Cognitive Defense In Three Steps:

TMI-Noise, Critical Ignoring, and Bullshit

A Primer for Strengthening Mental Immunity

October 11, 2025 • CornCon 11

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DISCLAIMER

- These are my ideas. (Winn)
- Don’t blame anyone else.
- These are not the official positions or tenets of the CSI.

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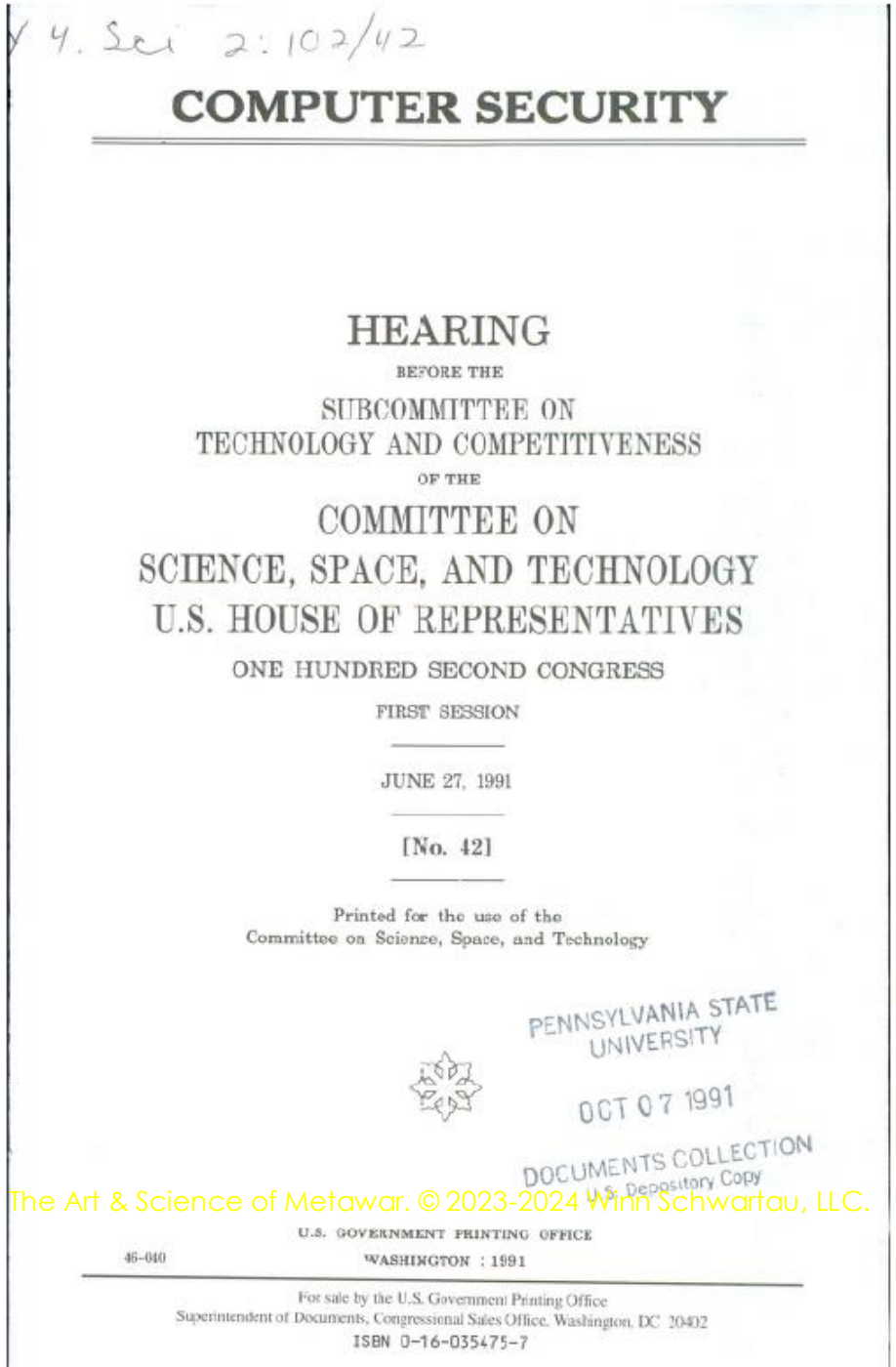

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COMPUTER SECURITY

HEARING

BEFORE THE

SUBCOMMITTEE ON
TECHNOLOGY AND COMPETITIVENESS

OF THE

COMMITTEE ON
SCIENCE, SPACE, AND TECHNOLOGY
U.S. HOUSE OF REPRESENTATIVES

ONE HUNDRED SECOND CONGRESS

FIRST SESSION

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Why would bad guys ever want to use the internet?

"Electronic Pearl Harbor"
Congressional Testimony, June 27, 1991

Winn Schwartau, the "*Civilian Architect of Information Warfare*"
(Commodore Pat Tyrrell OBE Royal Navy, 1996) and

Author, *Information Warfare:*
Chaos on the Information Superhighway

Why would the bad guys ever want to attack your mind?

Change your beliefs?

Control your behavior?

Does it Matter to You?

NEANDERTHALS

DENISOVANS

FLORESIENSIS

LUZONENSIS

SAPIENS

JULUENSIS

THE 6 Fs OF PRIMAL SURVIVAL

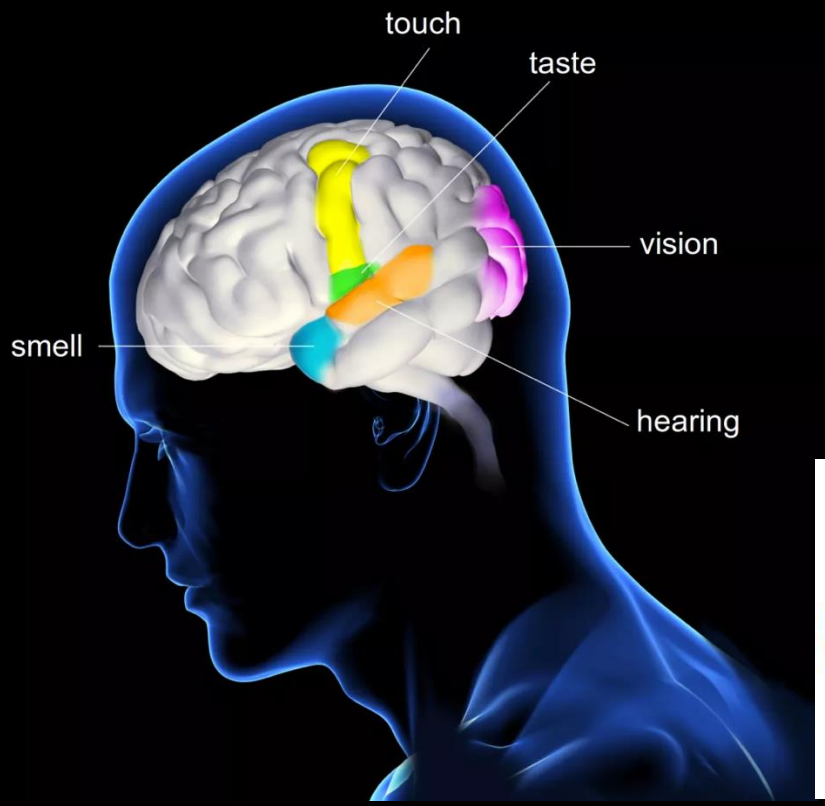
Trauma - Fear Challenge

Flee/Flight

Freeze

Fight

Fawn



Evolutionary Primal Need

Feed

Mate

Human – Technology Relationship

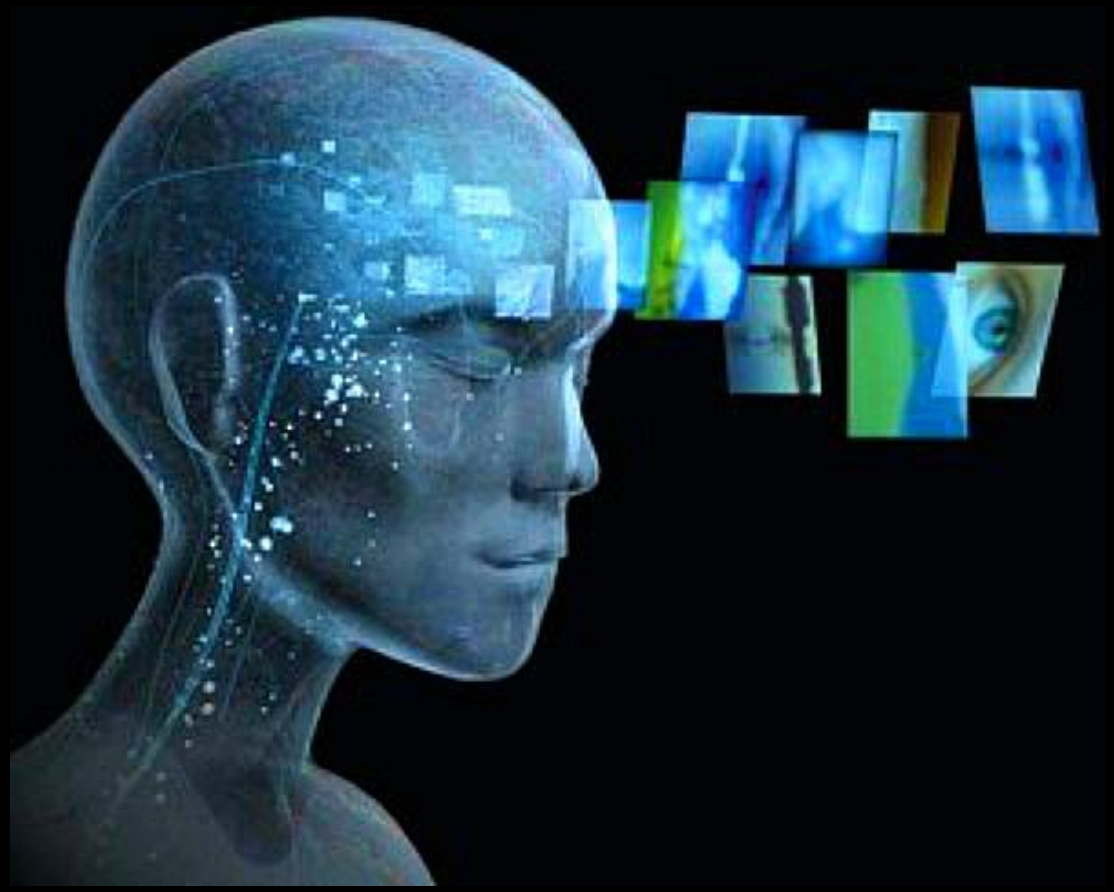
Love

Hate

Fear

Confusion

HUMANS WERE BUILT FOR SURVIVAL: BUT NOT AGAINST INFORMATION OR TECH



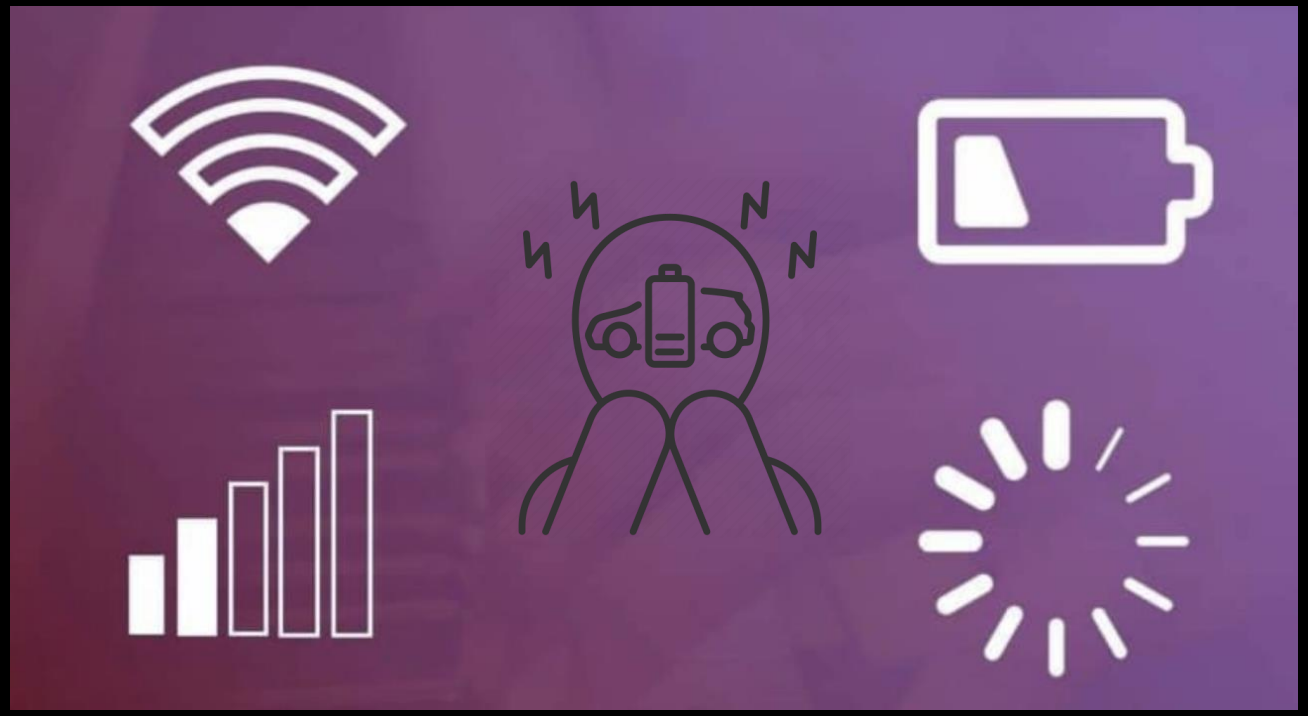
The key to survival and autonomy for **any** system is the ability to adapt to change quickly.

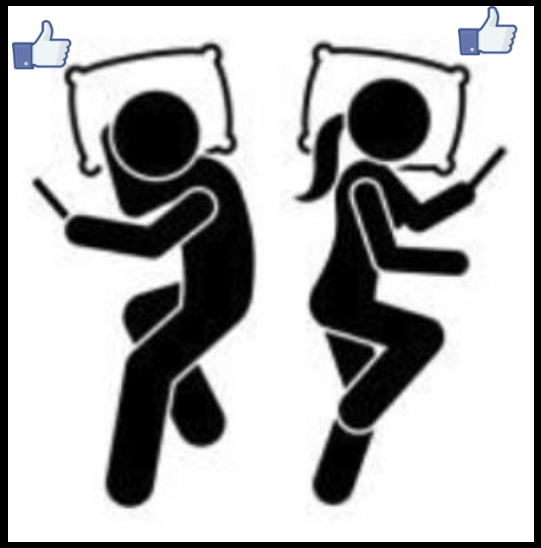
To coexist with tech, we must adapt by strengthening our cognitive immune systems.

