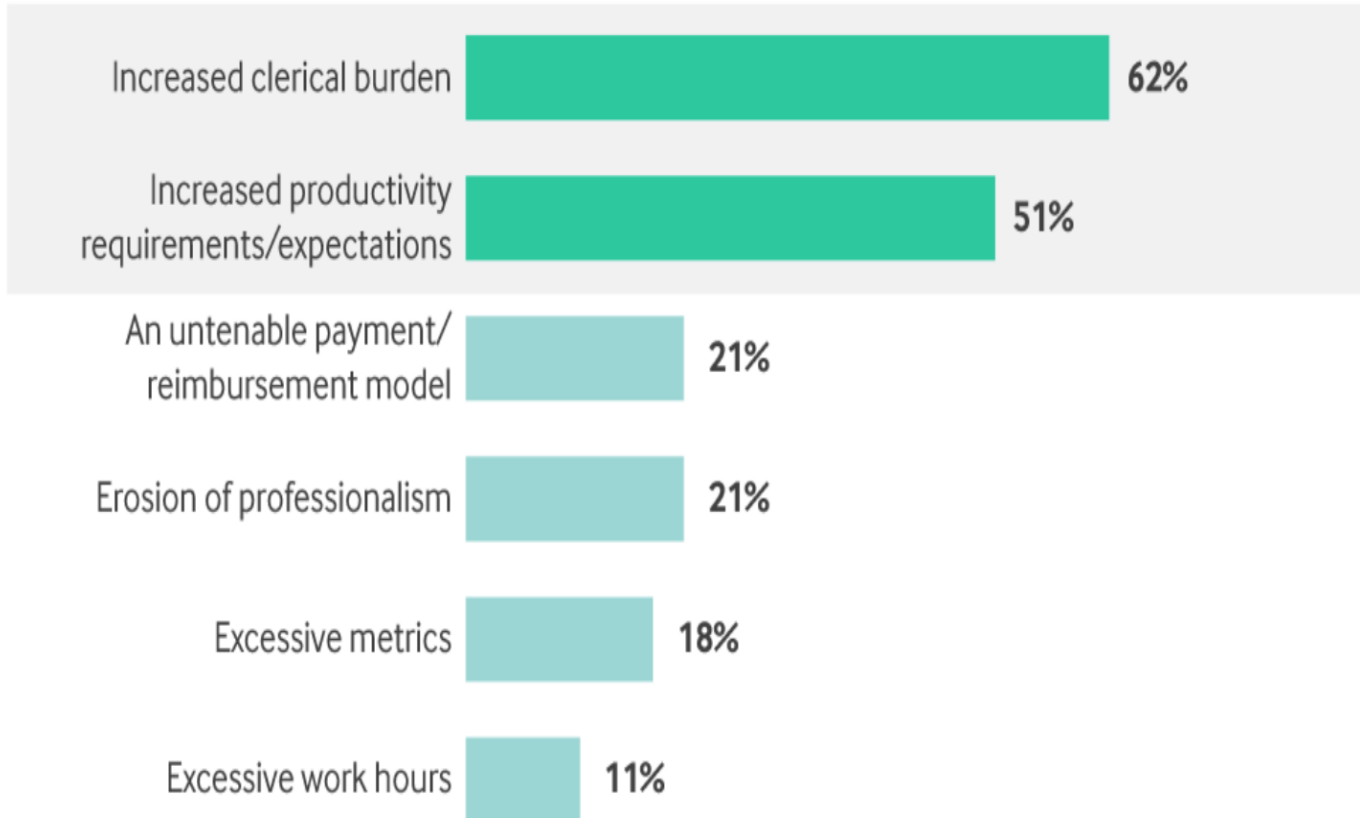
The Burnout Triad



Six Categories of Work Stress that can Contribute to Burnout

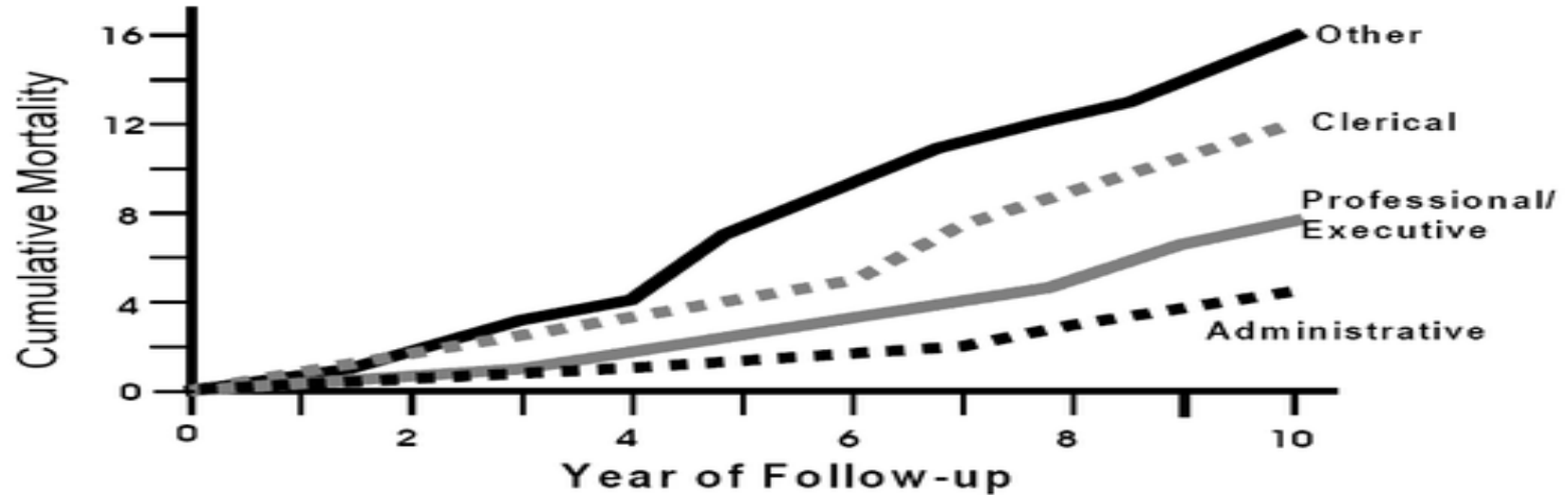
1. **Excessive workload**-physical, cognitive and emotional
2. **Lack of control**-being able to influence work environment
3. **Poor balance between effort and reward** -material and intangible rewards.
4. **Lack of community**- culture of mutual appreciation and teamwork
5. **Lack of fairness**- resources and justice
6. **Value conflict**- moral distress of having to participate in suboptimal, unethical circumstances.

What are the top two factors contributing to the increase in physician burnout?



Can your job kill you?

U.K. CIVIL SERVICE Mortality - All Causes



It's time we take physician satisfaction seriously

Now this is extremely vital. To be happier and healthier, we also need ways to process what we see. I believe we all need a philosophy or theology to help us cope with the suffering and pain around us and with the deep emotions we feel inside of us. To help us process evil and loss and grief, and offer us hope whether in this life or another. It's so easy to say, "I'm a scientist, I don't need all that hocus-pocus." And yet, that hocus pocus, those things that we call "the humanities" have sustained humanity for ages and ages beyond what we measure or recall. We need insights into what it means to be human and what it means to hope in something beyond our trouble. Art can help here. Music, paintings, sculpture, theater, film, all of these address the human condition and can offer us ways to process it all.

Edwin Leap, MD



Tree of Life, Borneo

Creativity

Creativity ultimately involves the production of original, potentially workable, solutions to novel, ill-defined problems of relatively high complexity.

(Besemer & O'Quin, 1999; Lubart, 2001)



CREATIVITY

The act of turning new and imaginative ideas into reality.



INVENTION

Creation of a new idea or concept



INNOVATION

Turning a new concept into commercial success or widespread use

Source: <https://innoway.me> | @innoway_me

DISCOVERY and DELIVERY skills quiz

Dyer, Gregersen & Christensen, The Innovator's DNA, 2011

Delivery skills

1. I follow through on all commitments
2. Extremely well organized
3. Never jump into new ventures quickly
4. I break down goals into micro-tasks
5. I hold myself and others strictly accountable for results

Discovery skills

1. My ideas/perspectives diverge radically from others'
2. I regularly ask questions to challenge the status quo
3. I find solutions to problems by drawing on information in other industries
4. I frequently experiment
5. I explore new possibilities in other fields of study

THE INNOVATOR'S DNA

*christensen, dyer,
gregersen*

What key behaviours are common to innovators?

Most orgs focus on **Project Delivery** skills.
For **innovation**, you also need **Discovery** skills.



Questioning

Ask lots of disruptive questions



Associating

Build ideas from varied inputs and connections.



Networking

Build diverse connections to get information and access to ideas



Observing

Hone the ability to observe people & behaviours with a fresh eye



Experimenting

Try new things along with an ability to handle failure and to learn

WWW.CHOOSETOOTHINQ.COM/SAMEPAGE

Why is Creativity Important?

- A survival Mechanism for the species
- Means to enrichment, emotional regulation, inspiration, meaning and motivation
- Helps one thrive in the rapid-change 21St Century

Shelley Carson, PhD

**Whatever
Happened to
Creativity?**



Creativity and Healthcare Professional

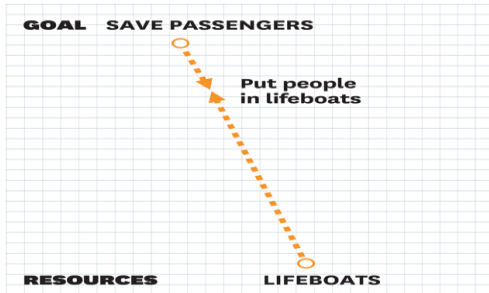
- Time constraints
- Limiting Mindsets
- Culture which emphasizes evidence-based practice
- No power or agency to make changes in the clinical landscape
- Difficulty to obtaining grant support for innovative ideas
- Lack of collaborators or concerns about competition
- Lack of motivation and experience to sustain the creative idea
- Reluctance to embrace one's identity as a "Creative" person

The two mindsets which could hold us back:

- **Functional Fixedness:** Cognitive bias that limits a person to use an object only in the way it is traditionally used.

Dominant Survival Strategy On the *Titanic*

The first step in discovering how resources could be used to reach a goal is to map the most obvious solution.



SOURCE: TONY MCCAFFREY AND JIM PEARSON
FROM "FIND INNOVATION WHERE YOU
LEAST EXPECT IT," DECEMBER 2015

© HBR.ORG

Lifeboats in RMS Titanic: 20
Lives Lost: 1552

- **Inattentional Blindness:** Failure to notice a fully-visible, but unexpected object because attention was engaged on another task, event or object.

GOAL

SAVE TITANIC PASSENGERS

KEEP PEOPLE
WARM & BREATHING

KEEP PEOPLE
OUT OF THE WATER

PUT PEOPLE
ON FLOATING THINGS

BUILD PLATFORMS
(TIE TOGETHER)

FLOATING

50'-100'
HIGH

SOLID

ICE

200'-400'
LONG

BUILD PLATFORM
WITH TIRES
BENEATH

BUILD PLATFORMS
BETWEEN BOATS

LIFEBOATS

PLANKS

CAR TIRES &
INNER TUBES

STEAMER
TRUNKS

RESOURCES

ICEBERG

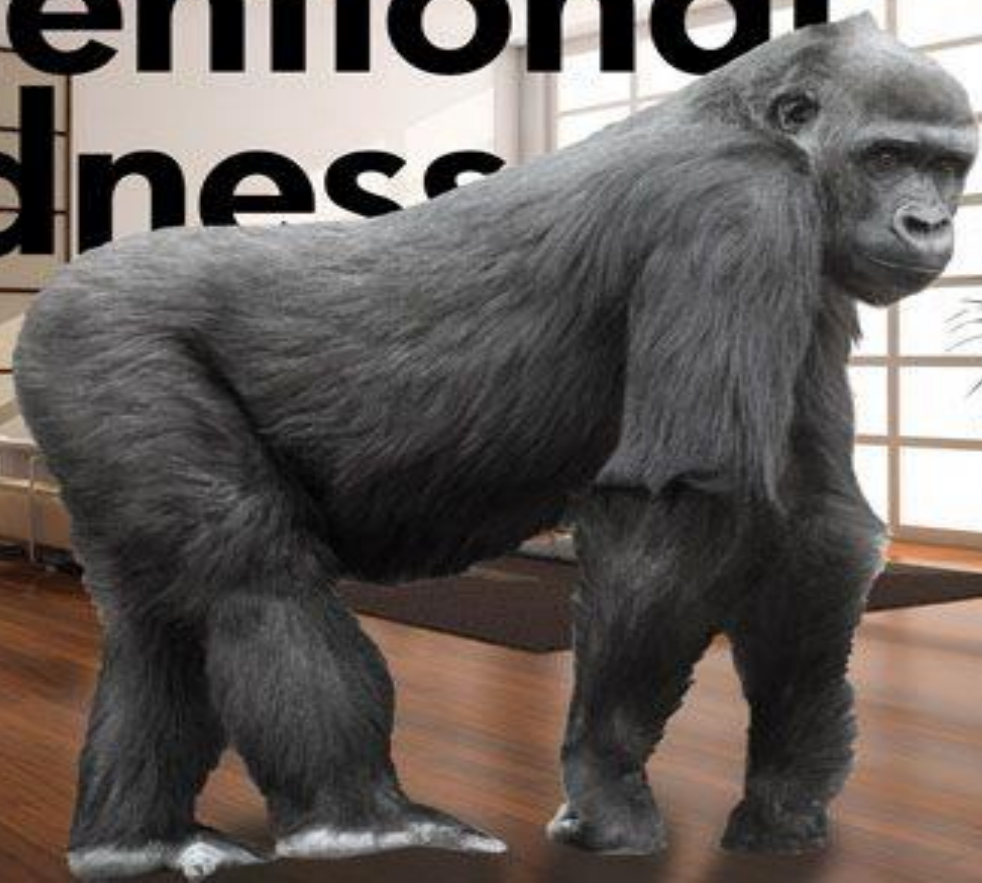
WOODEN
TABLES

OVERLOOKED STRATEGIES FOR SAVING TITANIC PASSENGERS

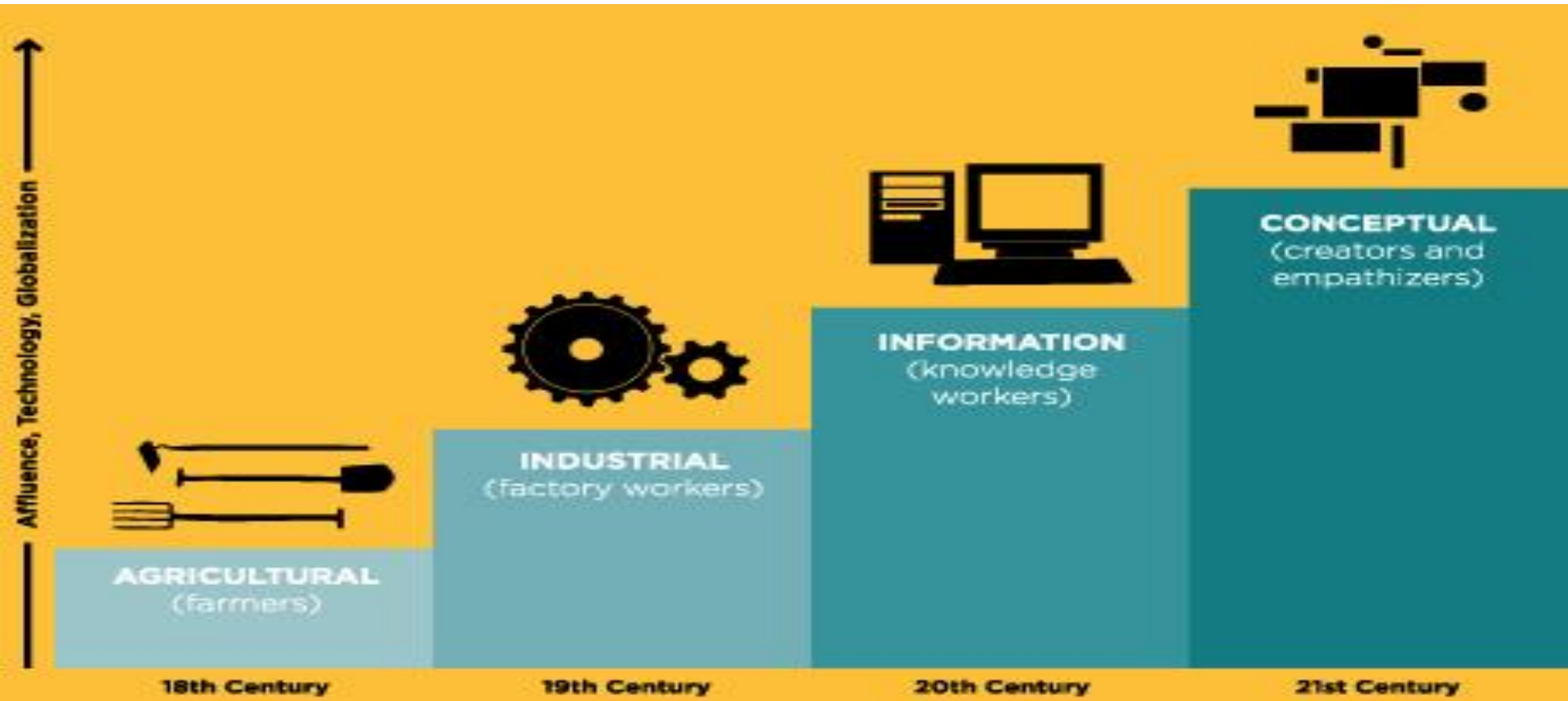
Find new ways to name the goal, and new resources may present themselves.

