

# SESSION #\_ - \_ DAY 2

NOVEMBER 10, 2021

# TOPICS TO ADDRESS

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- This session discusses a framework approach to collect and organize knowledge around cognitive-based capabilities and concepts centered around cognitive warfare. Participant discussions consider trends and infrastructures of connected networks and social platforms providing adversaries with cognitive and perceptual access points.
  - Framework approach to collect and organize knowledge around cognitive-based capabilities
  - Proposed principal environments and trends
  - Advanced Persistent Threats: A Complex Threat Landscape from Emergent Capabilities
  - Categories and Tactics Weaponizing Human Exploits
  - Scaling and Maintaining Cognitive-based Operations and Goals

# FRAMEWORK APPROACH TO ORGANIZE COGNITIVE WARFARE CAPABILITIES

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## Manage the Complexity to Sketch Ideas

- For this talk introduce a framework approach of categories to collect and organize cognitive-based capabilities
  - Consider offense and defense concepts and strategies through cognitive-based capabilities

## Approach Goals

- Conceptualize an ecosystem of
  - cognitive-based tactics and their unique force multiplier methodologies involving:
    - Exploiting cognitive vulnerabilities creating strategic advantage from their targets

# UNDERLYING SYSTEMS FOR COGNITIVE WARFARE CAPABILITIES

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## Cyberspace

- Mainly the internet; the local-to-global technology and infrastructure connections of computerized technologies and infrastructures facilitating online access points and controls:
  - managing data and affecting the digital infrastructures of critical information and communication assets and systems.

## Infosphere

- Global information infrastructure and environment fusing the world's communications/social networks, databases, and sources of information into a vast, intertwined and heterogeneous network of electronic interchange. managing data and affecting the digital infrastructures of critical information and communication assets and systems.
  - This includes knowledge and accessibility of tools and advanced technologies to navigate, manipulate and accumulate with the Noosphere, Infosphere and Cyberspace.

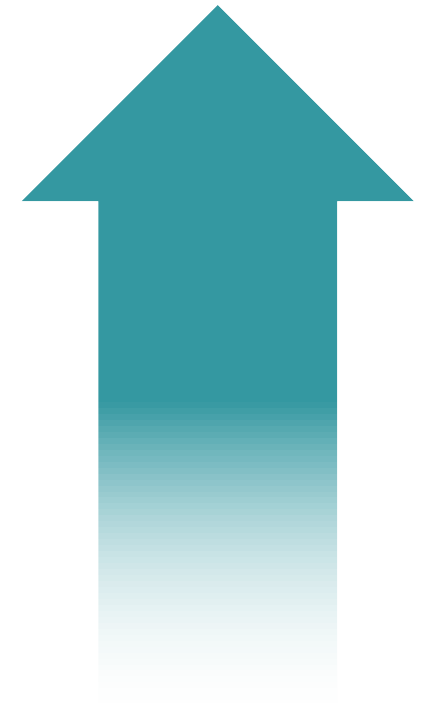
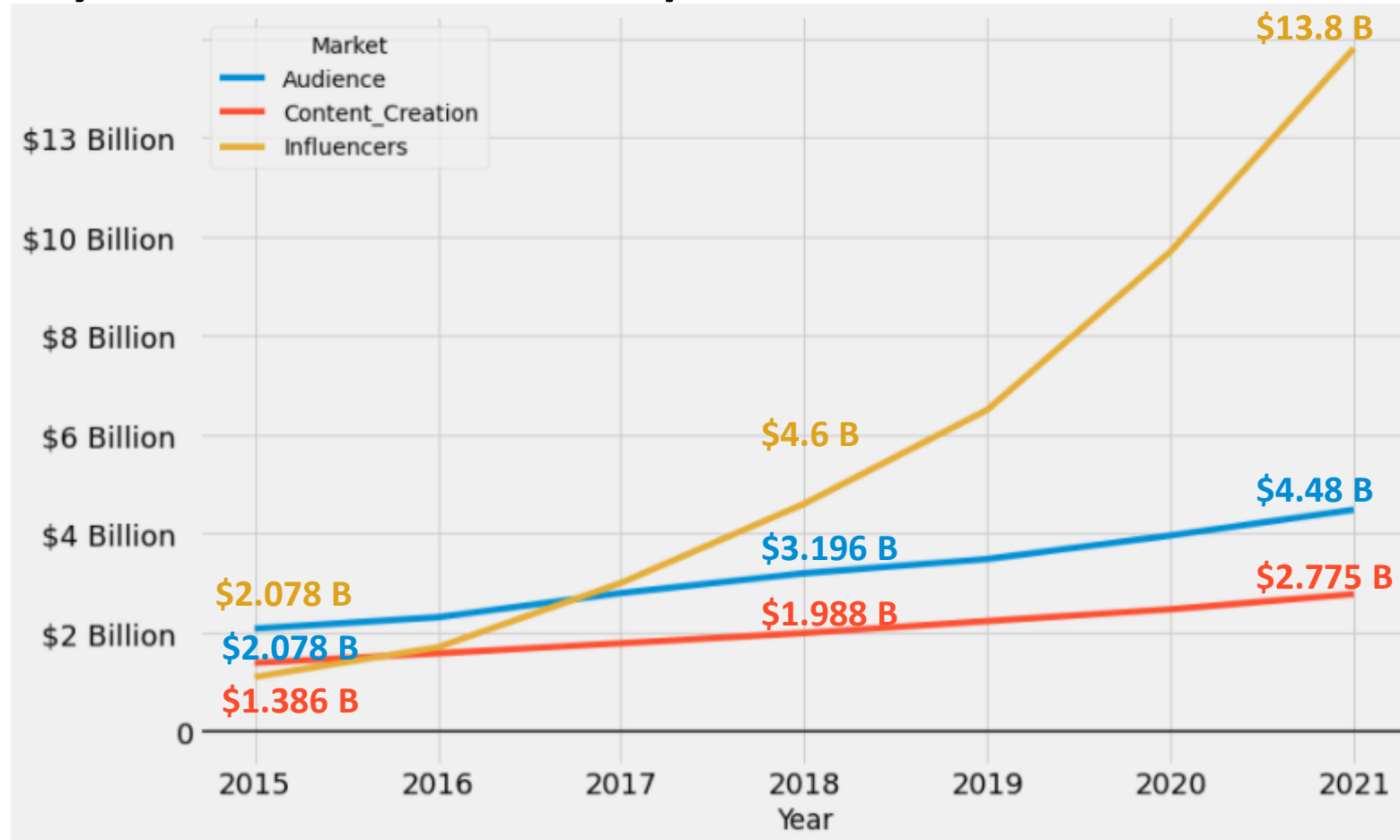
## Noosphere

- Collective organization of actionable human ideas/opinions, pervading Cyberspace (or local systems\*) through connected social and information networks This includes knowledge and accessibility of tools and advanced technologies to navigate, manipulate and accumulate with the Noosphere, Infosphere and Cyberspace.

*\*Systems: factors (or variables), relationships among factors, and contexts that affect both such as terrain, industries, population density (urban, rural), shared history, formal and informal power structures, religion, and ethnicity)*

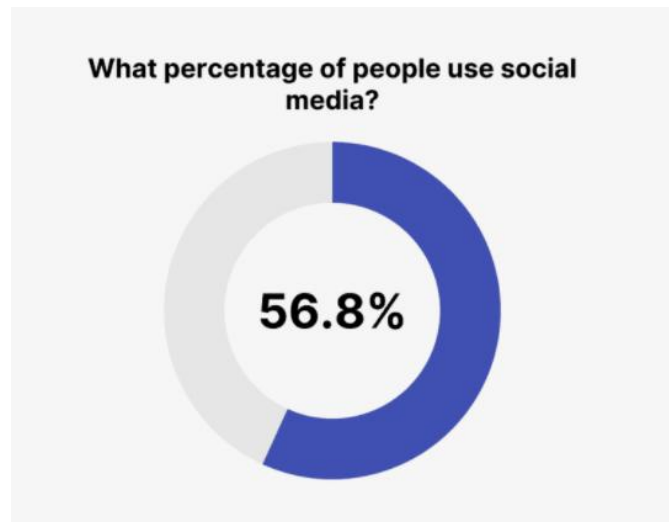
# TREND 1: AUDIENCE ACCESSIBILITY, CONTENT CREATION TOOLS, & INFLUENCERS

## Key Threat Actor & Landscape Growth Trends



# TREND 1: AUDIENCE ACCESSIBILITY, CONTENT CREATION TOOLS, & INFLUENCERS

## Quantifying the Scale of Potential Audience



### Key Statistics:

- **4.48 billion** people use social media worldwide
- **56.8%** of the world's population is active on social media when looking at eligible audiences aged 13+ years, rising to 82% in North America
- Out of **7.87** billion people in the world, **56.8%** of the population use social networks, regardless of age or internet access
- Out of **4.8** billion internet users, **93.33%** are active users
- Out of **5.27** billion unique mobile phone users, **85%** are active users
- Out of **4.48** billion social media users, **99%** access the websites or apps through a mobile device

### Top 6: Growth of social media users by country

1. India, with 130 M new users joining
2. China (15 M)
3. Indonesia (12 M)
4. Brazil (11 M)
5. Iran (9.4 M)
6. USA (6.9 M)

### Growth of social media users by region 2019-2020:

1. North America: **+6.96%**
2. South America: **+8.00%**
3. Europe: **+4.32%**
4. Africa: **+13.92%**
5. Asia: **+16.98%**
6. Australasia: **+4.9%**



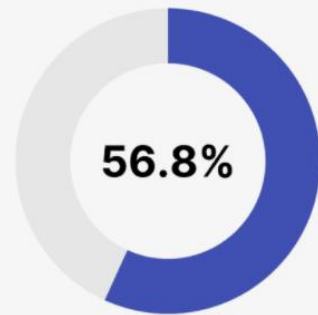
Developing countries **increasing in internet and smartphone adoption**—an indicator for future growth of social media

### Data-powered Noosphere

- Reflects the sphere of connected human thought
- Social platforms and networks provide this connection

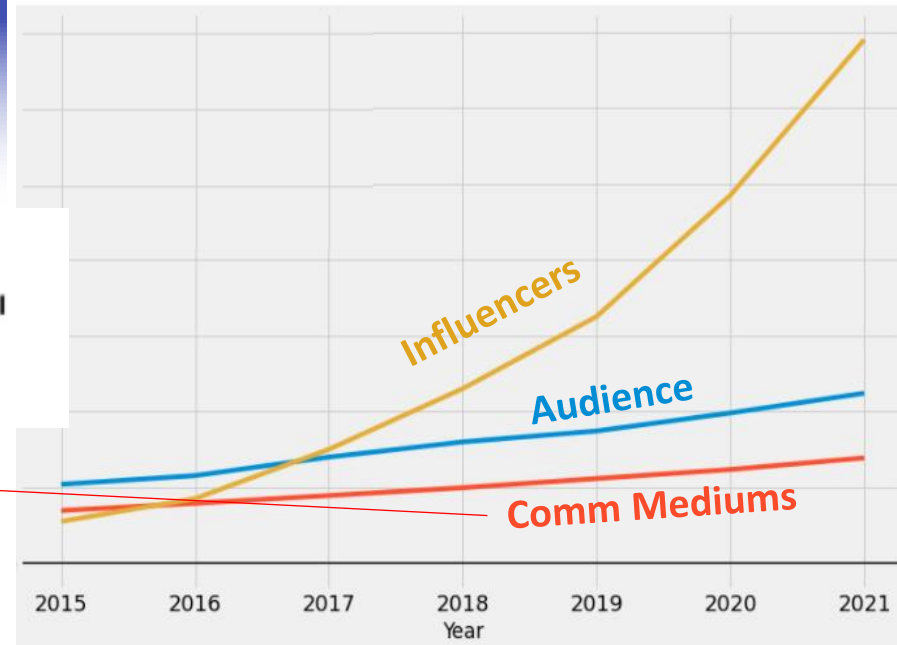
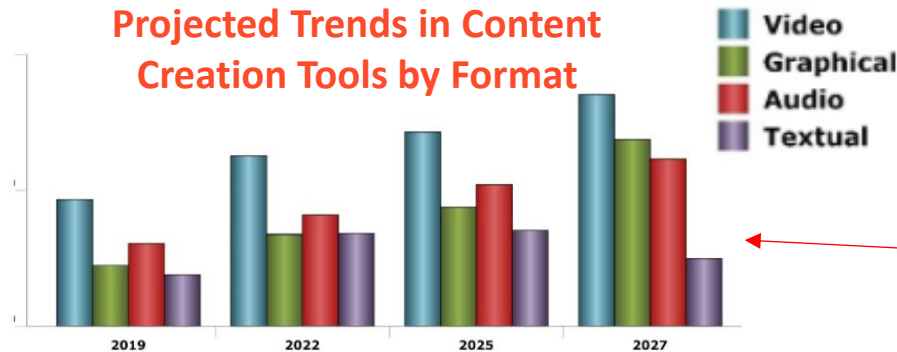
# TREND 1: AUDIENCE ACCESSIBILITY, CONTENT CREATION TOOLS, & INFLUENCERS

What percentage of people use social media?



**AUDIENCE GROWTH**  
National  
Regional  
International

**Projected Trends in Content Creation Tools by Format**



The noosphere fabric consists of

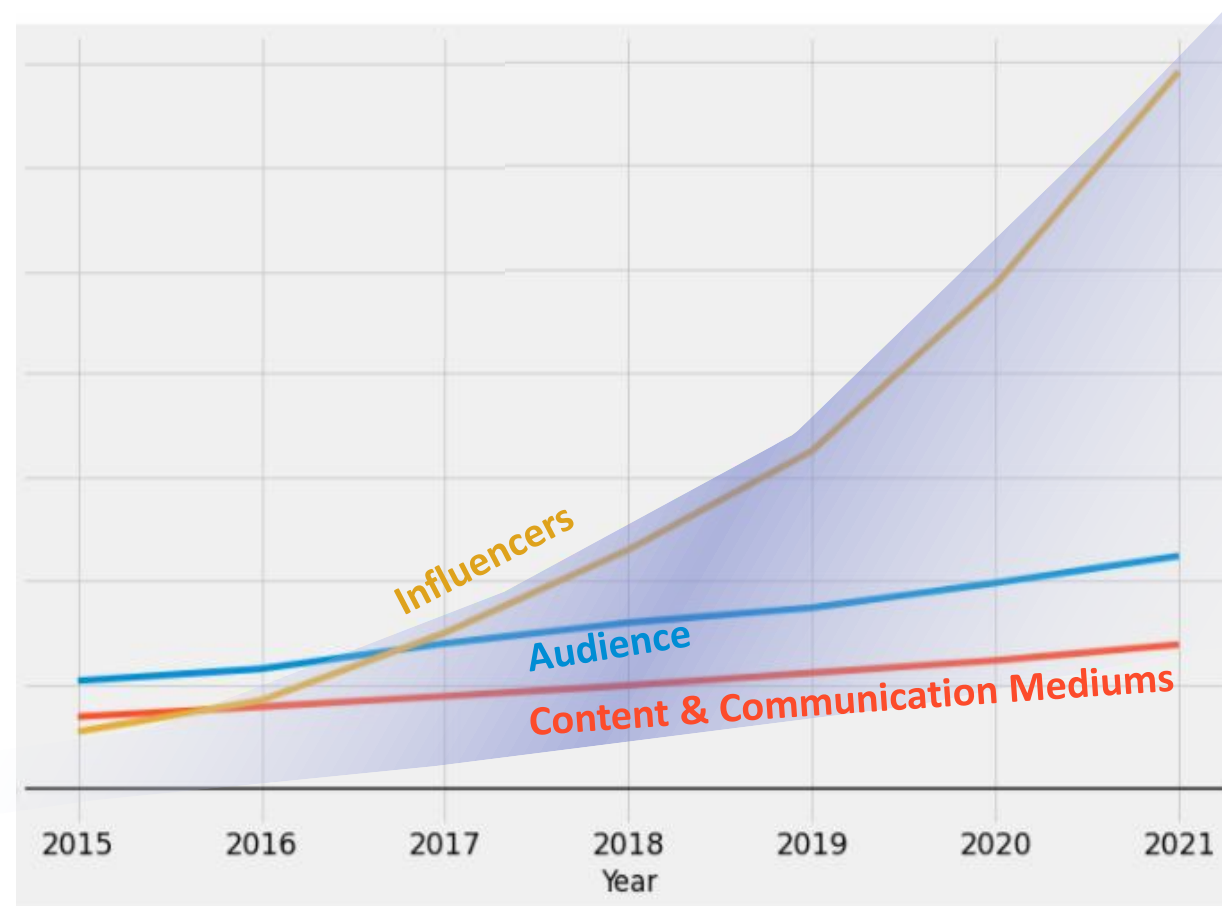
- Audience
- Influencing Environment
- Communication mediums and Perceptual stimuli

