

# “Illusion of control”

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# Welcome

- As first speaker and co-organizer, I'd like to add my welcome to all of you, speakers and audience, whether you came from afar or close by, and also to those who are attending the streaming of the conference at all hours of day and night!

# Summary

- Part One: Question, definitions and approach
- Part Two: Information processing
- Part Three: Categorization
- Part Four: A sustainable future?
- Part Five: How to change narratives
- Part Six: Conclusions

# Questions, definitions and approach

# Why is it difficult to respond to anthropogenic change?

- We have gained lots of knowledge about environmental dynamics
  - Since 1980 major research effort
  - Much less on the societal dynamics, since c. 2010
  - In the “Anthropocene”, societal dynamics drive climate and environmental change
- We approach the issue from the societal dynamics point of view
- Most arguments are proximate and domain-focused (energy, food, water ...)
- Ultimate causes not very specific:
  - “Absence of political will”
  - “We’re stuck in the capitalist economic system”
- We argue for an *ultimate* societal cause affecting our societies

# What is an illusion of control?

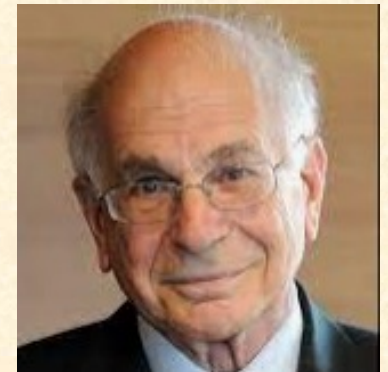
- Psychologist Langer (1975): “Proven solutions often extended to other problems”
- “The belief that if you wish strong enough, you halt the flow of change” (Michener 1989)
- Illusion of control occurs when attempting to control (partly understood) changes in a system’s (social or natural) environment by applying inappropriate measures
- Illusion of control frequent reaction to part-understood tipping points
- Currently most of the developed world is under an illusion of control concerning climate and environment change
- After 70 years of relative stability, recent events show that for many, also is under an illusion of political control

## Some pointers

- Einstein: “We cannot solve the problems we have by applying the thinking that was responsible for creating them”
- N.N. Taleb (2007) “Overconfidence in our knowledge and judgment is fed by the illusory certainty of hindsight”.
- D. Kahneman (2011) “excessive confidence in what we believe we know, and apparent inability to acknowledge the full extent of our ignorance and the uncertainty of the world we live in”.
- D. Kahneman: (2021) “People believe the reasons because they believe in the conclusions.” [...] “The belief will not change when the reasons [for it] are defeated. The causality is reversed”.



Taleb



Kahneman

# Why is it an illusion?

- The map is not the landscape – it is a simplification that leaves out many dimensions
- All human-devised solutions create problems
  - They are simplifications of nested multi-scalar complex dynamics
  - Their limited cognitive dimensions are always confronted with a more complex reality
- Applying the map to understand the landscape results in unanticipated consequences
  - Confronting the low-dimensional model (human solution) with the high-dimensional reality generates unintended consequences
- Ignoring those problems/consequences is maintaining an illusion of stability and control
  - But ultimately the illusion is inevitably shattered (“tipping points”)