Human view of Tech

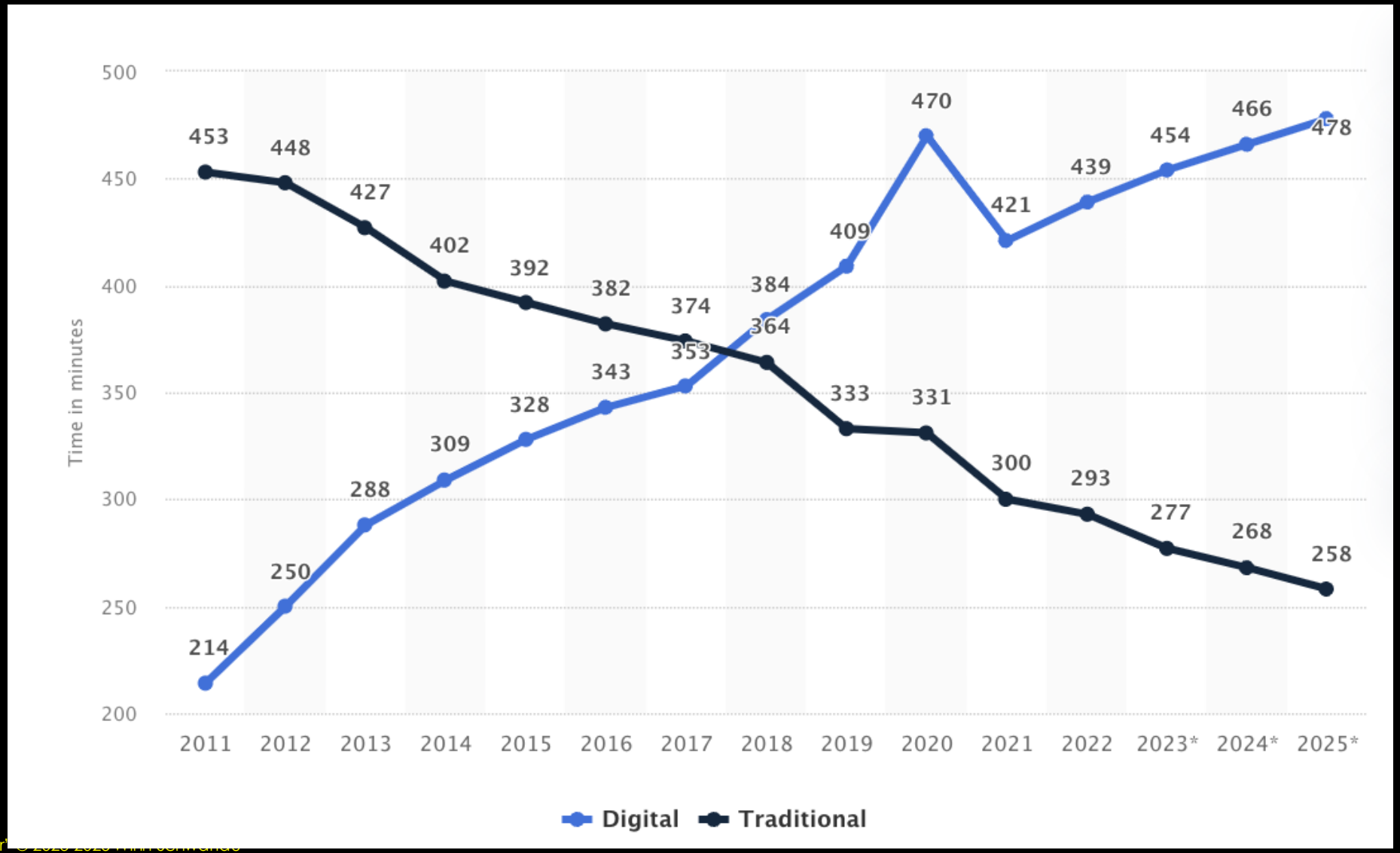
- We expect tech to always be on or connected.
- We expect tech always to work.
- We assume the tech is correct.
- We expect responses in less than 250ms. (A delay-free reality)
- We blame the tech first instead of user error (Apply Occam, please).
- We know tech can be a horrendous time-waster.
- Let’s build more of it to subsume our lives.

TECH STRESSORS: TMI, BATTERY, FOMO & ADDICTION





DIGITAL VS. ANALOG INFORMATION CONSUMPTION



WTF is Cognitive Defense?

Taking control of the narrative, cognitive detection, and responses, whether carbon or silicon-generated. Agency.

He who controls the technology controls the narrative.

He who controls the narrative controls your beliefs.

How Narratives Create Beliefs

Storytelling, the Narrative, is fundamental to human communications. He who controls the technology controls the narrative.

An **immersive experience** brings the audience inside the story. It relies upon

Reality distortion to make the narrative more believable by the exploitation of

TMI (mis/disinfo-/BS) to form mental images, which is how stories are told.

Using **Manipulation** the participants' worldview and belief systems are altered.

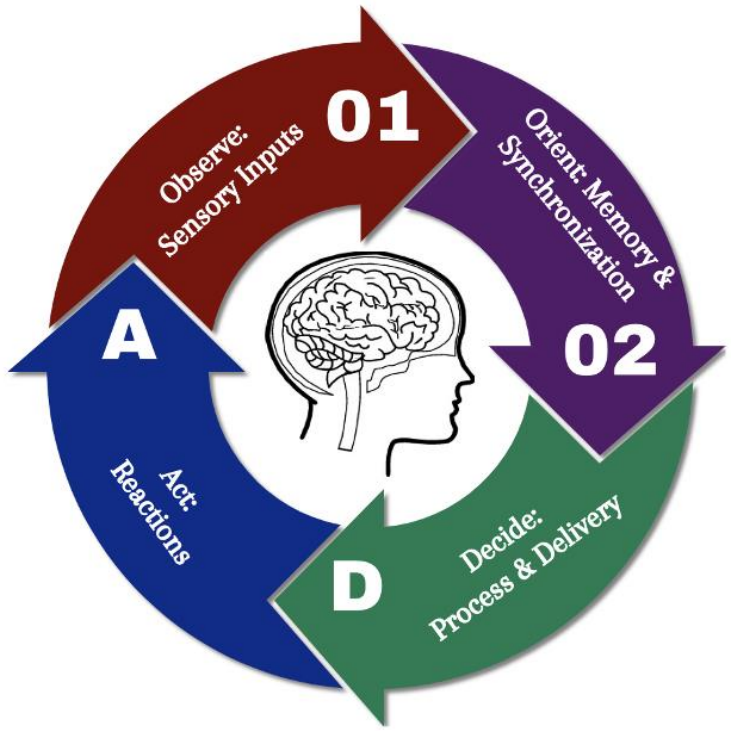
Reward systems target the human mind with digital opioids causing

Addiction to the narrative. The storyteller then induce behaviors and

Compliance through repetition and fear. That is how to create undying, absolute

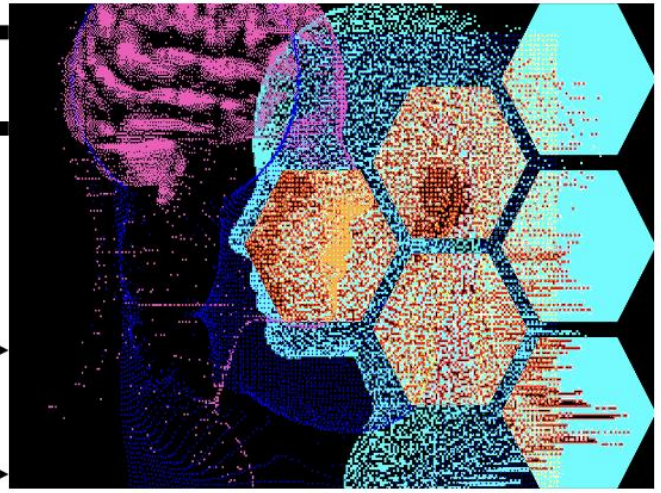
Belief

COGNITIVE/BELIEF MANIPULATION



Content Orchestration

Haptic Feedback



Tracking Behavior

Sensor Response

- Gaming
- Advertising
- EDU, Training, Corp.
- Medical, Industrial, etc.
- Propaganda, Indoctrination, Disinformation, etc.

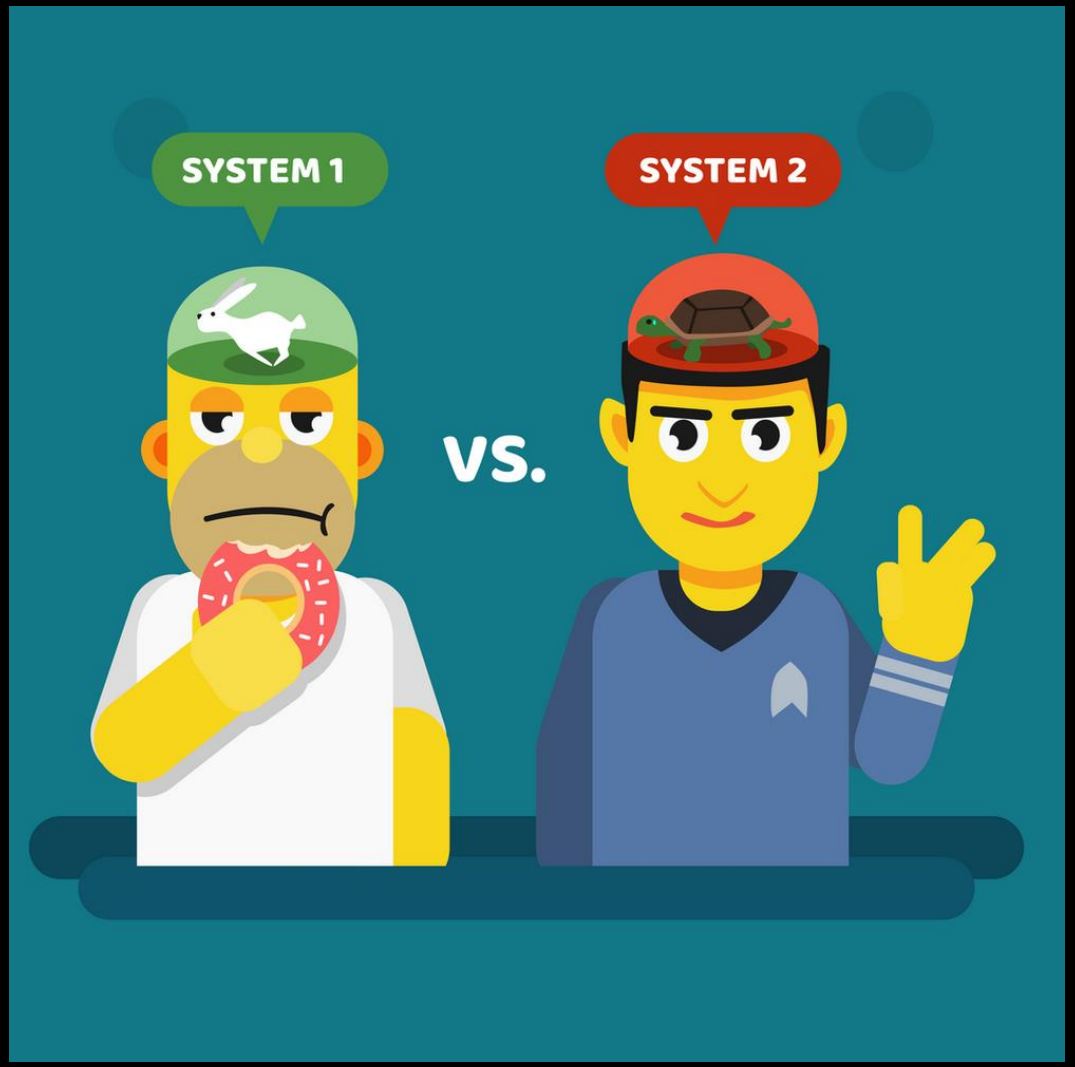
We are Digitally Terraforming the Future

Global Cognitive Infrastructure.

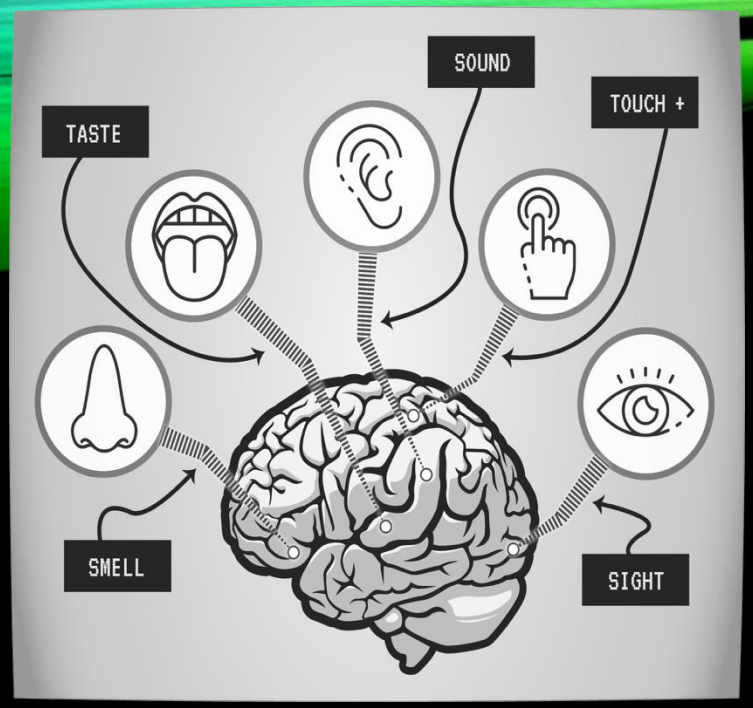
We have ONE chance to get it right.

We will not get another.

THE TWO SYSTEMS IN OUR BRAINS

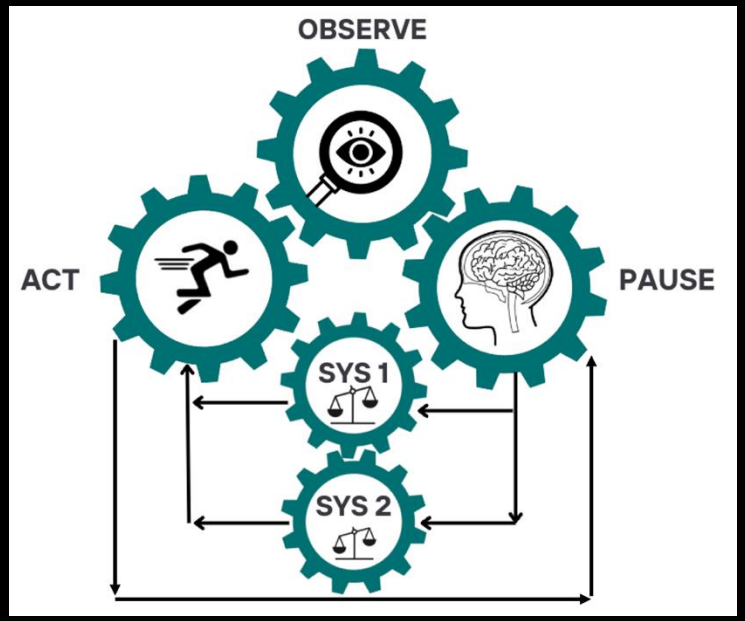


	System 1	System 2
Characteristics	Fast Effortless Unconscious Triggers emotions Associative Looks for patterns Looks for causation Creates stories to explain events	Slow Effortful Conscious Logical Deliberative Can handle abstract concepts
Advantages	Speed of response in a crisis Creativity through associations, so good for expansive thinking Easy completion of routine or repetitive tasks	Allows reflection and consideration of the "bigger picture", options, pros and cons, consequences Can handle logic, maths, statistics Good for reductive thinking
Disadvantages	Jumps to conclusions Unhelpful emotional responses Can make errors that are not detected and corrected, such as wrong assumptions, poor judgements, false causal links	Slow, so requires time Requires effort and energy, which can lead to decision fatigue