The fixation on a task leads to expectations -
and it is those expectations that foster

inattentional blindness



A whole new mind-Daniel Pink



Models of Creative Process:

4 P Model of Creativity

4 C Model

4 S Model

Wallas Model for Creativity

Brandt and Eagleman Model of Creativity

Design Thinking

THE 4Ps of CREATIVITY

Mel Rhodes



THE 4-C MODEL OF CREATIVITY



MINI-C

INTERPERATIVE
CREATIVITY



LITTLE-C

EVERYDAY
CREATIVITY



PRO-C

EXPERT
CREATIVITY



BIG-C

EMINENT
CREATIVITY

4 S Model of Creativity (K.H. Kim)



1. Soil
(Diverse Resources & Experiences)



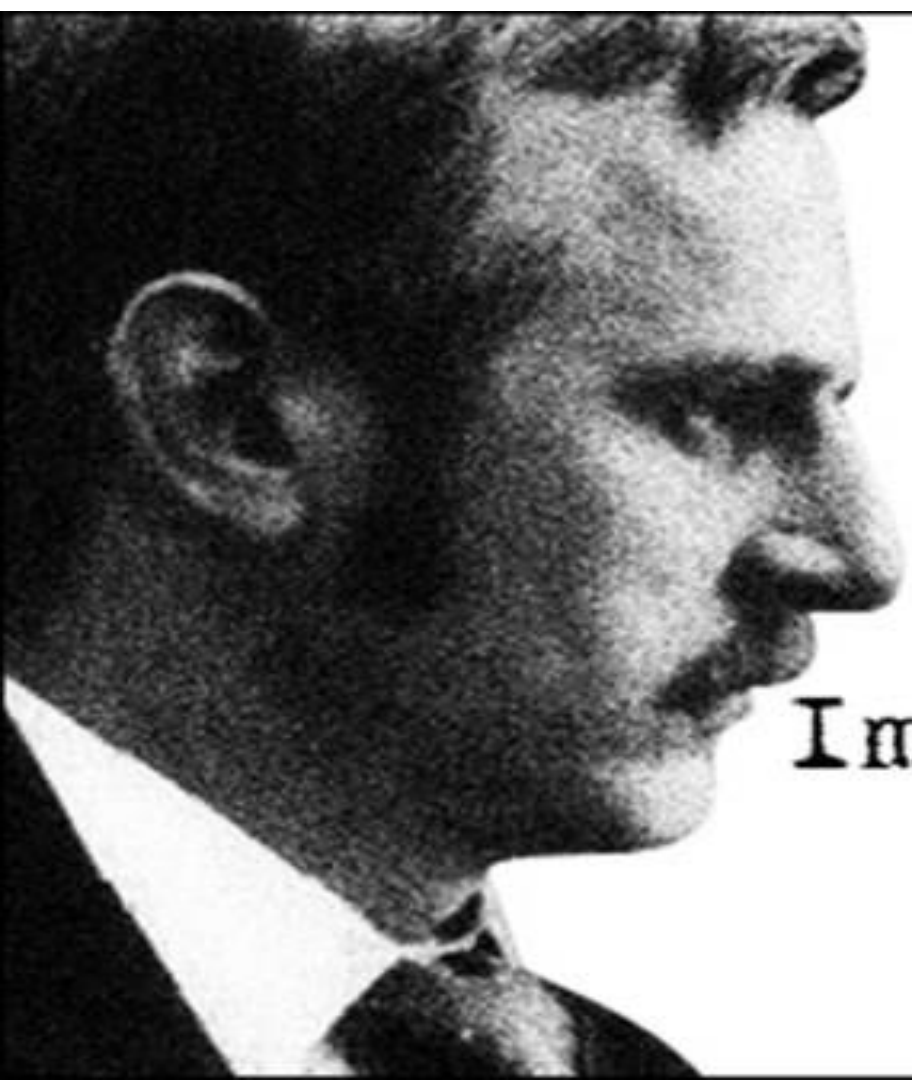
2. Sun
(Inspiration & Encouragement)



3. Storm
(High Expectations & Challenges)



4. Space
(Freedom to be Alone & Unique)



Preparation

Incubation

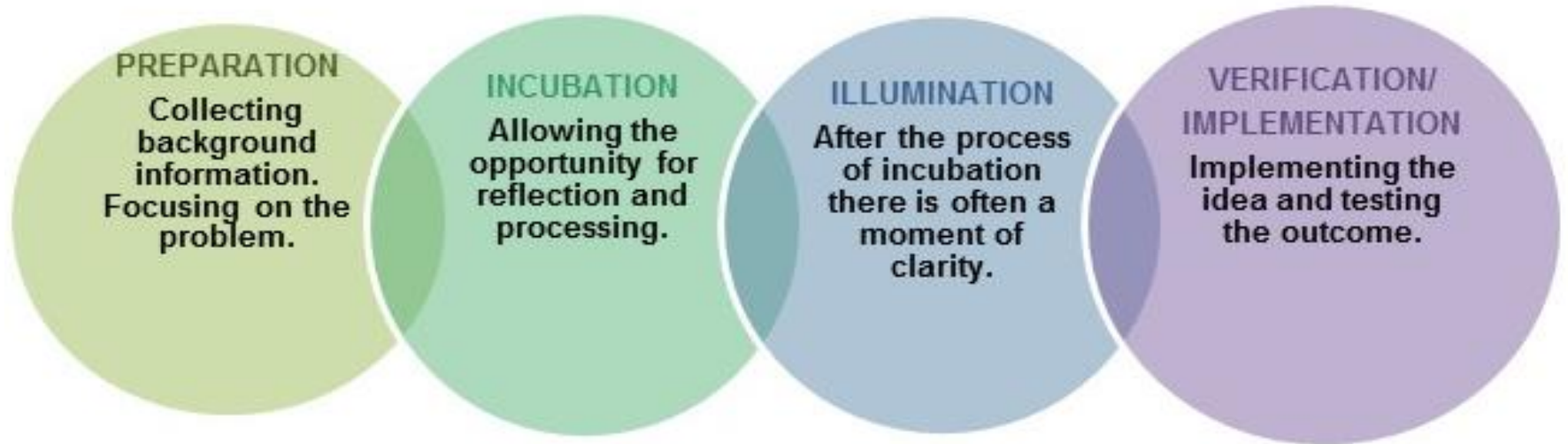
Illumination

Implementation

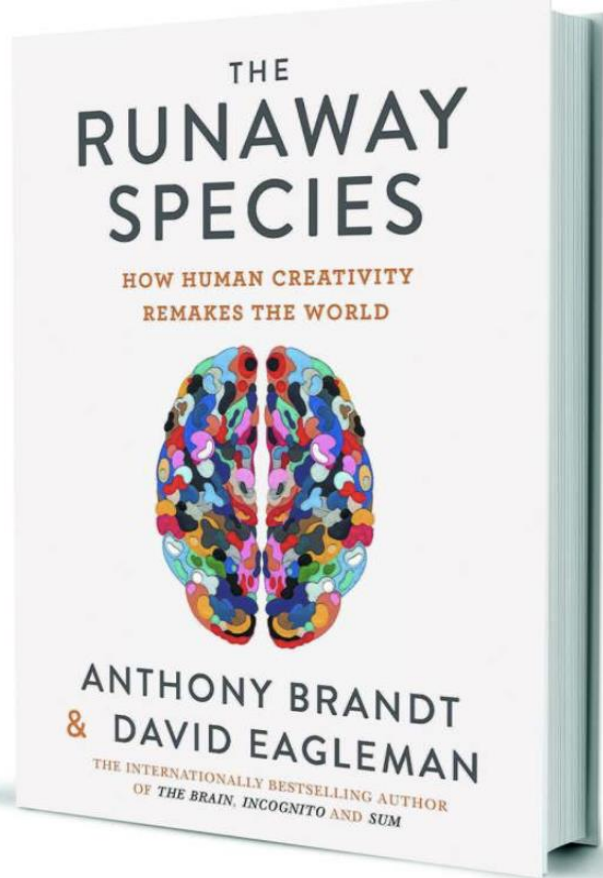
"Art of Thought"

Graham Wallas

Wallas Model for Creativity



Bending, Breaking and Blending - Brandt and Eagleman
Model of Creativity

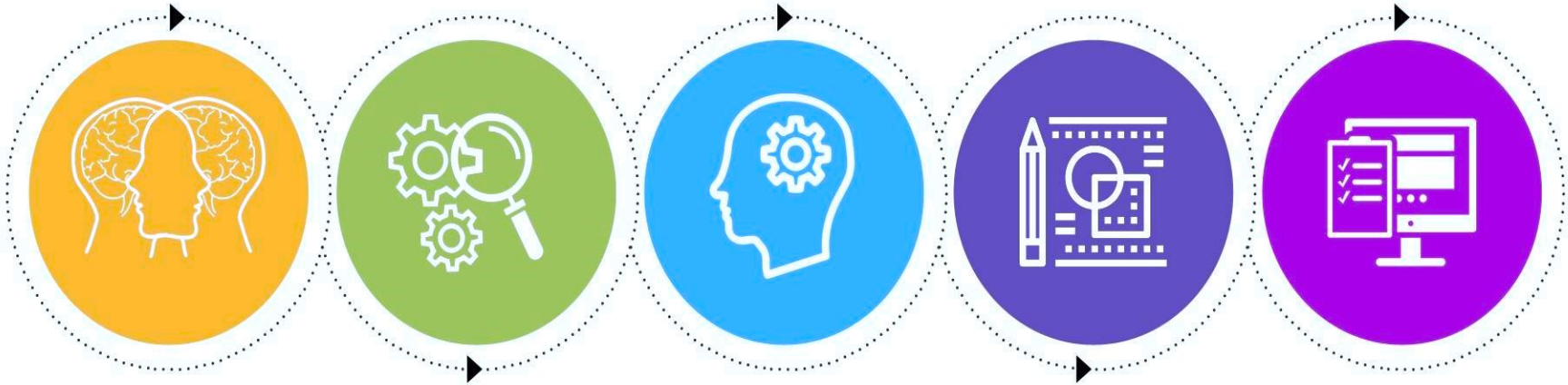


Thread 5:

We suggest there are three primary means by which all ideas evolve, three basic strategies: bending, breaking & blending.



Design Thinking



EMPATHISE

Understand the user's needs and problems

DEFINE

Analyse your observations to define the problem

IDEATE

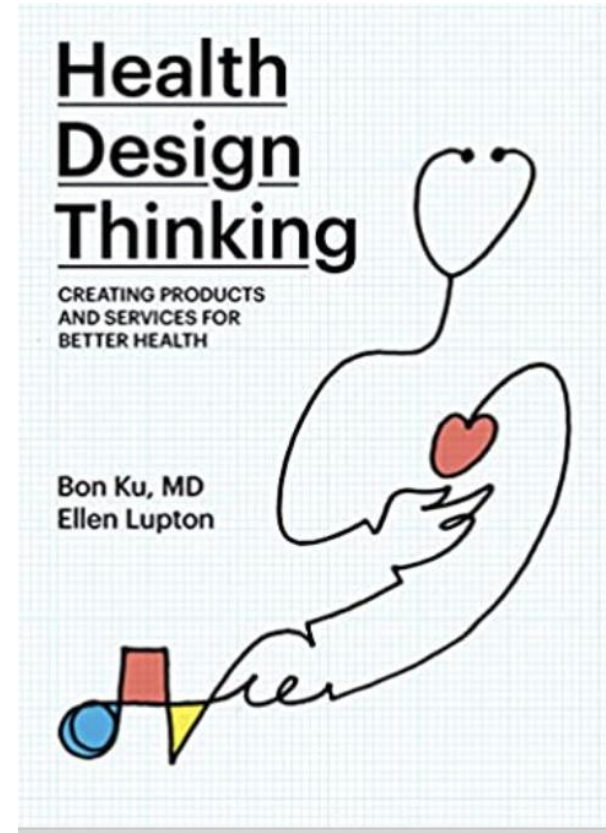
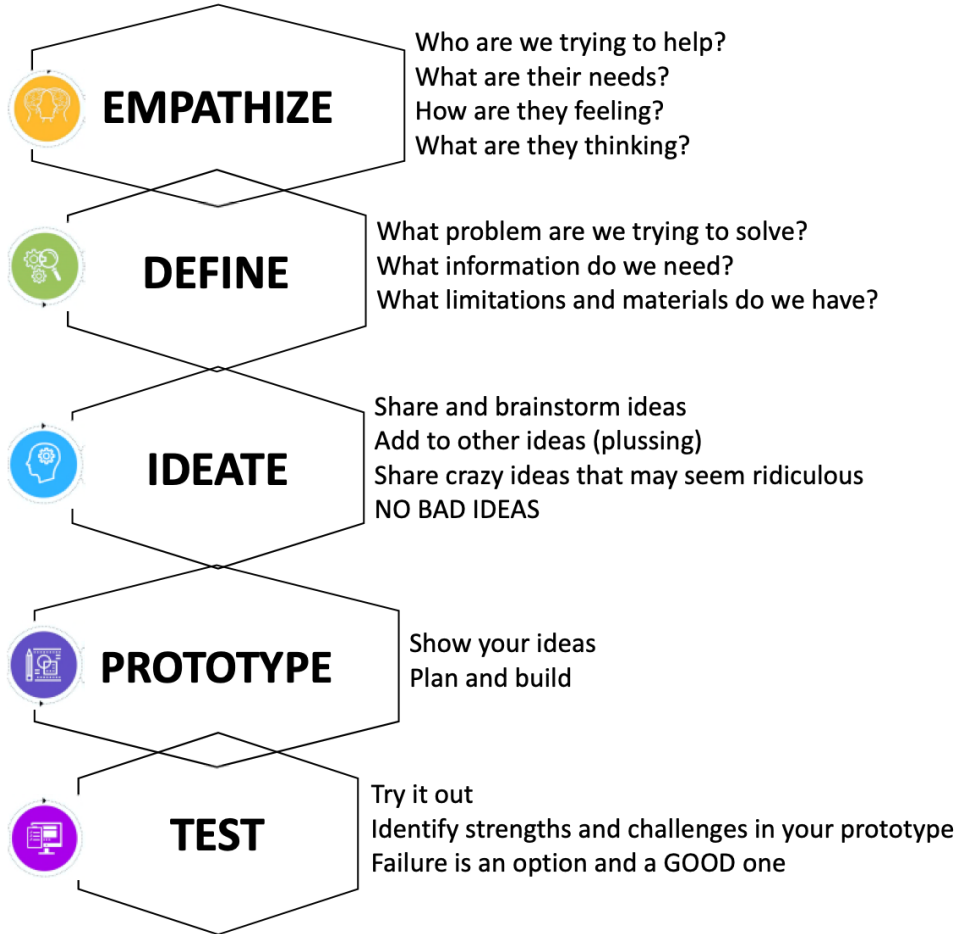
Think of solutions to each aspect of the problem

PROTOTYPE

Develop solution prototype for each aspect of the problem

TEST

Test the product using the best solutions identified



7 Forces that Drive Creativity

1. Chance
2. Collaboration
3. Competition
4. Clusters/Culture
5. Curiosity
6. Crisis
7. Convergence



SERENDIPITY

CHANCE

COINCIDENCE

FATE

FORTUITY

LUCK

PROVIDENCE

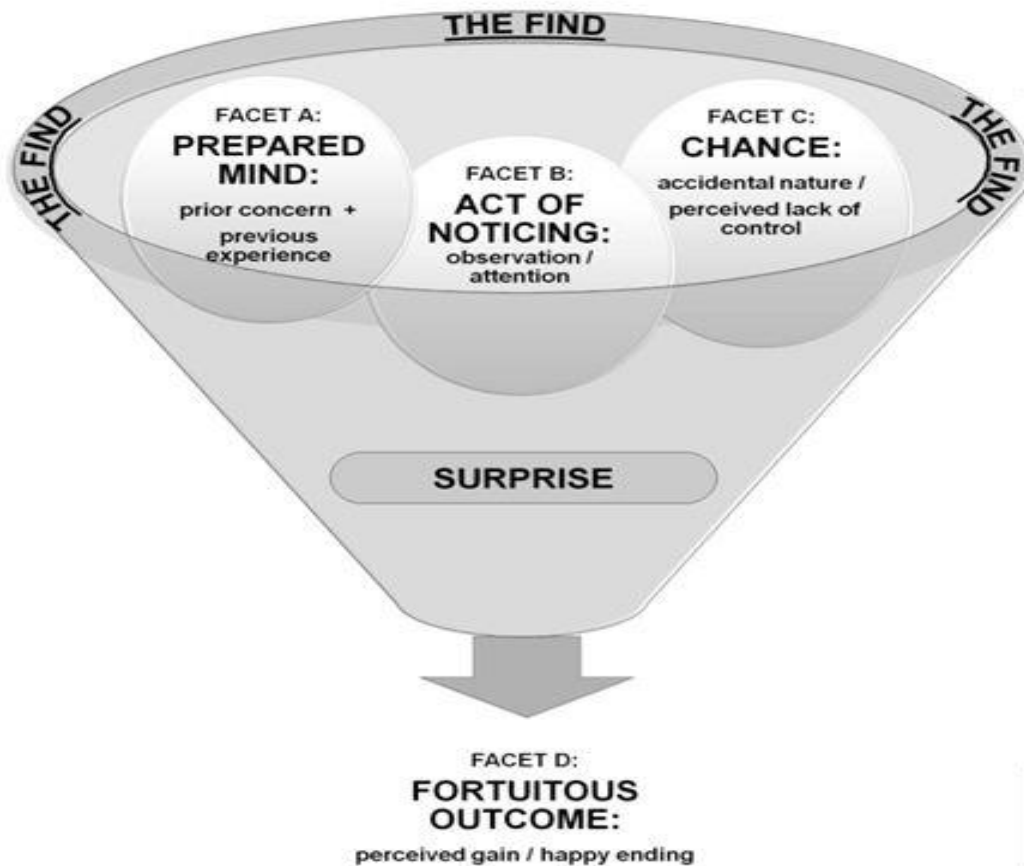
OPPORTUNITY

1. Chance

Serendipity

Chance interacting with human action, leading to a usually positive outcome.