Open and Social Infrastructure

- These embedded platform attributes promote:
  - openness
  - interactivity and
  - Community
- This is a worldwide phenomena

# TREND 1: AUDIENCE ACCESSIBILITY, CONTENT CREATION TOOLS, & INFLUENCERS

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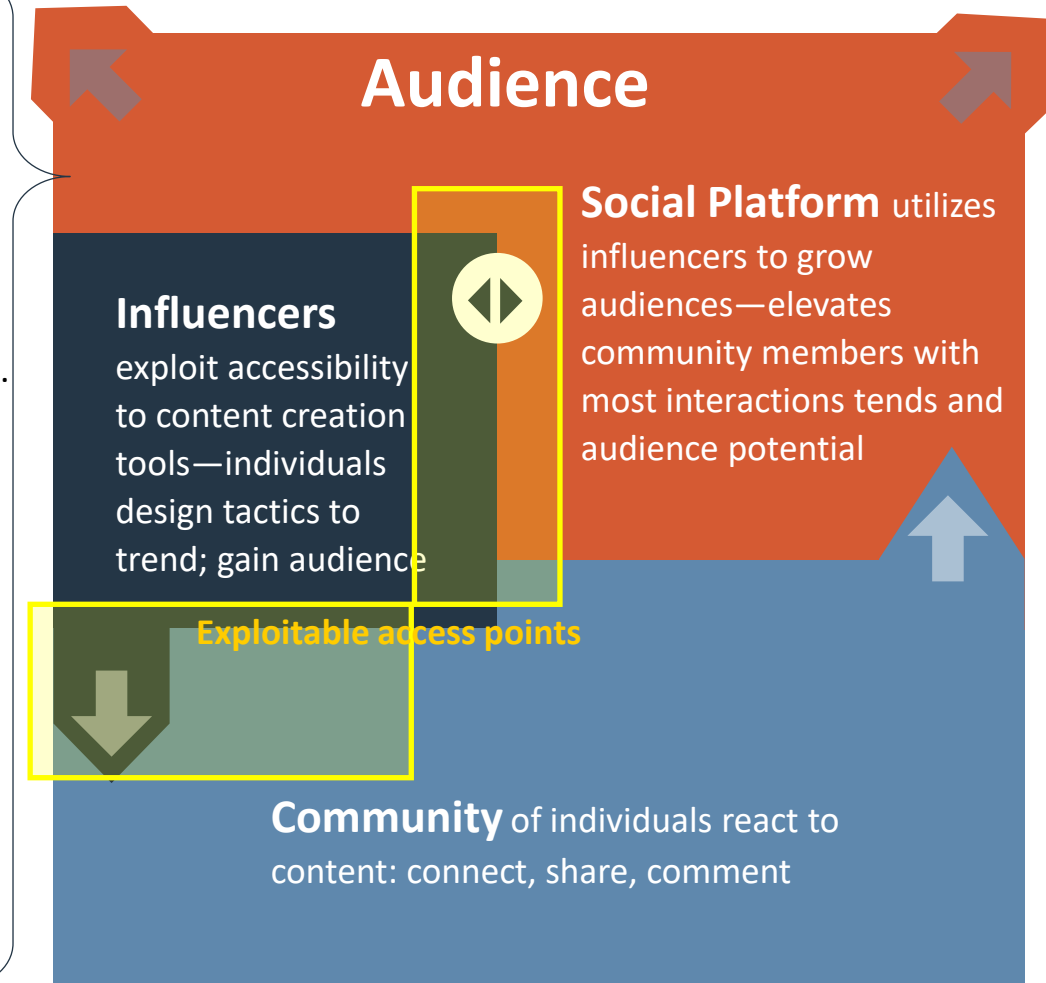
# UNDERLYING COMMUNICATION MEDIUMS & EMERGENT CAPABILITIES

## Growth between communication mediums (text audio video) and audience environment

- Platforms designed to grow audiences,
  - Influencers craft strategic multimedia designs to flood perceptual stimuli, capturing cognitive attention—inviting interaction and participation
    - Active participation procures and produces data
      - The individual communicates the influencer messages, building own social structures—extending audiences, networks and groups.
        - Platform encodes Interactivity with individuals and groups processing the stimuli as feedback
    - Compares current and past reactions to similar perceptual and emotional stimuli; selecting certain narratives to ingest
      - Builds personalized recommendations

## Embedded Cognitive Elements create Exploitable Cognitive Access Points

- Cyclical relationship: content creation tools, scalable audience and influencer
  - Could be exploited as a powerful framework for behavior shaping capabilities---'make everyone a weapon'



# COGNITIVE WARFARE & EMERGENT CAPABILITIES

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- Adversaries (both domestic and abroad) are growing more complex and harder to detect,
  - **Leads to the next trend:**

**Complexity of the Cognitive Warfare threat landscape and operations is increasing**

- ***Cognitive warfare attack operations, techniques, technologies and potential terror acts/actors are emergent***

# TREND 2: INCREASING COMPLEXITY OF COGNITIVE WARFARE CAPABILITIES

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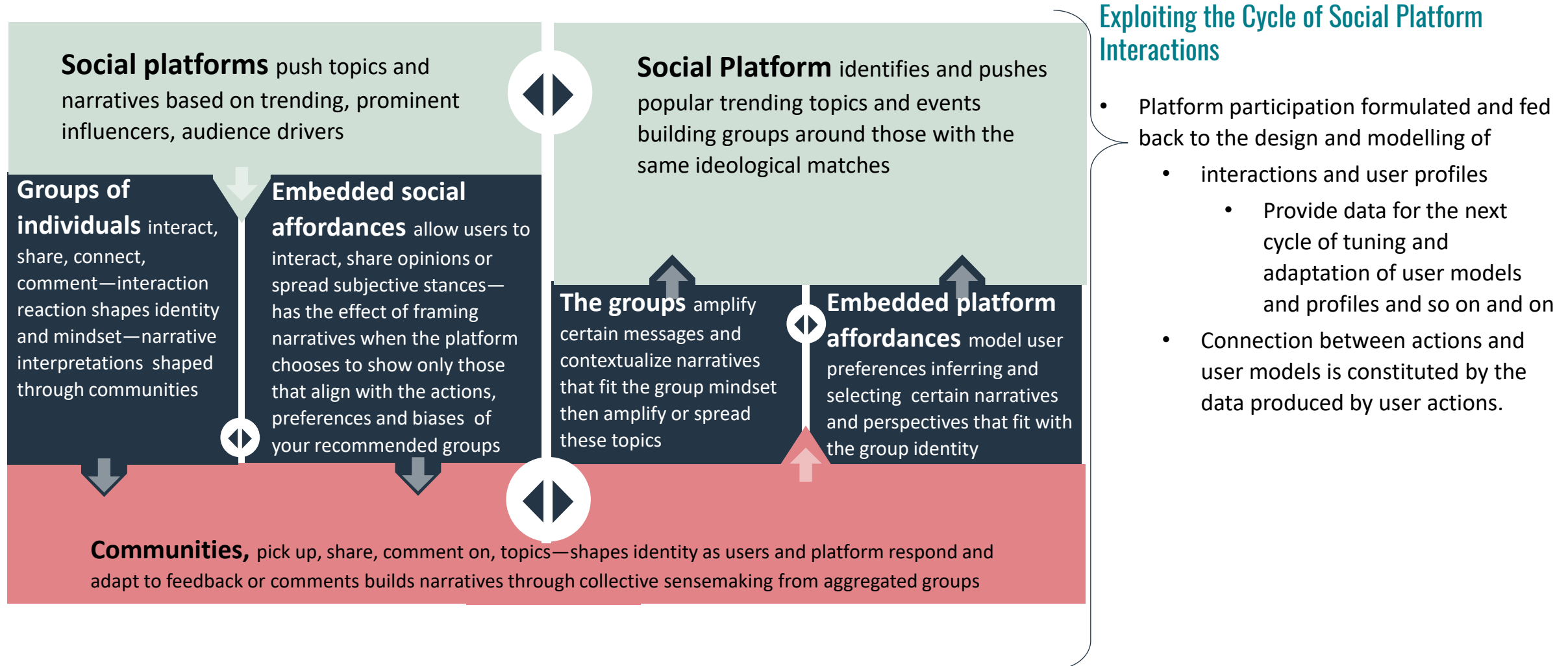
## Noosphere: An infrastructure of social affordances

- Individuals engage in the basic social interactions of action and communication
  - Establish rules and roles.
- Platform and connected networks abstract these interactions into a few standardized inter-action categories:
  - [1] Following, [2] sharing, [3] liking, [4] tagging, [5] commenting, [6] uploading

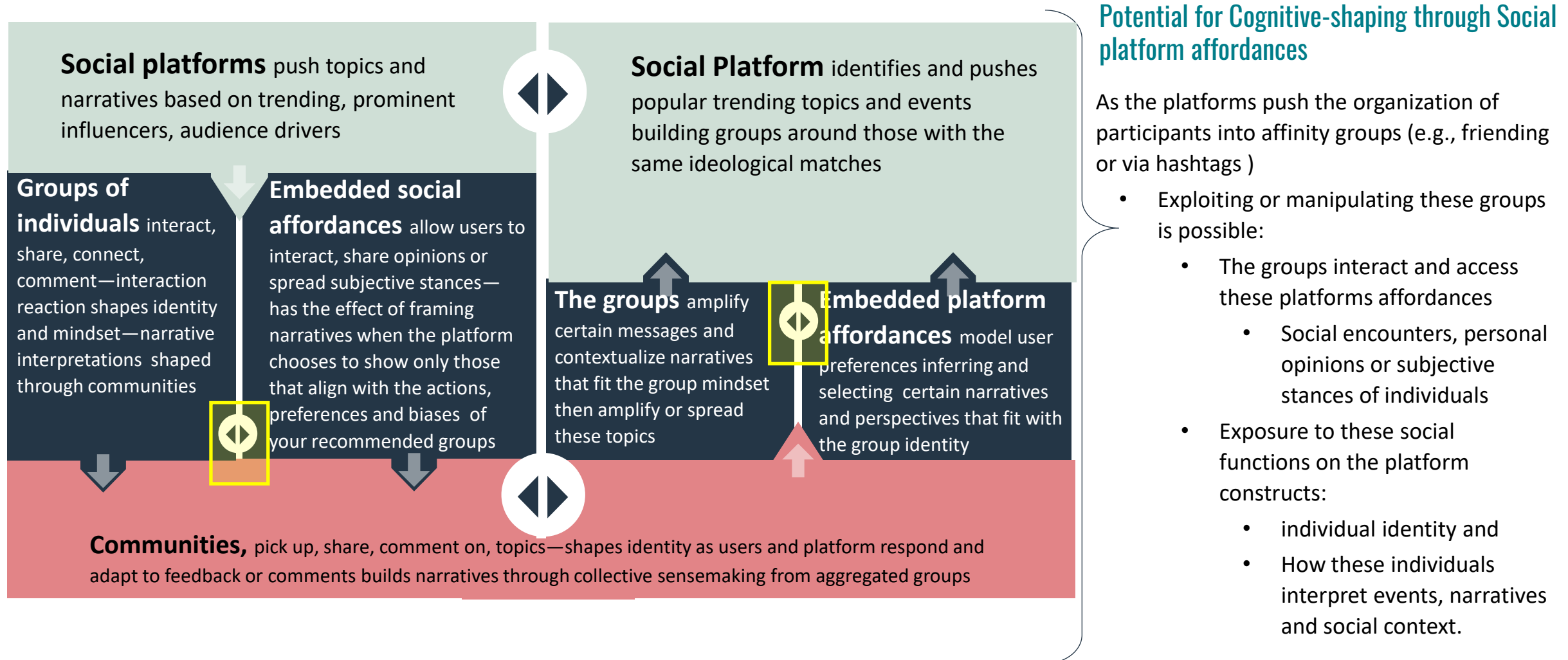
## From Individuals to groups through Data

- Interactions [1-6] produce data
  - Scored, measured, and compared—similar patterns cluster into collectives as new classifying groups
    - The groups are aggregated further as the platform suggests recommendations by assessing new interactions and preferences
    - Social exchanges that underlie the interactions constantly **construct**, **reassert** and **validate** social roles and behavioral expectations
      - Contribute to shaping motivations and identity of individuals and groups
        - In turn Individuals construct their own identity from interactions with others--understand social contexts in terms of the roles they acquire by interacting within certain communities, and groups

# RELATIONSHIP OF SOCIAL PLATFORM AFFORDANCES & CW CAPABILITIES

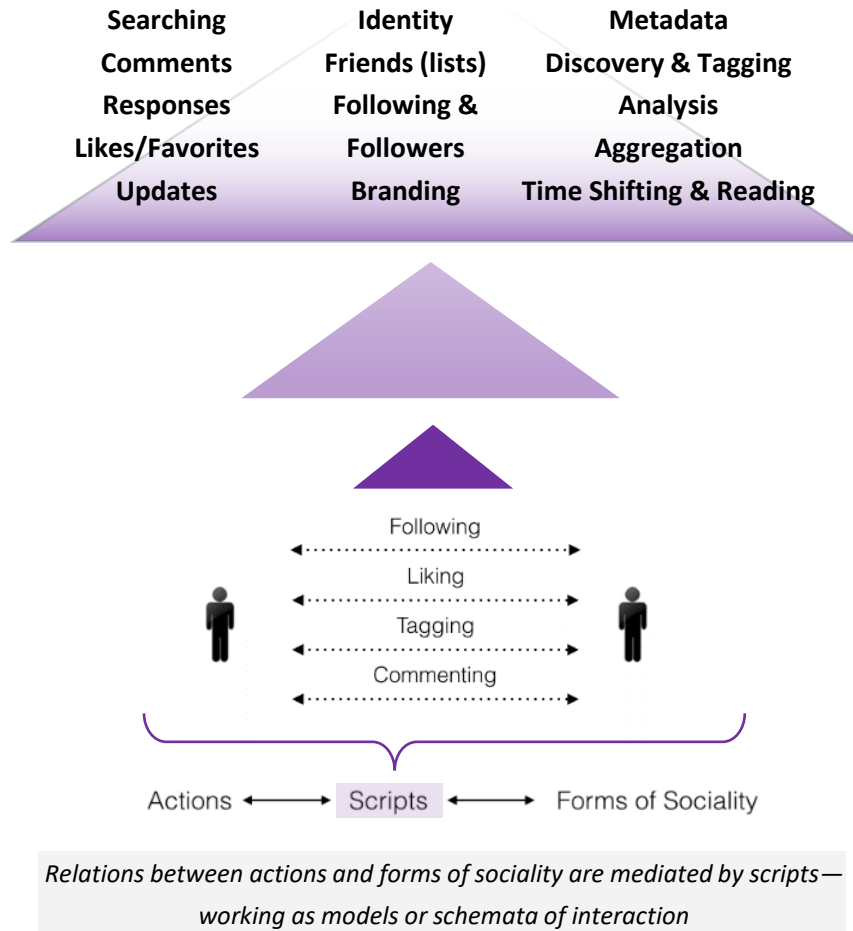


# RELATIONSHIP OF SOCIAL PLATFORM AFFORDANCES & CW CAPABILITIES



# THE COGNITIVE GRIDS UNDERLYING COGNITIVE WARFARE CAPABILITIES

## Some Embedded Social Affordances



## Individuals orient their behavior collectively

- Groups use the embedded social affordances on the platforms to build community and interact. The platforms monitor the group dynamics to recommended topics or content the group prefers seems to prefer
  - Incidentally framing many narratives and omitting points of view as the group receives topics and content—setting their agenda