Human Sensory System

- Max Bandwidth: 11.1 mb/sec
- With eyes closed: 1.7 mb/sec



Human Detection/Reaction System

- System 1: 30 – 300 ms
- System 2: 300 ms +
- Feedback strengthens

Bandwidth is a Time Function

COGNITIVE DEFENSE TRIAD

TMI

CRITICAL IGNORING

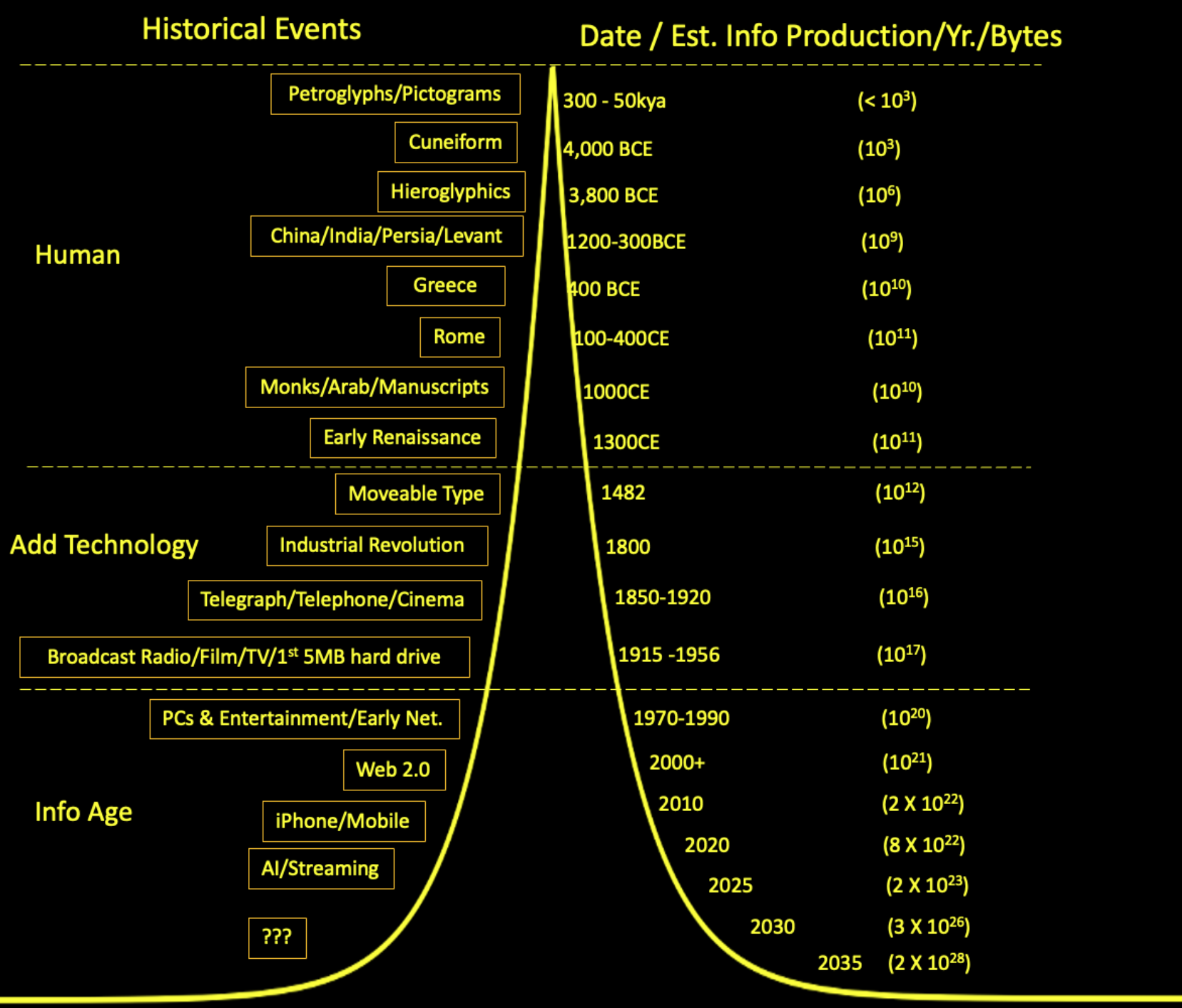
BS

TMI?

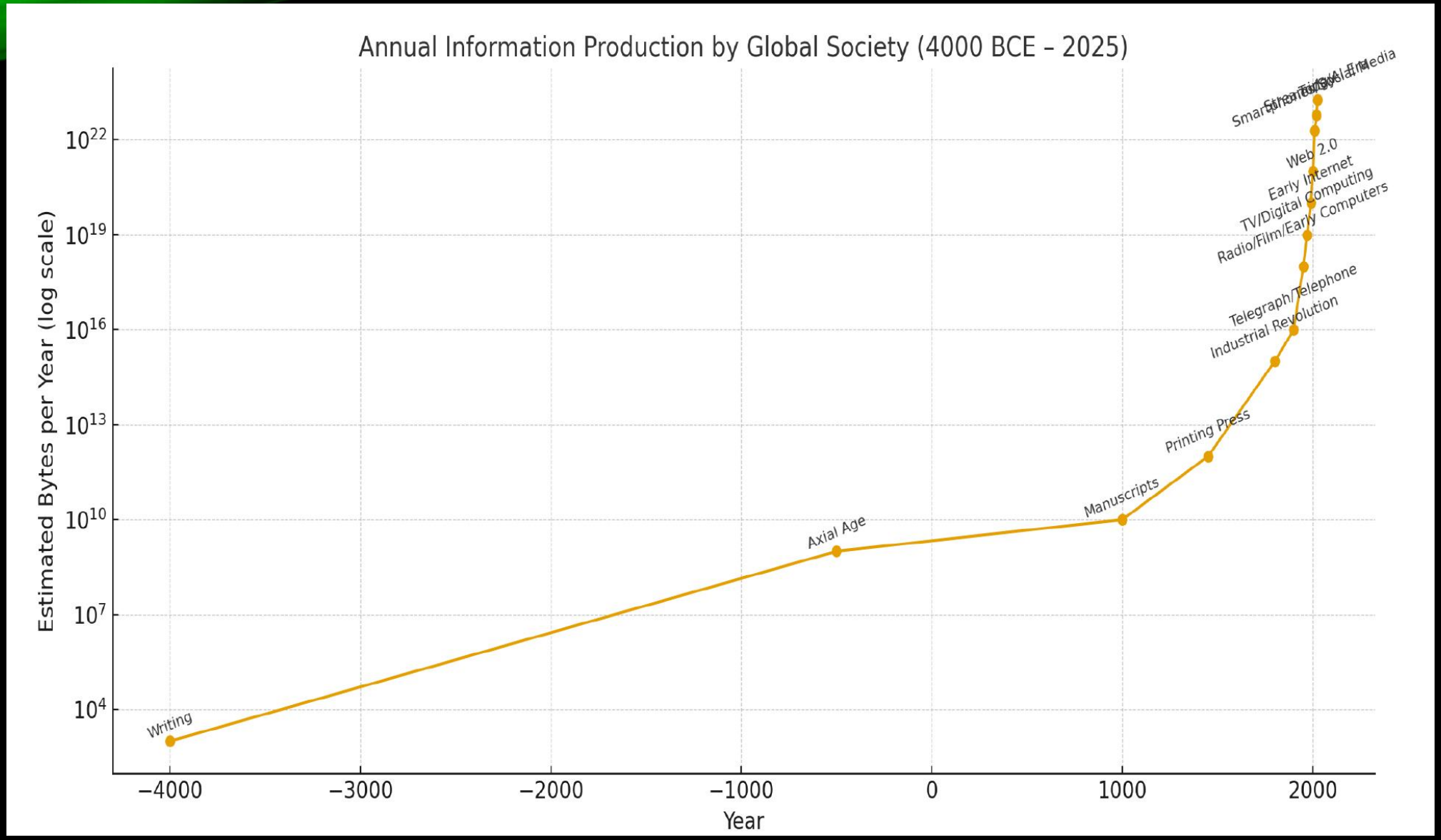
Do y'all remember, before the internet, that people thought the cause of stupidity was the lack of access to information?
Yeah. It wasn't that.

TMI in Human History

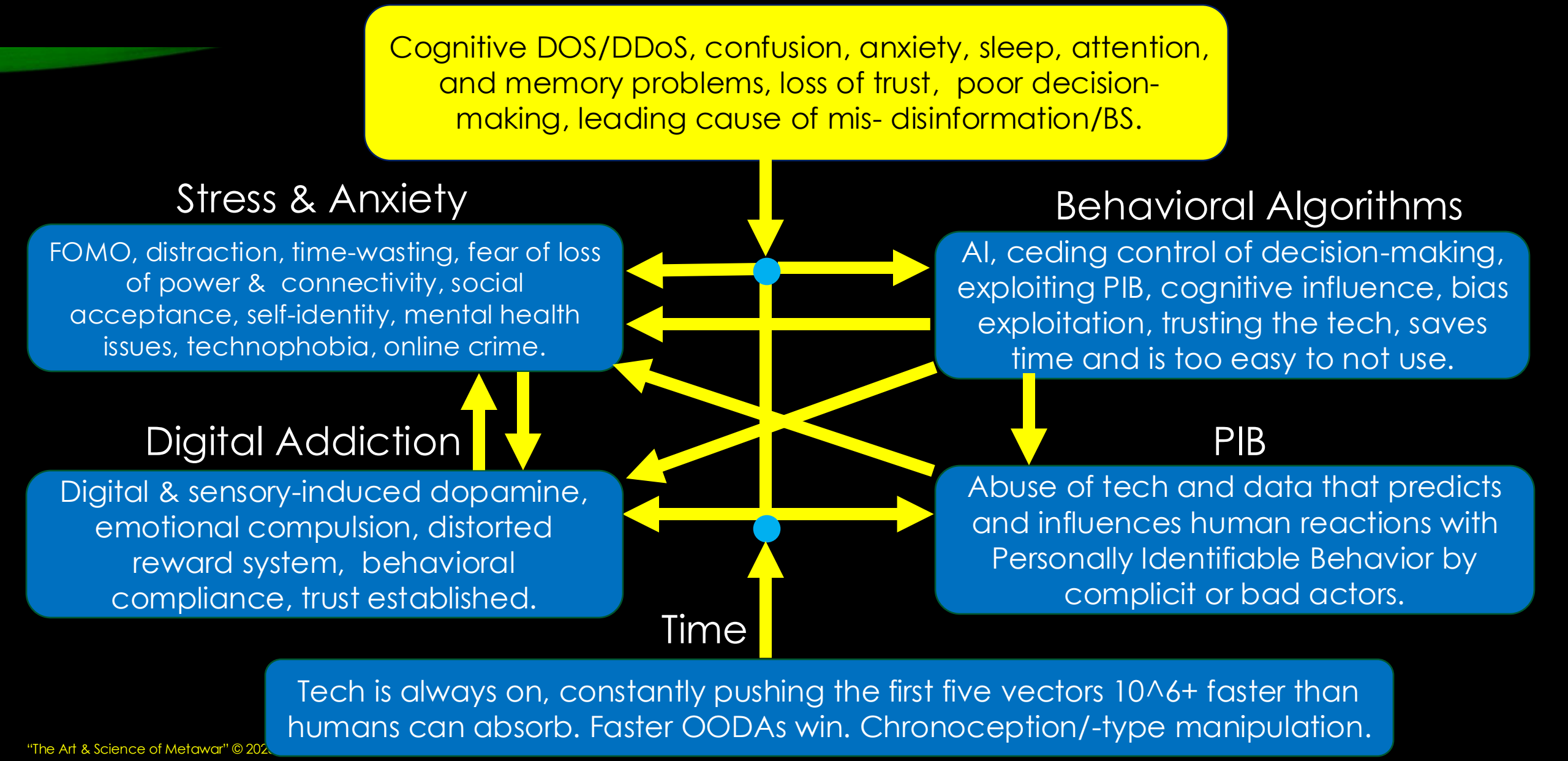
300 kya – 2035CE
(10^{25} increase)



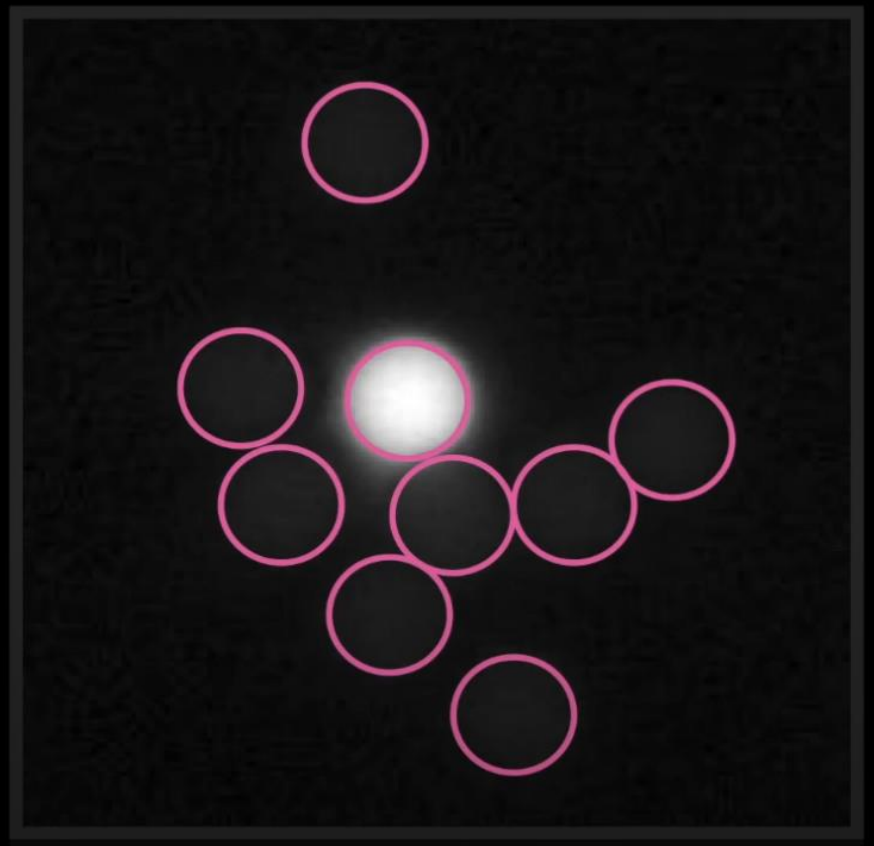
TMI BY THE NUMBERS



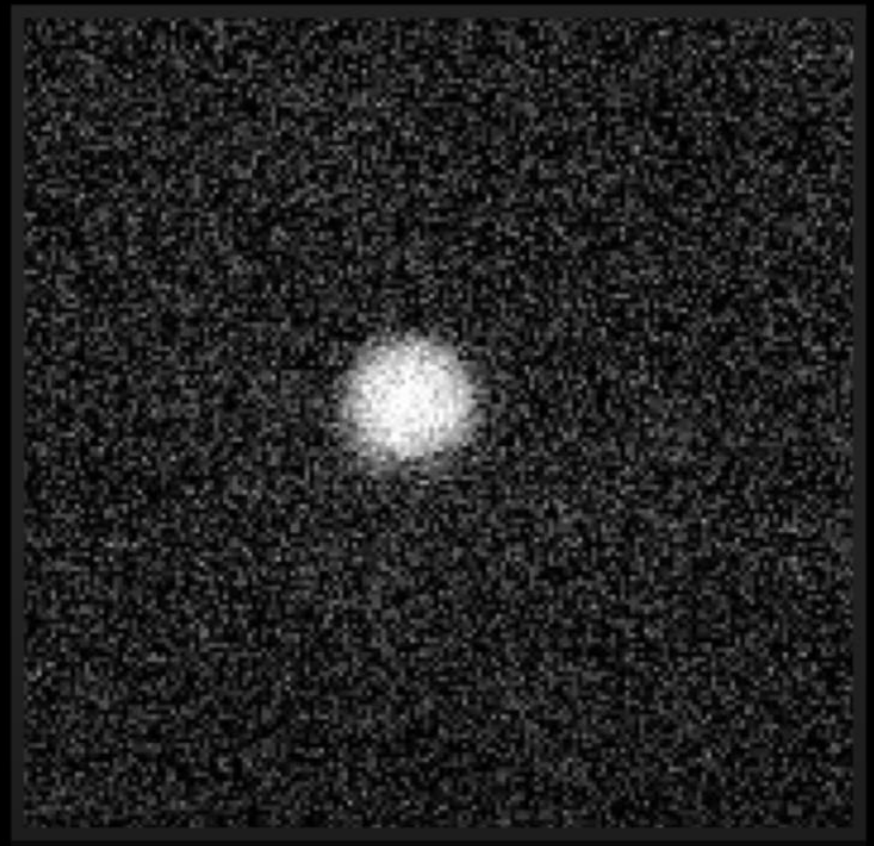
Too Much Information



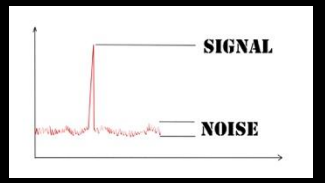
SIGNAL TO NOISE RATIO
(YEP, IT'S ANALOGUE)



decent SNR



increase noise

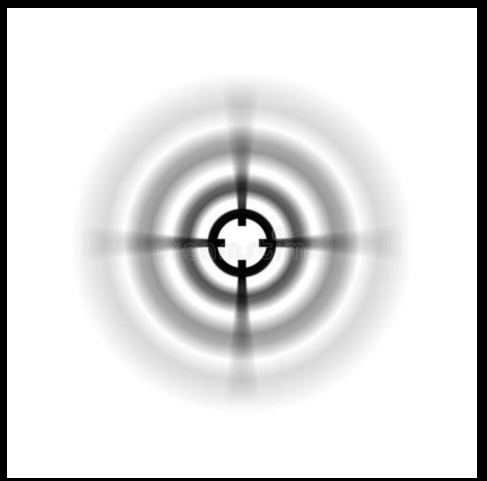


TMI?
Noise?
TRY CRITICAL IGNORING.