# Examples

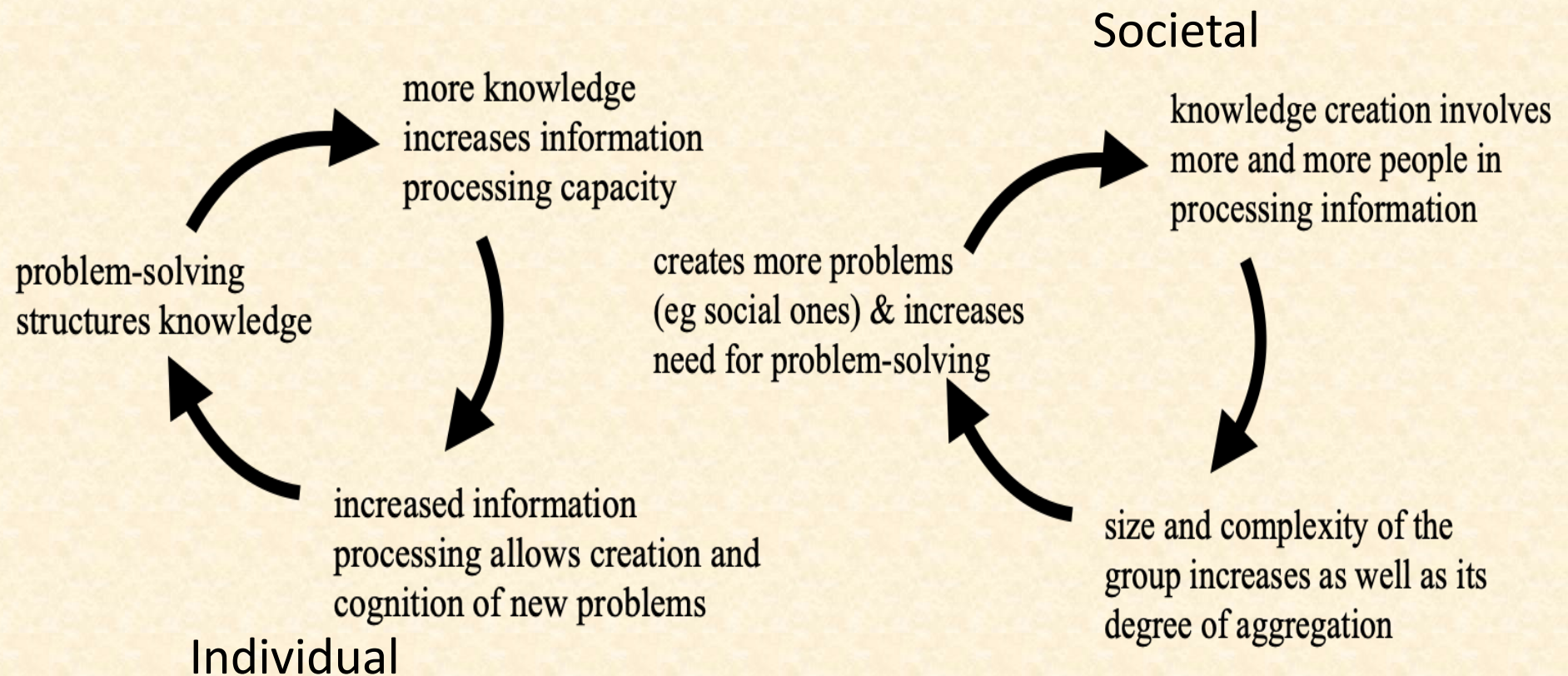
- Health: We thought we could ensure human health ... and reduce the costs of the health system ... until Covid-19 came about
- Politics: We thought the West could maintain its global supremacy ... until China entered the scene
- War: We believed in W. Europe that there would not be another war ... until Ukraine showed us differently
- Energy: The nuclear, the fossil and the renewables lobbies all believe their solution is currently the best one
  - They ignore the complexity of the dynamics involved
- Climate: We thought it would not change under human impact ...
- In all these case studies, an “*Illusion of control*” hindered effective responses to each conundrum

# Information processing

# Social-environmental dynamics as information processing

- For survival, societies need to adequately process information about their environment
  - Taking into account both externally and internally driven dynamics
- Luhmann (1989): societies do not exchange information *with* the environment; they self-referentially exchange information *about* the environment among themselves.
  - They define their environment, its problems and its potential solutions
  - That is done based on their worldview, their information processing apparatus
- Human information processing is here viewed a societal dynamic
- Its apparatus co-evolves with the environment
- Two feedback/feedforward loops: individual and collective (after c. 50,000 BCE)