## The Noosphere Vulnerability is embedded into Social Infrastructure

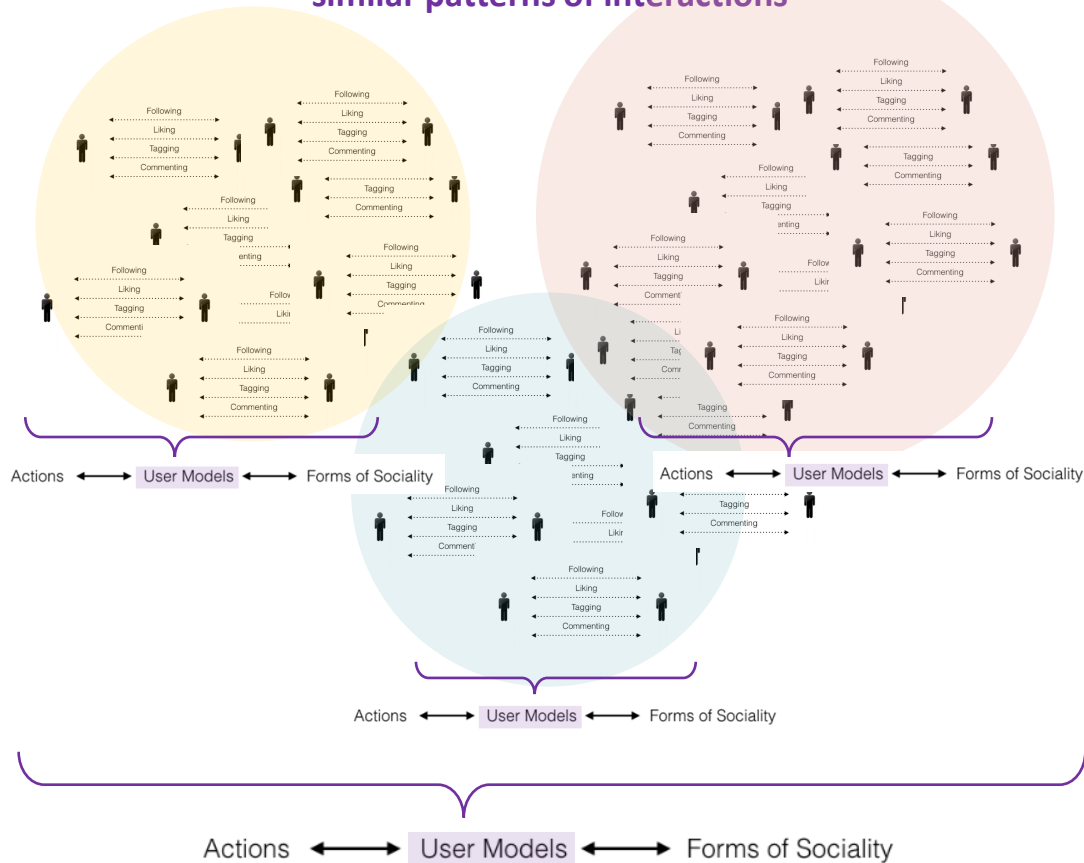
designs Platforms encode the pattern of scripts and interactions to facilitate feeding content—whether from group members or the platforms themselves to keep engagement and optimize the social experiences

## Platforms social infrastructure is supported by cognitive grids

- The scripts guide action and serve facilitating social interaction
- Scripts working as cognitive models or schemata of interaction,
  - Patterns of following, liking, commenting mediate relations between actions and forms of sociality
- The platforms seek to cluster individuals with similar patterns

# THE COGNITIVE GRIDS UNDERLYING COGNITIVE WARFARE CAPABILITIES

Platforms facilitate modelling, grouping and growing similar patterns of interactions



## Cognitive behavior grids take Groups to Echo Chambers

- As group members apply these scripts to navigate the platforms and build community, the platform streamlines the process of showing only what individuals might want to see.
  - This can lead to **echo chambers**
    - Serving to strengthen the passages of context and messages sent between group members

## Cognitive grids can shape group interpretation of narratives

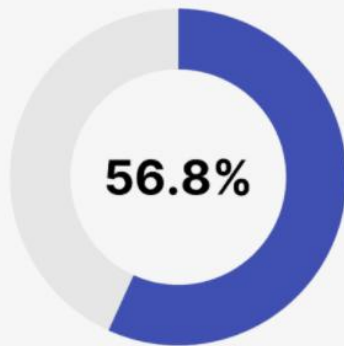
- By applying scripts, individuals link interactions to:
  - established expectations, rules and roles and
  - contribute to shaping forms of sociality

## Platforms reproduce the relations between actions, scripts and forms of sociality

- In this way the mind is completely engaged in this realm and is open to receiving the same feelings of community and meeting social needs as in the real world
  - This creates a key cognitive vulnerability

# THE GROWTH OF CONNECTED AUDIENCES SCALES COGNITIVE HACKING

What percentage of people use social media?



**Massive Connected Audiences Amplify Impact (and threat) of successful Cognitive Operations**

## The Cognitive-grids (scripts) modulating behavior are flexible

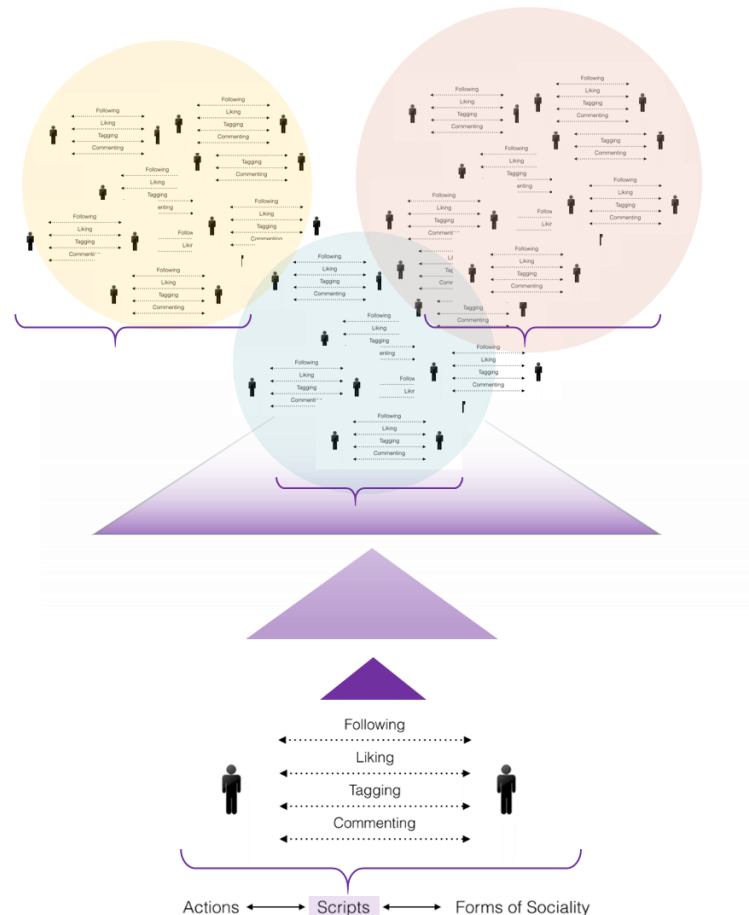
- The platforms accommodate individual interpretations and adjust to information as it is presented within collectives.
  - Facilitates and encodes certain ways of interpreting narratives, information, and behavior within groups
  - Everything is not one-sided; the platforms allow organic groups to form---content creators are elevated for contributing and growing the community
    - *doing their own research,*
      - finding meaning in circumstances and building their own stories to reshare with the group as insight

## Vulnerable to motivated adversaries or opportunists

- Consider priming the infrastructure with strategic pieces of information
  - The embedded infrastructure can take these messages and reweave the connections between action, scripts and forms of sociality
    - Hacking the platform's social affordances to shape participation
  - Exploit the imprinting of daily interaction and communication within platform
    - Habits, mindsets and relationships honed online translate audience behavior to IRL processes: such as category making, social influence and decision making---where the real impacts of Cognitive warfare



# EMERGENCE IN COGNITIVE WARFARE CAPABILITIES



Personalized modulation provides constant, implicit suggestion of how to think

- Dominating social and structural forces at the mindset.

Strategically generated content can acquire particular importance

- By being systematically fed back to the group members
  - as personalized behavioral suggestions.
- If the can trend, then there's a chance it could take hold and initiate mindset change at scale
  - Such threat complexity--of this and other activities cannot be detected or curtailed in a reasonable way
    - They are emergent
  - Stemming from the social affordances embedded within the infrastructure of the social platforms and connected networks.

Cognitive Warfare capabilities

- Next section introduces capabilities (cognitive bias vulnerabilities) that could find their way into cognitive warfare operations,
  - *Because* they exploit these cognitive access points within the Noosphere.

# COGNITIVE BIASES: THE ACCESS POINT TO COGNITIVE WARFARE CAPABILITIES

## The Errors behind judgements and decisions

- Routinely rely on approximations, heuristics, and rules of thumb—even when not consciously aware of these strategies.
- The errors, limitations or gaps in these decision-making strategies,
  - Resulting from uncertainty manifest as cognitive biases.
- Wikipedia lists 176 known cognitive biases

## Structuring and categorizing biases for operational use

- Organized cognitive biases through a similar operational perspective proposed by Dimara et. al, and categorized by the operations, assessments and decision tasks individuals were performing when the bias was observed

## Operational Attributes for Biases to Assess Cognitive-based Capabilities

- **Subcategories and attributes:** reflect similarities among biases and which biases connect to CW operational goals

- 1) **Association**, where cognition is biased by associative connections between information items
- 2) **Baseline**, where cognition is biased by a comparison with what's perceived as a baseline
- 3) **Inertia**, where cognition is biased by the prospect of changing the current state

- 4) **Outcome**, where cognition is biased by how well something fits an expected or desired outcome
- 5) **Self perspective**, where cognition is biased by a self-oriented viewpoint

Level 1 Basic Operations within CW capabilities	Level 2 Varieties of Cognitive Bias Categories the operations are open to		Level 3 Cognitive Function impact from biases
ESTIMATION	Association Baseline Inertia	Outcome Self-perspective	
DECISION	Association Baseline Inertia	Outcome Self-perspective	
HYPOTHESIS ASSESSMENT	Association Outcome		
CAUSAL ATTRIBUTION	Outcome Self-perspective		
RECALL	Association Baseline Inertia	Outcome Self-perspective	
OPINION REPORTING	Association Baseline Inertia	Outcome Self-perspective	
OTHER	Association Baseline Outcome		

decision-making

memory & learning

fatigue & alertness

trust & empathy

cognitive speed

impulse control

movement & performance

wake-sleep cycles

mood, anxiety, self-perception

















# COGNITIVE BIASES: THE ACCESS POINT TO COGNITIVE WARFARE CAPABILITIES

## Convolution of Content generation tools and massive available audiences as emergent threat

- **Example:** generate strategic content messages then let the modulating behavior of the social platforms distribute it to the aggregated groups
  - The combined effects of perceptual stimuli and resulting interactions with others
    - shape the approximations and heuristics, for future decision making regarding the topics of the content message,
  - The exploited cognitive biases shapes how the target likely interprets and reacts to future exposure to those topics

## Mapping biases to capabilities to identify and visualize patterns between capabilities

- Capabilities exploit biases and can be organized into operational or decision-making task categories to profile a capability
  - Capabilities composed of generalized operations

Level 1 Basic Operations within CW capabilities	Level 2 Varieties of Cognitive Bias Categories the operations are open to		Level 3 Cognitive Function impact from biases
ESTIMATION	Association Baseline Inertia	Outcome Self-perspective	
DECISION	Association Baseline Inertia	Outcome Self-perspective	
HYPOTHESIS ASSESSMENT	Association Outcome		
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RECALL	Association Baseline Inertia	Outcome Self-perspective	
OPINION REPORTING	Association Baseline Inertia	Outcome Self-perspective	
OTHER	Association Baseline Outcome		
 decision-making			 memory & learning
 trust & empathy			 cognitive speed
 movement & performance			 fatigue & alertness
			 wake-sleep cycles
			 impulse control
			 mood, anxiety, self-perception

# COGNITIVE WARFARE CAPABILITIES: DIRECT VS INDIRECT METHODS

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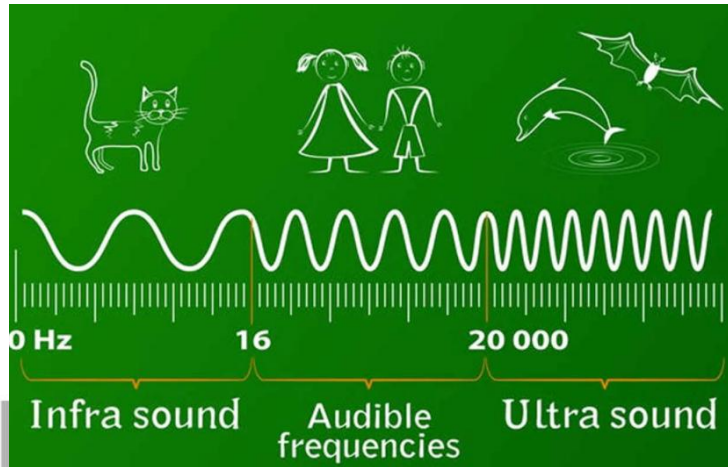
## Direct

- Capabilities with a direct effect on neuro-processes also have the potential to embed into the social infrastructure of the noosphere.
  - Bottom-up effect—affected biological structures result in affecting higher level cognitive processing

## Indirect

- Capabilities with an indirect effect on neuro-processing, include behavior and cognitive modulating social interactions or personal experiences.
  - Top-Down effect—Engaging in repeated certain higher level cognitive processing behaviors has the effect of shaping behavior and at some level the associated neural pathways

# COGNITIVE WARFARE CAPABILITIES: BRAIN STIMULATION



## Direct Method

### How Does TMS Work?

TMS uses a focused electromagnet to rapidly pulse a magnetic field to the targeted area. The magnetic pulses induce an electrical current in the brain, stimulating the cells into activity



### Transcranial Magnetic Brain Stimulation may enhance memory

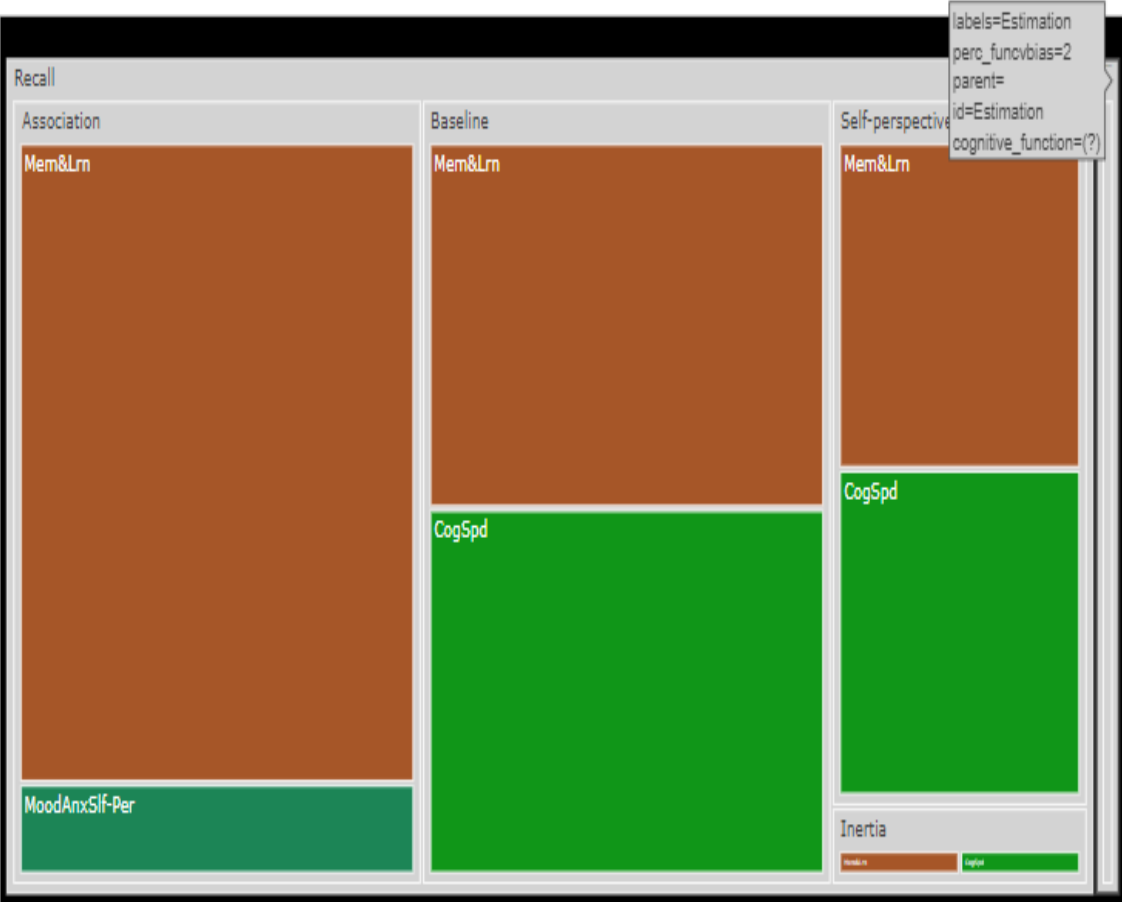
- Low-frequency magnetic stimulation of a particular part of the brain enhances the formation of episodic memory
  - People's capacity to form new memories of events in their lives,
- New way to boost episodic memory, using magnetic pulses.
- May reflect a change in the balance between nervous stimulation, or "excitation," and inhibition.
- Stimulation of a certain area seemed to have tipped this balance towards more inhibition, which seems beneficial for memory encoding