Earliest Public Usage
May 17, 2021 — Sam Wineburg, Nieman Journalism Lab.
Introduces the phrase "critical ignoring" in the context of online literacy.
Link: https://www.niemanlab.org/2021/05/to-navigate-all-the-junk-on-the-internet-you-need-powers-of-critical-thinking-but-also-critical-ignoring/

Earliest Peer-Reviewed Academic Definition
Kozyreva, A., Wineburg, S., Lewandowsky, S., & Hertwig, R.
"Critical Ignoring as a Core Competence for Digital Citizens."
Current Directions in Psychological Science, Epub Nov 8, 2022 (print 2023).DOI: https://doi.org/10.1177/09637214221121570
PubMed: https://pubmed.ncbi.nlm.nih.gov/37994317/

AUDITORY & VISUAL CRITICAL IGNORING



SENSORY HABITUATION: CRITICAL IGNORING

Tier 1,2,3 Defenses

- *Next-Generation Firewalls (NGFWs)*
- *(IPS/IDPS)*
- *Secure Web Gateways (SWG)*
- *Email Security Gateways:*
- *Distributed Denial-of-Service (DDoS) Protection.*
- *Web Application Firewalls (WAFs)*
- *DNS Filtering & Security*
- *Data Loss Prevention (DLP)*
- *CDN Security Layers*
- *Anomaly Detection*
- *Network Behavior Analytics (NBA)*
- *AI/ML-based and Threat Detection.*
- *Bot/AI Detection*

Enterprise Defenses

- Firewalls (Next-Gen, UTM)
- Web Application Firewalls (WAFs)
- Geo-blocking Filters
- Rate Limiters / DoS Protection
- DNS and Web Filters
- Threat Intelligence Filters
- Data Stream Filtering
- DLP (Data Loss Prevention)
- ML/AI Sorting Models
- Queue Systems (Kafka, RabbitMQ)
- SIEM & SOAR
- Zero-Trust
- Bot/AI Detection

Endpoint Defenses

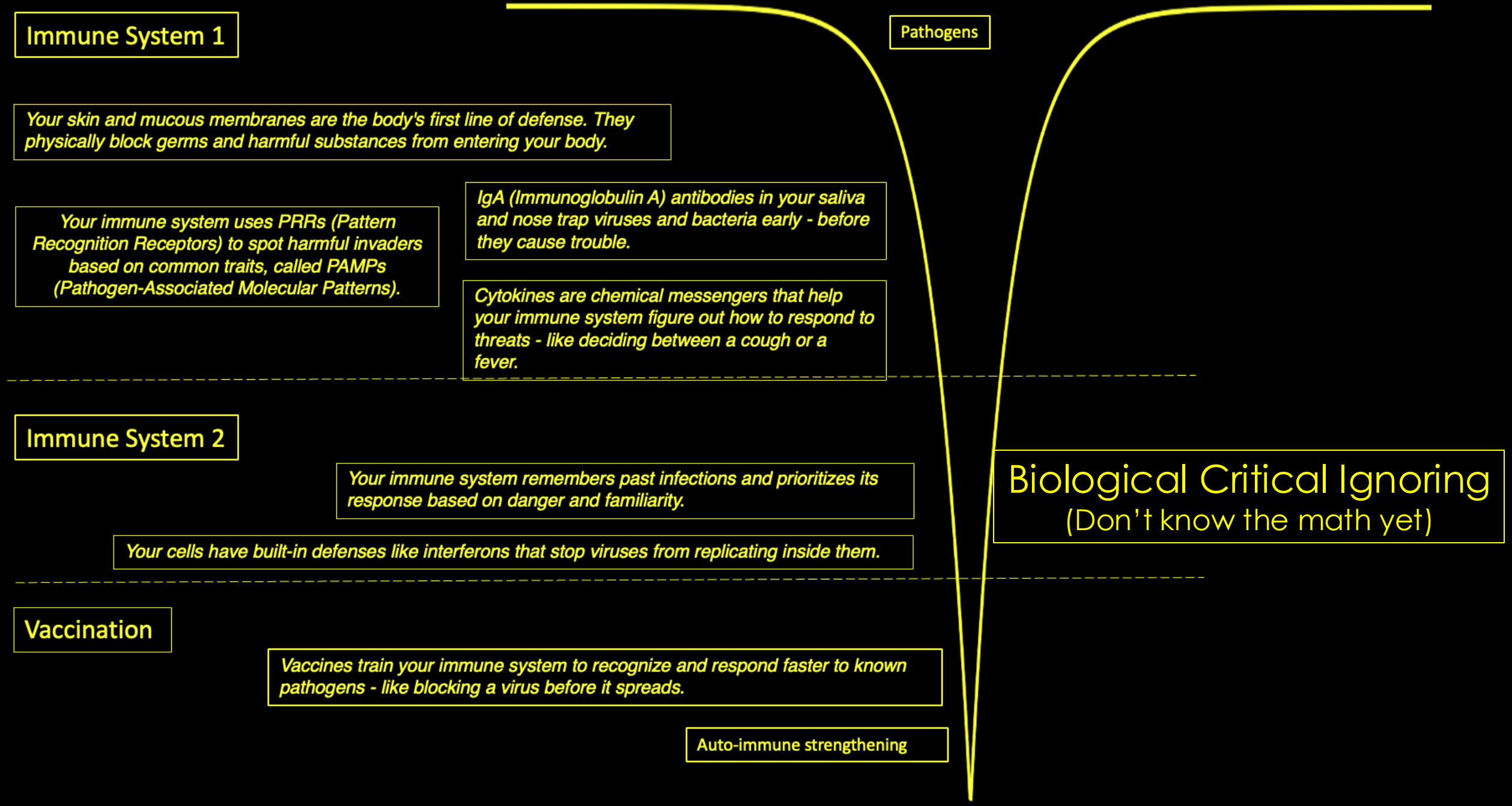
- Antivirus/EDR Agents
- Local URL/Domain Blocklists
- Application Whitelisting
- User Behavior Analytics (UBA)
- Reputation Services
- Security Awareness Training
- MFA, MDM, & FDE
- Personal Firewalls
- Sandboxing, VPN
- Bot Detection

Data Production
2 X 10^{21}/Bytes/Day

Cyber Critical Ignoring
(~10^{12})

Time?

Data Capacity
7.4Human X 10^{9}/Bytes/Day

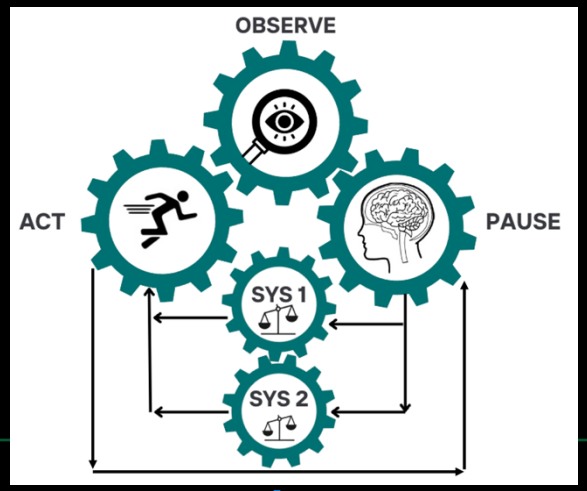


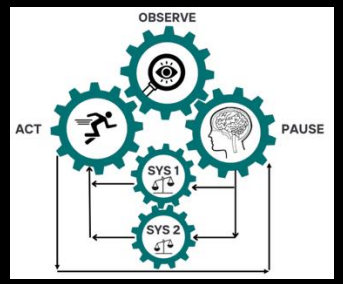
TIME-BASED COGNITIVE ACTIVITIES

The Issue	The Facts
Kids K-12 go to school:	~1,260 hrs/ year. (7 hours or 420 minutes per day for 180 days)
Average adults work	~ 2,000hr per year (8 hours or 480 minutes per day)
Checks a mobile device:	~370 times per day. That's roughly once every 3 minutes in a 16-hour day.
Internet consumption:	6.5 hours per day (390 minutes per day, ~2,500 hours per year. More than an American works in a year.)
TV/Streaming consumption:	4.5 hours per day (270 minutes per day or 1,642 hours per year)
Social Media consumption1:	2.7 hrs per day (162 minutes per day or ~1,000 hours per year)
News Consumption.	~70% online. ~30% claim never to see the news.
Uploading videos:	817,000 unique video content program titles in February 2022
YouTube uploads:	18,000 hours of content every hour.
Pix posted:	100 million pix daily on Instagram.
Average reading speed:	~238 wpm (words per minute) or 14,280 words per hour.
Spoken word speed in media:	~160 wpm (9,600 words per hour on average)
Reading books in the US:	~20 mins per day. RUFKM?
Adult American reading skills:	7th/8th grader, 12 to 14 years old

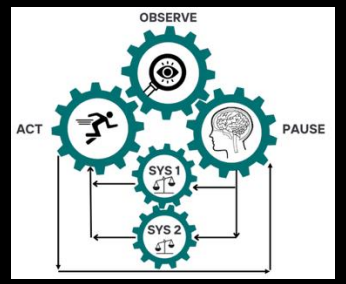
I have ~16 hrs. per day to spend my limited mental resources on the things ***I Choose.*** *Critical Ignoring is our System 1 personal defense against TMI..*

Critical Ignoring (System 1)

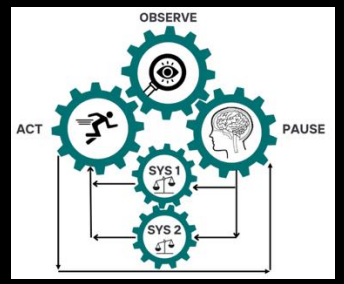




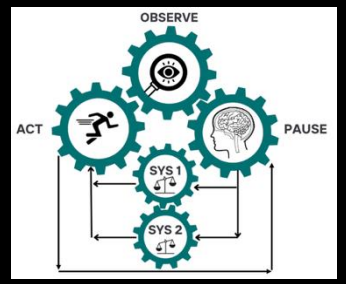
I don't care



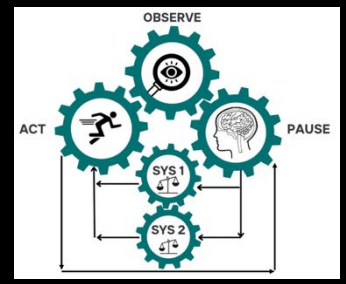
I don't have the time.



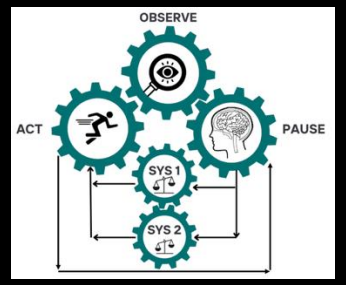
The algorithm and addiction.



I already know that stuff.

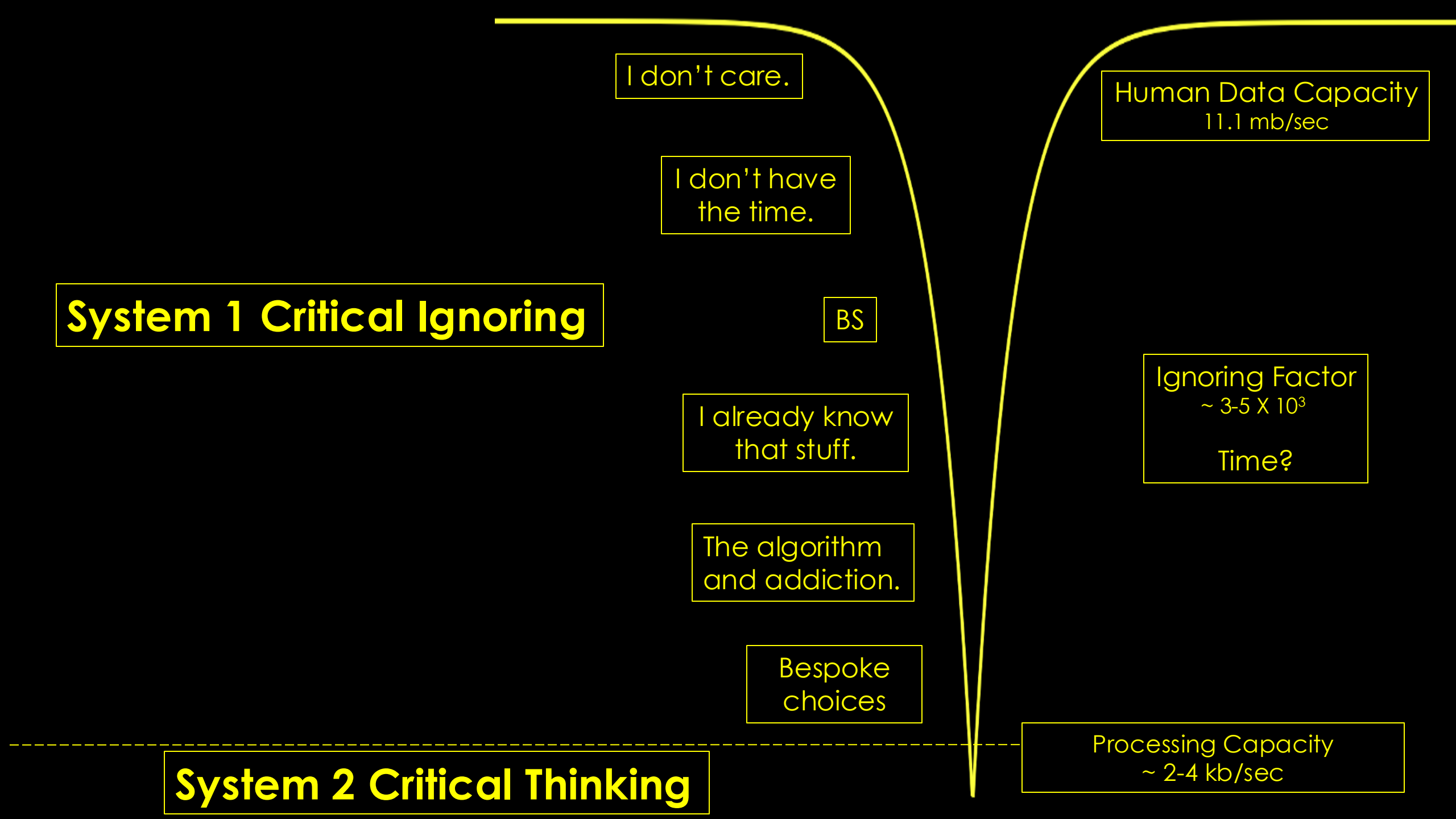


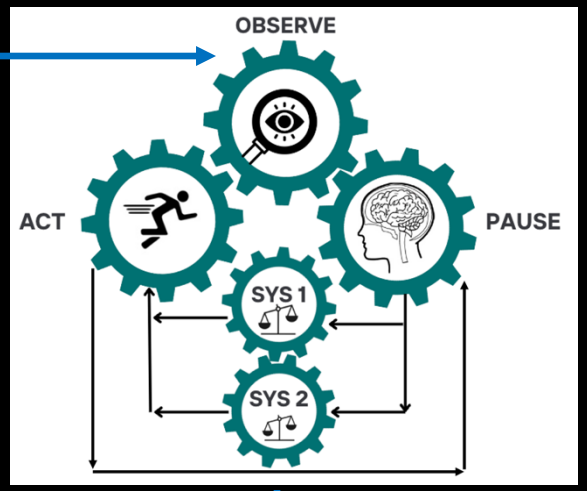
Bespoke choices



BS

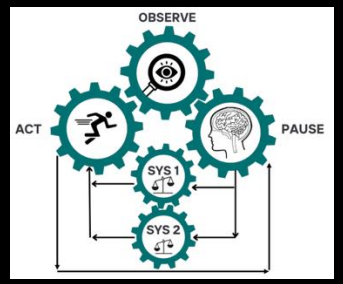
A strong mental immune System 1 works fast and talks to' *System 2. Critical Thinking. It takes time, mental energy, and an open mind.*