Facets of Serendipity in Everyday Chance Encounters



re-framing of the events /
a story re-told /
an unsought finding

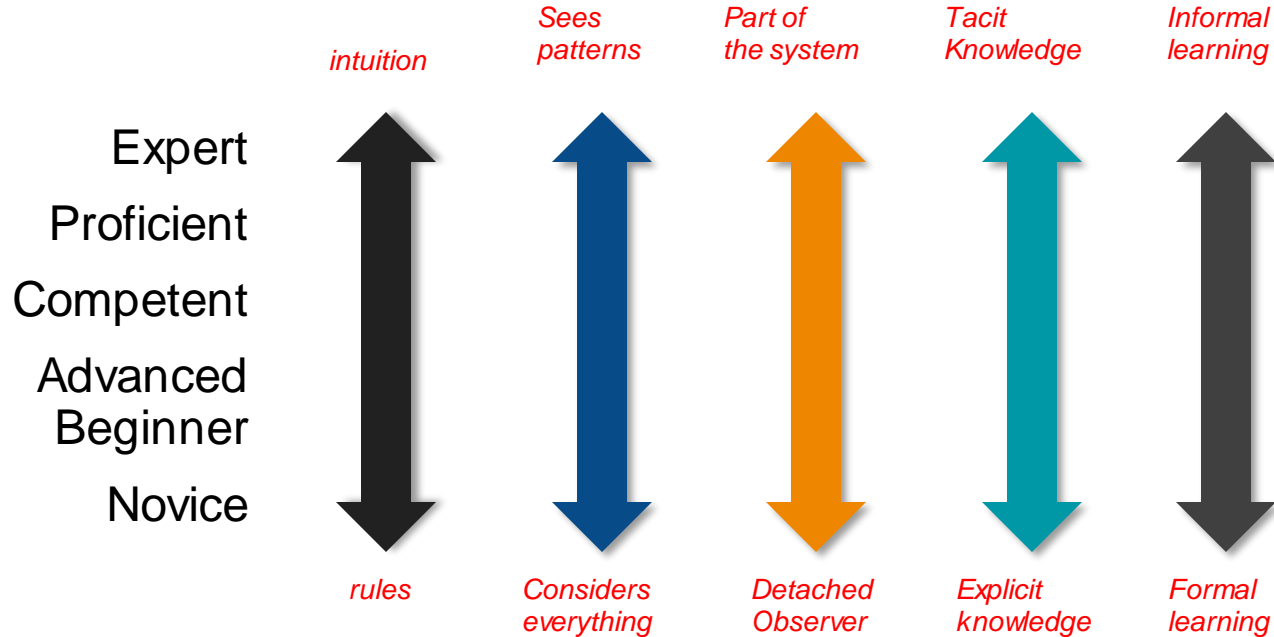
SERENDIPITY

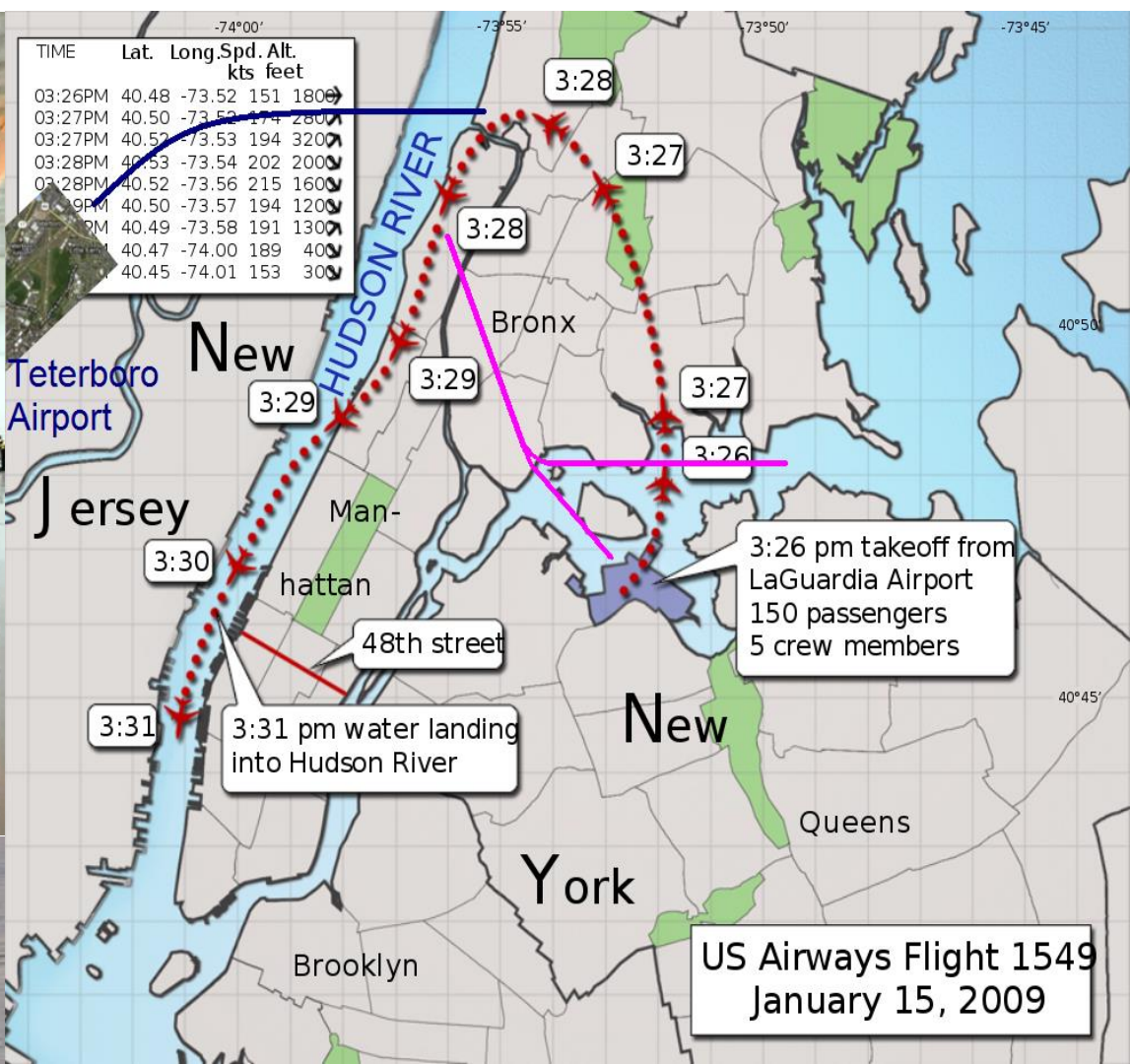
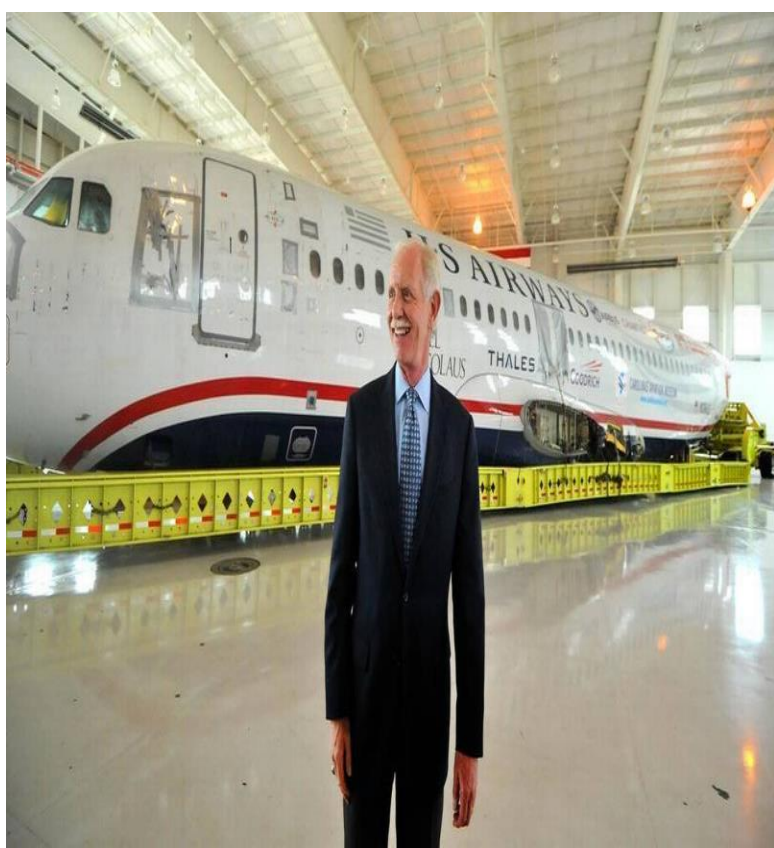


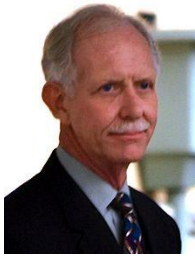
Chance
favours
only
the
prepared
mind.

- Louis Pasteur

The Novices to Expert Progression







Chesley B. "Sully" Sullenberger, III

Captain for a major U.S. airline with over 40 years of flying experience

A former U.S. Air Force (USAF) fighter pilot

Has served as an instructor and Air Line Pilots Association (ALPA) safety chairman, accident investigator and national technical committee member.

He has participated in several USAF and National Transportation Safety Board (NTSB) accident investigations. His ALPA safety work led to the development of a Federal Aviation Administration (FAA) Advisory Circular.

Working with National Aeronautics and Space Administration (NASA) scientists, he coauthored a paper on error inducing contexts in aviation. He was instrumental in the development and implementation of the Crew Resource Management (CRM) course used at his airline and has taught the course to hundreds of his colleagues. Sully is a graduate of the U.S. Air Force Academy (B.S.), Purdue University (M.S.) and the University of Northern Colorado (M.A.).

He was a speaker on two panels at the High Reliability Organizations (HRO) 2007 International Conference in Deauville, France May 29-31, 2007.

Visiting Scholar at the University of California, Berkeley.

"One way of looking at this might be that for 42 years, I've been making small, regular deposits in this bank of experience, education and training. And on January 15, the balance was sufficient so that I could make a very large withdrawal"

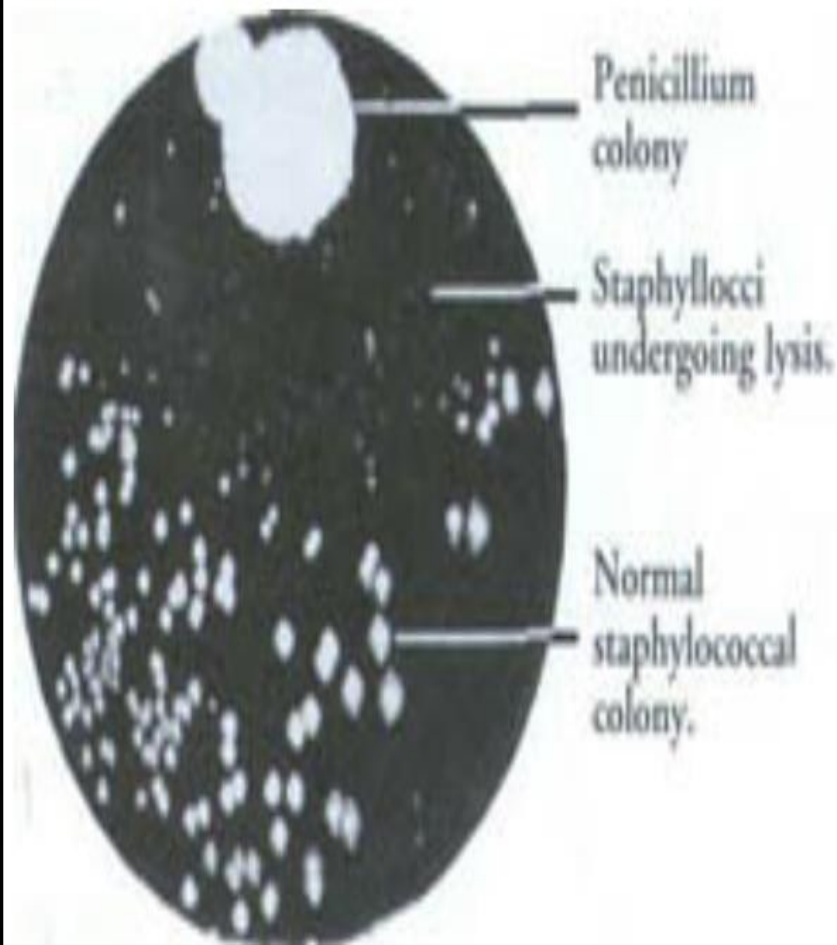
- Chesley B. "Sully" Sullenberger, III



115211-004-C122A5B1



*Print of the culture plate which started
the work on Penicillins
(25 years old and rather dried up.) F*

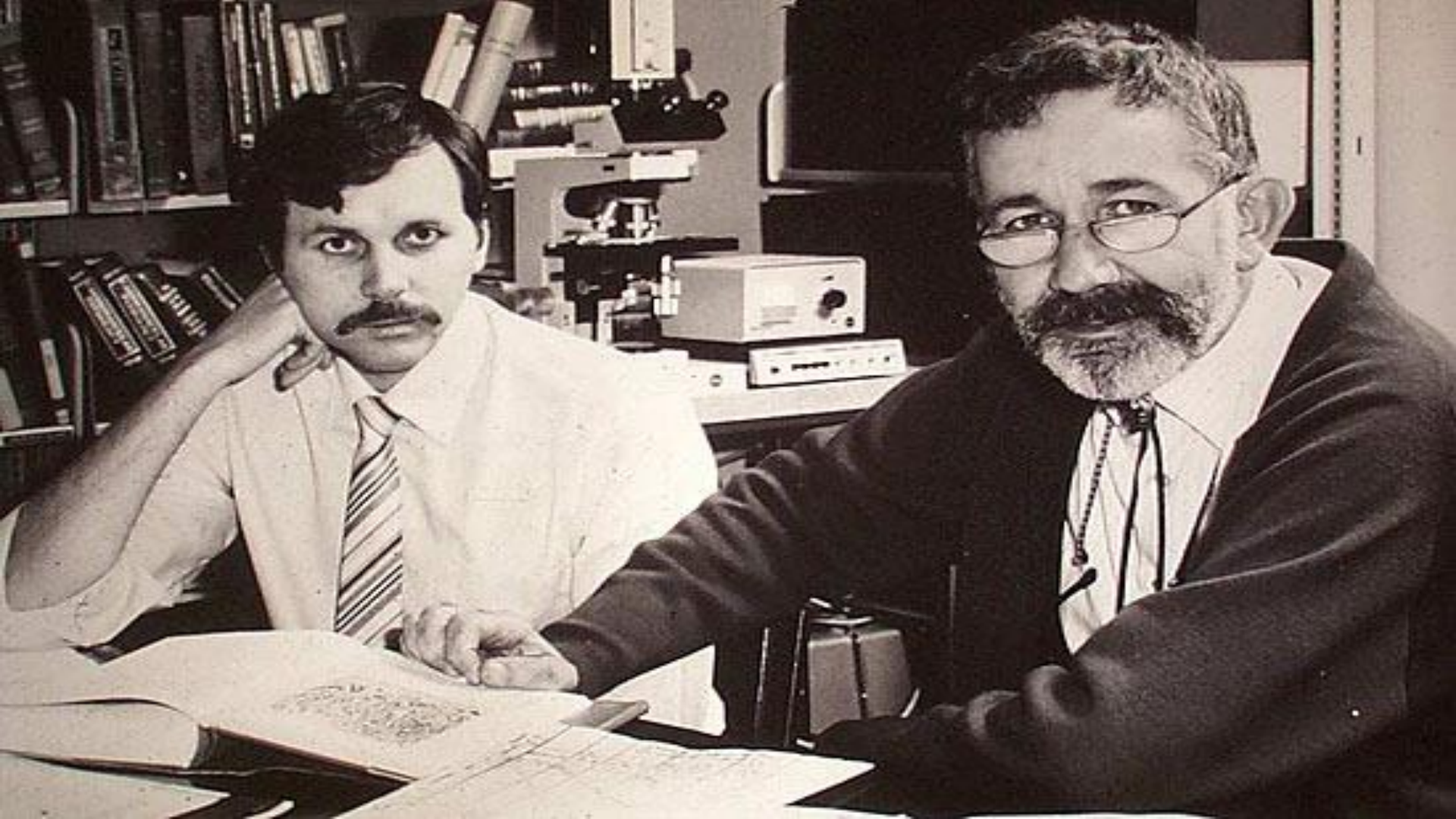


Though most well-known as the discoverer of penicillin, Sir Alexander Fleming (1881-1955) was also a pioneer in the field of microbial art.

Six of his “paintings” were reproduced on the endpapers of Andre Maurois’s 1959 biography of the scientist.



AMERICAN
SOCIETY FOR
MICROBIOLOGY



First publications of Marshall & Warren

- **Letters**

- Warren JR. Unidentified curved bacilli on gastric epithelium in active chronic gastritis. Lancet 1983; i: 1273.
- Marshall B. Unidentified curved bacilli on gastric epithelium in active chronic gastritis. Lancet 1983; i: 1273-4.

- **Original article**

Marshall BJ, Warren JR. Unidentified curved bacilli in stomach of pts with gastritis & peptic ulceration. Lancet 1984; i: 1311-4.

The discovery of Helicobacter Pylori

“At the time of their discovery, Warren and Marshall were physicians doing their daily jobs. They were not in the laboratory chasing after the Nobel Prize. They had no intention of being in the limelight. They had no research grants for studying ulcer disease. Rather, they happened upon something interesting, and driven by curiosity, they investigated and reported it. They proved again that we, as physicians, can make groundbreaking discoveries in the course of our clinical practices if we attend to our work with open eyes, a sense of curiosity, a desire to understand, and a willingness to pursue ideas to their completion.”

Julie Parsonnet, M.D., NEJM 2005; 353:2421-23

How to Cultivate the Art of Serendipity:

Non-encounterers

Occasional encounterers

Super-encounterers

The New York Times

How to Cultivate the Art of Serendipity



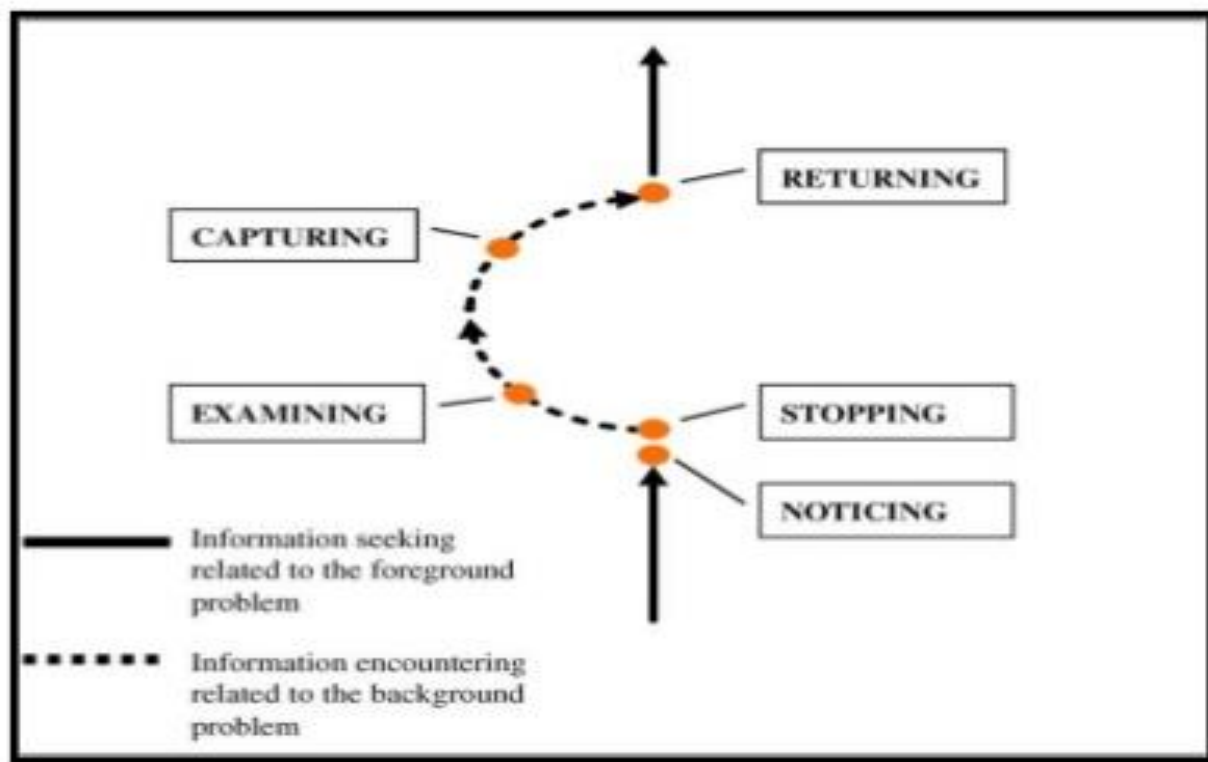
By Pagan Kennedy

Jan. 2, 2016



Sandra Erdelez, PhD

Information Encountering



Erdelez, S. (2004). Investigation of information encountering in the controlled research environment. *Information Processing & Management*, 40(6), 1013-1025. doi:10.1016/j.ipm.2004.02.002



Serendipity in Psychiatry

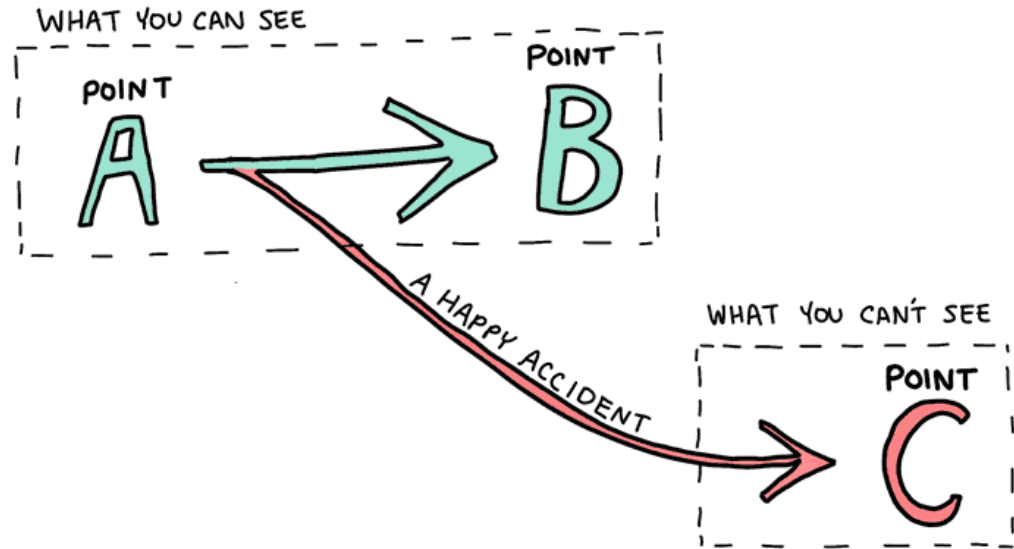
Lithium

Chlorpromazine

MAO Is

TCAs

? Aripiprazole



Art of observation:

An active experience which focuses your senses and engages your environment

Goes beyond our subconscious filters

Pays attention to details

Prioritizes the critical, important and the urgent

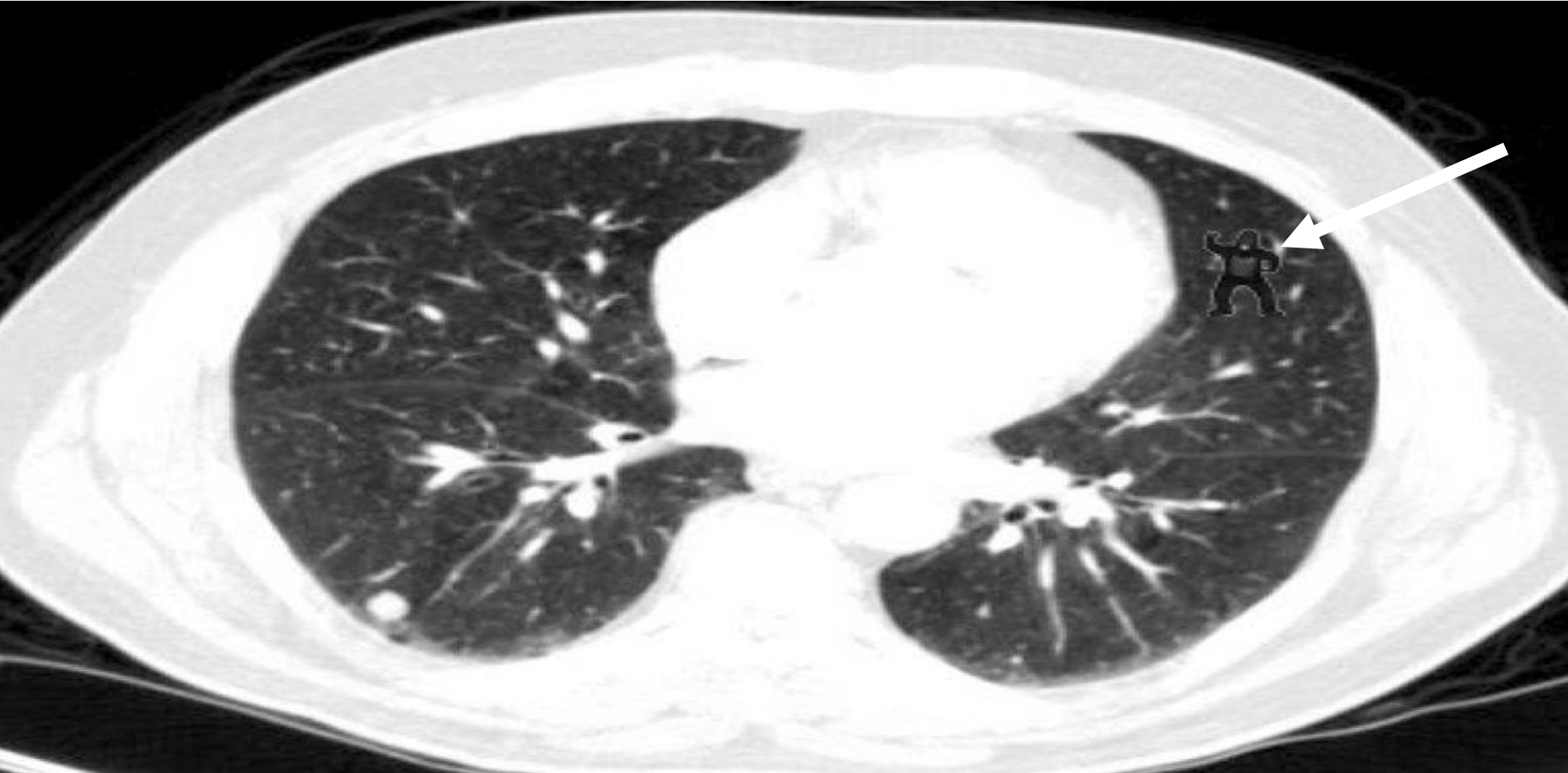


Inattentional Blindness in “Hitchhiker’s Guide to the Galaxy”

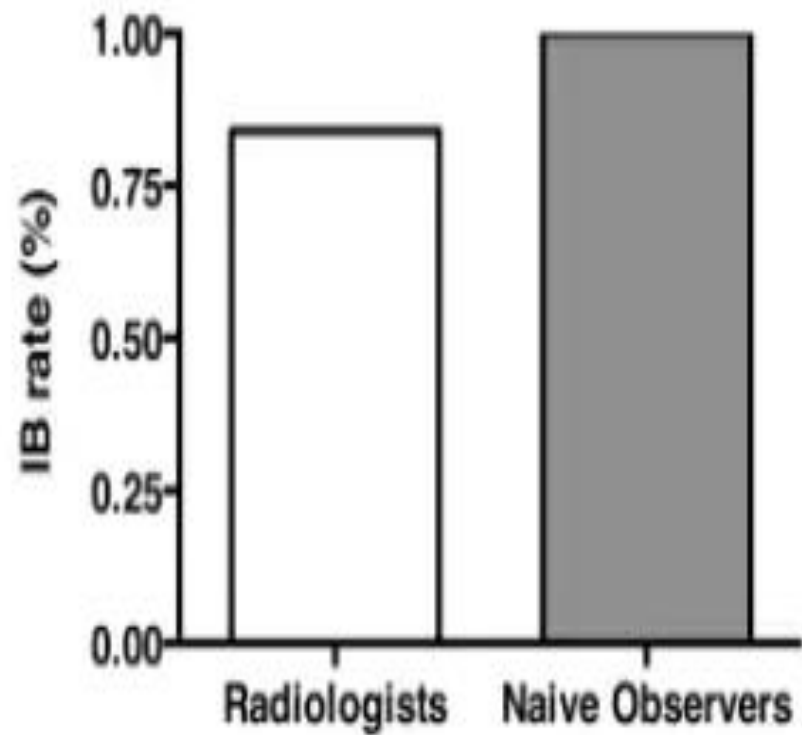
“Something that we can’t see, or don’t see, our brain doesn’t let us see, because we think that it’s somebody else’s problem. The brain just edits it out; it’s like a blind spot. If you look at it directly, you won’t see it unless you know precisely what it is. It relies on people’s natural predisposition not to see anything they don’t want to see, weren’t expecting or can’t explain,

-Douglas Adams

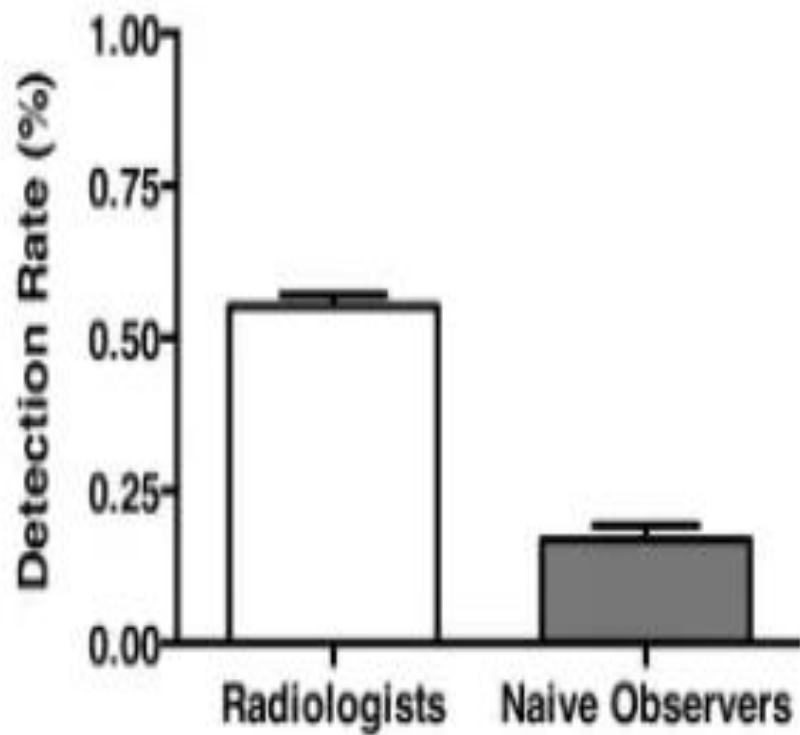
Inattentional Blindness (IB) in Radiologists



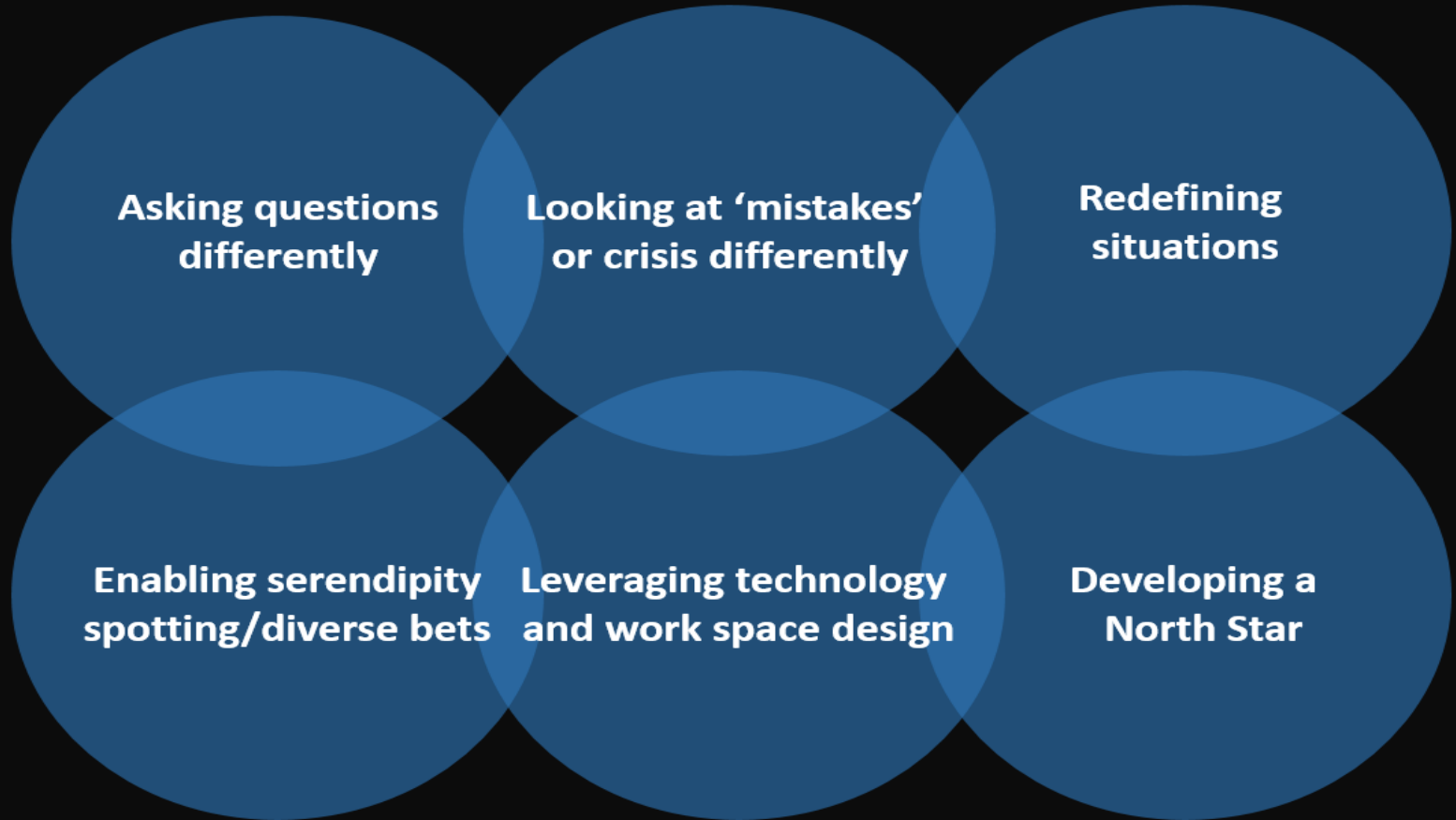
Inattentional Blindness Rate

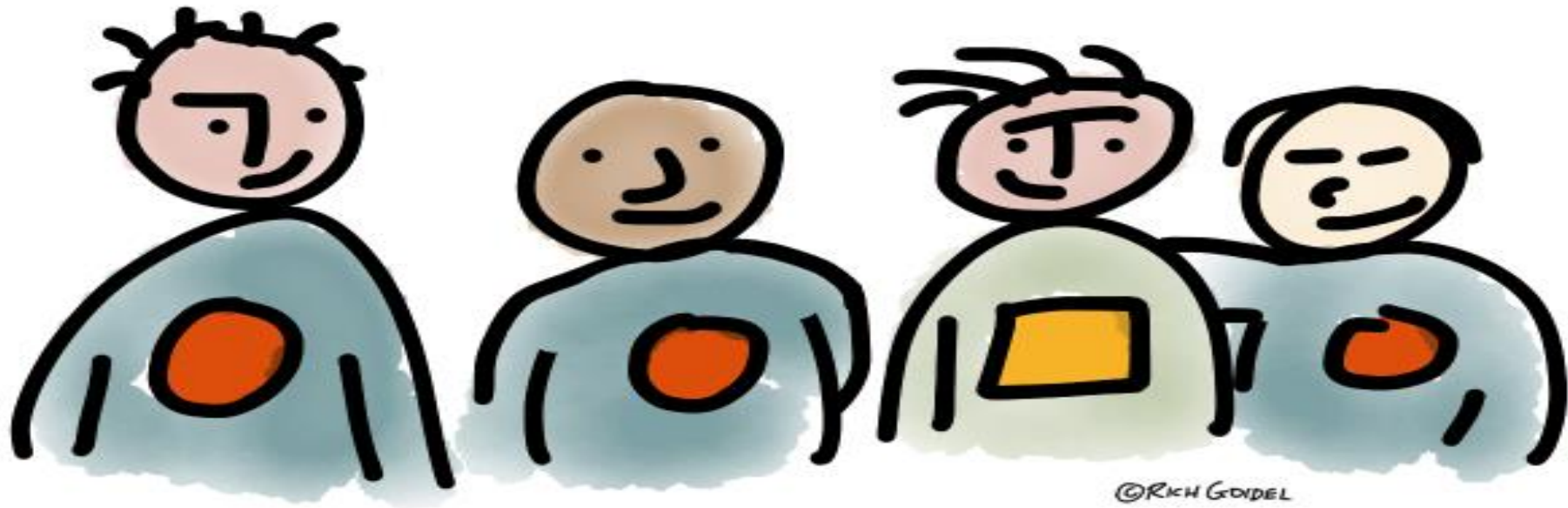


Nodule Detection



Cultivating Serendipity





2. Collaboration

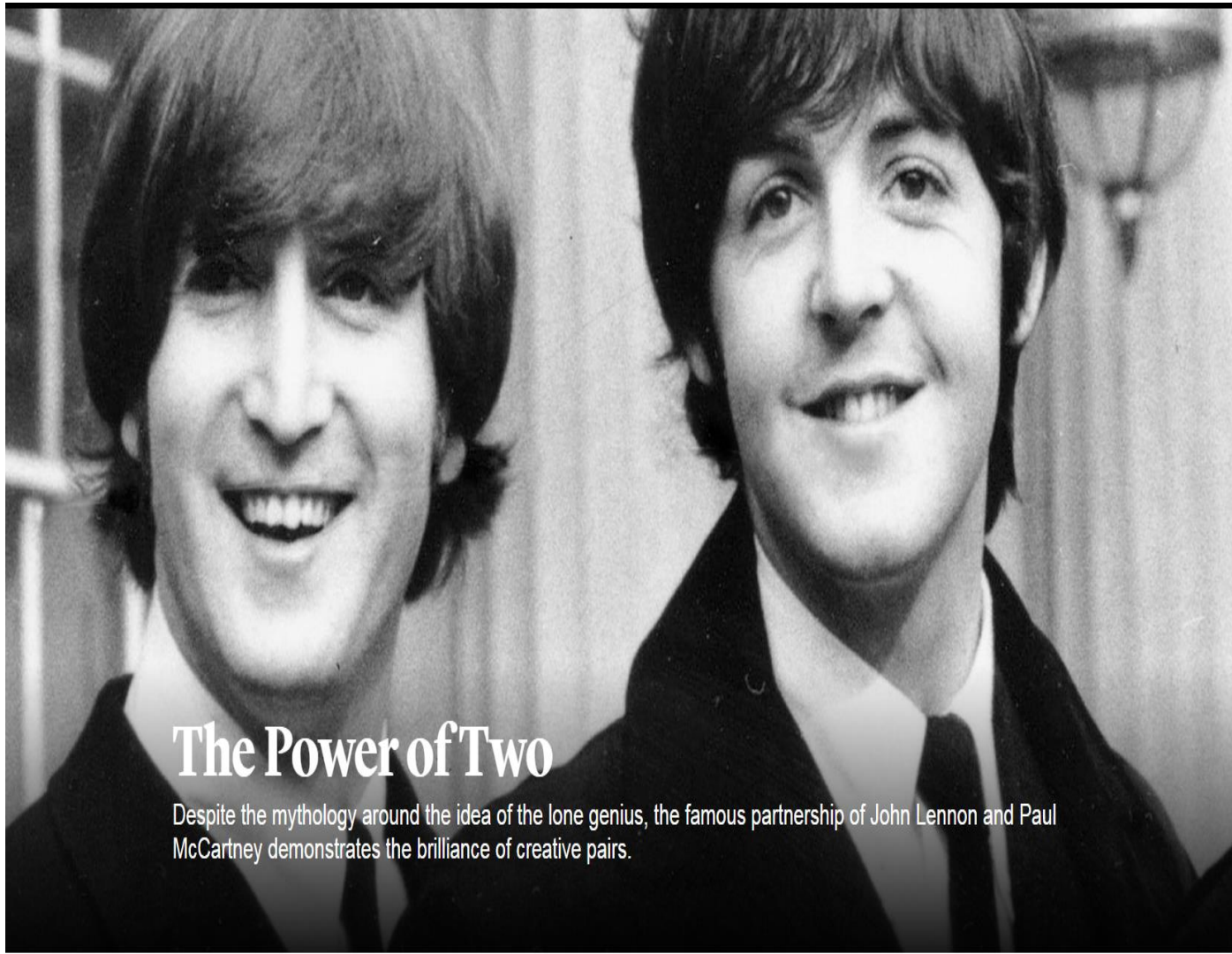
Creativity and the “Power of Twos”:

John was the badass older brother Paul never had. Paul was a charming sidekick who could do something rare: keep up with John.

- Joshua Shenk

-Compensatory Genius:

A brilliant mind makes up for the shortcomings of another brilliant one



The Power of Two

Despite the mythology around the idea of the lone genius, the famous partnership of John Lennon and Paul McCartney demonstrates the brilliance of creative pairs.

Paul was meticulous and organized: he always carried a notebook around with him, in which he methodically wrote down lyrics and chord changes in his neat handwriting. In contrast, John seemed to live in chaos: he was constantly searching for scraps of paper that he'd hurriedly scribbled ideas on. Paul was a natural communicator; John couldn't articulate his ideas well. Paul was the diplomat; John was the agitator. Paul was soft-spoken and almost unfailingly polite; John could be a right loudmouth and quite rude. Paul was willing to put in long hours to get a part right; John was impatient, always ready to move on to the next thing. Paul usually knew exactly what he wanted and would often take offense at criticism; John was much more thick-skinned and was open to hearing what others had to say. In fact, unless he felt especially strongly about something, he was usually amenable to change.



Does Collocation Inform the Impact of Collaboration?