# The information processing feedback loops



# Human evolution as “dissipative flow structuring”

- Information is that which humans pay attention to among all the impulses our senses receive.
  - How do humans come to pay attention?
- Paying attention [is] the behavioral and cognitive process of selectively ignoring other potentially perceivable information to concentrate on a discrete set of impulses.
  - Ignoring “noise” rather than identifying signals (I come back to this)
- Learning is a positive information processing feedback loop creating order out of the — seemingly chaotic — unknown world
  - From “unknown unknown” to “known unknown”, to “part known”, to “known”...
- It isolates patterns, identifies and defines their perceived dimensions, and uses them as “knowledge” to interpret new signals and patterns

# Meteorology as an example

- Ever increasing number of cognitive dimensions allows solving more and more complex problems
  - Began with searching for what is responsible for weather
- Research identified more and more dynamics:
  - Chemical, physical, spatial processes
  - From macro- to molecular-level dynamics
  - Identification of more and more signals, new dimensions of understanding
  - New scientific fields (e.g., modeling), technologies to observe (e.g., high performance computing)
  - Recently: inclusion of societal dynamics (Anthropocene)
- In each phase new questions, problem dimensions and appropriate metrics

# Interaction between the mind and the environment

- Observations interpreted in so far as they resonate with information processing apparatus
  - Never complete resonance, so always confrontation with new signals
  - These change the information processing structure of the mind and the environment it interacts with
- Society's knowledge (internal niche) and environment (external niche) change concurrently (cf. Atsushi Iriki later in the conference for details)
- Human perception always limited in dimensionality, partial and biased
  - $8 \pm 2$  sources of information can be simultaneously combined by an individual
  - When more sources, collective processing emerges, but is also limited
  - Hence always unanticipated consequences of human actions
- Solutions always cause problems, sometimes far into the future

# Janus: present between past and future

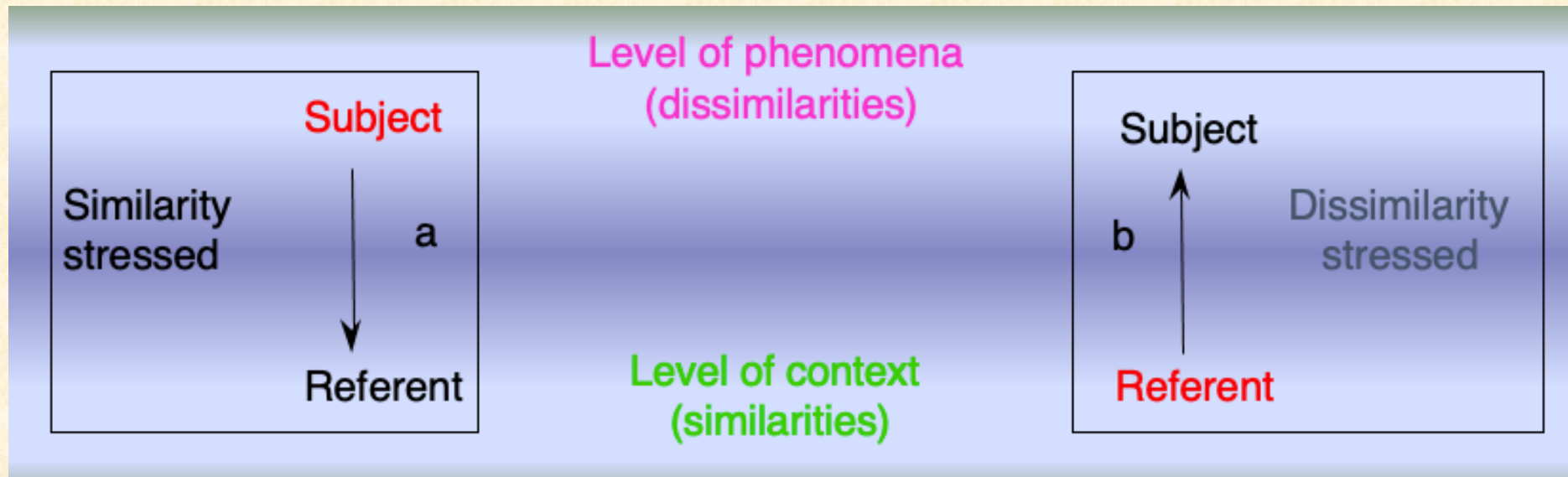
- Perception of present (understanding) integrates conception of past and anticipation of future
- Ex-post and ex-ante perception are combined
  - Exploiting the past and exploring the future
  - Combining the old worldview, and shaping the new one
  - Combining accepted values and ideas (knowledge) with exploration of change to gain understanding
  - Results in hypotheses expressed in possibilities and probabilities
- Over time, initial uncertainty and ambiguity give way to growing certainty
  - From “unknown unknown” to “known unknown”, to “part known”, to “known”...
  - Once certainties come to dominate and “knowledge” dominates, perceptual revolutions emerge (Kuhn)