I don't care.
I don't have the time.
System 1 Critical Ignoring
BS
I already know that stuff.
The algorithm and addiction.
Bespoke choices
Human Data Capacity
11.1 mb/sec
Ignoring Factor
~ 3-5 X 10^3
Time?
Processing Capacity
~ 2-4 kb/sec
System 2 Critical Thinking



BS

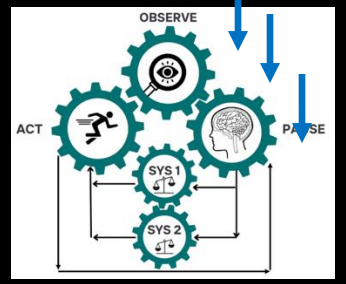
Detection & Reaction (Just like in Cyber)



Influence ops
Propaganda
Malinfo

Emotional Triggers

ALT Facts



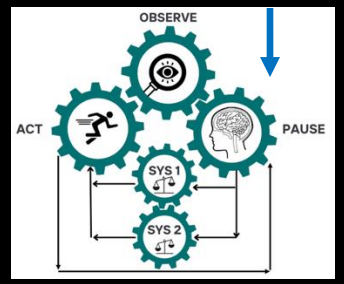
Hoax

Click bait

PsyOps

Lies

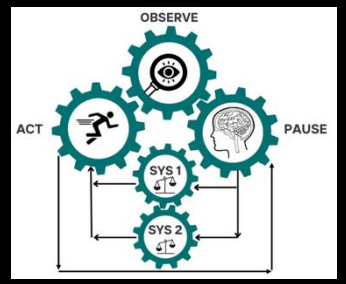
Too easy.



Fake News

BS

Deceptive

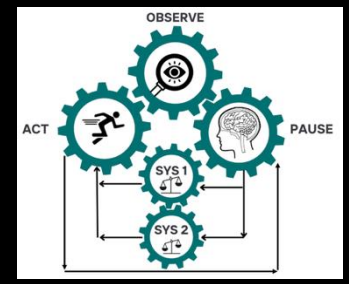


WTF?

Too good a deal.

Trolling

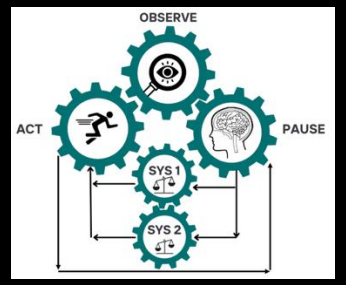
Manipulative



Too biased

Tripe
Disinfo

Makes no sense



Illogical

Feels wrong

Outrageous claims

Misinfo

Academic Bullshit History & References

- *Frankfurt, H. G. (2005). On Bullshit. Princeton University Press.*
- *Wardle, C., & Derakhshan, H. (2017). Information Disorder: Toward an interdisciplinary framework for research and policymaking. Council of Europe Report DGI(2017)09.*
- *Petrocelli, J. V. (2018). Antecedents of bullshitting. Journal of Experimental Social Psychology, 76, 249–258. DOI*
- *Petrocelli, J. V. (2021). The Life-Changing Science of Detecting Bullshit. St. Martin's Press.*
- *Pennycook, G., et al. (2015). On the reception and detection of pseudo-profound bullshit. Judgment and Decision Making, 10(6), 549–563. PDF*
- *Paul, C., & Matthews, M. (2016). The Russian 'Firehose of Falsehood' Propaganda Model. RAND Corporation.*
- *Benkler, Y., Faris, R., & Roberts, H. (2018). Network Propaganda: Manipulation, Disinformation, and Radicalization in American Politics. Oxford University Press.*

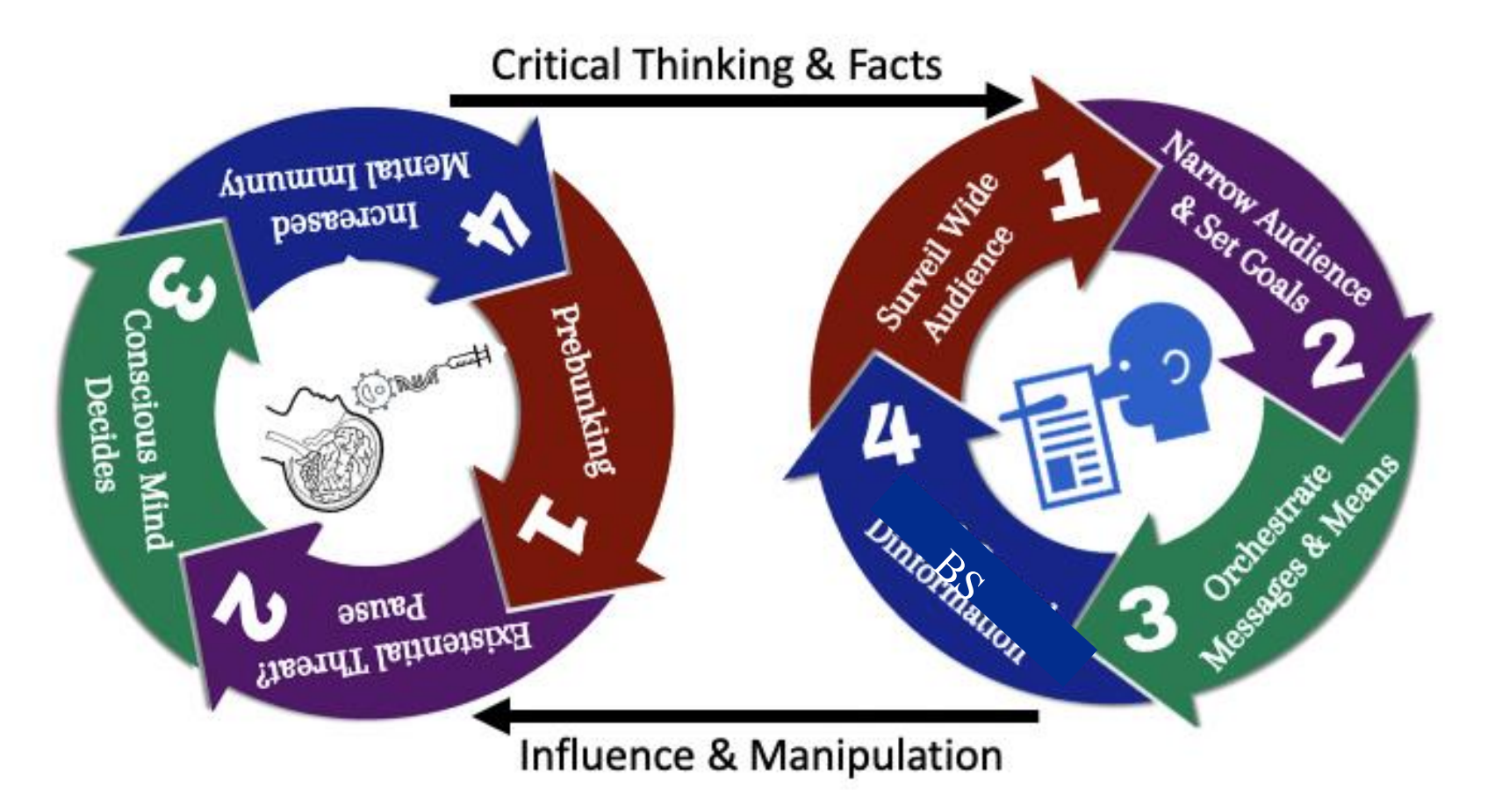
We can argue that 'bullshit,' as defined by Harry Frankfurt and expanded upon in empirical research, serves as an umbrella category encompassing misinformation, disinformation, and malinformation. The argument integrates philosophical foundations, empirical psychology, and information disorder frameworks.

Drawing on Frankfurt's philosophical conception of bullshit as communication indifferent to truth and aligning it with Wardle & Derakhshan's taxonomy of information disorder (mis-, dis-, and malinformation), this paper situates all three categories within the broader umbrella of bullshit.

Empirical contributions by Petrocelli, Pennycook, and others strengthen this framing by showing how bullshit operates in psychological, social, and political contexts. RAND's Firehose of Falsehood and Benkler et al.'s Network

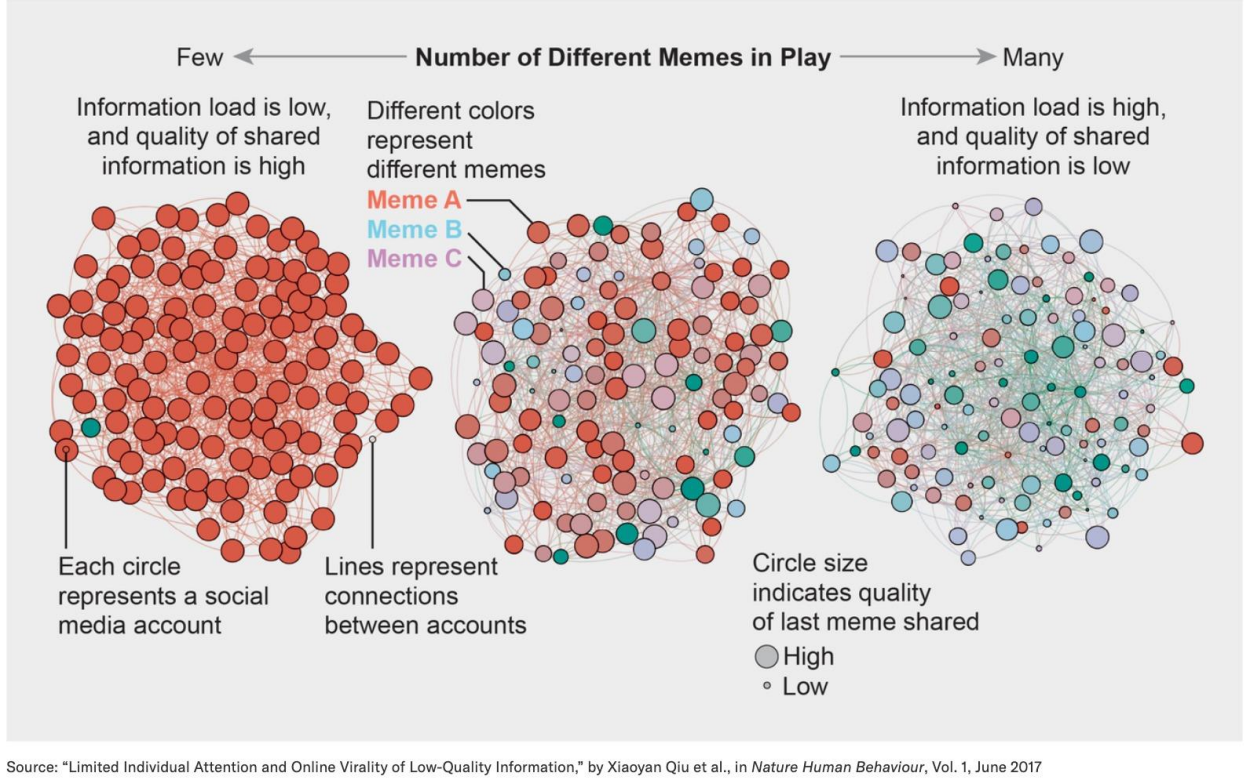
Propaganda further illustrates truth-indifferent communication strategies at scale.

BS OODA Loop



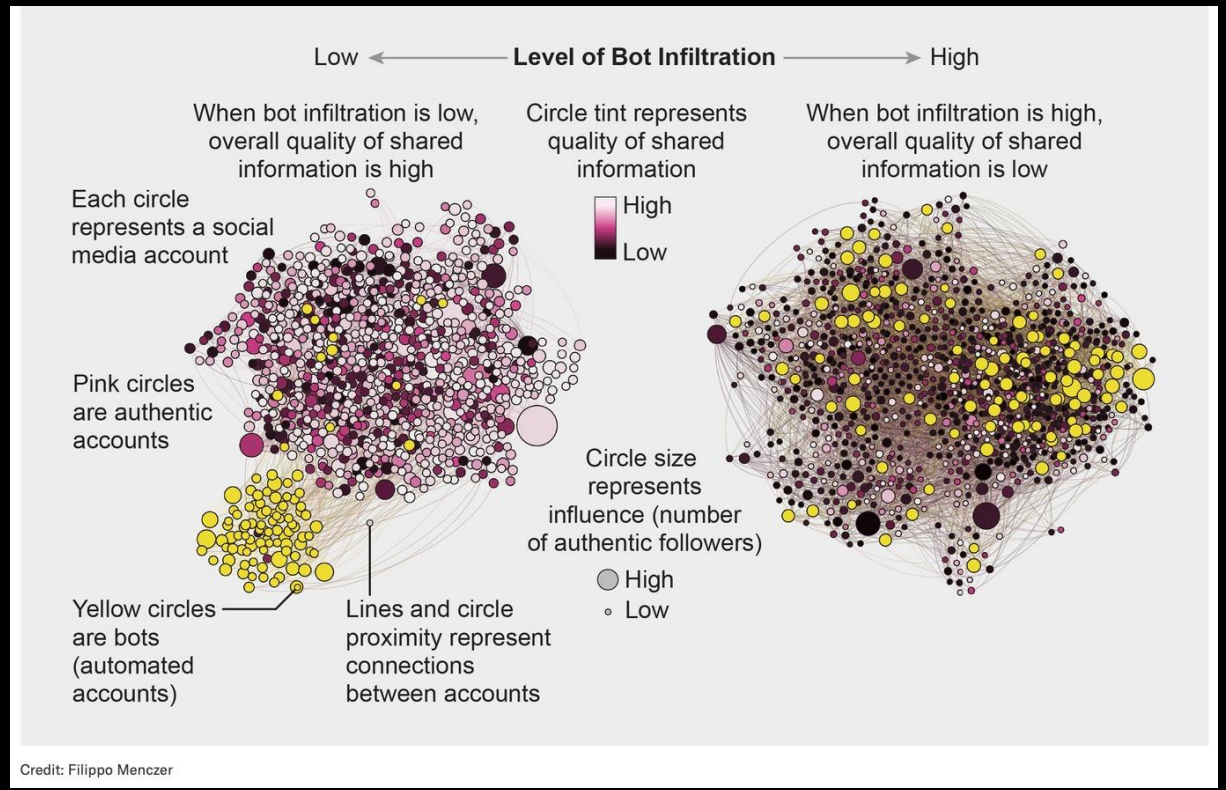
Fast, automatic cognitive defenses and pauses in BS OODA Loops, help engage *System 2*.