Kyungjoon Lee¹, John S. Brownstein², Richard G. Mills³, Isaac S. Kohane^{1,2*}

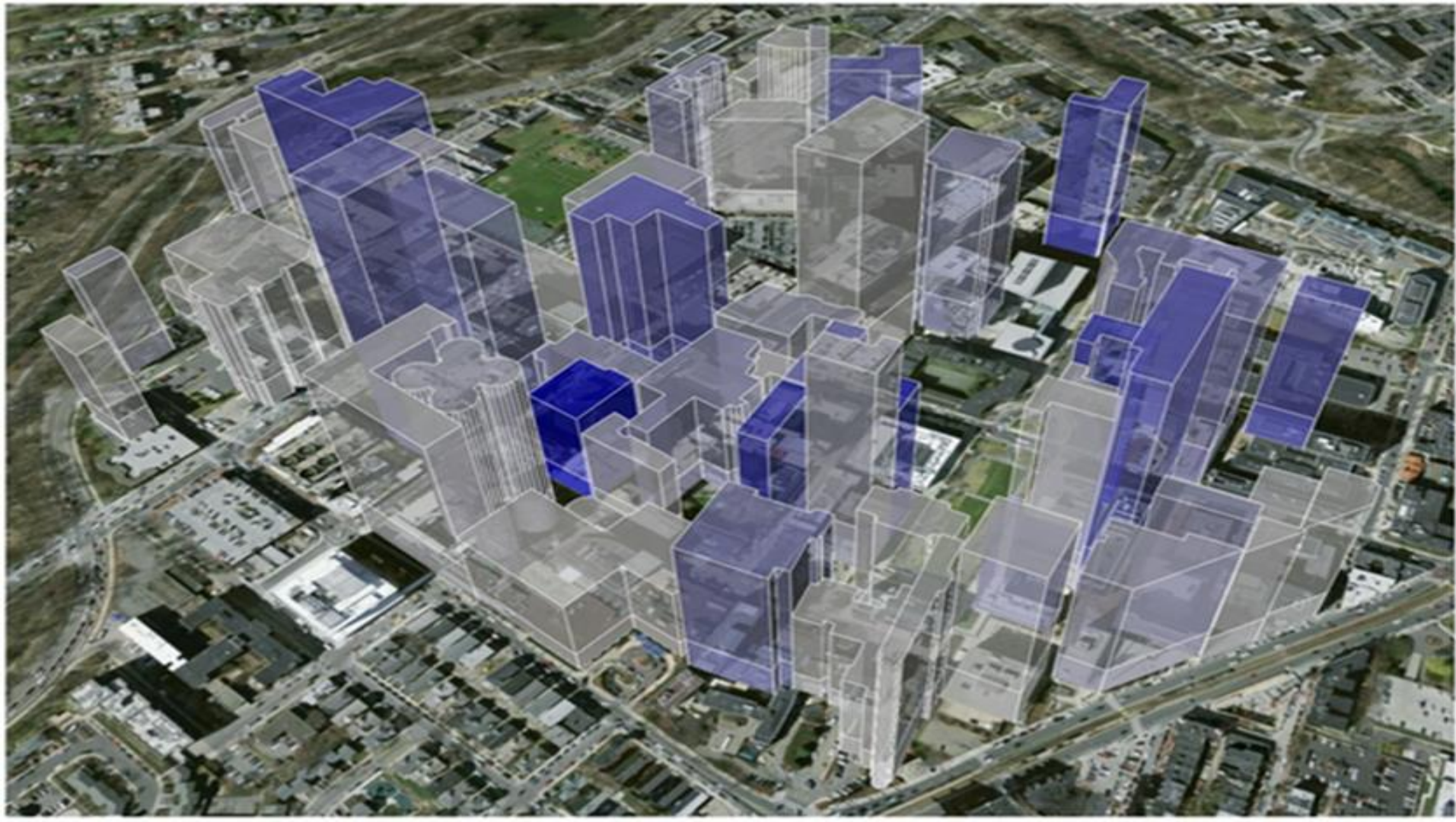
1 Center for Biomedical Informatics, Harvard Medical School, Boston, Massachusetts, United States of America, **2** Children's Hospital Informatics Program at the Harvard-MIT Division of Health Sciences and Technology, Boston, Massachusetts, United States of America, **3** Operations and Business Affairs, Harvard Medical School, Boston, Massachusetts, United States of America

Abstract

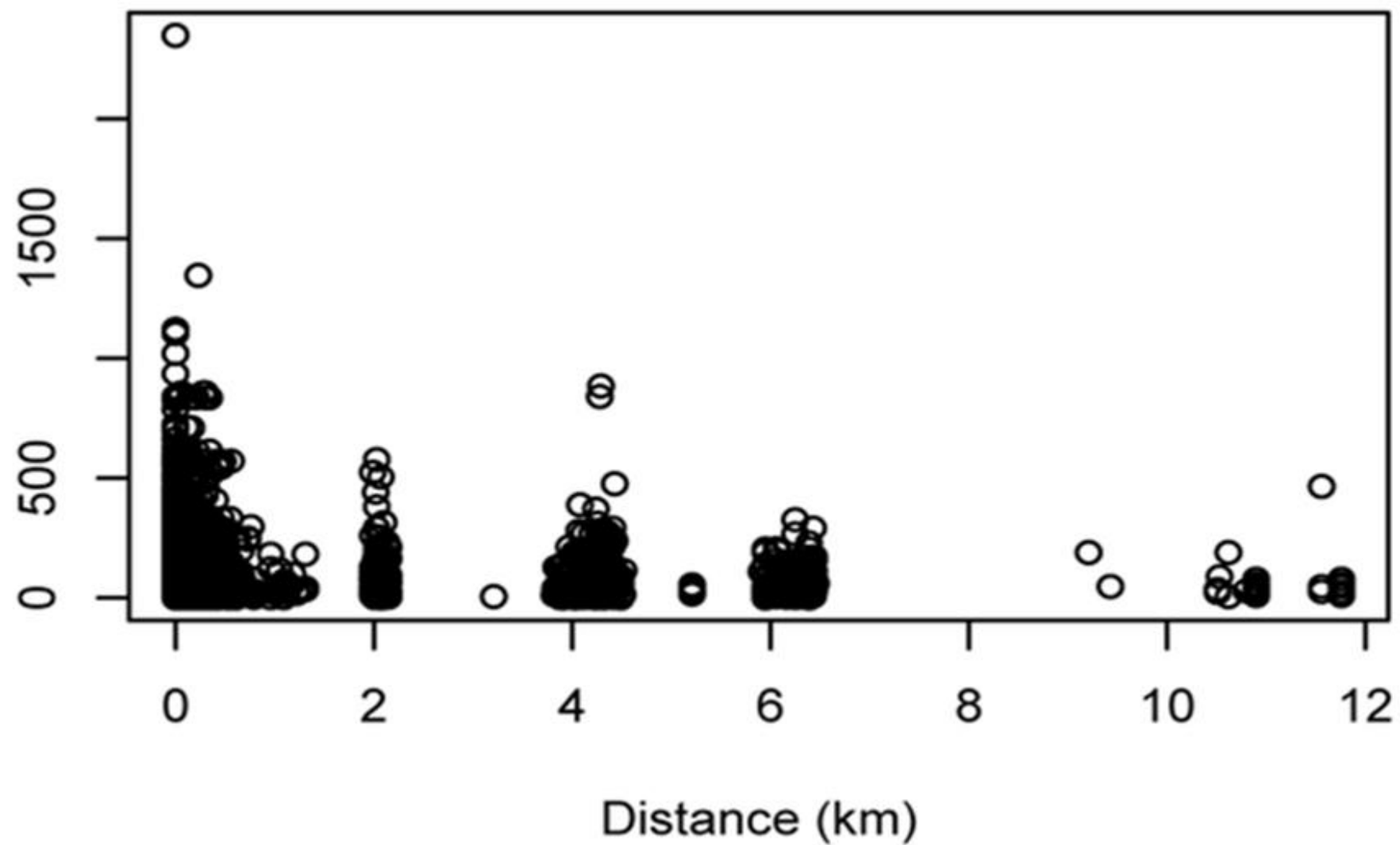
Background: It has been shown that large interdisciplinary teams working across geography are more likely to be impactful. We asked whether the physical proximity of collaborators remained a strong predictor of the scientific impact of their research as measured by citations of the resulting publications.

Methodology/Principal Findings: Articles published by Harvard investigators from 1993 to 2003 with at least two authors were identified in the domain of biomedical science. Each collaboration was geocoded to the precise three-dimensional location of its authors. Physical distances between any two coauthors were calculated and associated with corresponding citations. Relationship between distance of coauthors and citations for four author relationships (first-last, first-middle, last-middle, and middle-middle) were investigated at different spatial scales. At all sizes of collaborations (from two authors to dozens of authors), geographical proximity between first and last author is highly informative of impact at the microscale (i.e. within building) and beyond. The mean citation for first-last author relationship decreased as the distance between them increased in less than one km range as well as in the three categorized ranges (in the same building, same city, or different city). Such a trend was not seen in other three author relationships.

Conclusions/Significance: Despite the positive impact of emerging communication technologies on scientific research, our results provide striking evidence for the role of physical proximity as a predictor of the impact of collaborations.



Citation





MIT's Building 20: "The Magical Incubator"

An eccentric amalgam of people who knew little to nothing about each other, suddenly thrust together within the walls of what seemed like an awful building.



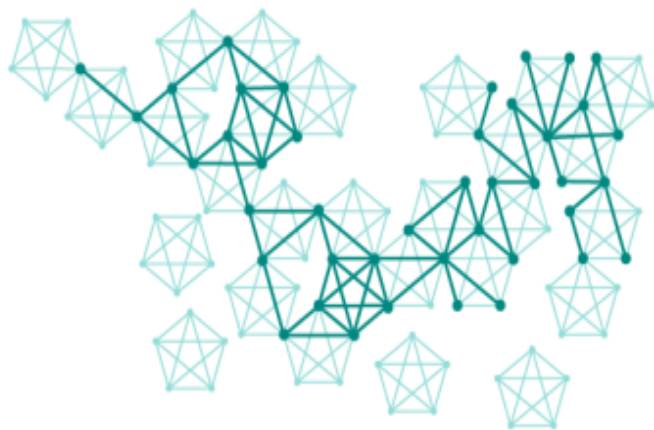
Q Factor: Why too much chumminess and too little friction are bad for business?



Source: Dangerous Kitchen



Low Q



Medium Q



High Q

The power of Q:

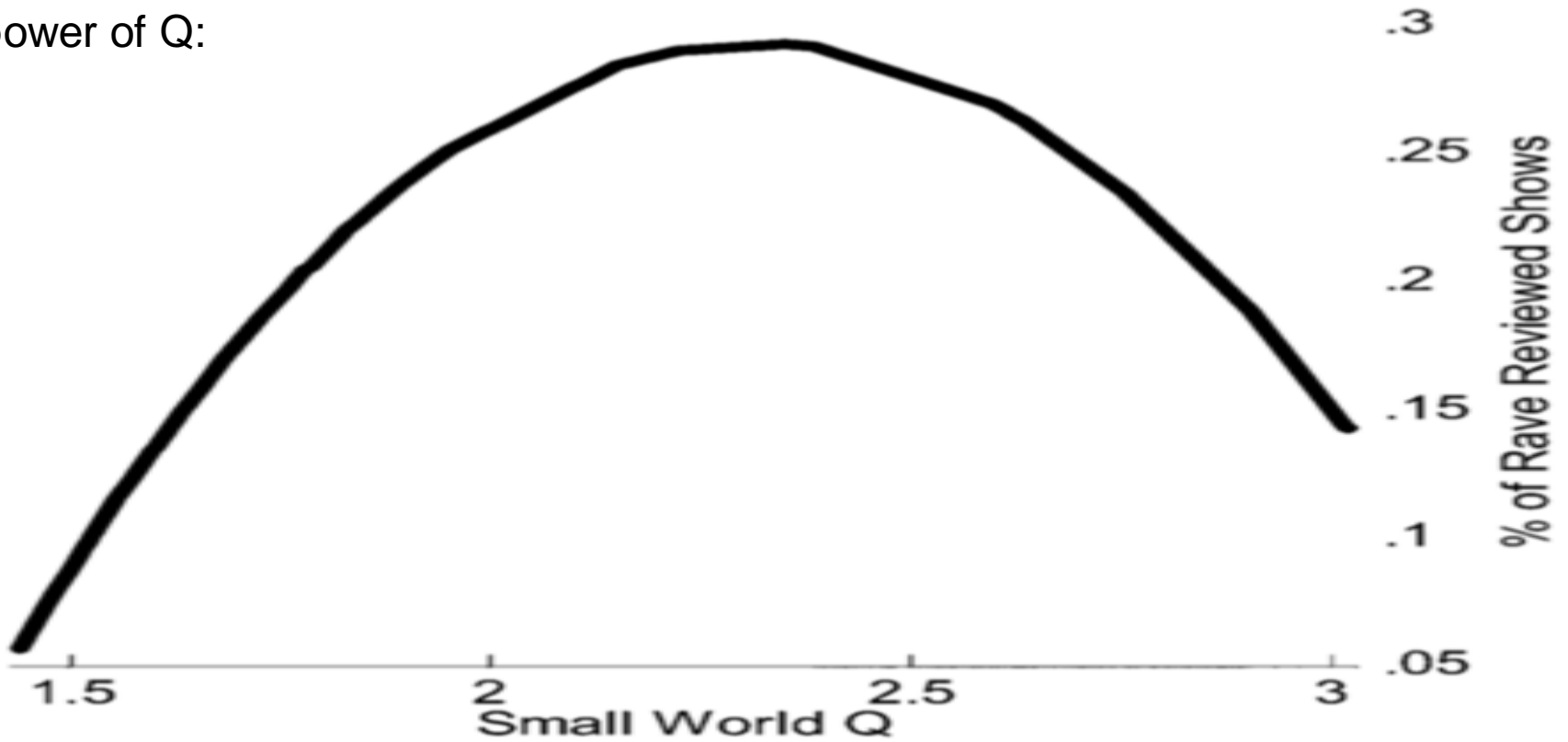


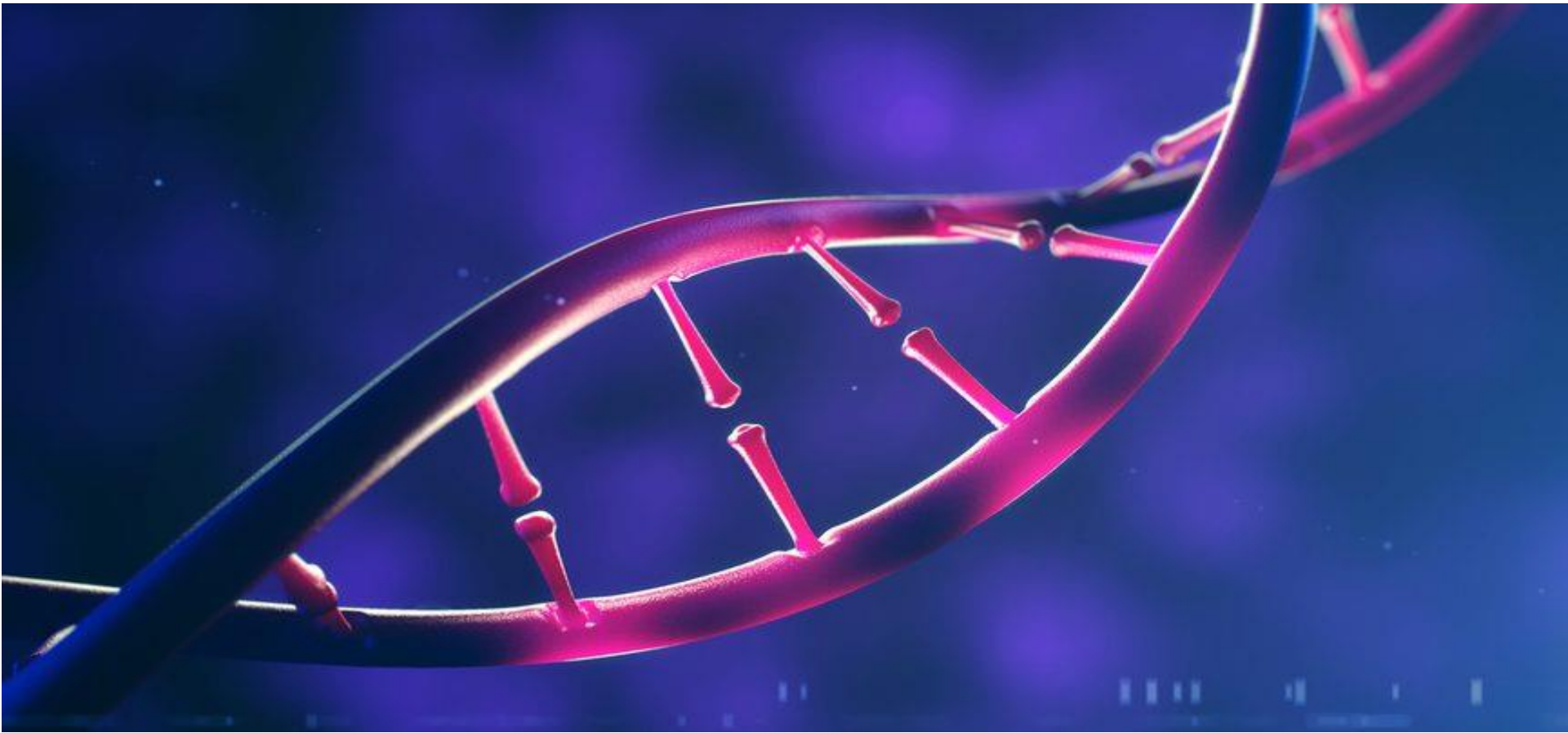
FIG. 7.—Artistic success of a season

Brian Uzzi on Q factor:

“

People have a tendency to want to only work with their friends. It feels much more comfortable. But that's exactly the wrong thing to do. If you really want to make something great, then you're going to need to seek out some new people too.

”



3. Competition



King's College



Rosalind Franklin



Maurice Wilkins

Cambridge University



James Watson

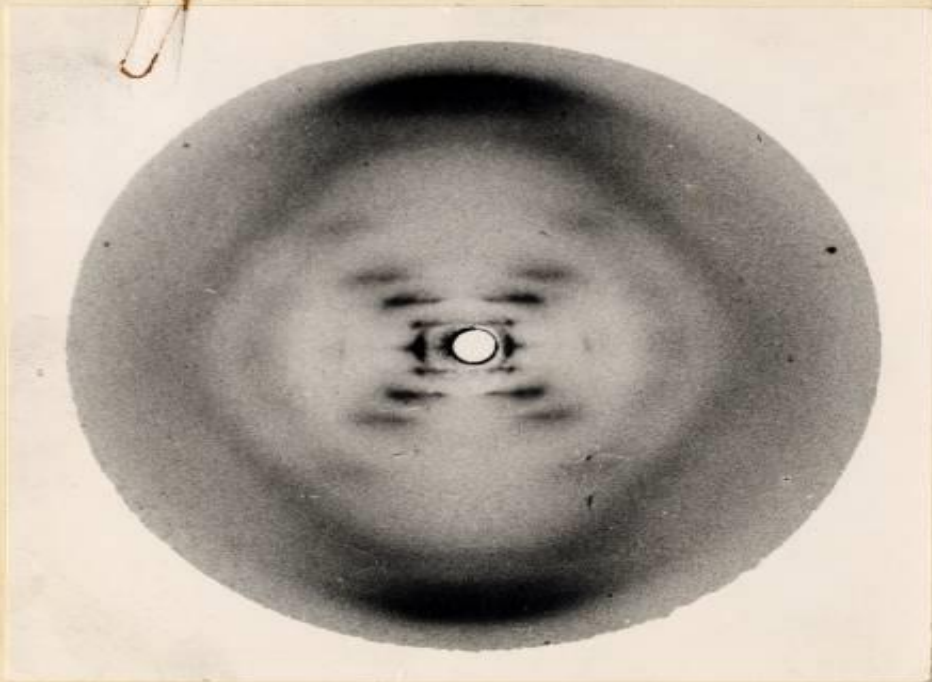


Francis Crick

Caltech University



Linus Pauling



Franklin &
Gosling
Solid State
Type I

Plate 1



MOLECULAR STRUCTURE OF NUCLEIC ACIDS

A Structure for Deoxyribose Nucleic Acid

WE wish to suggest a structure for the salt of deoxyribose nucleic acid (D.N.A.). This structure has novel features which are of considerable biological interest.

A structure for nucleic acid has already been proposed by Pauling and Corey¹. They kindly made their manuscript available to us in advance of publication. Their model consists of three intertwined chains, with the phosphates near the fibre axis, and the bases on the outside. In our opinion, this structure is unsatisfactory for two reasons:

(1) We believe that the material which gives the X-ray diagrams is the salt, not the free acid. Without the acidic hydrogen atoms it is not clear what forces would hold the structure together, especially as the negatively charged phosphates near the axis will repel each other. (2) Some of the van der Waals distances appear to be too small.

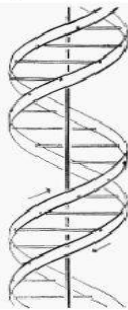
Another three-chain structure has also been suggested by Fraser (in the press). In his model the phosphates are on the outside and the bases on the inside, linked together by hydrogen bonds. This structure as described is rather ill-defined, and for this reason we shall not comment on it.

We wish to put forward a radically different structure for the salt of deoxyribose nucleic acid. This structure has two helical chains each coiled round the same axis (see diagram). We have made the usual chemical assumptions, namely, that each chain consists of phosphate diester groups joining β-D-deoxy-ribofuranose residues with 3',5' linkages. The two chains (but not their bases) are related by a dyad perpendicular to the fibre axis. Both chains follow righthanded helices, but owing to the dyad the sequences of the atoms in the two chains run in opposite directions.

Each chain loosely resembles Furbberg's² model No. 1; that is, the bases are on the inside of the helix and the phosphates on the outside. The configuration of the sugar and the atoms near it is close to Furbberg's 'standard configuration', the sugar being roughly perpendicular to the attached base. There is a residue on each chain every 3.4 Å. in the z-direction. We have assumed an angle of 36° between adjacent residues in the same chain, so that the structure 'repeats after 10 residues on each chain, that is, after 34 Å. The distance of a phosphorus atom from the fibre axis is 10 Å. As the phosphates are on the outside, cations have easy access to them.

The structure is an open one, and its water content is rather high. At lower water contents we would expect the bases to tilt so that the structure could become more compact.