### Low Frequency (Infrasound)

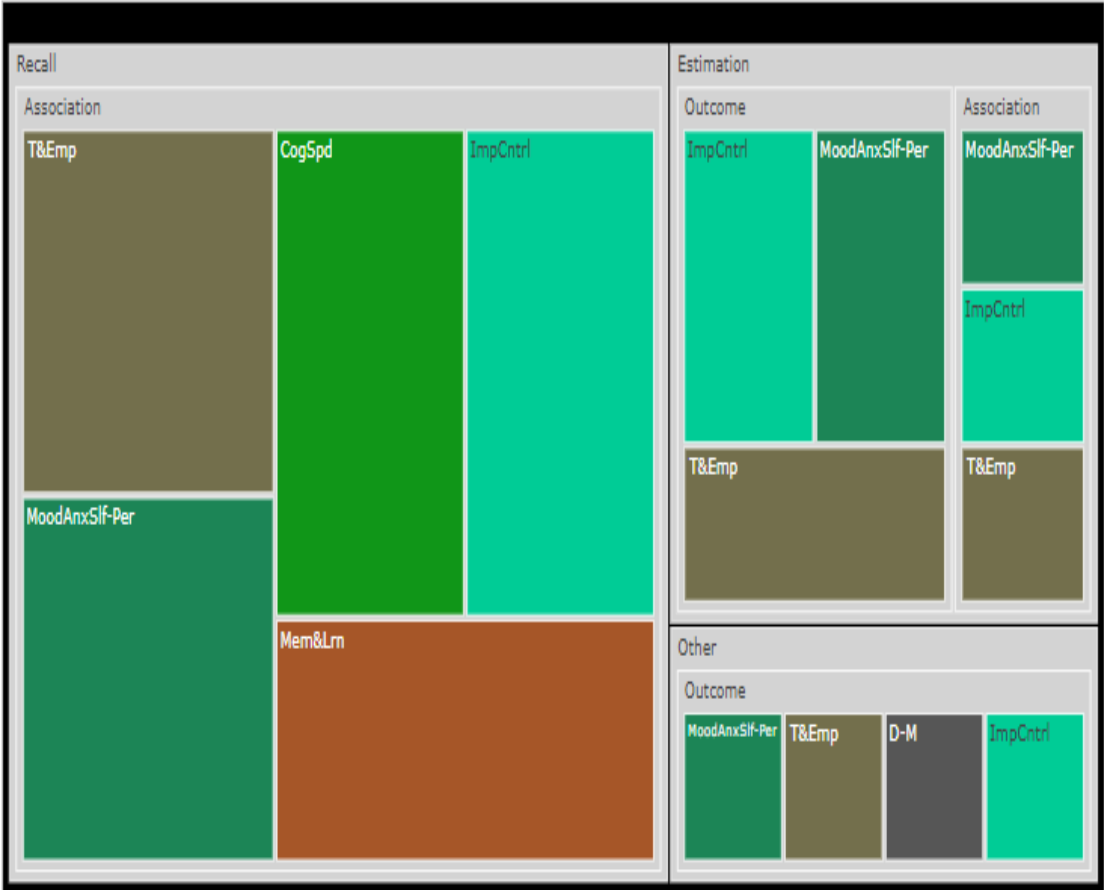
- Acoustical factors elevate stress affecting changes of cognitive and physiological parameters
- Known to amplify emotions associated with stress and uncertainty (fear, anxiety, paranoia)

# COGNITIVE WARFARE CAPABILITIES: BRAIN STIMULATION

Direct Cognitive Warfare Capabilities:  
Transcranial Magnetic Brain Stimulation

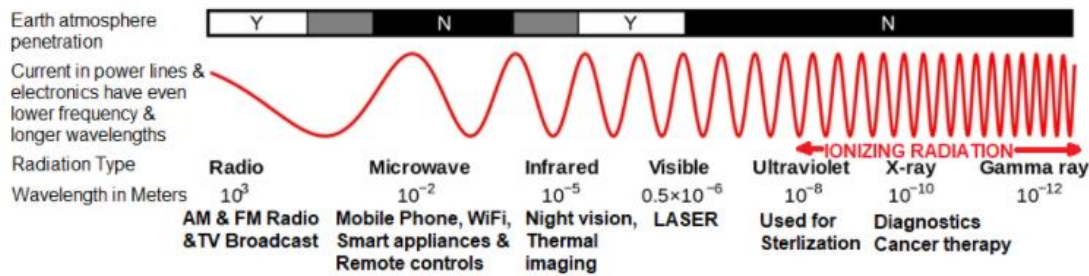


Direct Cognitive Warfare Capabilities:  
Infrasound exposure



# COGNITIVE WARFARE CAPABILITIES: DIRECTED ENERGY ATTACKS

## Direct Method



## Widescale use of electronics to carry out a neuro attack

- Hearing noises, pressure in their ears, followed by symptoms:
  - headaches, vertigo, dizziness and loss of cognitive functions.
- After exposure, objective findings of balance disorders on 100 percent of the 25 victims
- Report states several possibilities:
  - drugs alone was deemed “unlikely.”
  - Ultrasonic (acoustic) exposures judged “very possible and likely.”
  - Electromagnetic pulsing also rated “very possible and probable.”
  - Microwave energy was deemed possible, but “unlikely.”
  - Pulsed lasers—Near infrared lasers penetrate far into the head all of the above weapons can produce cavitation in fluids and can produce these effects

## Threat of Lobotomies at a distance

- Targeting the brain regarding its structure and functions, (e.g., **cognitions, emotions and behaviors**) —
  - Disrupts on a variety of scales from systems in the individual to systems in the social and political
  - **Current state of technology not subtle; physical effects noticeable**



# COGNITIVE WARFARE CAPABILITIES: DIRECTED ENERGY ATTACKS

## Direct Cognitive Warfare Capabilities: Directed Energy Attacks





# COGNITIVE WARFARE CAPABILITIES: COGNITIVE TUNNELING

## Indirect Method



### Fixation to manage complexity or changes

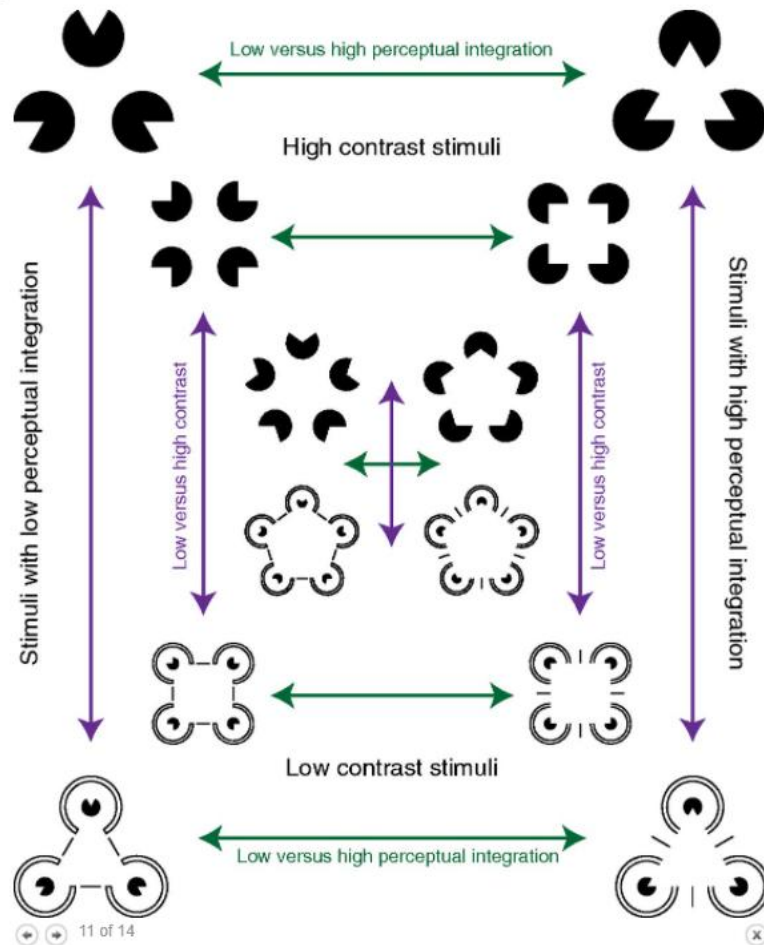
- **Cognitive Tunneling:** Tendency to remain fixated on initial hypothesis,
  - Or when an operator becomes fixated on one ongoing task in a scene of many.
- **Attentional tunneling:** Related phenomena where people exhibit changes in behavior or decision-making associated with the way a problem or situation is described,
  - Even though the underlying environment is still the same
- **The framing effect** is all about how people view information and can lead to cognitive or attentional tunneling.
- Too much, or too rapid switching can destroy task continuity
  - (Even as too few and too slow switching can create unwanted cognitive tunneling).

# COGNITIVE WARFARE CAPABILITIES: COGNITIVE TUNNELING

## Indirect Cognitive Warfare Capabilities: Cognitive Tunneling



# COGNITIVE WARFARE CAPABILITIES: PERCEPTUAL/SENSORY OVERFLOW



## Indirect Method

### Fixation to manage complexity or changes

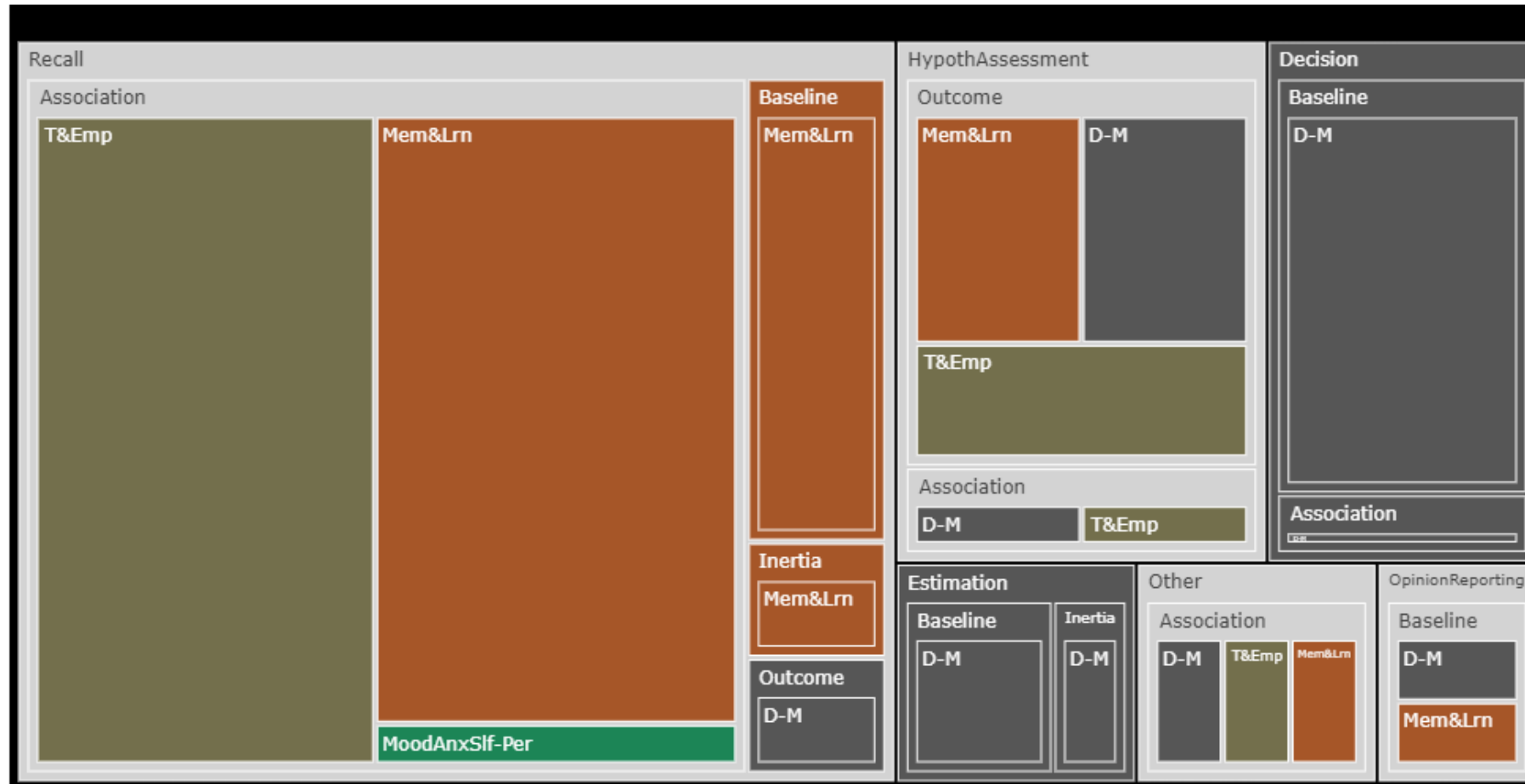
- Diverse array of stimulatory triggers for the brain to begin perceiving.
  - Brain receives 11 billion bits of sensory information from all the senses
    - when it can only process, at most, 50 bits per second
- From the overflow of information, the brain needs to adjust; shortcuts gather the most central and relevant information as quickly as possible,
  - As cognitive access to the scene content is limited when compared to the full sensory scene taken in.
  - This could manifest in phenomena of **attribute amnesia** (context is known but the details aren't quite clear).
- To resolve gaps as sensory input is optimized, humans may resort to appealing to a type of "internal imagery" to recover the information.