TMI CREATES FERTILE GROUND FOR BS



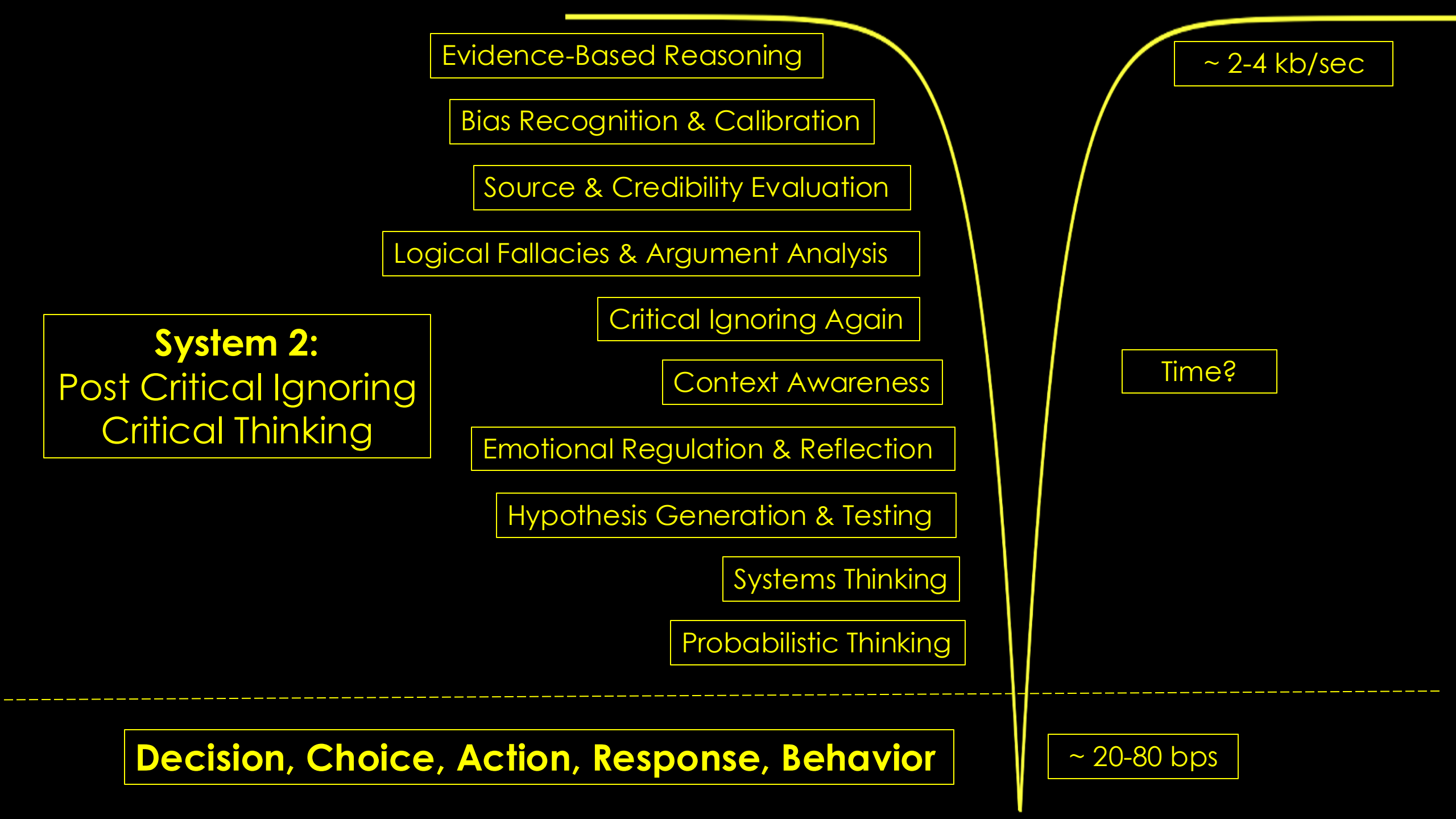
Source: "Limited Individual Attention and Online Virality of Low-Quality Information," by Xiaoyan Qiu et al., in *Nature Human Behaviour*, Vol. 1, June 2017

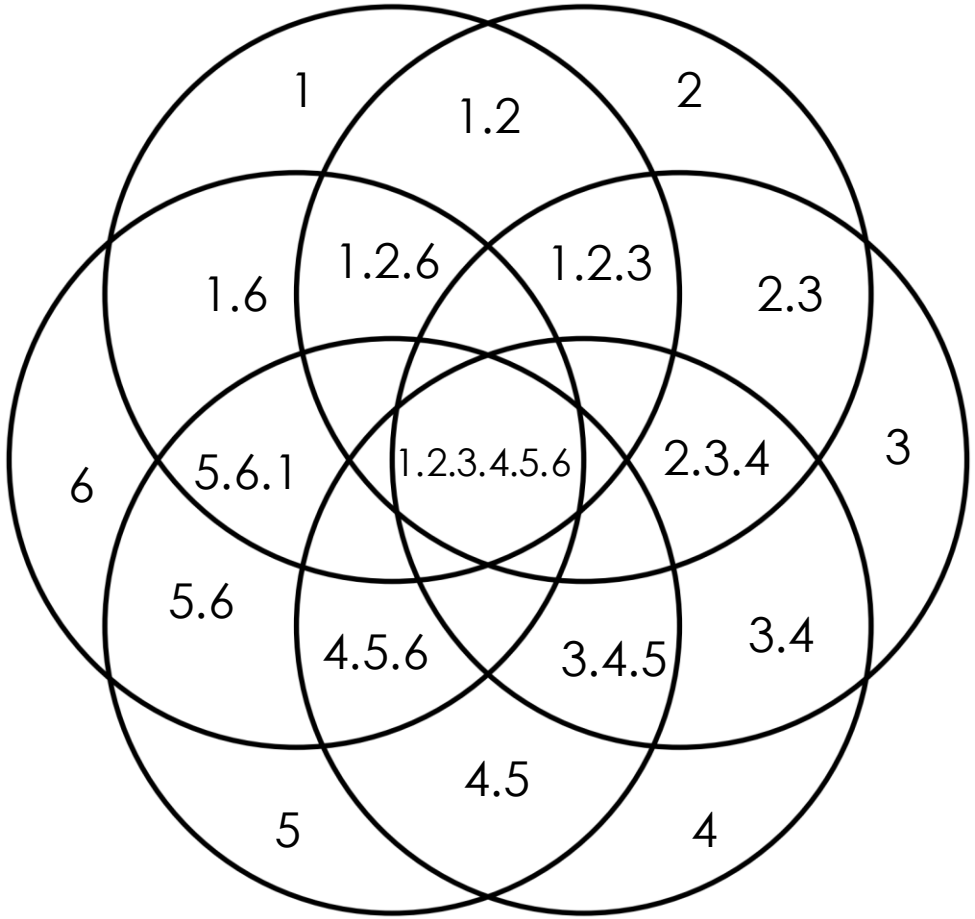
Human generated BS



Credit: Filippo Menczer

AI/Bot generated BS is a powerful amplifying weapon.


Evidence-Based Reasoning
Bias Recognition & Calibration
Source & Credibility Evaluation
Logical Fallacies & Argument Analysis
Critical Ignoring Again
Context Awareness
Emotional Regulation & Reflection
Hypothesis Generation & Testing
Systems Thinking
Probabilistic Thinking
System 2:
Post Critical Ignoring
Critical Thinking
~ 2-4 kb/sec
Time?
Decision, Choice, Action, Response, Behavior
~ 20-80 bps



Critical Ignoring is Not Binary

BUT… Confirmation Bias Looms

Ask: Am I ignoring this because it's garbage or because it threatens my assumptions?

Beware of ignoring anything that makes you uncomfortable. That's not defense—that's building a deluxe confirmation bias rabbit hole.

Don't dismiss something just because it pisses you off.

- System 1 > System 2 Engagement
  - Build Cognitive Resilience
  - Mental Immunity Strengthening

- Build Habituation:
  - Audio/Video Senses (We have)
  - Smell/Taste/Touch (We have)
  - Information (Not native to humans)

- Primal Survival Reactions
  - Enhance Audio/Video
  - Strengthen System 1 > System 2 Engagement
  - Information Valuation (subjective and time objective)

THE "DO I GIVE A S***?" GAME

Critical Ignoring

- Do I care?
- Do I have time?
- Do I need it or want it?
- Human or AI?
- BS Detection
- Do I trust it?
- Quality or Quantity?
- Digital provenance?
- Accuracy?
- Or just BS?

Can I PLEASE Turn Off those Algorithms?

Pre-bunking Proven to Strengthen Mental Immune System

Intellectual and emotional attacks, arguments, and persuasion do not work.

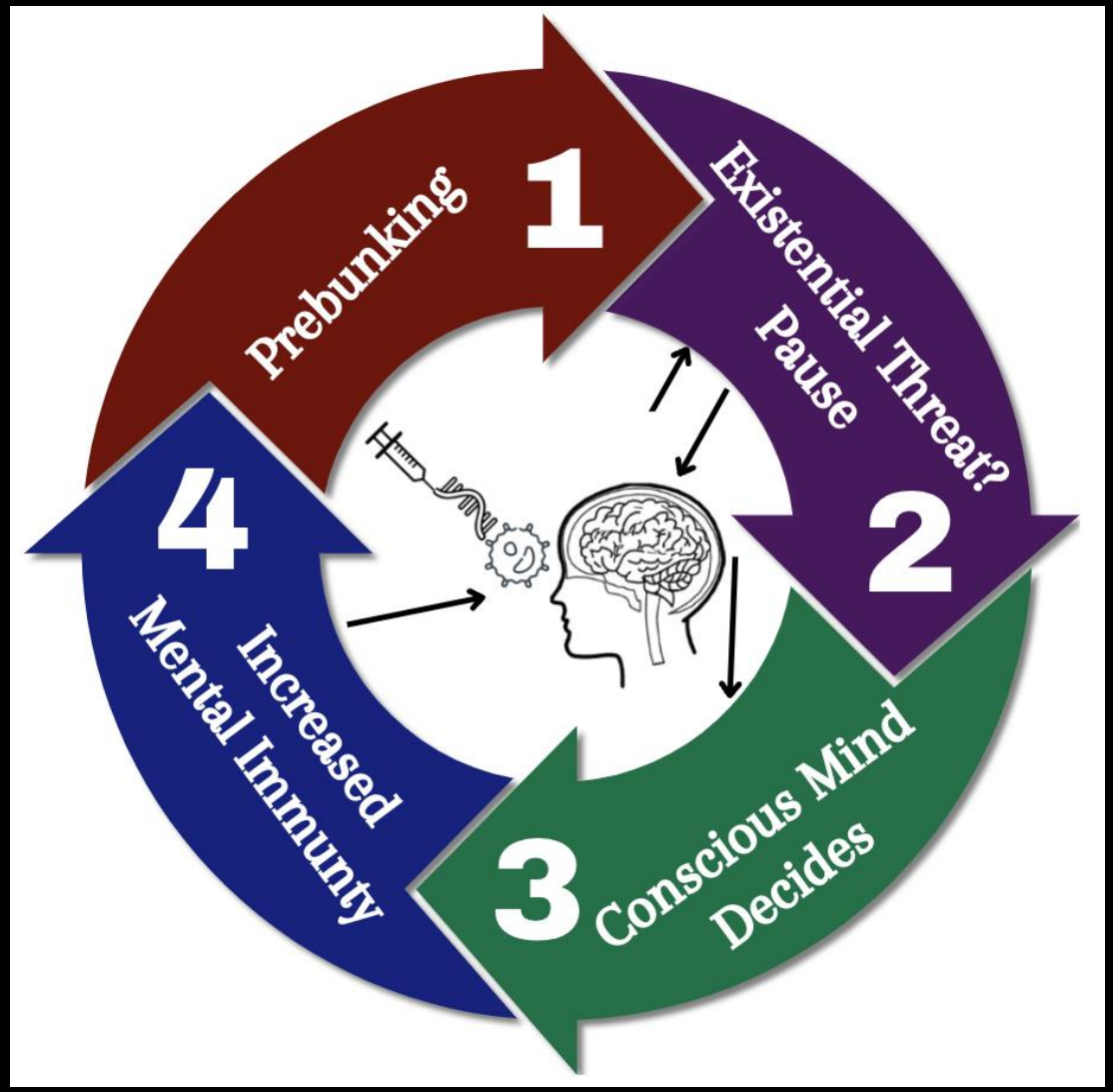
"Over 50 years of research has shown that inoculation is among the most effective frameworks to help people resist persuasion attempts."

Professor Sander van der Linden
Cambridge Univ., UK

"A bit of fake news and a dollop of explanation and we can inoculate people against disinformation by explaining the techniques used to distort the facts."

Professor John Cook, Senior Research Fellow
University of Melbourne, AU

COGNITIVE PREBUNKING OODA LOOP



Prebunking is a promising, research-backed strategy for building resilience against BS. It is effective, safe, and scalable,

- **Key Requirements**

- More Research
- Critical Ignoring
- Experimental Cyber Ranges
- Real-world testing
- Interdisciplinary cooperation
- Resources Support

HOW? JUST PAUSE!

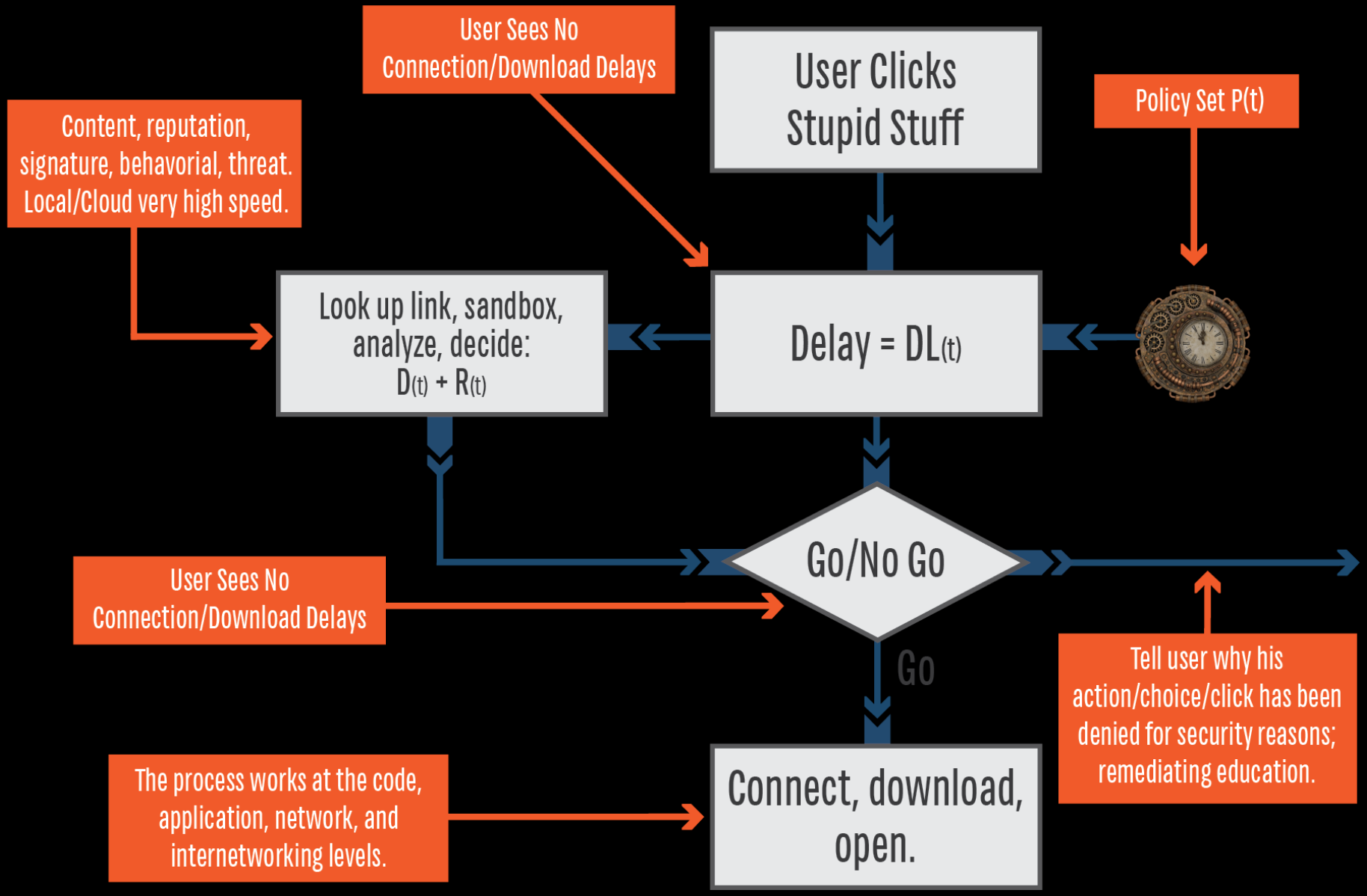
GRAB ATTENTION

- WOW Factor
- Curiosity
- Games
- Chat with AI
- Pre-bunking
- Creative experiences
- Non-confrontational challenges
- Rewards

LAUNCH SYSTEM 2

- Ask a Question
- Take a breath/break
- Count to 10
- Think for a second
- Analyze the situation
- “Thimmmk.” (My mom)
- Take the long way
- Sleep on it
- ”Men take a day to think about things.”