The novel feature of the structure is the manner in which the two chains are held together by the purine and pyrimidine bases. The planes of the bases are perpendicular to the fibre axis. They are joined together in pairs, a single base from one chain being hydrogen-bonded to a single base from the other chain, so



This figure is purely diagrammatic. The two ribbons symbolize the two phosphate-sugar chains, and the horizontal rods the pairs of bases holding the chains together. The vertical line marks the fibre axis.

that the two lie side by side with identical z-co-ordinates. One of the pair must be a purine and the other a pyrimidine for bonding to occur. The hydrogen bonds are made as follows: purine position 1 to pyrimidine position 1; purine position 6 to pyrimidine position 6.

If it is assumed that the bases only occur in the structure in the most plausible tautomeric forms (that is, with the keto rather than the enol configurations) it is found that only specific pairs of bases can bond together. These pairs are: adenine (purine) with thymine (pyrimidine), and guanine (purine) with cytosine (pyrimidine).

In other words, if an adenine forms one member of a pair, on either chain, then on these assumptions the other member must be thymine; similarly for guanine and cytosine. The sequence of bases on a single chain, does not appear to be restricted in any way. However, if only specific pairs of bases can be formed, it follows that if the sequence of bases on one chain, is given, then the sequence on the other chain is automatically determined.

It has been found experimentally^{3,4} that the ratio of the amounts of adenine to thymine, and the ratio of guanine to cytosine, are always very close to unity for deoxyribose nucleic acid.

It is probably impossible to build this structure with a ribose sugar in place of the deoxyribose, as the extra oxygen atom would make too close a van der Waals contact.

The previously published X-ray data^{5,6} on deoxyribose nucleic acid are insufficient for a rigorous test of our structure. So far as we can tell, it is roughly compatible with the experimental data, but it must be regarded as unproved until it has been checked against more exact results. Some of these are given in time following communications. We were not aware of the details of the results presented there when we devised our structure, which rests mainly though not entirely on published experimental data and stereo-chemical arguments.

It has not escaped our notice that the specific pairing we have postulated immediately suggests a possible copying mechanism for the genetic material.

Full details of the structure, including the conditions assumed in building it, together with a set of co-ordinates for the atoms, will be published elsewhere.

We are much indebted to Dr. Jerry Donohue for constant advice and criticism, especially on interatomic distances. We have also been stimulated by a knowledge of the general nature of the unpublished experimental results and ideas of Dr. M. H. F. Wilkins, Dr. R. E. Franklin and their co-workers at King's College, London. One of us (J.D.W.) has been aided by a fellowship from the National Foundation for Infantile Paralysis.

J.D. WATSON
F.H. C. CRICK

Medical Research Council Unit for the Study of the Molecular Structure of Biological Systems, Cavendish Laboratory, Cambridge, April 2.

¹ Pauling, L., and Corey, R. B. *Nature*, 171, 346 (1953); *Proc. U.S. Nat. Acad. Sci.*, 39, 84 (1953).

² Furbberg, S., *Acta Chem. Scand.*, 6, 634 (1952).

³ Chargaff, E., for references see Zamenhof, S., Dreyerman, G., and Chargaff, E., *Biochim. et Biophys. Acta*, 9, 402 (1952).

⁴ Wyatt, G.R., *J. Gen. Physiol.*, 36, 201 (1952).

⁵ Astbury, W.T., *Symp. Soc. Exp. Biol.*, 1, *Nucleic Acid*, 66 (Camb. Univ. Press, 1947).

⁶ Wilkins, M. H. F. and Randall, J. T., *Biochim. et Biophys. Acta*, 10, 102 (1953).

SCIENTIFIC RIVALRIES
AND SCANDALS

THE

RACE

TO DISCOVER
THE

AIDS VIRUS

LUC MONTAGNIER
VS ROBERT GALLO

STUART A. KALLEN





Mr. [Name]
[Address]
[City, State, Zip]

Dr. [Name]
[Address]
[City, State, Zip]



The Nobel Prize in Physiology or Medicine 2008

"for his discovery of
human papilloma
viruses causing
cervical cancer"



Harald zur Hausen

Germany Cancer Research
Center, Heidelberg, b 1936

"for their discovery of human immunodeficiency
virus"



Françoise Barre-Sinoussi

Regulation Retroviral Infections
Unit, Virology Department,
Institut Pasteur, b 1947



Luc Montagnier

World Foundation for
AIDS Research and
Prevention, b 1932



4. Clusters

6 \$25 Billion Companies That Started in a Garage

Every new company has to begin somewhere. These 6 world-famous ones--worth more than \$25 billion each--started in garages.

in f t



By **Drew Hendricks** *Contributor, Inc.com* [@DrewAHendricks](#)





Creative clusters: Essentials for success

Outstanding university research and commercial linkages

Availability of venture capital

Anchor firms and mediating organizations

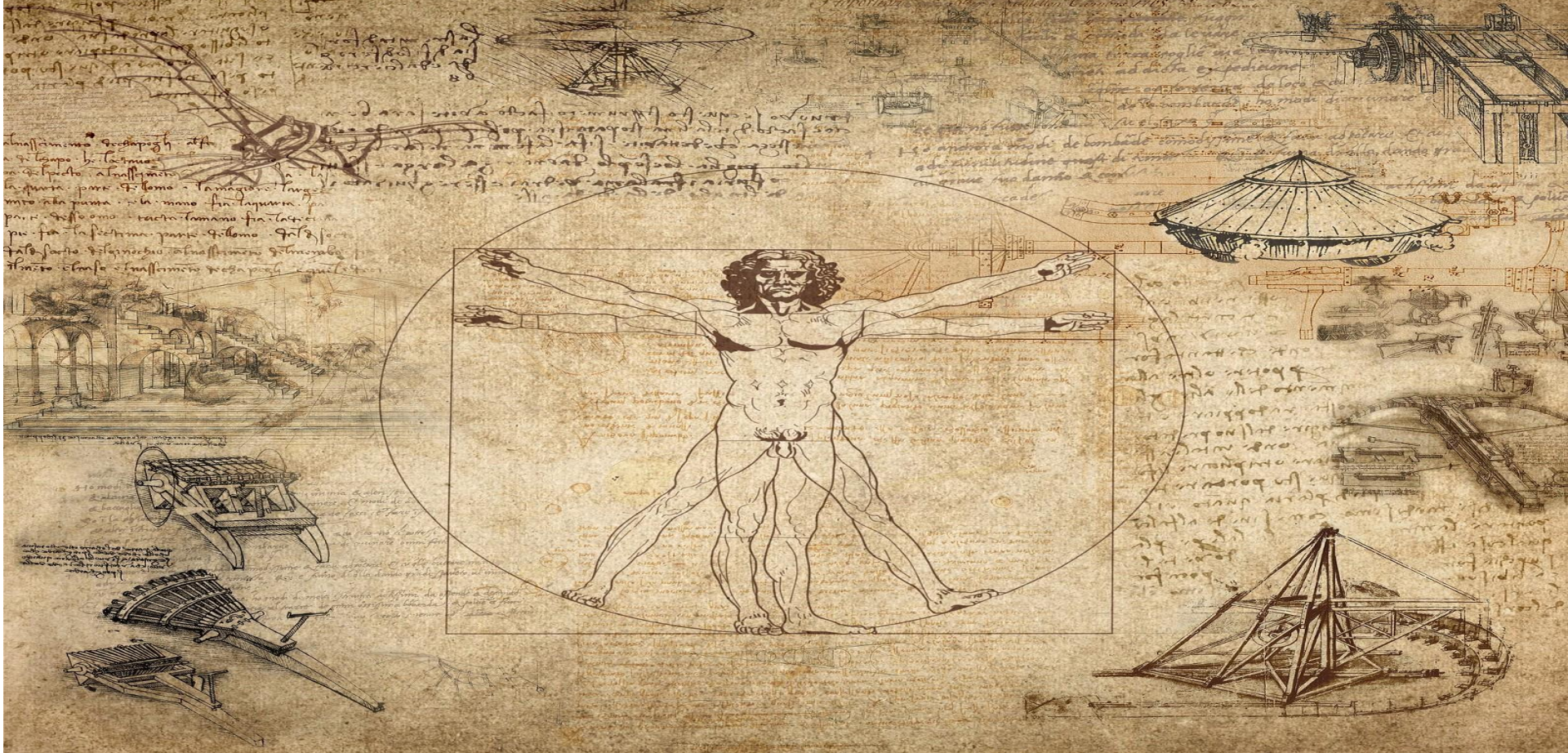
Appropriate base of knowledge and skill

Targeted public policies

Quality of services and infrastructure

Diversity and quality of place

Sense of Psychological Safety



5. Curiosity



“Leonardo da Vinci had such a playful curiosity. If you read his notebooks, you’ll see he’s curious about what the tongue of a woodpecker looks like, but also why the sky is blue, or how an emotion forms on somebody’s lips. He understood the beauty of everything. I’ve admired Leonardo my whole life, both as a kid who loved engineering - he was one of the coolest engineers in history - and then as a college student, when I travelled to see his notebooks and paintings.”

~WALTER ISAACSON



History of Starbucks



1971 Starbucks opens first store in Seattle's Pike Place Market.

1982 Howard Schultz joins Starbucks as Director of Retail Operations and Marketing

1983 Howard travels to Italy, inspired by popularity of espresso bars in Milan.

1987 Il Giornale acquires Starbucks assets and changes name to Starbucks Corporation. Opens in Chicago and Vancouver, Canada. Total stores: 17

1992 Completes IPO, traded on the Nasdaq using "SBUX". Total stores: 165

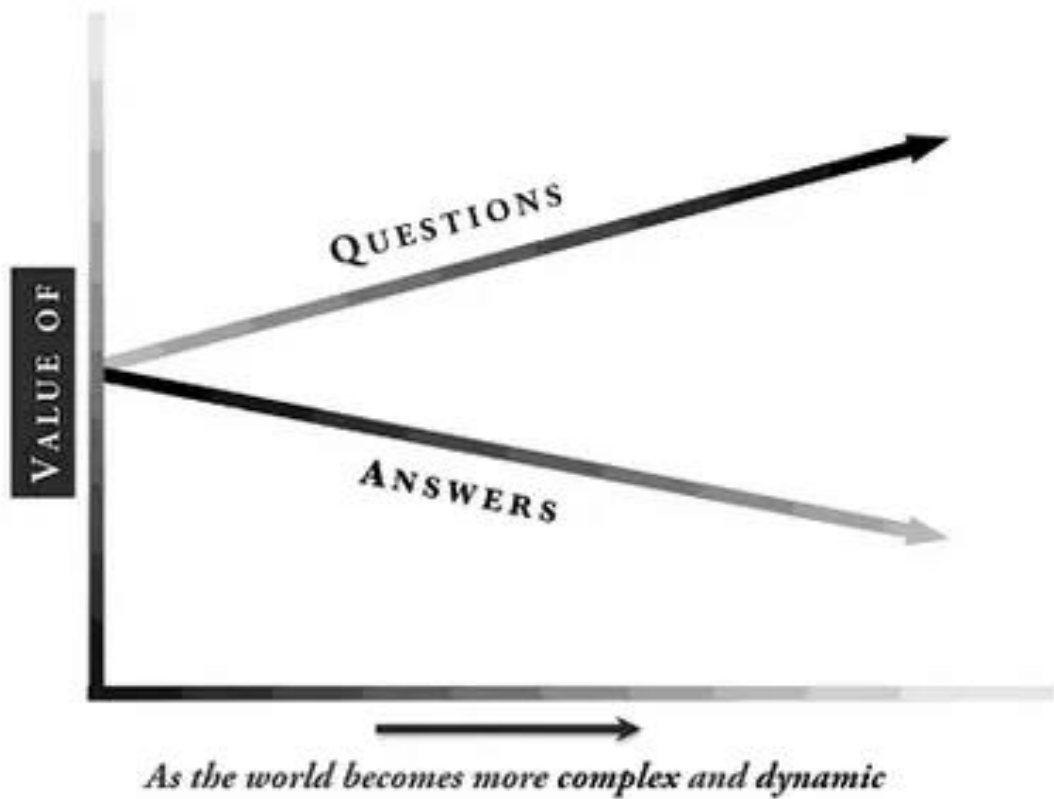
1996 Opens first stores outside of North America in Japan and Singapore. Total stores: 1,015

1998 Acquires Tazo, a tea company based in Oregon. Launches Starbucks.com. Total stores: 1,886

2000 Schultz transitions from chairman and CEO to chairman and chief global strategist.

2008 Schultz returns as CEO. Focus on customer experience and innovation. Total stores: 16,680.

2012 Starbucks has >17,600 stores and is valued at \$35.6 billion.



WHAT IS CURIOSITY?

The drive to learn and explore something to attain further knowledge and skill of the subject.

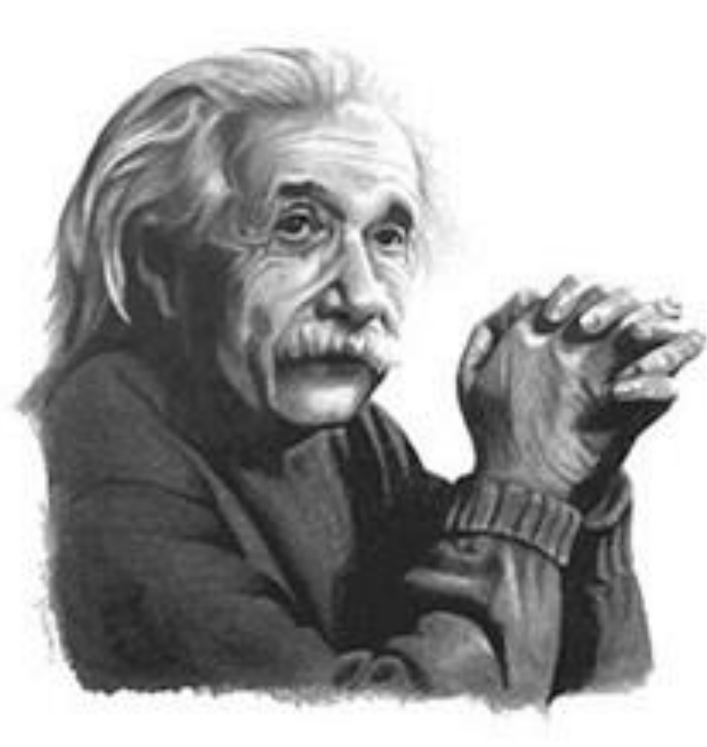
Self-regulates inherent goal effort, grit, personal growth, and creativity (Kashdan & Fincham, 2002).

A CLOSER LOOK AT CURIOSITY

We tend to observe exciting things and actions, which produces optimal stimulation.

These high levels of stimulation are followed by the developing predominance of behaviors (Leuba 1958).

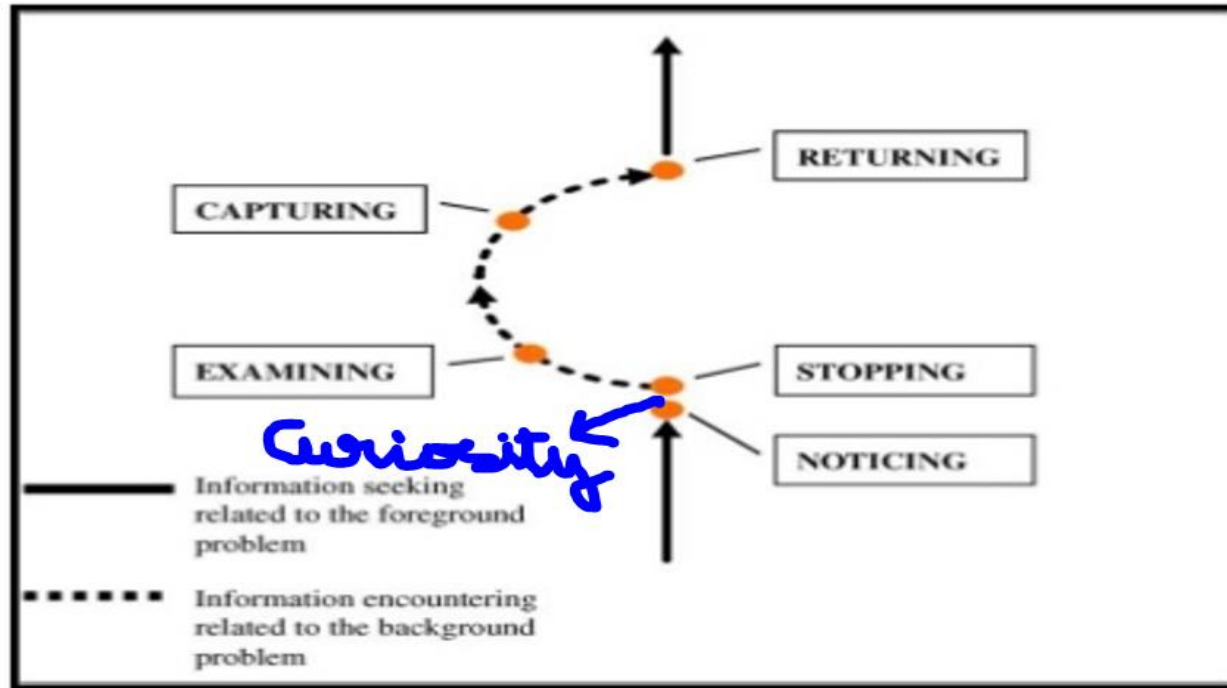
These behaviors are reinforced, turning into habits.



"I have no special talent. I am only passionately curious."

Albert Einstein

Information Encountering



Erdelez, S. (2004). Investigation of information encountering in the controlled research environment. *Information Processing & Management*, 40(6), 1013-1025. doi:10.1016/j.ipm.2004.02.002

BARRIERS OF CURIOSITY



Emotions



Overconfidence



Hurriedness and
Haste

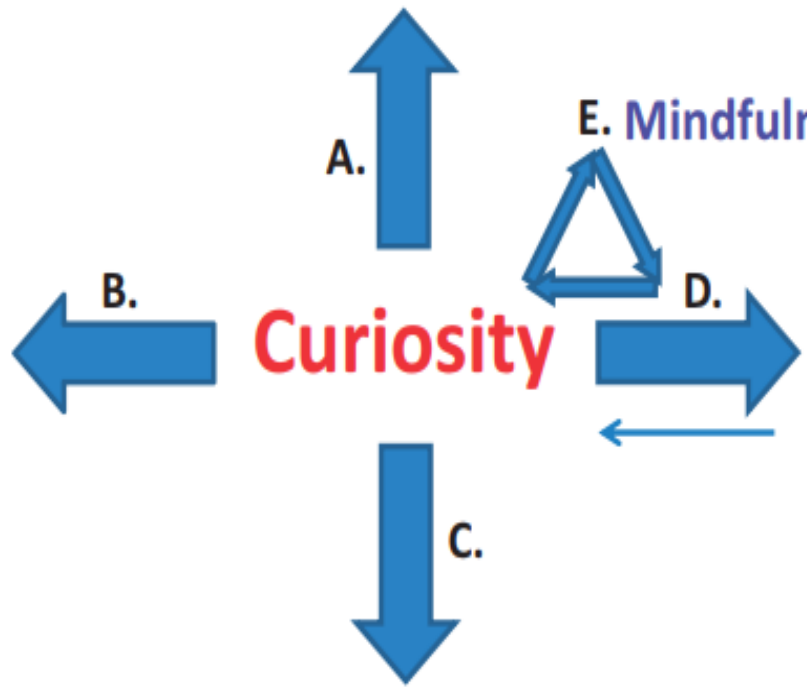
← Cognitive → ← Emotive →

Data Collection

Learning Opportunity

Personal Patient's Aspects

Curiosity



Trigger of Research

'Culture of medicine' factors

- The 'Hidden curriculum' – no marks for Curiosity-driven excellence in patient-centred care
- Technology-focused and test-focused encounter, not really patient-centred
- Patient-centred care perceived as time-consuming, unrewarding and non-prestigious
- Patients perceived as wanting prescriptions, tests and referrals – not a 'Curiosity'-driven encounter
- Defensive practice

Copyrighted Material

NATIONAL BESTSELLER

Jim Lovell and Jeffrey Kluger

APOLLO 13



"Gripping . . . a classic adventure story . . . recreates the remarkable group effort that brought the crippled spacecraft back to earth." — PHILADELPHIA INQUIRER

Copyrighted Material

MARINER BOOKS

6. Crisis

Moon men fight for their lives 200,000 miles from earth

EXPLOSION IN APOLLO 13!