### Sensory/perceptual overflow Vulnerability

- Sensory/perceptual overload, can exploit cognitive access points or vulnerabilities to information of interest
  - Dominate what is encoded because if only a select set of elements are available to cognitively access at a time
  - Ensure a probability that the information you want the target accessing is near the top

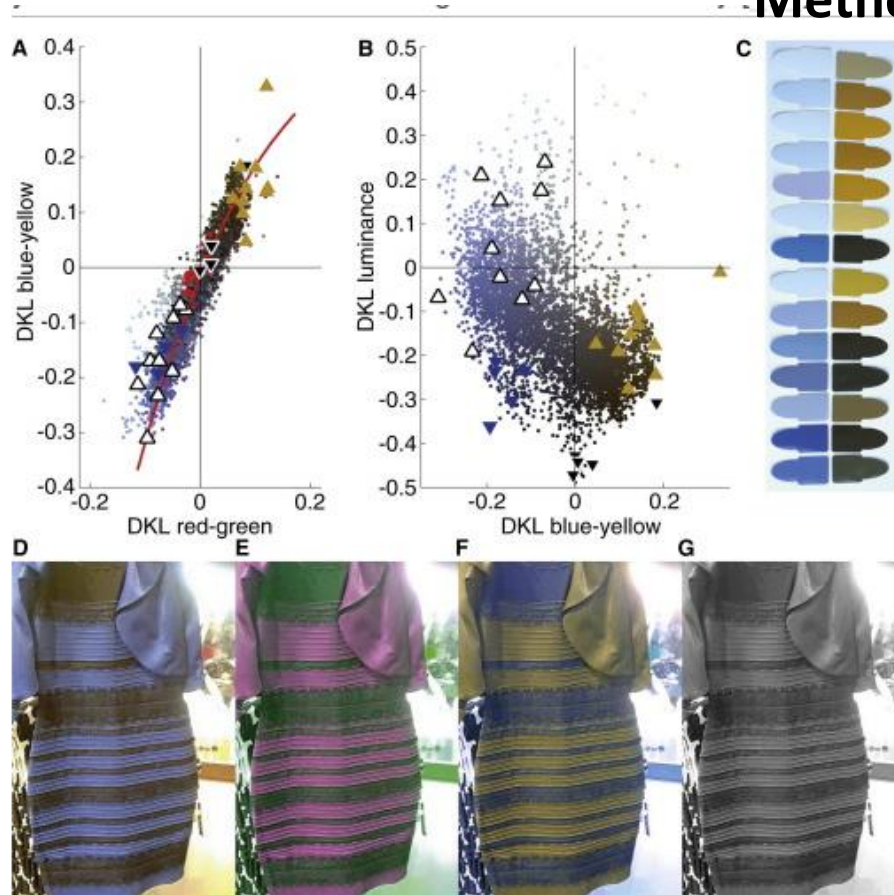
# COGNITIVE WARFARE CAPABILITIES: PERCEPTUAL/SENSORY OVERFLOW

## Indirect Cognitive Warfare Capabilities: Perceptual/Sensory Overflow



# COGNITIVE WARFARE CAPABILITIES: CONTROLLED ATTENTION/HALLUCINATION

## Indirect Method



## Mechanisms behind resolving details from attribute amnesia

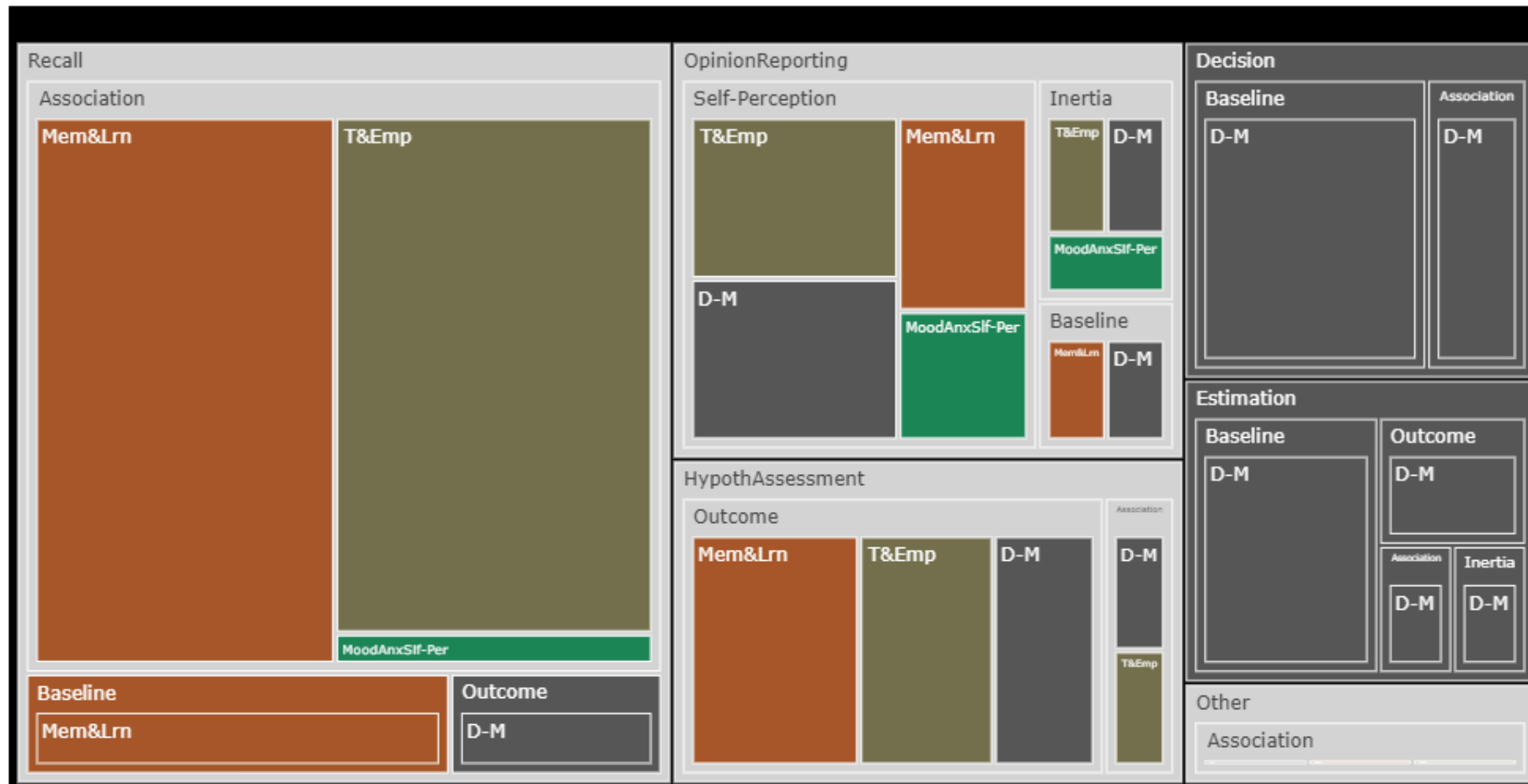
- The mechanisms behind resolving details from attribute amnesia via perceptual/sensory overflow relate to: **controlled attention/hallucination**
- Sensory overflow forces the brain to infer and construct details of the external world from ambiguous inputs (because the full range of details is not cognitively available)---
  - The brain always builds models of the world to explain and predict incoming information;
    - it updates these patterns when the prediction and experience we get from our sensory inputs diverge.
- The entirety of perceptual experience is a neural fantasy that remains linked to the world through continuous making and reworking of better perceptual assumptions, **controlled hallucinations**.
  - Some think we exist in a per hallucinate all the time. It's just that when we agree on our hallucinations, that's what we call reality.

## State of Persistent Hallucination

- This is another opportunity to hijack cognitive access points and dominate this cognitive cycle (inferring reality via arriving information)
  - Embed the context or insight you want in your target to access, at the forefront of their mindset

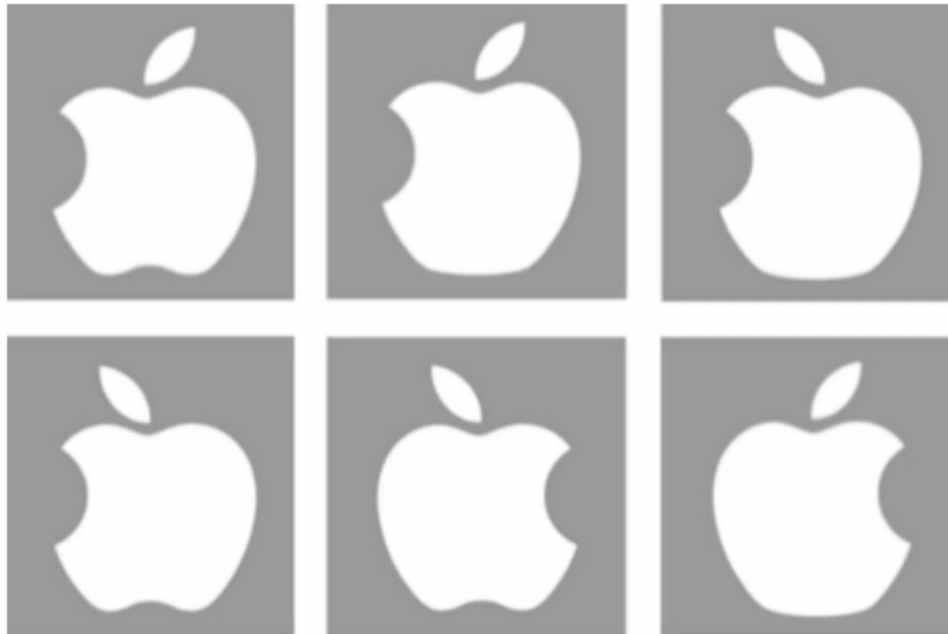
# COGNITIVE WARFARE CAPABILITIES: CONTROLLED ATTENTION/HALLUCINATION

## Indirect Cognitive Warfare Capabilities: Controlled attention/hallucination



# COGNITIVE WARFARE CAPABILITIES: ATTENTIONAL SATURATION

*Which is correct?*



**Scientists say people are terrible at remembering what the Apple logo looks like**

By Rich McCormick | Mar 11, 2015, 1:19am EDT  
Via Fast Co Design | Source The Quarterly Journal of Experimental Psychology

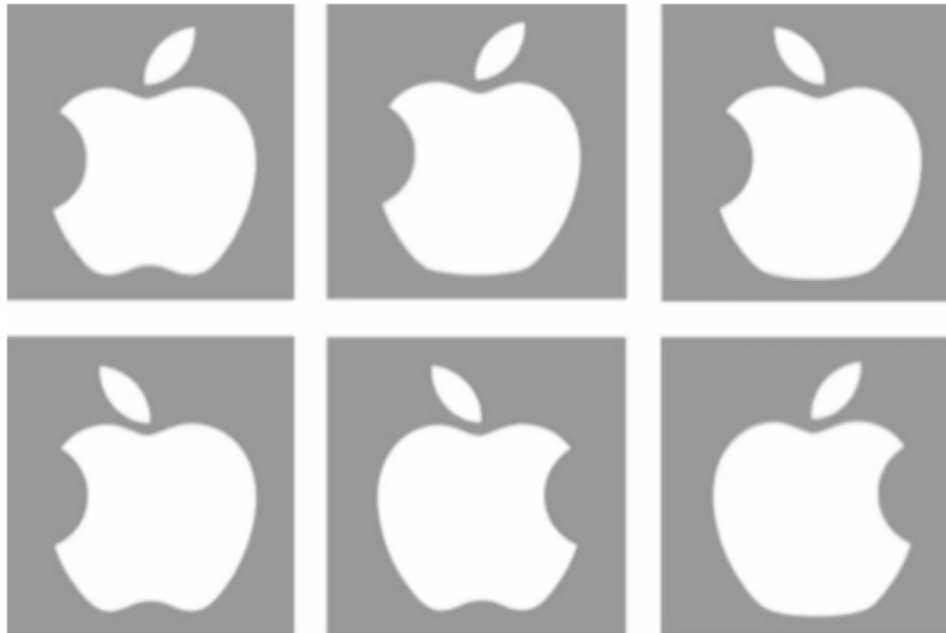
## Indirect Method

**We are largely unaware of everyday perceptual phenomenon**

- We see cars, phones, houses all the time, but do we notice them?
  - When we see things very often, we may reach what can be called **attentional saturation**.
    - Through constantly seeing and attending to the same thing repeatedly, our brains may learn that it is unimportant to remember specific details.
- When we first encounter things, we might have a very distinct depiction of it in our memories.
  - But with continued use, that distinct memory may blend with other experiences with the object
    - Then we start to only really pay attention to the important (or abnormal) characteristics

# COGNITIVE WARFARE CAPABILITIES: ATTENTIONAL SATURATION

*Which is correct?*



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## Indirect Method

### Cognitive Vulnerability access point

- If it's possible for our minds to omit details when we are regularly exposed, what else might this affect?
  - Could this be another cognitive access point to exploit?
    - This could result in missing or not noticing things which could be important, such as:
      - Specific features of groups and people
      - Specific behaviors or actions within geopolitical structures
      - Important details of events or tasks

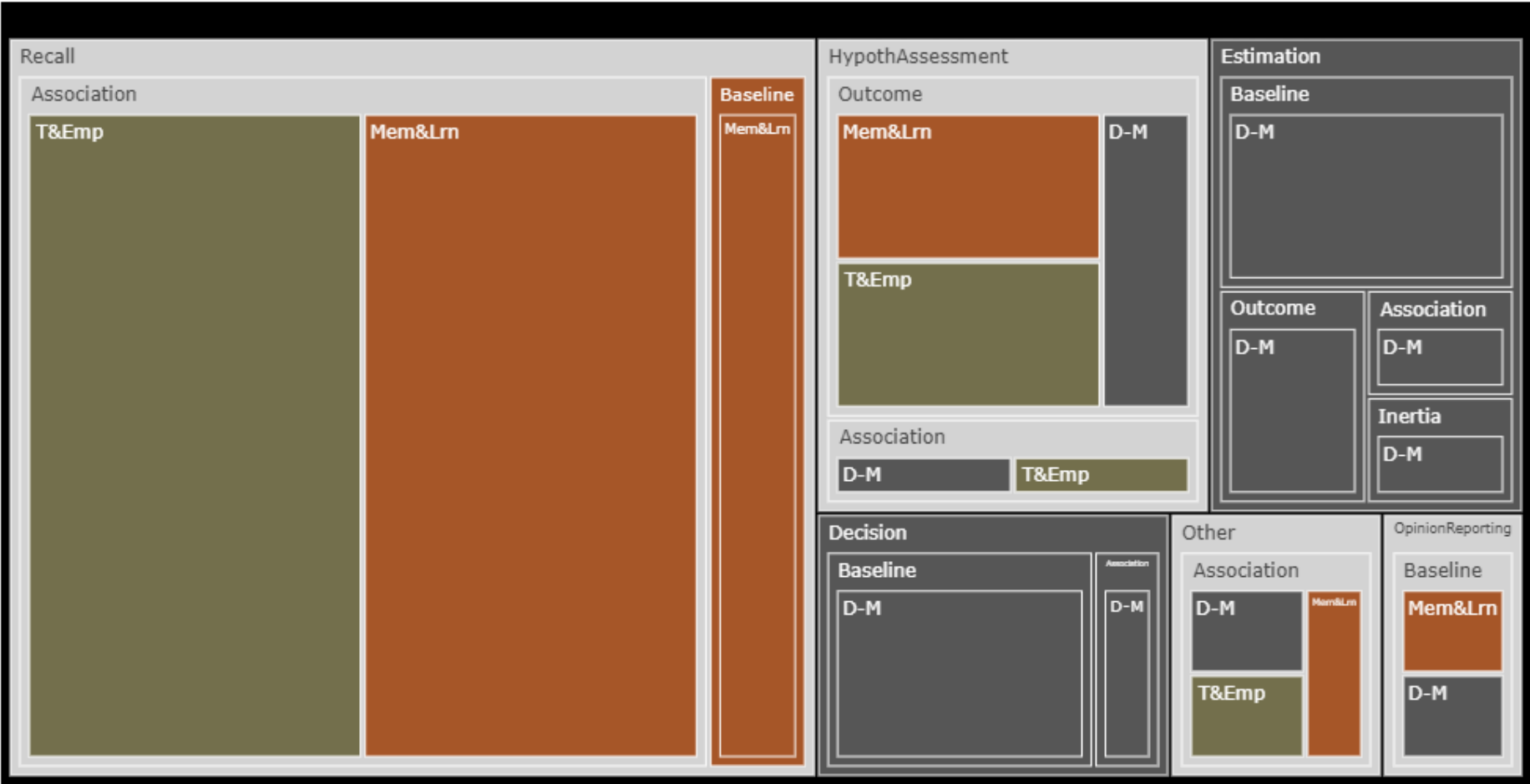
### A more complex Cognitive warfare capability

- Finding novel ways to exposure the information you want your targets to keep top of mind
  - While also subverting meaningful details that might alert a population to the adversary's agenda



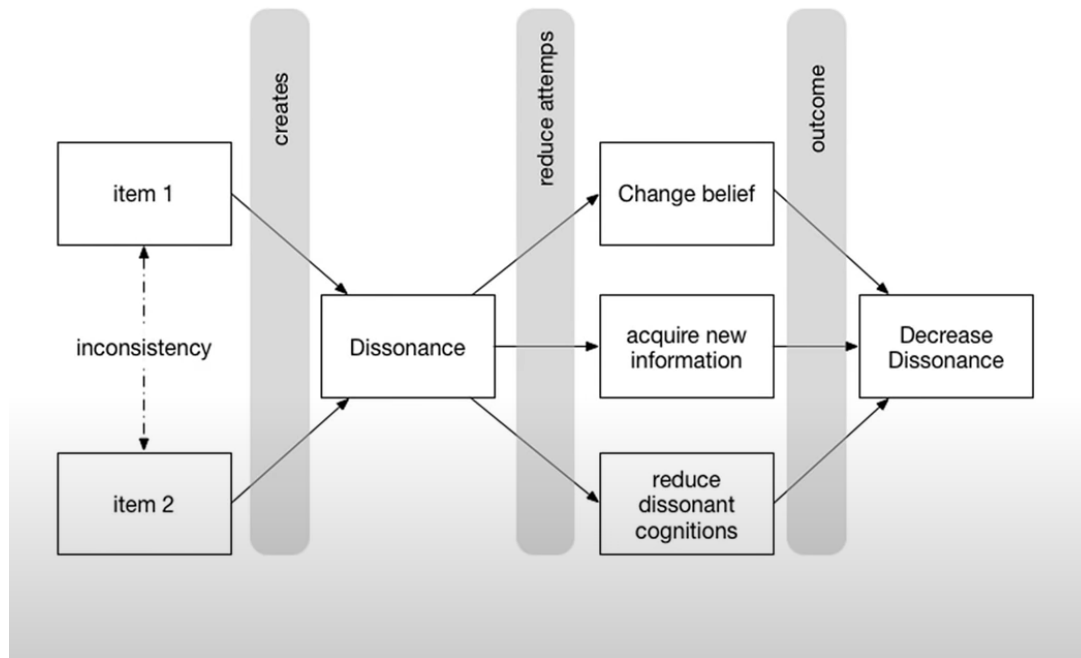
# COGNITIVE WARFARE CAPABILITIES: ATTENTIONAL SATURATION

## Indirect Cognitive Warfare Capabilities: Attentional Saturation



# COGNITIVE WARFARE CAPABILITIES: COGNITIVE DISSONANCE

## Indirect Method



### What is it?

- **Cognitive dissonance:** “people seek to justify their own behavior-to reassure themselves that they’ve sought out and made the best possible use of all the available information, to believe the resources weren’t wasted, and to see that their actions are commendable and consistent.”