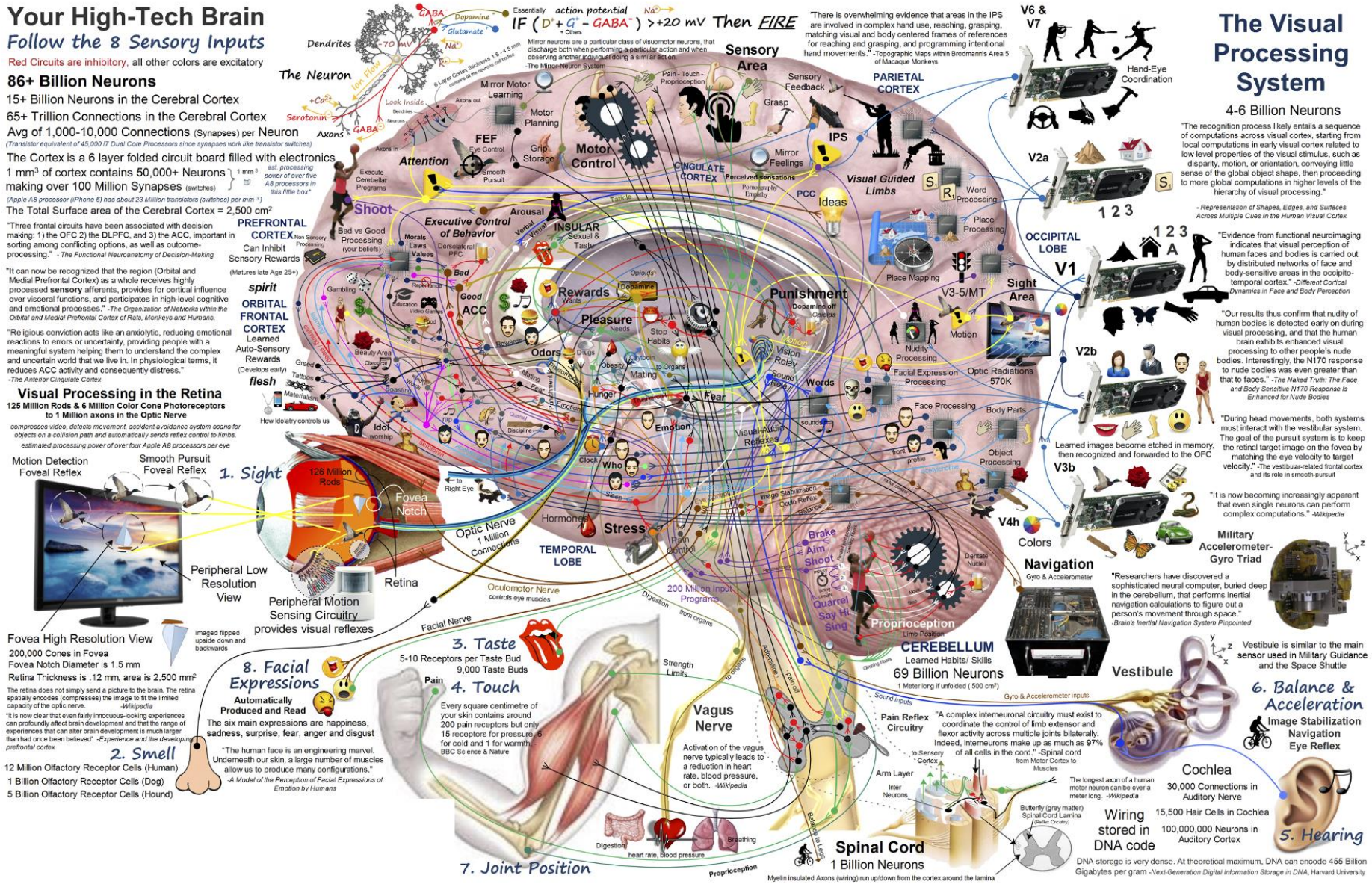
Cyber: System 1 Engages System 2



MULTI-PLAYER COGNITIVE CYBER RANGES

Languages, GUIs, & Content	Education	Enterprise	Everyone Else
P *assive Content*	Age based, grade based	Tailored to specific industry	Age based
A *ctive Content*	Multiple topics of study	Culturally sensitive	Cultural
L *ogic-GPT*	Cultural differentiation	Cognitive Security Awareness	No contentious content
M *ulti-player Range*	Learning simulations	Red-Blue Teaming	Real-world simulations

THE COGNITIVE ATTACK SURFACE



COGNITIVE DEFENSE TRIAD

TMI

CRITICAL IGNORING

BS

Cognitive Defense Is Interdisciplinary

Tech	Policy	Cognitive
Cybersecurity	Lawyers	Behavioral design
Infrastructure defense	Diplomats	Game Designers
AI experts	Policy Makers	Experimentalists
Supply chain	Privacy advocates	Neuroscientists
Blockchain	Educators	Social scientists
Data science	News media	Psychiatrists
Mathematicians	Science & Skeptic	Cultural anthropologists
Quantum scientists	Entertainment	Cognitive psychologists
UI/XI Designers	Economists	Psychoactive druggists
Immersive artists	Public Opinion	Linguistic Experts

Tier 1,2,3 Defenses

- *Next-Generation Firewalls (NGFWs)*
- *(IPS/IDPS)*
- *Secure Web Gateways (SWG)*
- *Email Security Gateways:*
- *Distributed Denial-of-Service (DDoS) Protection.*
- *Web Application Firewalls (WAFs)*
- *DNS Filtering & Security*
- *Data Loss Prevention (DLP)*
- *CDN Security Layers*
- *Anomaly Detection*
- *Network Behavior Analytics (NBA)*
- *AI/ML-based and Threat Detection.*
- *Bot/AI Detection*

Enterprise Defenses

- Firewalls (Next-Gen, UTM)
- Web Application Firewalls (WAFs)
- Geo-blocking Filters
- Rate Limiters / DoS Protection
- DNS and Web Filters
- Threat Intelligence Filters
- Data Stream Filtering
- DLP (Data Loss Prevention)
- ML/AI Sorting Models
- Queue Systems (Kafka, RabbitMQ)
- SIEM & SOAR
- Zero-Trust
- Bot/AI Detection

Endpoint Defenses

- Antivirus/EDR Agents
- Local URL/Domain Blocklists
- Application Whitelisting
- User Behavior Analytics (UBA)
- Reputation Services
- Security Awareness Training
- MFA, MDM, & FDE
- Personal Firewalls
- Sandboxing, VPN
- Bot Detection

Data Production
2 X 10^{21}/Bytes/Day

Cyber Critical Ignoring

Data Capacity
7.4Human X 10^{9}/Bytes/Day

Pathogens

Immune System 1

Your skin and mucous membranes are the body's first line of defense. They physically block germs and harmful substances from entering your body.

Your immune system uses PRRs (Pattern Recognition Receptors) to spot harmful invaders based on common traits, called PAMPs (Pathogen-Associated Molecular Patterns).

IgA (Immunoglobulin A) antibodies in your saliva and nose trap viruses and bacteria early - before they cause trouble.

Cytokines are chemical messengers that help your immune system figure out how to respond to threats - like deciding between a cough or a fever.

Immune System 2

Your immune system remembers past infections and prioritizes its response based on danger and familiarity.

Your cells have built-in defenses like interferons that stop viruses from replicating inside them.

Vaccination

Vaccines train your immune system to recognize and respond faster to known pathogens - like blocking a virus before it spreads.

Auto-immune strengthening

System 1 Critical Ignoring

I don't care.

I don't have the time.

BS

I already know that stuff.

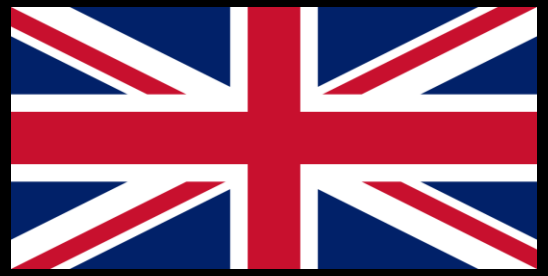
The algorithm and addiction.

Bespoke choices

5.5 X 10^{20} Bytes/Day

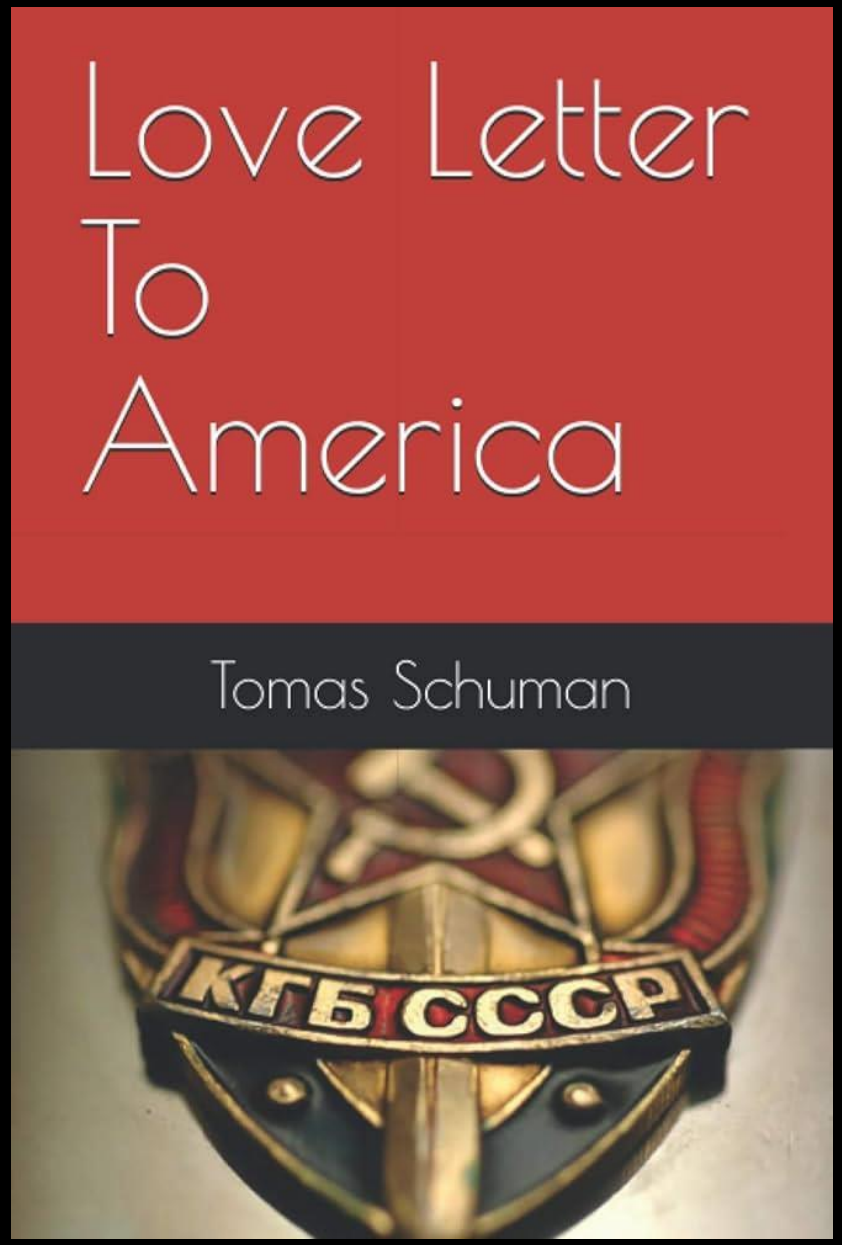
System 2 Critical Thinking

Human Data Capacity
7.4 X 10^{9}/Bytes/Day



UK-EU COGNITIVE DEFENSES

- Cognition is a National Security Imperative
- National Education programs (Toddler+)
- Digital Literacy
- Adult upskilling
- Academic Studies/R&D
- Hundreds of private, public, and hybrid cooperatives
- 80% are publicly funded
- > € 10 billion annual investment



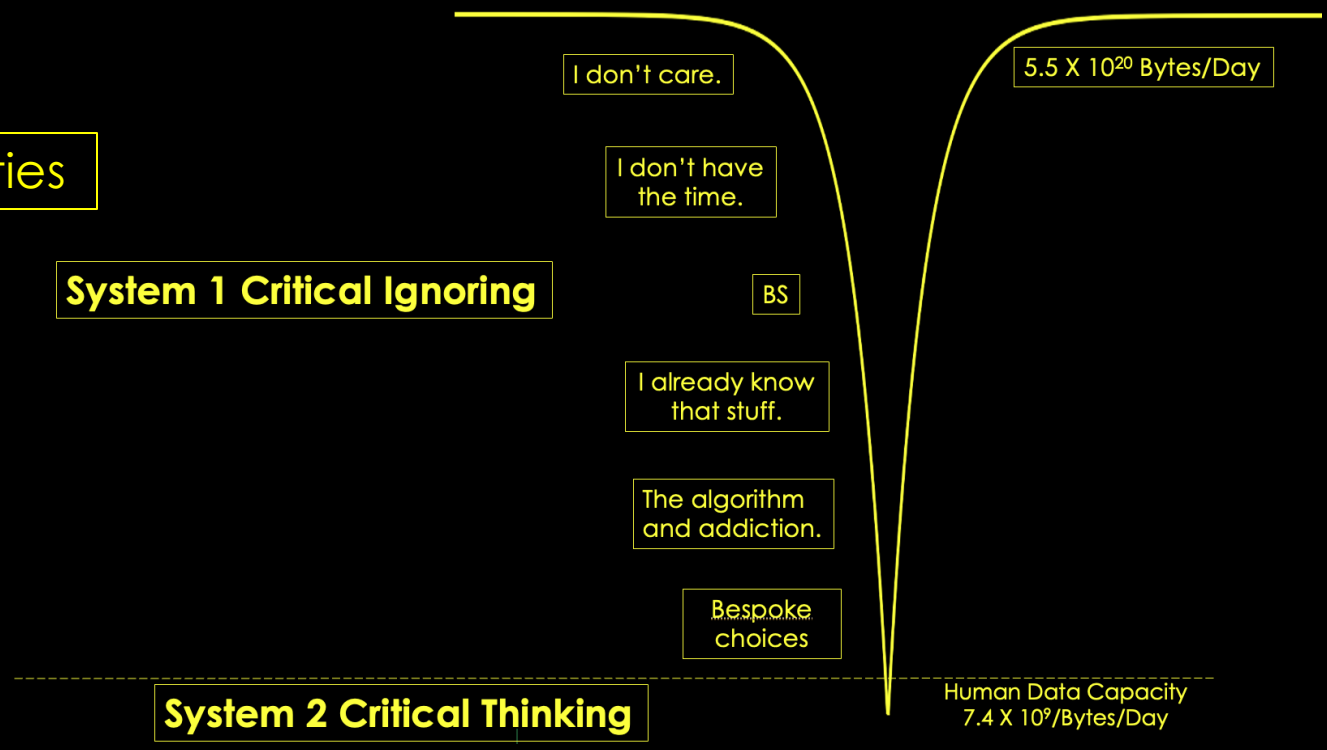
One of the most influential booklets (~80pp) I have ever read.