# Categorization

# The driver: pattern recognition



- Comparison between similarities and difference
  - Tversky & Gati (1978) experimentally isolate two steps,
- First stress on similarities, then on differences

# Differences between the two steps

- 1. Identifying *similarities* in *extrinsically* (space-time dependent) defined sample inductively creates *open* categories, describing *groups* of phenomena
  - Uncertain which phenomena will ultimately fit, which phenomena do not
- 2. Deductively extending the categories to *intrinsic* (space-time independent) *closed* ones, describing *classes* of phenomena
  - Selectively reducing the dimensionality of the category definitions
    - Reduces energy involved in maintaining memory
  - Formal definitions, creating fitting phenomena and excluding non-fitting ones
  - A. Tversky & I. Gati (1978): first objects to referents, then referents to objects.
- Interaction among three cognitive spheres structures decisions
  - *Certainty sphere*: closed categories rooted in the past
  - *Possibility sphere*: open categories, flexibility to include new phenomena
  - *Problem sphere*: no categories, unknown or dimly perceived, unsolved challenges

## From *comprehension* to *competency*

- As information processing progresses, more closed categories
- Overall cognitive shift from *understanding* to *knowledge*
  - Time is getting shorter, precision is increasing; from relational to transactional social interaction
  - Distinguishing between 'pure' and value-laden statements; taking Hume's 'is' and 'ought' in reverse is sharpening definitions by excluding dimensions
  - Increasing confirmed values among the population: from relational polythetic perspectives to topical, analytic narrower perspectives
  - Solutions (closed catts.), problems (open catts.) and unanticipated challenges
- The externalization of information processing: rules, institutions, technologies
  - Due to growth of processing load
  - From *comprehension* to *competency* limits dimensionality of interactions
  - Human-machine interaction: humans adapt to machines rather than vv.
- This shift increasingly fixes our worldview, limits adaptability