### How does it work?

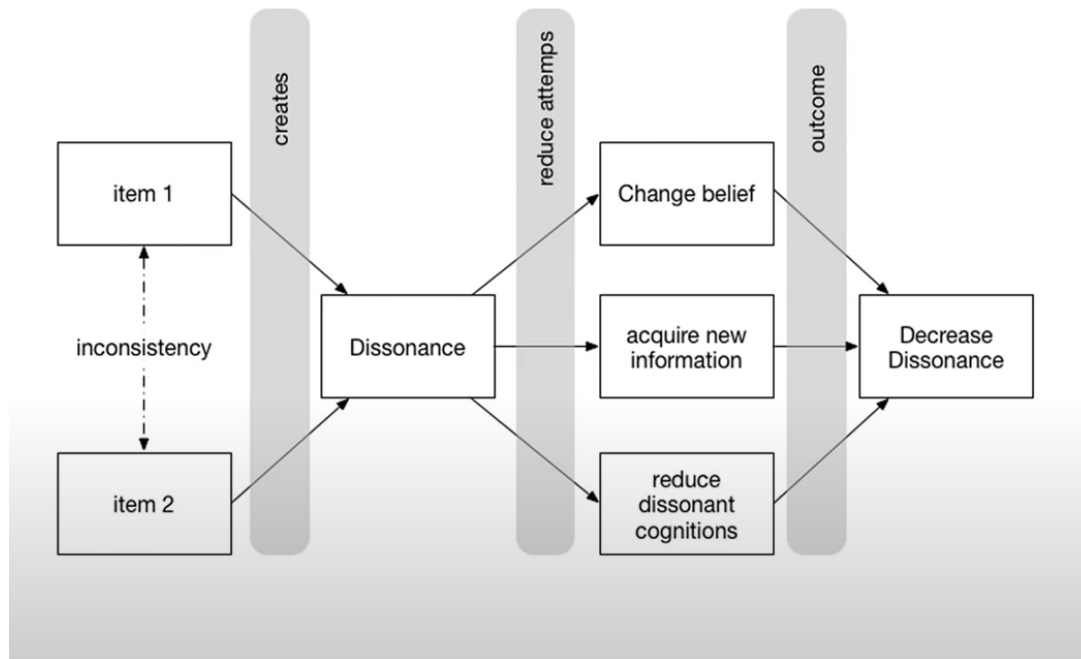
- Cognitive dissonance also enables the spread of misinformation, which works to the advantage of adversaries
  - To the emotion of fear, triggered by the narrative element of victimization, we can add the emotion of hate,
    - triggered by the narrative element of villains doing harm and wanting everyone to be a ‘hero’ to prevent or lash out at it
- Visceral reactions against demonstrators can be understood as ego defensive,
  - protecting against the cognitive dissonance of pre-conceived beliefs that anchor one’s sense of self

### Enables Weaponized Narratives by Obfuscating Intent

- Cognitive dissonance is a significant reason why determining the intent in Weaponized Narrative can be difficult.

# COGNITIVE WARFARE CAPABILITIES: COGNITIVE DISSONANCE

## Indirect Method



### Who is the Audience?

- Those already facing emotional or stressful situation,
  - clinging to certainty takes on added importance.
  - ‘Sense of belonging’ creates an instinct to defend what one belongs to,
    - particularly if one identifies with it strongly

### Potential Adversarial Goals

- Weaken the target from the inside by identifying ethnic, racial and partisan discord
  - Spread dissonance about democracy, social institutions political process, often through ideological groups.

### Cognitive Dissonance enables a Cognitive Vulnerability Access point

- Exploits cognitive vulnerabilities in the target by manufacturing crisis and controversy toward topics:
  - gun rights, immigration, race relations, politicians, policies.
- Topics should “[provoke] and [enforce] internal conflicts and contradictions within hostile-negative forces
  - topics and messages fragmenting, paralyzing, disorganizing and isolating the opponent until the targets are driven to action on their own accord

# COGNITIVE WARFARE CAPABILITIES: COGNITIVE DISSONANCE

## Indirect Cognitive Warfare Capabilities: Cognitive Dissonance



# SCALABLE & EFFECTIVE COGNITIVE WARFARE CAPABILITIES ARE EMERGENT

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## The intersection of the connected infrastructure of social platforms and cognitive biases is complex

- Connected infrastructure of social platforms
  - Cognitive biases and
    - limitations of the underlying bio structure of the many millions in this human audience
      - Provides Cognitive access points to
      - Potential for asymmetric exploits of a target's vulnerabilities
        - Denying disrupting distorting or destroying an adversary
          - politically, socially, and economically through their own population
  - Leads to the next trend:
- ***The most destructive, scalable and effective cognitive warfare capabilities will be emergent.***

# AUDIENCE DISCUSSION PROMPT

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## Question

- *Without mentioning AI, machine learning, or Quantum computing—*
  - ***Can anyone think of a Cognitive Warfare capability of the future?***

# TREND 3: DESTRUCTIVE, SCALABLE & EFFECTIVE CAPABILITIES ARE EMERGENT

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## What are emergent capabilities and where do they come from?

- Results from utilizing unintended functions from social platforms or communication mediums creating complexity
  - The complexity allows of cognitive-based techniques and tactics to exploit the audience's cognitive access points.

## Extremely difficult to detect

- Emphasize importance of this workshop
  - Coalesce around organizational themes and concepts
    - Develop indicators to detect classify and categorize events in cognitive warfare

# COGNITIVE WARFARE CAPABILITIES: DECEPTION

## Indirect Method



## Deception is fundamentally psychological

- Range of Deceptive techniques exploits range of variability in human cognitive processing

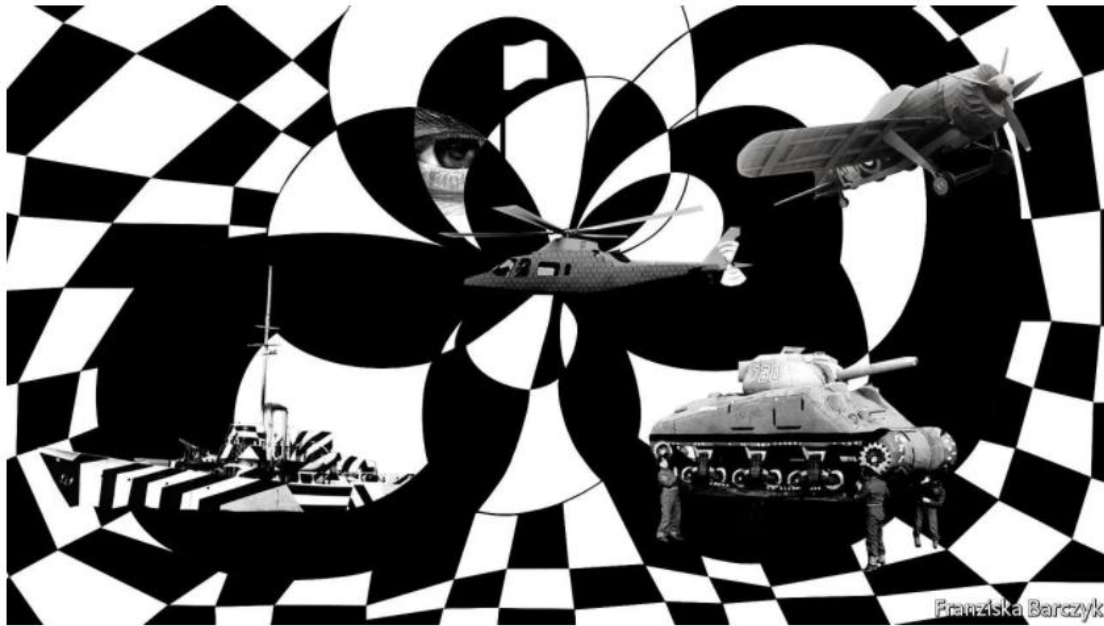
## How does it work?

- Aims for level of
  - Uncertainty/Ambiguity-increasing.
  - Uncertainty/Ambiguity-decreasing
    - in the mind of the deception target.
- This ambiguity has the potential to compel the target to mistakenly perceive:
  - friendly motives, intentions, capabilities, and vulnerabilities
  - Altering the target's ability to assess
- Deceptive events are designed to
  - manipulate, distort, confuse, and/or frustrate,
  - for misleading or degrading objectives,
    - Gain advantage over a range of capable adversaries.



# COGNITIVE WARFARE CAPABILITIES: DECEPTION

## Indirect Method

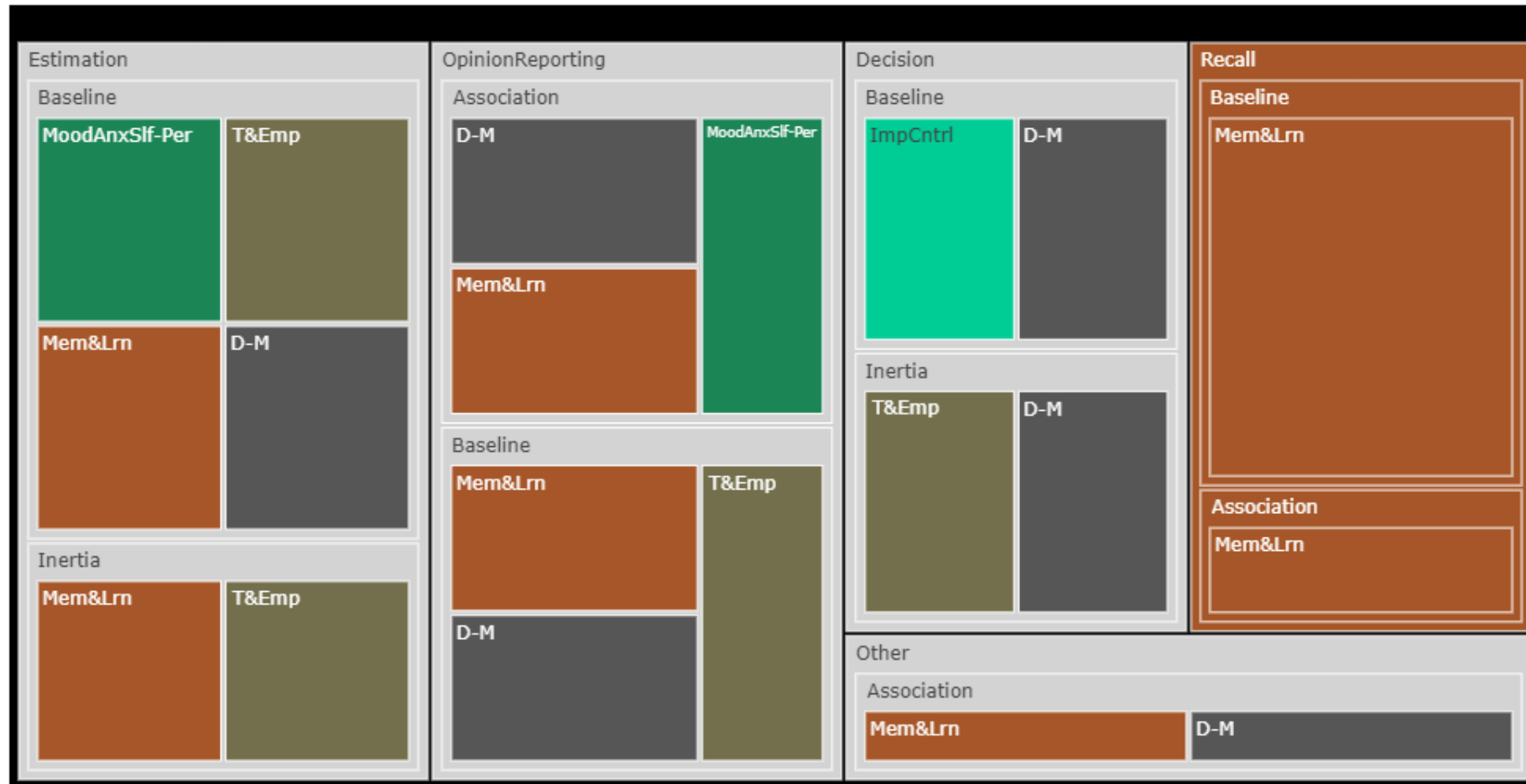


## Active and Passive deception

- Regarding Cognitive Warfare,
  - information honeypots and related environments example of “**passive deception**” implementation
    - (target is allowed to interpret deceptive information and decide on a course of action).
    - Provide false information in deceptive events to trigger desired interpretations of information or actions by the target.
- In an **active approach**,
  - Possible to covertly modulate behavior via ambiguous stimuli or information
    - **Goal:** Exploit platforms pushing (crafted messages or misinformation) –platform modulates responses (decisions) and future interactions by suggestions driven by feedback.
  - Within embedded social infrastructures
    - Group interactions and repeated content suggestions are recorded into memory and cycled—
      - influencing future behavior (behavior shaping).

# COGNITIVE WARFARE CAPABILITIES: DECEPTION

## Indirect Cognitive Warfare Capabilities: Deception: Example Tactic Diversion



# COGNITIVE WARFARE CAPABILITIES: WEAPONIZED COGNITIVE DISSONANCE

## Indirect Method



## Application

- Get audience to understand that the adversarial message is already in agreement with another of their beliefs —
  - Exploit their need to avoid the impending cognitive dissonance
    - will cause them to adopt whatever it is you're pitching.
- Convince audience of their own "self agreement".

## Example

- Take a hotly debated and taboo subject of abortion.
  - The images of anti-abortion activists protesting outside, what is the overall message that they are trying to convey?
  - Abortion = murder
- This is the association the protesters want to cultivate in the minds—
  - abortion, something that people have divided opinions on, **is the same as** another thing almost no one has divided opinions on— murder.