If any aspect of Cognitive Security is on your radar, this one document will change everything.

https://ia600904.us.archive.org/6/items/love-letter-america/love-letter-america.pdf

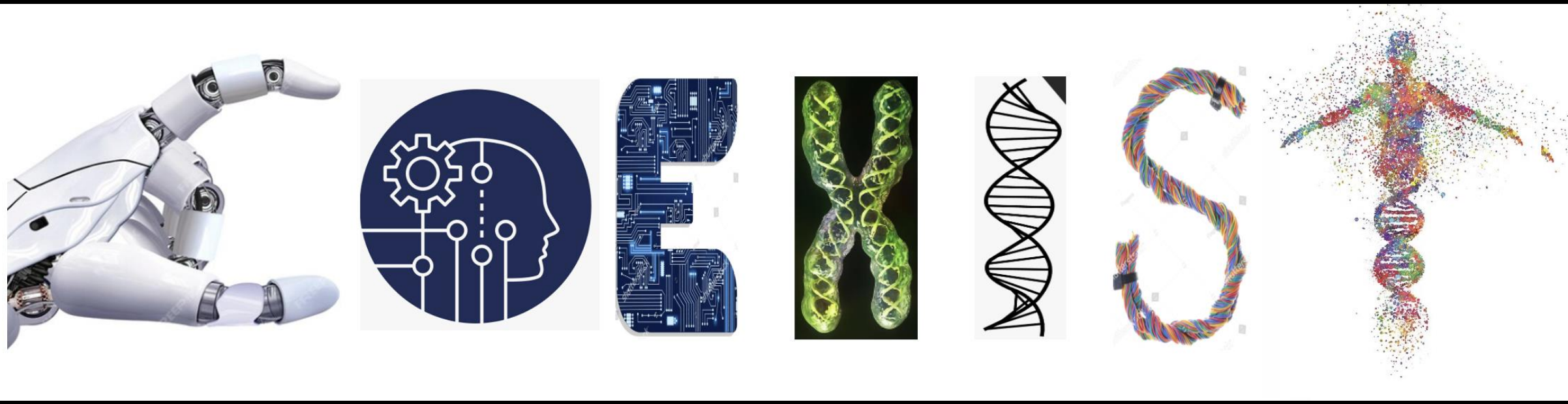
What Can We Do to Strengthen Human System 1?

- Agree Solutions Are Needed
- Engage with Policymakers
- Identify Private & Public Funding Opportunities
- Coordinate & Cooperate Globally
- Learn & Adapt Other Successes
- Support Large Scale Studies
- Build Common Taxonomies
- Take Moon Shots
- Be Willing to be Wrong
- Include All Stakeholders

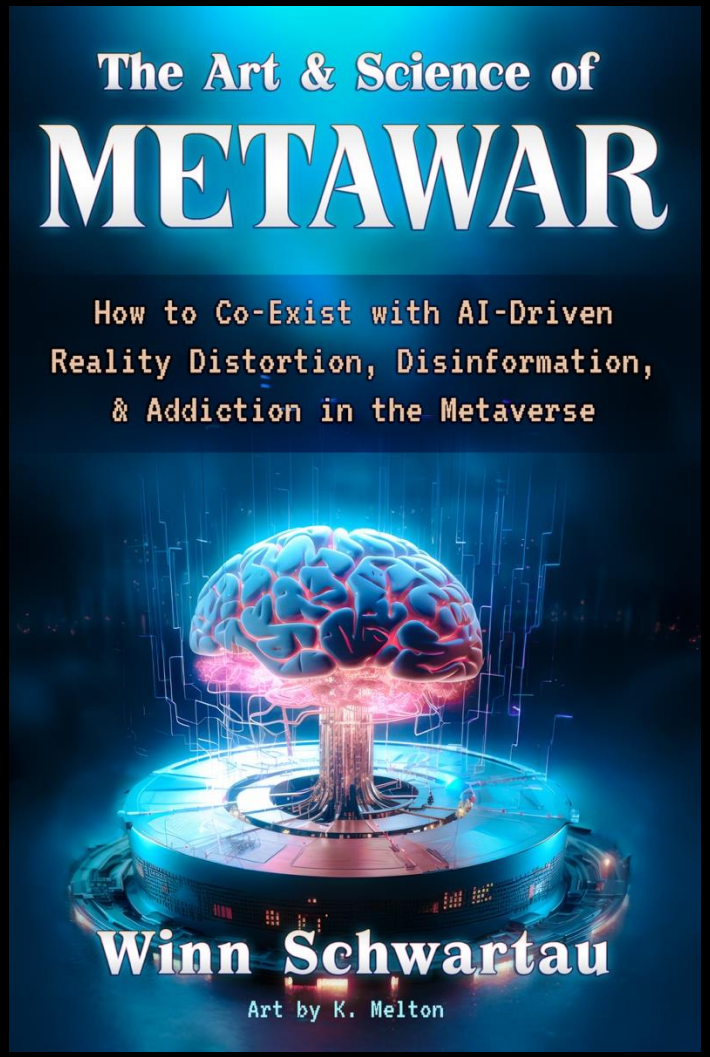


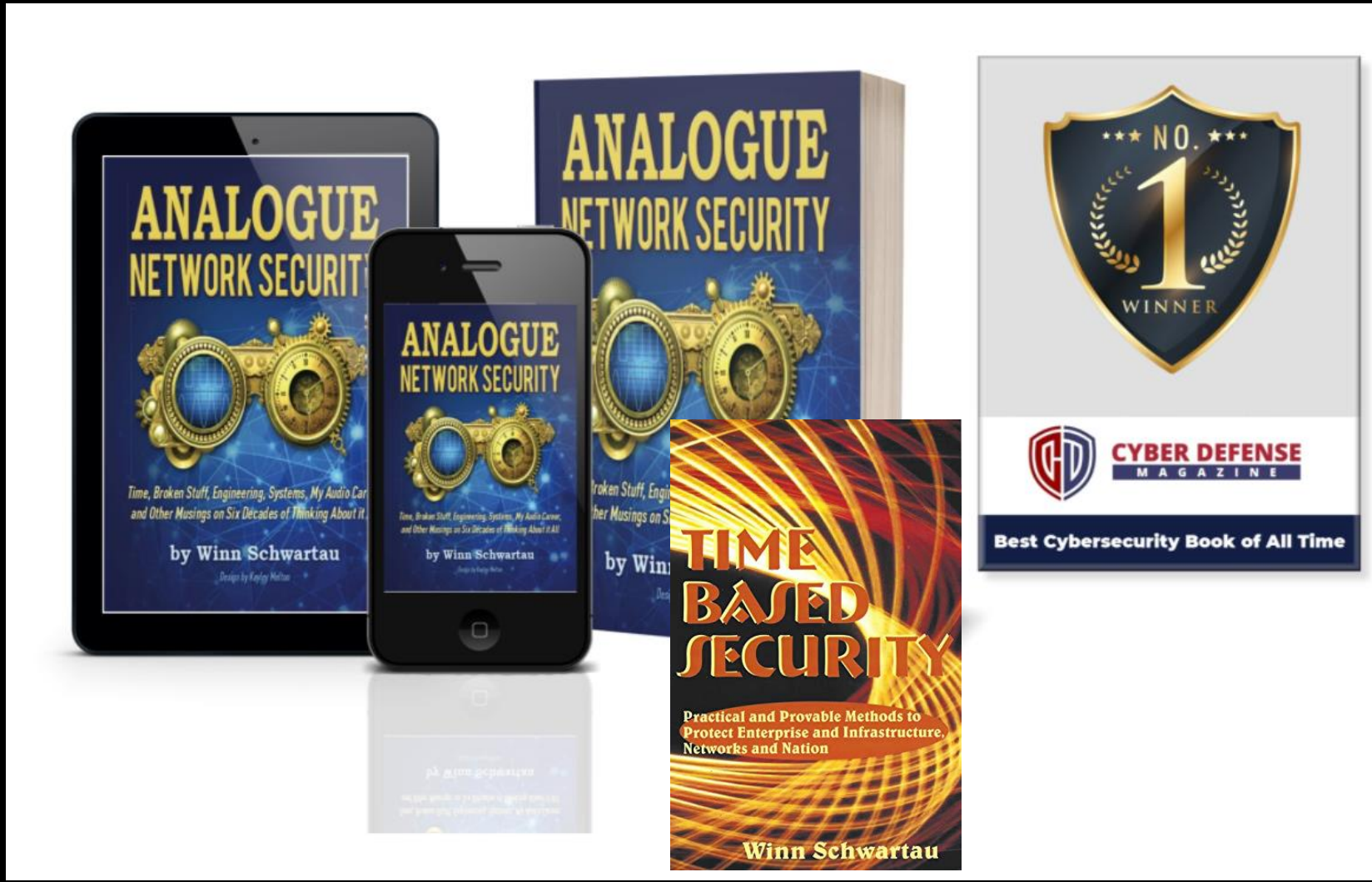
Never Stop

Long-term Human Survival



SUPPLEMENTARY READING
ON TIME-BASED COGNITIVE OFFENSE & DEFENSE

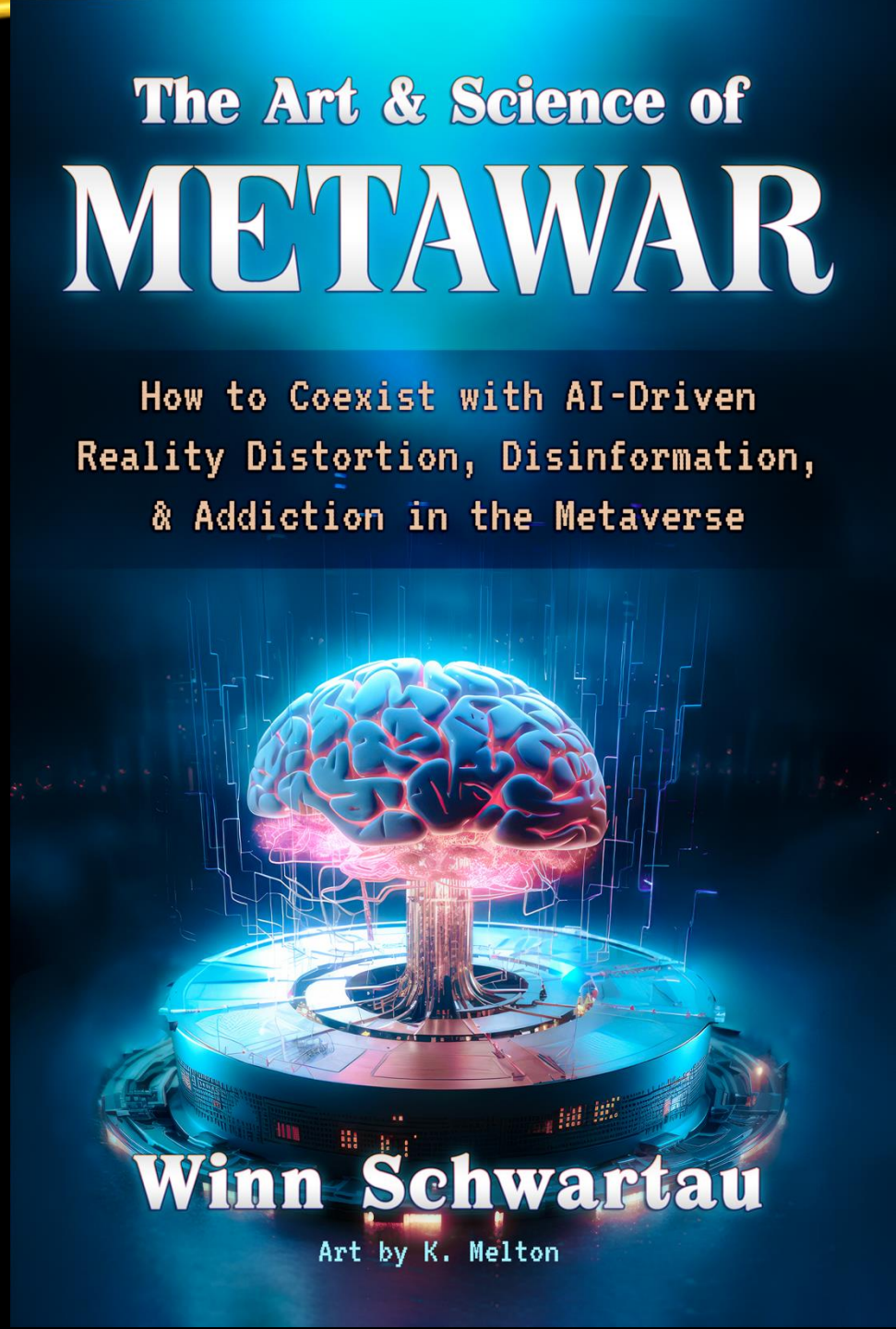




Defending & Strengthening the mental immune system is a national security mandate.

We have our work cut out for us.

Winn Schwartau, FRSA
Director, Special Projects
Cognitive Security Institute
Info@CognitiveSecurityInstitute.Org



Gamification works because it provides immediate feedback, visible progress, emotional engagement, and habit-forming rewards.

1961:

William McGuire, an American Social Psychologist, developed the theory of Attitude Inoculation.

He postulated that by introducing weaker persuasive arguments, a person could counter larger, more persuasive arguments in the future.

2018:

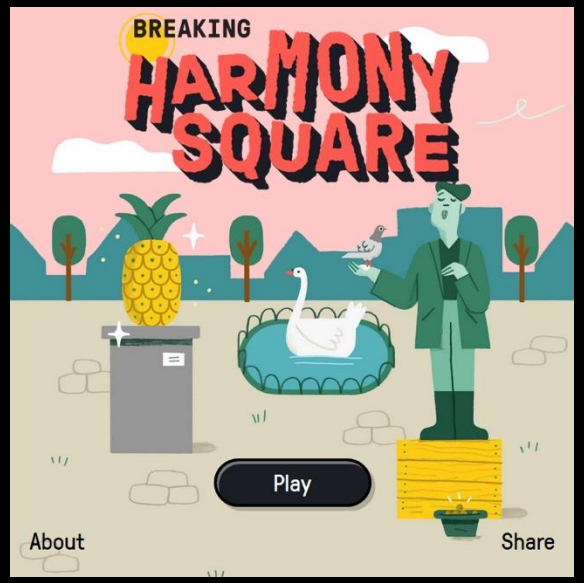
Psychologists Jon Roozenbeek and Professor Sander van der Linden led a team at the Department of Psychology, University of Cambridge, UK, that asked:

"What would our online inoculation task look like? Our answer was an online game we created called Bad News, in which people pretend to be a fake news creator."

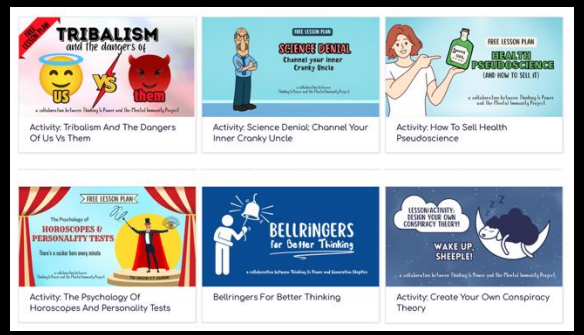
GAMING WORKS

- *Motivation & Engagement*
- *Safe Failure*
- *Reinforcement*
- *Narratives*
- *Critical Thinking*
- *Adaptive Difficulty*
- *Collaboration*

- *Learn to Lie, Cheat, & Deceive*
- *Fallacy bingo*
- *Bias Quests.*
- *“Beat the Algorithm”*
- *AI or Not?*
- *Deep Fakery*
- *Telephone Game*



- *Cognitive Phishing*
- *Escape rooms*
- *Red vs Blue Roleplay*
- *BS Offense & Defense*



Gaming is Necessary in Cognitive Security Awareness Programs

Thank You!