Racing News

Tamil could take Craven



FIGHT TO SAVE THE MOON MEN

Near-disaster in unlucky Apollo 13 200,000 miles out

3 SPACEMEN IN FIGHT FOR LIFE

A DANGEROUS game was being played as the Apollo 13 spacecraft tried to avoid the effects of a disaster...



Apollo-for two women a long, agonising wait



WE NEED TO
MAKE THIS...

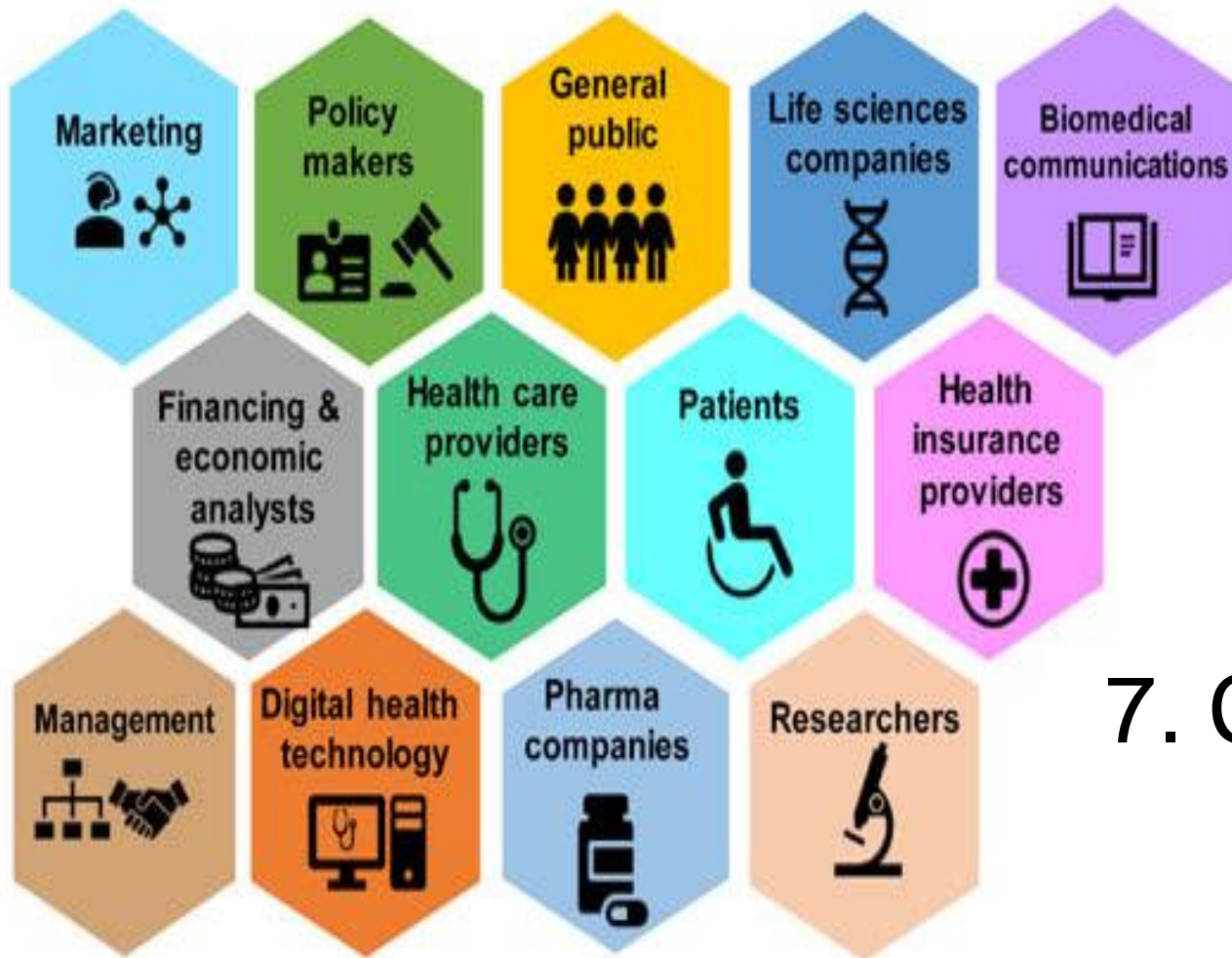


...FIT INTO A
HOLE MADE
FOR THIS...



...USING ONLY THIS!





7. Convergence

Medici Effect:

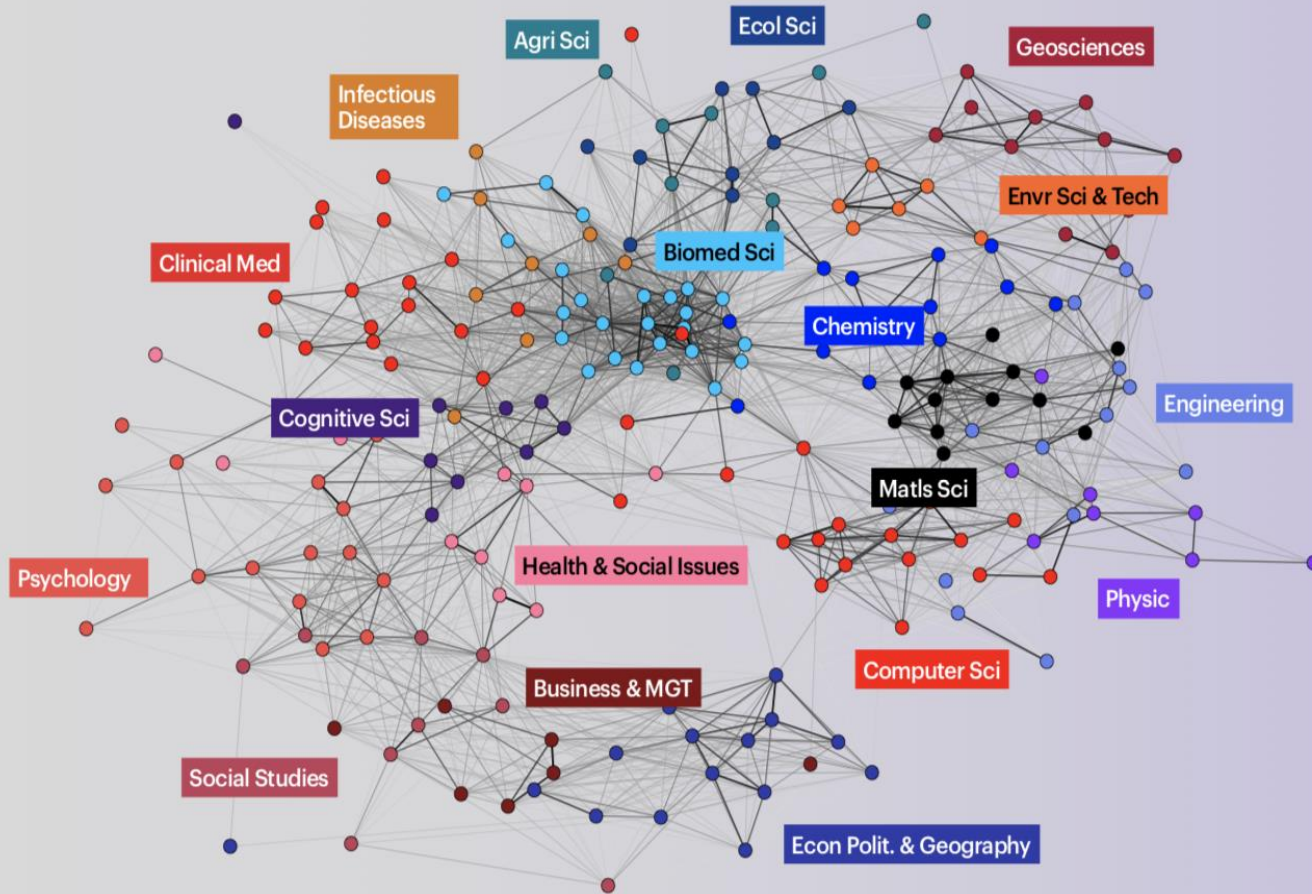
Where fields meet

Field = culture, domain, discipline

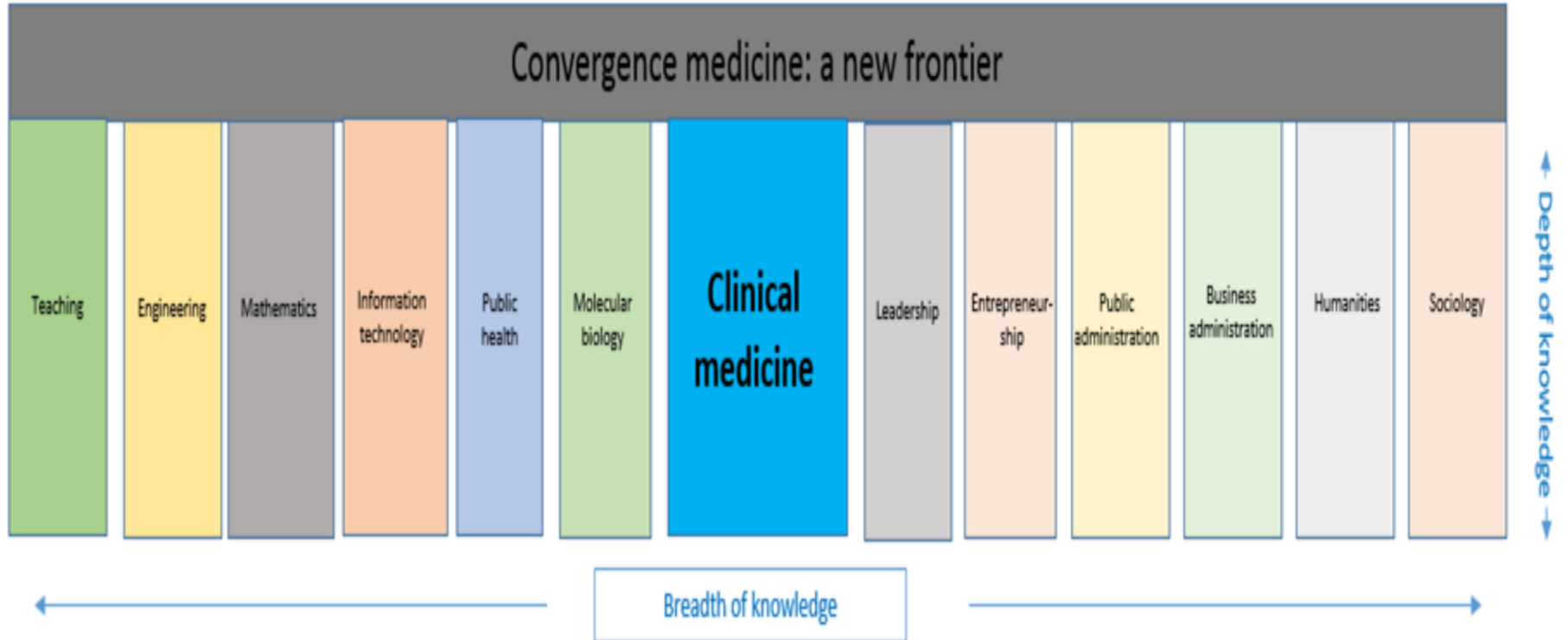
Fields consist of concepts (knowledge, practices)



Mapping Convergence:



Convergence medicine arrives







The Impact of Convergent Bioscience

The faculty and research teams of the USC Michelson Center for Convergent Bioscience are working on new frontiers in medicine and health. Interdisciplinary collaboration is leading to the development of new life-saving devices and therapeutics.

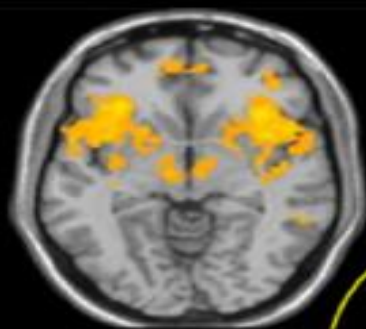
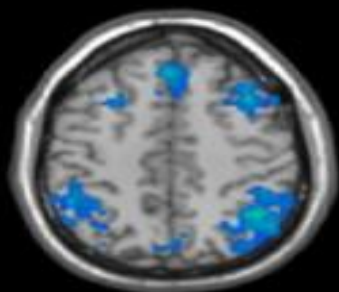


The background of the image is a vibrant blue, overlaid with a dense, chaotic pattern of thin, hand-drawn lines in bright yellow and red. These lines crisscross and loop across the entire frame, creating a sense of dynamic energy and complexity. The text is rendered in a clean, white, sans-serif font, standing out prominently against the busy, colorful background.

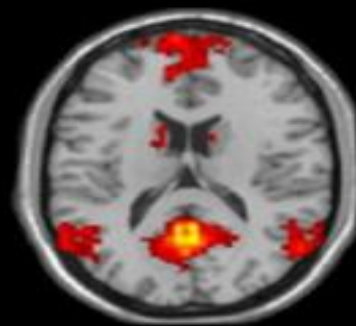
WIRED to CREATE

NEUROSCIENCE OF CREATIVITY

The Large Scale Brain Networks That Make Up Creativity



Sensory and limbic inputs



Default Mode Network

This is the network responsible for your thoughts about you

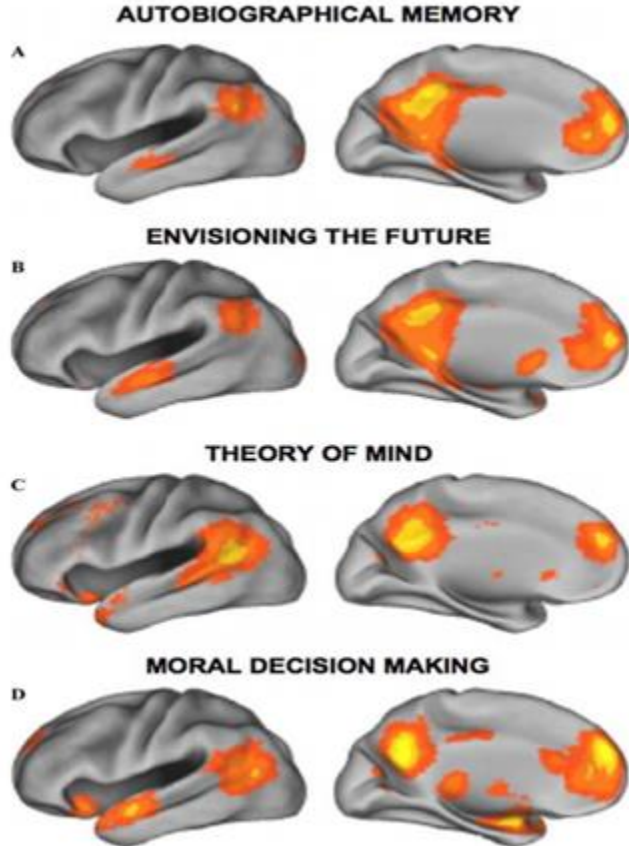
Salience Network

Think of this like the operator, directing all input we receive to different areas of the brain for processing

Central-Executive Network

Responsible for demanding, focused mental activity (like a math problem)

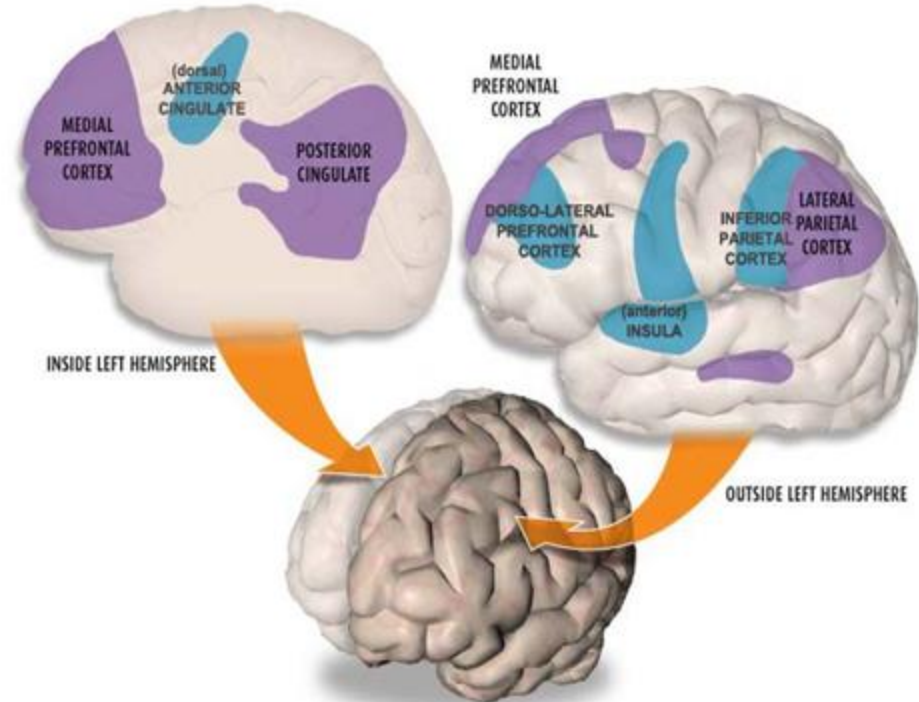
Default Mode network-the seat of creativity:



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



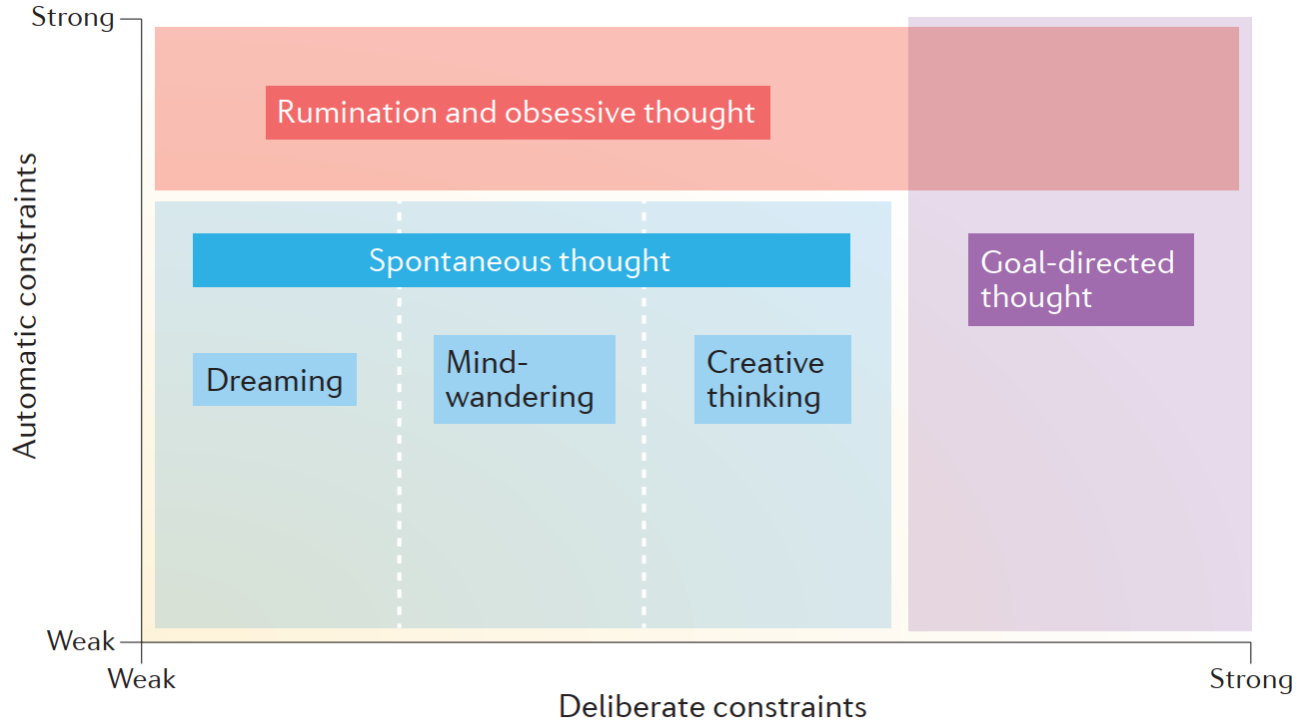
Creativity and daydreaming:

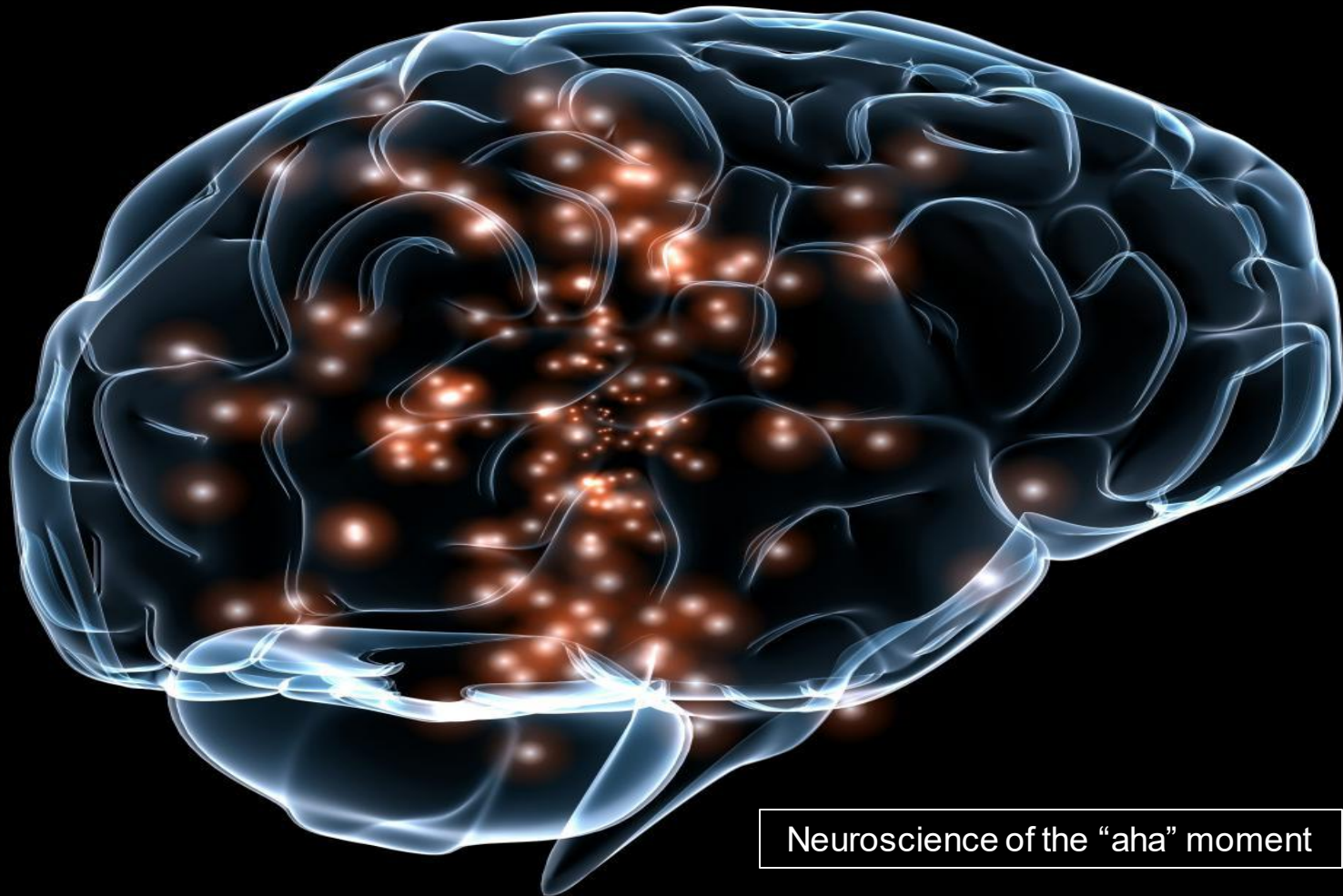
We need a place free from stimulations and distractions

Walking leads to less stress, boosted engagement and better mood

Day dreaming is envisioning the future-autobiographical planning

72% of survey respondents got new ideas in the shower





Neuroscience of the “aha” moment

“The sudden hunch, the creative leap of the mind that “sees” in a flash how to solve a problem in a simple way...”

– *Martin Gardner, mathematician*

“...that moment of insight becomes the creative act as a joining of two previously incompatible ideas”

– *Watson, biologist*

Conscious

Immersion

fish
mine
rush

hint

Insight

goldfish
goldmine
goldrush



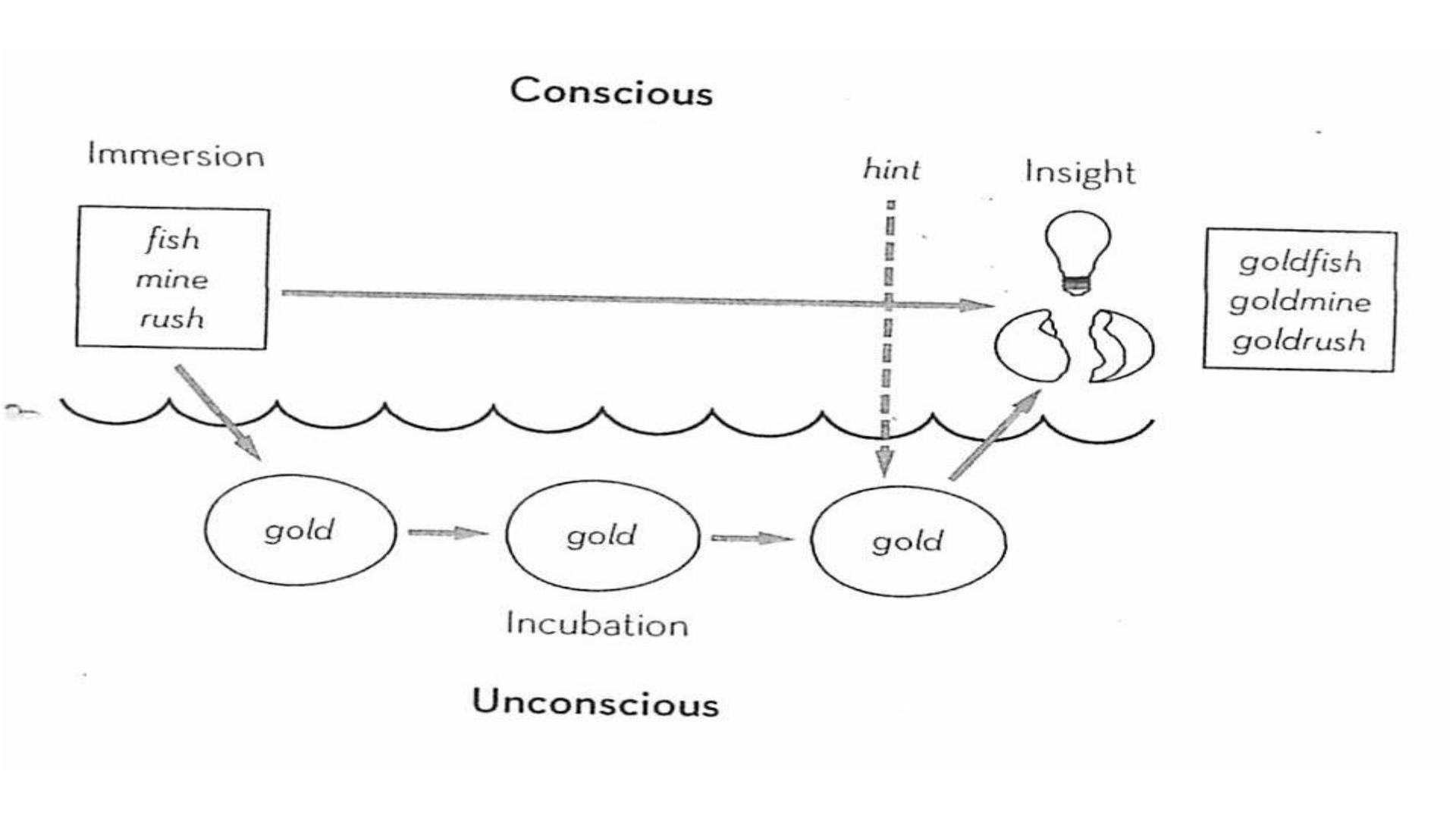
gold

gold

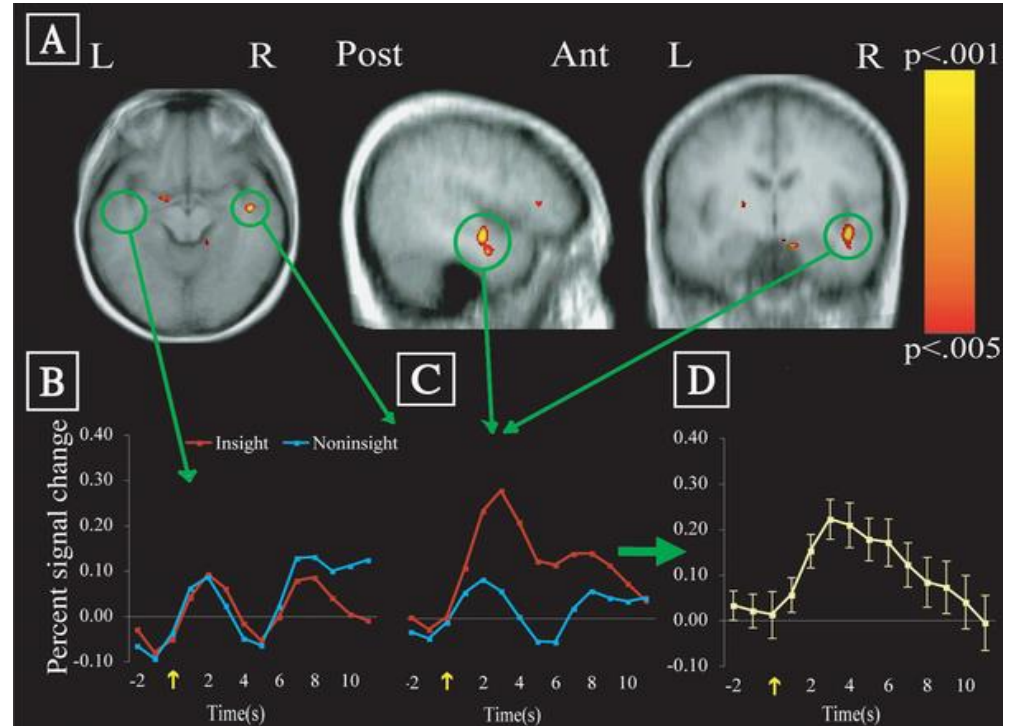
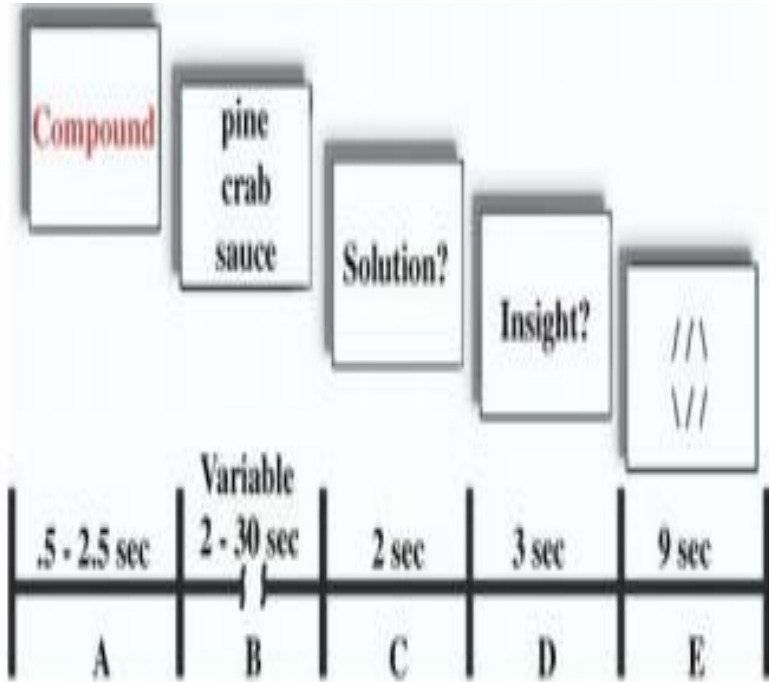
gold

Incubation

Unconscious



Neural basis of Insight:



Insight culminates with a sharp increase in neural activity in the right anterior temporal lobe at the moment of insight. (Kounios and Beeman)

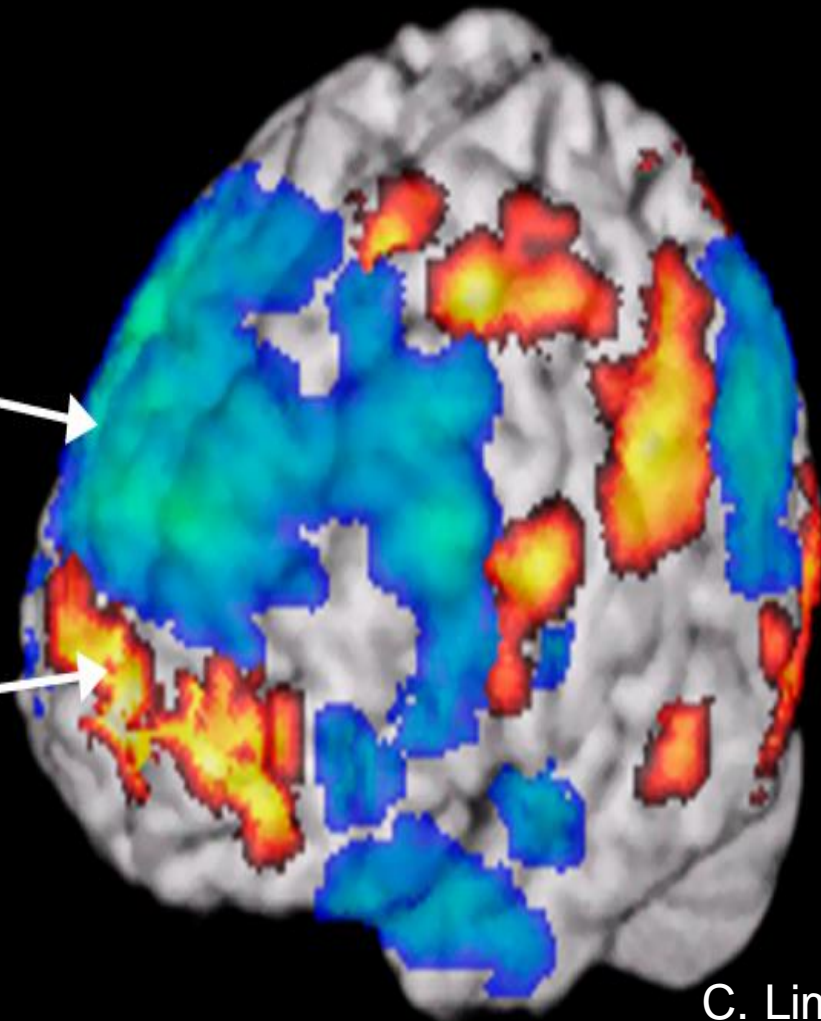
Brain on Jazz

Lateral prefrontal deactivation

Self-monitoring

Medial prefrontal activation

Self-expression



Interdisciplinary advice for Creativity-Keith Sawyer

- Choose a domain
- Move to the Center
- Get to know the gate keepers
- Be intrinsically motivated
- Collaborate
- Don't worry about who gets the credit
- Take Risks

The creatives...

Made connections by...

Varying their routines

Being observant

Making mental space

Relaxing their boundaries

Projected the value
of connections by...

Drawing on previous experiences

Looking for patterns

Exploited the value
of connections by...

Seizing opportunities

Re-igniting Creativity

Engage in activities which put you in the “Flow” state

Dare to resist conformity

Take control of your schedule

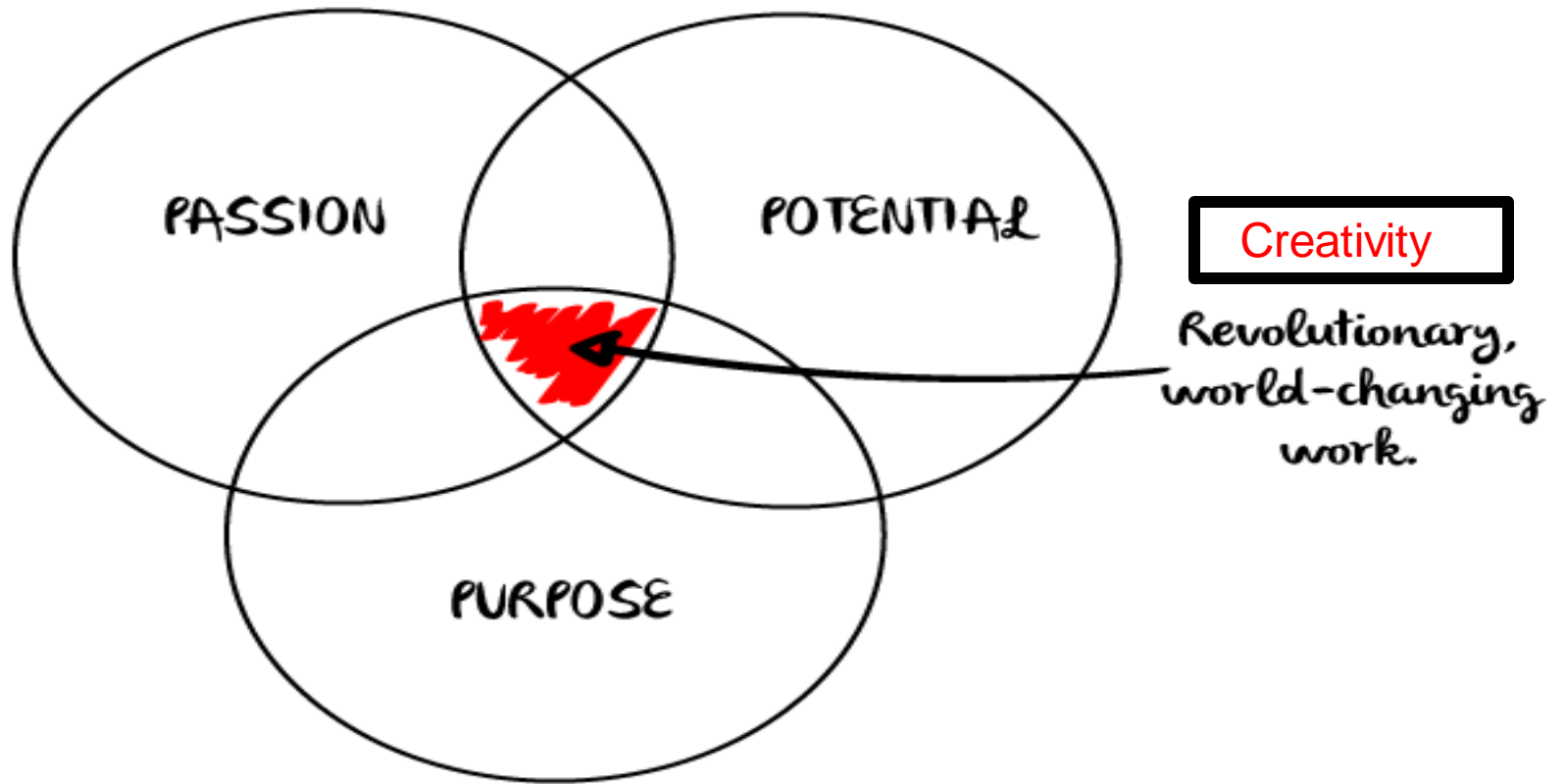
Connect the dots AND be prepared for serendipity in your life

Make time for day dreaming

Shape your space AND find your creative partner

Find out what you like and what you hate about your life

Start doing more of what you love and less of what you hate





MHTTC

Mental Health Technology Transfer Center Network
Funded by Substance Abuse and Mental Health Services Administration

The purpose of the MHTTC Network is technology transfer - disseminating and implementing evidence-based practices for mental disorders into the field.

Funded by the Substance Abuse and Mental Health Services Administration (SAMHSA), the MHTTC Network includes 10 Regional Centers, a National American Indian and Alaska Native Center, a National Hispanic and Latino Center, and a Network Coordinating Office.

Our collaborative network supports resource development and dissemination, training and technical assistance, and workforce development for the mental health field. We work with systems, organizations, and treatment practitioners involved in the delivery of mental health services to strengthen their capacity to deliver effective evidence-based practices to individuals.

Our services cover the full continuum spanning mental illness prevention, treatment, and recovery support.

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