## How to Combat this?

- Only understanding the equivalency that is being drawn is a false one,
  - There is no actual contradiction

# COGNITIVE WARFARE CAPABILITIES: WEAPONIZED COGNITIVE DISSONANCE

## Indirect Method



## Powerful and ubiquitous persuasion technique

- Plays on this human need to avoid contradiction,
  - used in the arguments of every political issue.
  - Gun Rights — Well you don't like when guns kill people, right?
  - Climate Change — You don't want the polar bears to die, right?
  - Immigration — You want to keep your job, don't you?
- “Appeal to authority” technique
  - From a self perspective,
    - who is a better authority than themselves?
    - Every person believes their own beliefs

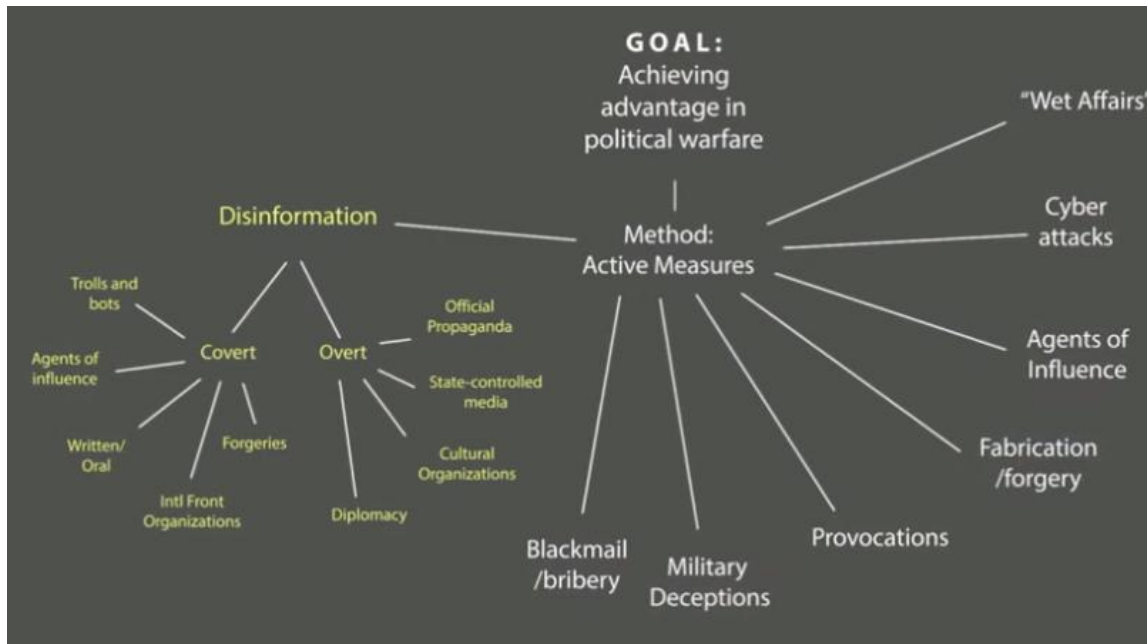
# COGNITIVE WARFARE CAPABILITIES: WEAPONIZED COGNITIVE DISSONANCE

## Indirect Cognitive Warfare Capabilities: Weaponized Cognitive Dissonance



# COGNITIVE WARFARE CAPABILITIES: REFLEXIVE CONTROL

## Indirect Method



## Hybrid warfare tactic

- Used to manipulate an opponent into unknowingly making decisions benefiting the manipulator
  - while harming the opponent.

## Complex

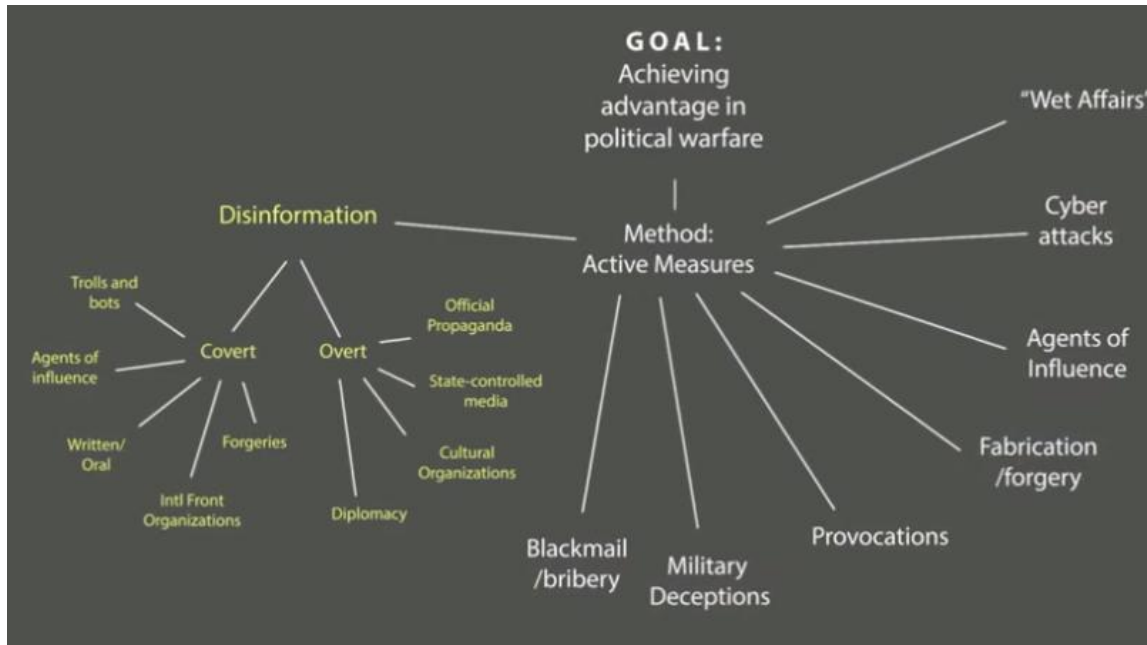
- Executed through many outlets,
  - reflexive control is exploits flaws within the opponent's decision-making process.
    - Such flaws categorized as cognitive biases
      - The mental shortcuts that can lead the brain to misjudge information.

## Large Scale Reflexive control workflow

- Against large populations doesn't require a deep understanding of its victims,
  - Only exploiting the audience's cognitive biases on a grand scale.
    - An influencer can exploit the audience's cognitive vulnerabilities,
      - utilize intermediaries (i.e., social platforms) to gain reflexive control of a target.
- Implemented through strategic release of tailored **information** through the right **mediums** with access to a large **audience**

# COGNITIVE WARFARE CAPABILITIES: REFLEXIVE CONTROL

## Indirect Method



## Reflexive Control Inherently deceptive

- The deception attempts to steer the decision-making of an opponent through
  - provocations, misdirection, false objects, and blatant lies.

## Reflexive Control is also manipulative

- The influencer provides information in a manner that causes its target to react in an expected fashion,
  - With the expected response, the decision made is favorable to the influencer and unfavorable to the victim.
- Key for the influencer:
  - Understand the moral, psychological, and environmental factors that shape a target's decision-making process
    - Exploit through the selective presentation of information.

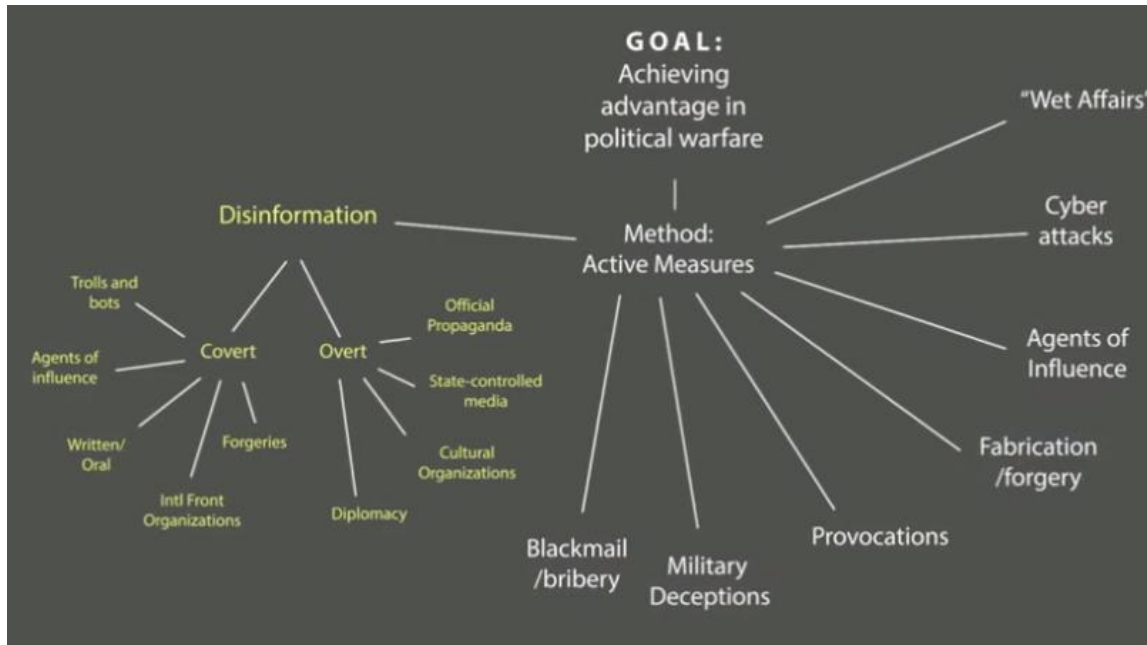
## Content Creation, Accessible Audiences, Influencers Enable Reflexive Control

An influencer can use reflexive control against individual targets or groups

- Requires the means to transmit the information
  - **Goal:** manipulate the decision and action functions of individuals or groups by appealing to their psychological predispositions and cognitive biases

# COGNITIVE WARFARE CAPABILITIES: REFLEXIVE CONTROL

## Indirect Method



## Cognitive Biases are the Cognitive Vulnerability Access points

- New research suggests only need to stimulate
  - the superficial beliefs of their targets – realm of cognitive bias –
    - Not the deeper modes of thinking
- Some of the tactics primary tactics employed seen to sow discord by exploiting Several cognitive biases coincide favorably to the strategy of either strategically timed release or blitzkrieg of information:
  - 1) message repetition and
  - 2) confirmation bias.
  - 3) organizational bias



# COGNITIVE WARFARE CAPABILITIES: REFLEXIVE CONTROL

## Indirect Cognitive Warfare Capabilities: Reflexive Control

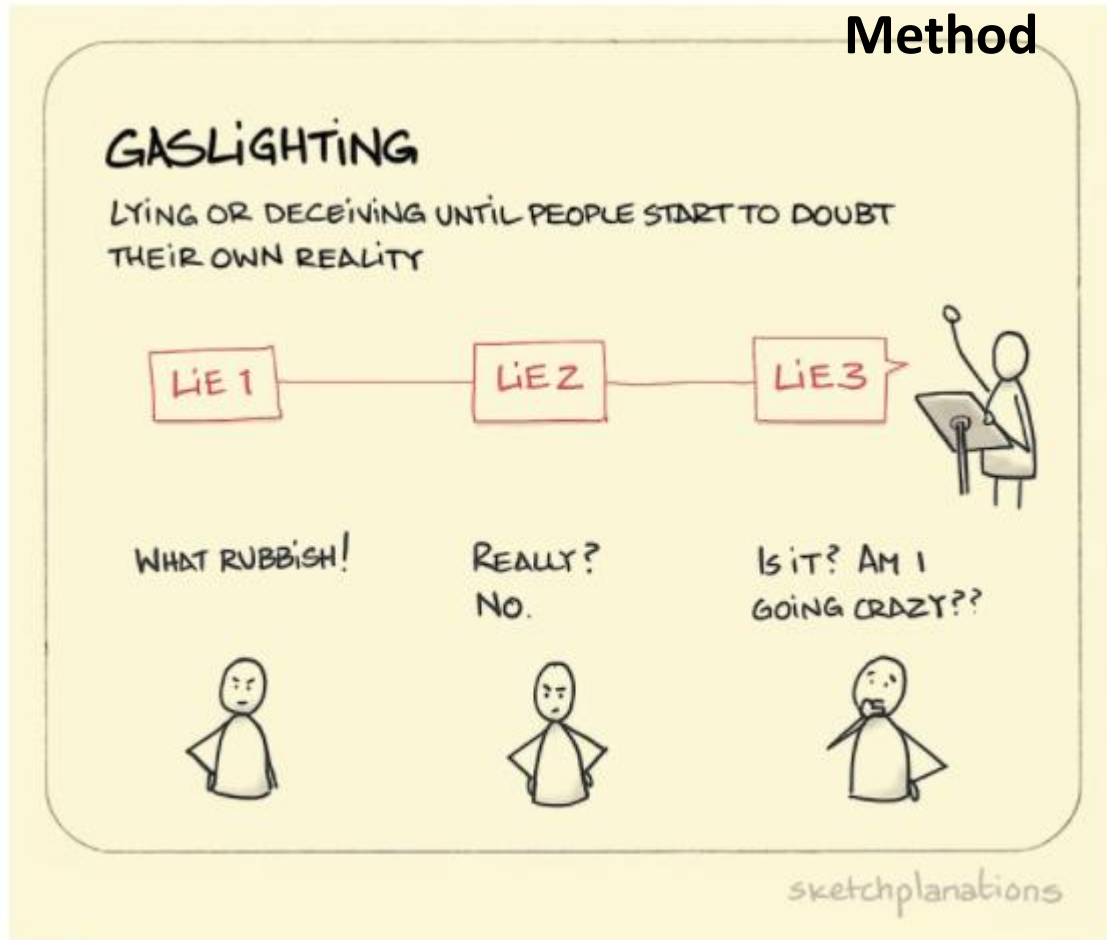


# COGNITIVE WARFARE CAPABILITIES: AUTHORITATIVE GASLIGHTING AT SCALE

## Indirect Method

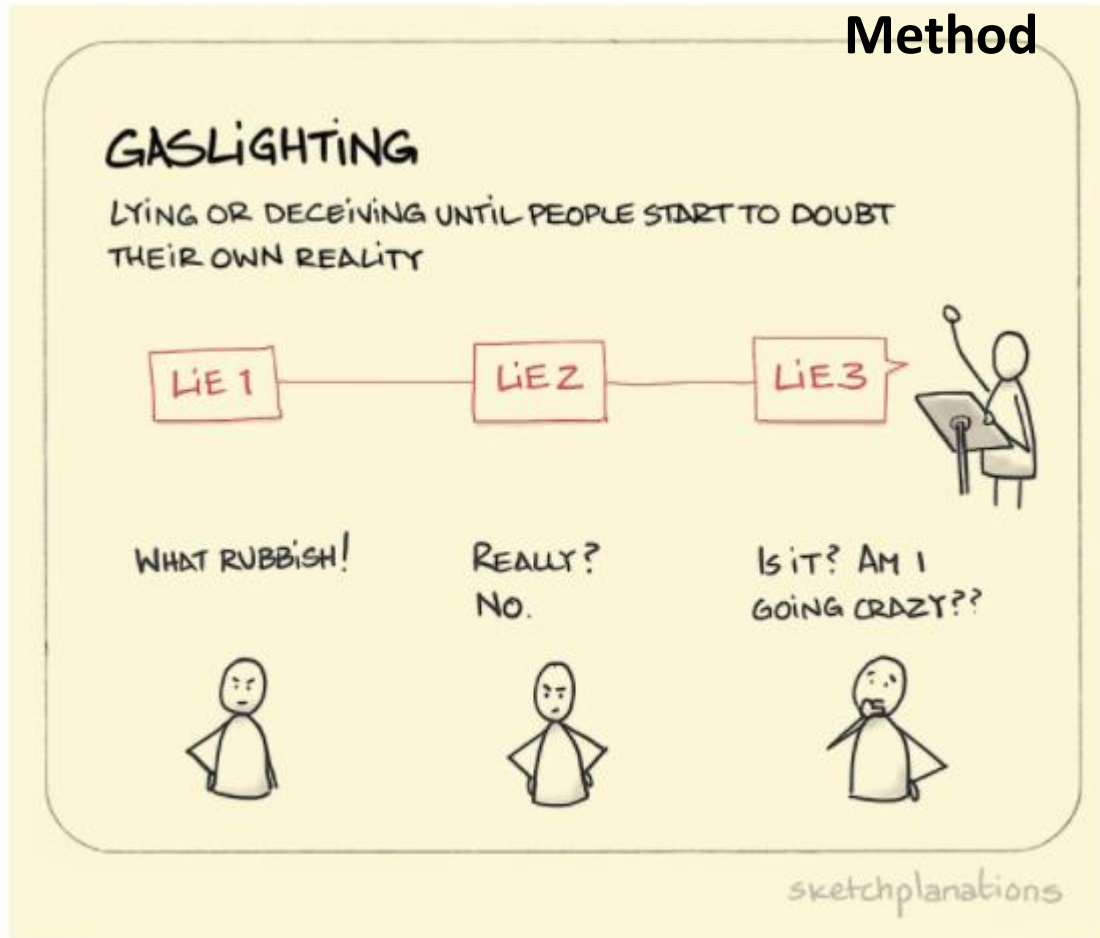
### Authoritative, influencer or political gaslighting

- Possible hybrid warfare tactic
  - more subtle and longer lasting than reflexive control
    - which focuses on the strategic release of information and the predictable audience reactions
    - Emergent tactic differs from leading the brain to misjudge by reaction, but
      - Rather reduces cognitive agencies and faculties of those who support the gaslighter---
        - evolving supporters into ready and willing proxies and non-state actors (domestic and foreign)
  - Gaslighting aims to induce in someone the sense that
    - reactions, perceptions, memories and/or beliefs are not just mistaken, but utterly without grounds.
    - Involves not merely ignoring or dismissing,
      - but a hostility to even the possibility of challenge
      - In extremes the abuse conditions the destruction of the “independent, separate, deliberative perspective to approach disagreeing topics.



# COGNITIVE WARFARE CAPABILITIES: AUTHORITATIVE GASLIGHTING AT SCALE

## Indirect Method



## Political Gaslighting

- When one political actor induces some citizen or group of citizens to
  - Doubt their ability respond rationally to evidence,
    - independently of the political actor's guidance.
  - The political actor may characteristically negate some citizens' reasoning capacities

Such leaders exploit their followers with a dependency on their signals or messages

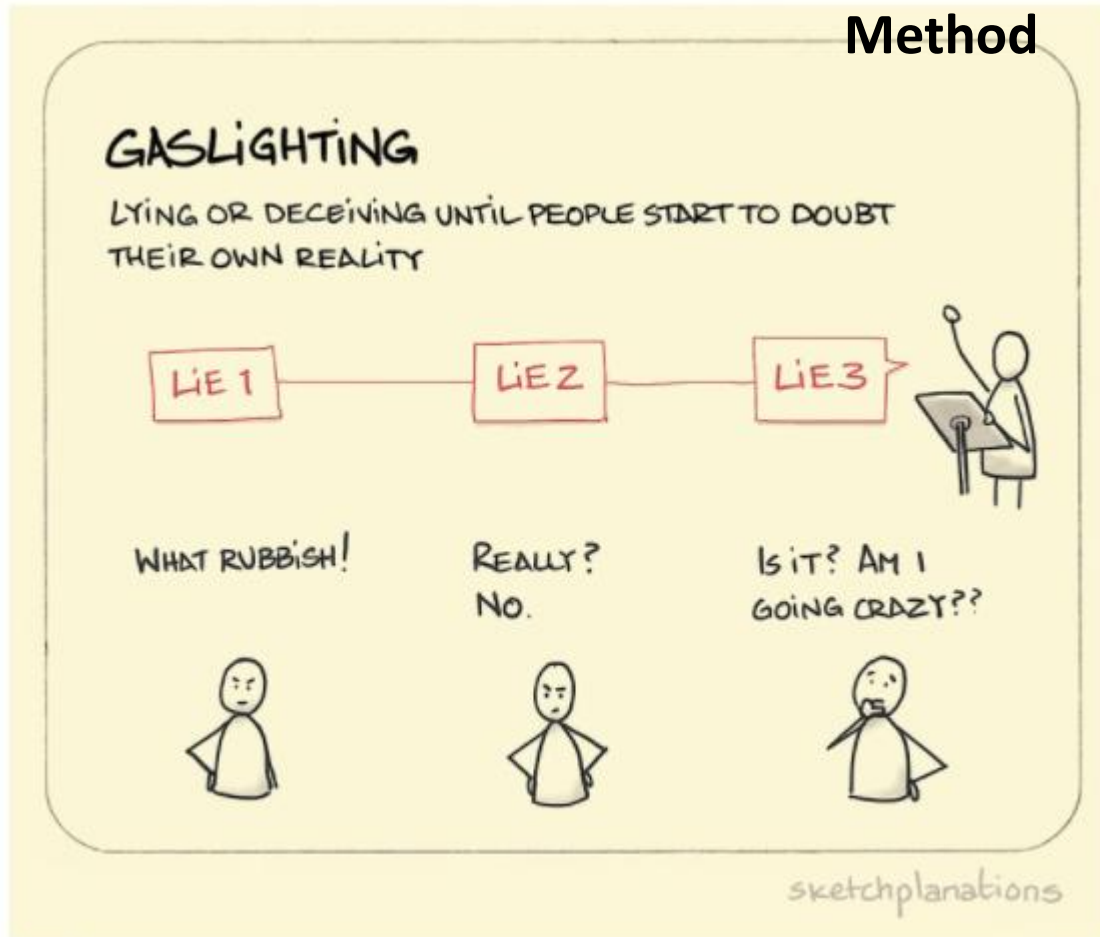
- These influence and shape their beliefs
- Elites may lead partisans to affirm beliefs they previously rejected (i.e., partisan identity causes the same citizens to accept different reasonings)
  - citizens not deceived but reasoning capacity may resist evidence
    - Elites may amplify the effects of partisan identity
      - undermine some sources of evidence to insulate against challenge

Such leaders exploit their followers with a dependency on their signals or messages

- They influence and shape their beliefs

# COGNITIVE WARFARE CAPABILITIES: AUTHORITATIVE GASLIGHTING AT SCALE

## Indirect Method



## Distance between beliefs and evidence symptomatic of the gaslit Citizen

- Gaslighters partition their audience from beliefs that may undercut authority
  - Insist core sensory inputs of the citizen — the news media — is nothing more than a counterfeiter of evidence.
    - Any beliefs that citizens have acquired through this medium should be, by extension, abandoned.

## Political Gaslighting target the lower brain code of citizens

- Changes how we handle evidence.
  - The manipulation of Gaslit citizens is morally distinct in a deep cognitive way,
    - targeting our knowledge mechanisms—
      - our evidence about our evidence.
  - Such manipulation poses a threat to our agency to think

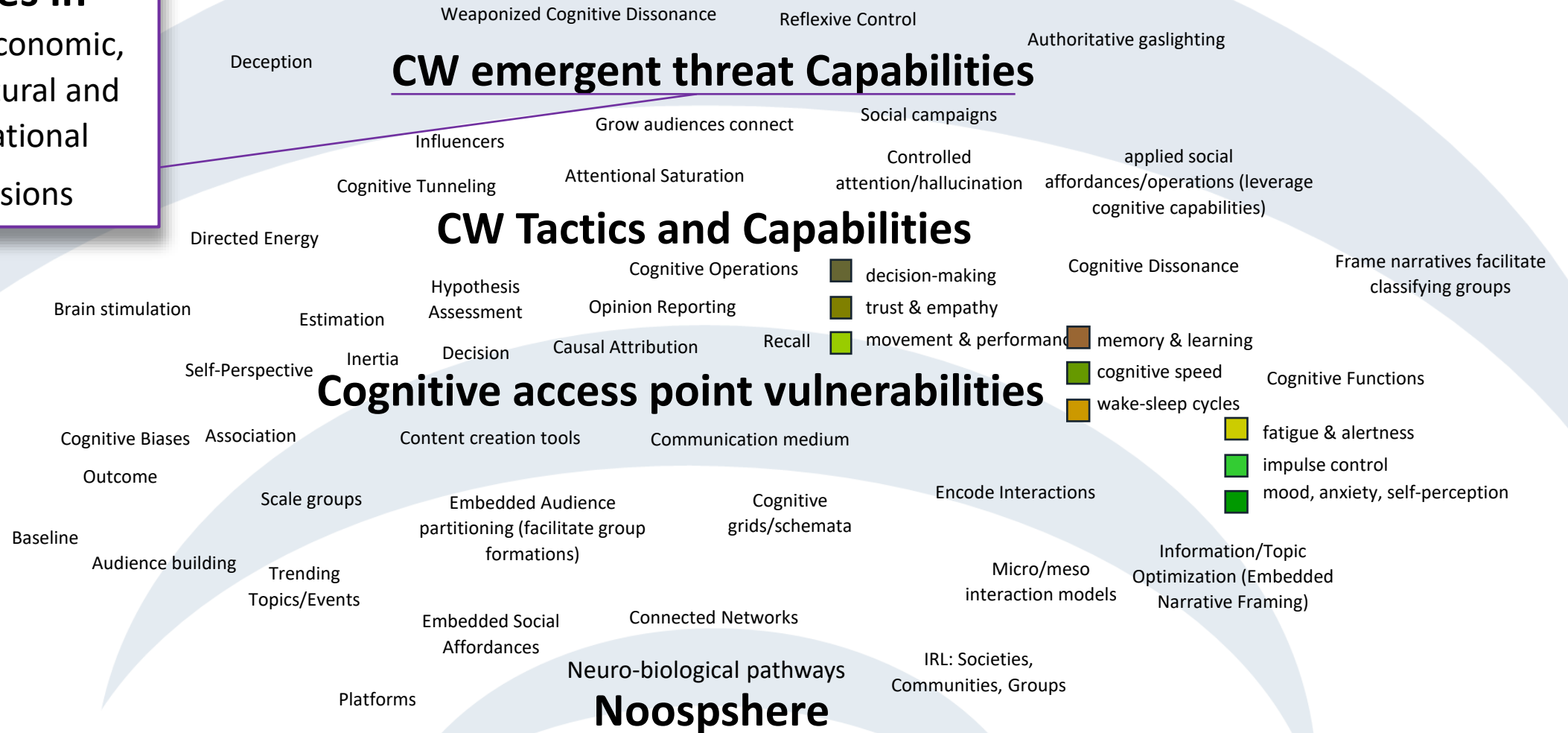
# COGNITIVE WARFARE CAPABILITIES: AUTHORITATIVE GASLIGHTING AT SCALE

Indirect Cognitive Warfare Capabilities:  
Authoritative gaslighting at scale



# ECOSYSTEM OF COGNITIVE WARFARE CAPABILITIES

**Ripples in**  
politico-economic,  
socio-cultural and  
informational  
dimensions



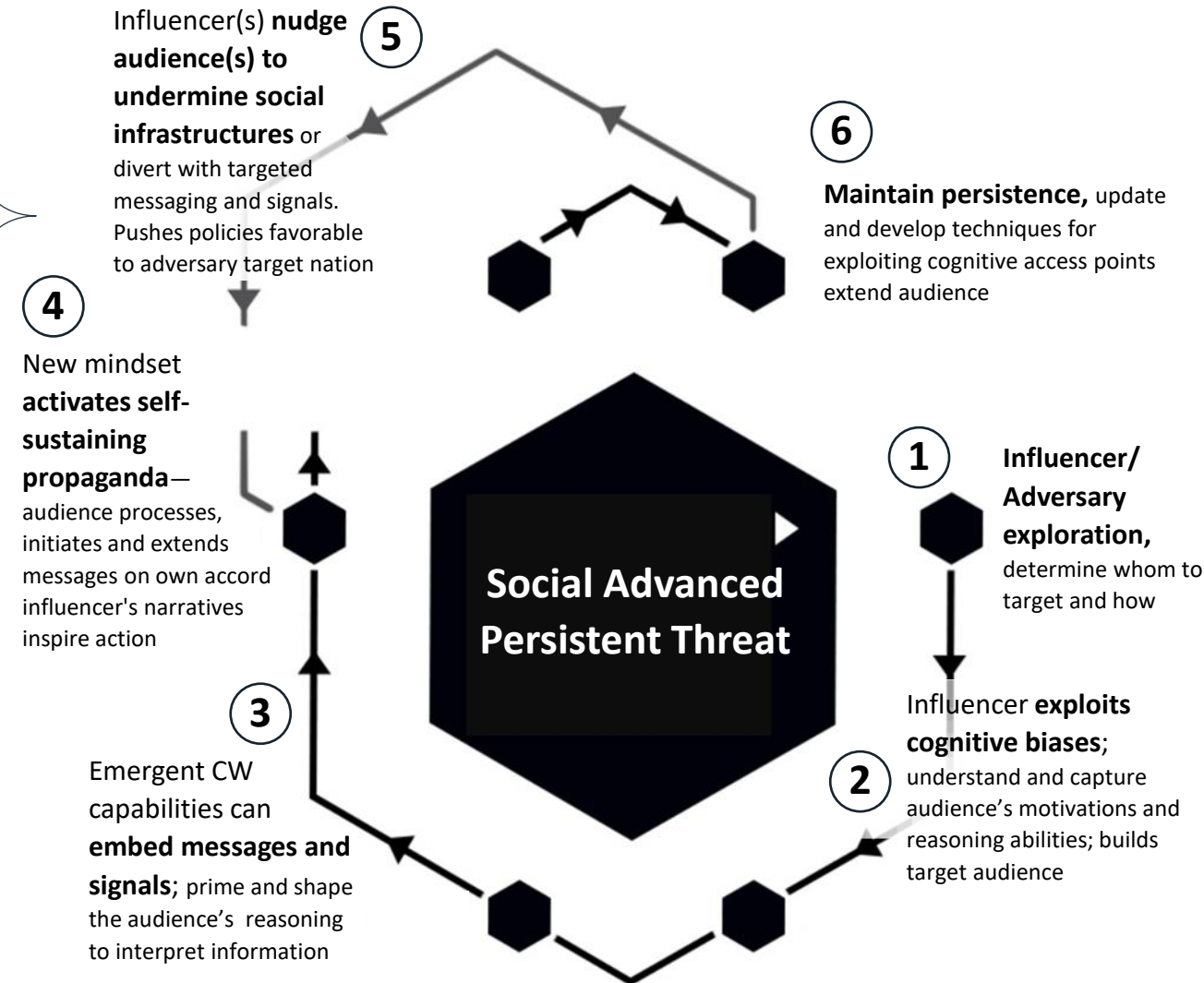
# COGNITIVE WARFARE CHALLENGES

## Cognitive Biases are Key Amplifiers

- Hard defending against such influence tactics
  - Small amounts of information may disproportionately affect a target due to cognitive biases.
    - Individuals and groups will latch on to information that is consistent with their pre-existing mental constructs

## Emerging threat: Mobilizing Collective groups via cognitive exploits

- Exploiting the cognitive effects of Gaslighting showed a danger of state adversaries, non-state actors, and ideologically motivated entities distorting their audience's conventional motivations and ability to process evidence and facts
  - Negating independent thought to push an agenda.
    - Then audiences are vulnerable to receiving signals from their community, willing to engage in abnormal behaviors
      - as affiliates, proxies, auxiliaries, or surrogates for those matching their ideologies.





# SELF-SUSTAINING EMERGENT CAPABILITIES IN COGNITIVE WARFARE

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## Ecosystem of cognitive warfare capabilities

- When applied, functions as self-sustaining cognitive and behavior propaganda mechanisms
  - the groups act on ideas/opinions/realities/ presented to them, as they progress a four-stage process of consensus, co-existence, maintenance and fragmentation
    - ideological spread follows fragmentation,
    - Remnants can potentially connect with similar groups,
      - Then operating as auxiliaries with a narrower view of the narratives and shared realities, falling to more dangerous activities.

## Day 3 Conversation...

- Navigating this ecosystem has all the components for IRL games,
  - Adversaries could take these capabilities and apply gamification
    - weaponizing a game that plays people to great effect
      - Inducing the addictive neuro chemicals and stimuli to keep the audience coming back
        - to get online
          - do your own research
            - share, comment, get feedback contribute insight---repeat
  - hardening the neural connections preventing escape from this cycle



# AUDIENCE DISCUSSION PROMPT

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## Question

- *What would a cognitive ‘nuclear’ or ‘9-11’ / ‘pearl harbor’ attack of the future be; what would it look like? —*
  - *Or have we already experienced one?*

**DAY 2 JOHN CONTENT END**