# The dynamics responsible for this shift

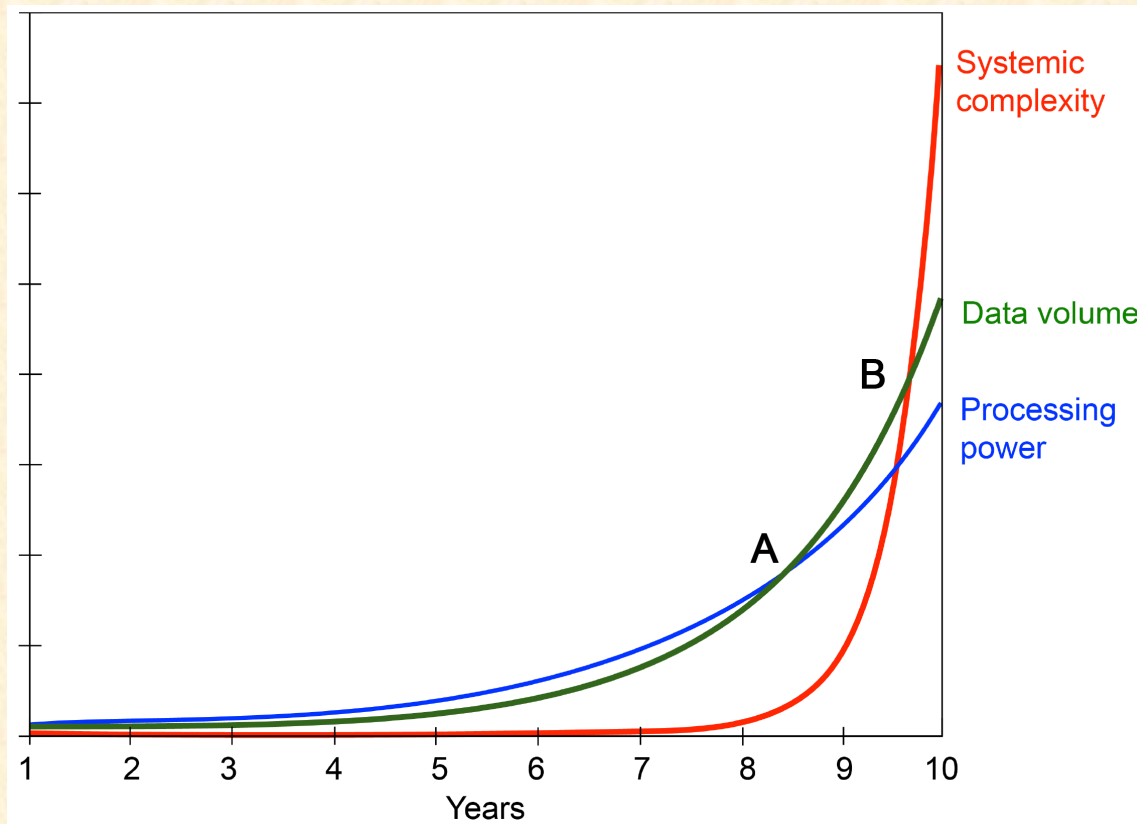
- Tett (2016): silo-effect is inherent in group interaction
  - Reduction of dimensionality; reliance on closed categories; in-crowd language
  - Gives group a sense of control
- Taleb (2010): an illusion, achieved by banishing from thinking the imponderables of the context in which the group operates
- Western societies defined more and more closed categories (solutions)
  - Focus onto perspectives, values and norms from past experiences
  - Exploiting existing knowledge, stability, rather than exploring novelty, change
  - Proliferation of rules, institutions, technology
- Illusion of control ignores dynamic super-linearity generating unexpected, un-cognized problems ('unknown unknowns'), or cognized ones not creating new knowledge ('known unknowns').

# A sustainable future?

# Narratives

- Oldest known 'backbone' of human societies: Gilgamesh epic
  - Similar to Jason's, Odysseus', travels, etc.
- Determine fundamental aspects of world views
- E.g., difference between Greek and Judeo-Christian structure
  - Greek tradition: Gods behave like Humans
  - Judeo-Christian tradition: Humans ideally behave like Gods
- Superficially linear stories resonate with multi-dimensional world through "Gestalts" deeply anchored in culture
  - Trees, mountains, myths, heroes, places, etc. (remains of animism?)
  - Hundreds preserved on Miyako Island (Japan)
- Narratives grounded in cognitive categories are essential in decision-making
  - Example: UN SDGs are grounded in Western narrative of progress

# Processing power and systemic complexity



Source: D. Helbing



# Survival of society

- As the volume of unexpected problems grows, an increasing proportion will remain unsolved, or be dealt with through unsuitable solutions
- For a society's survival, the balance between (1) closed and (2) open categories and (3) unsolved problems is fundamental.
- At times societal dynamics rely on closed categories, making the system predictable; when the unsolved problems exceed a limit, the society moves towards open ones enabling change
  - Monod (1970): "Between chance and necessity"
- Dealing with tipping points by re-structuration is time-consuming, and is often initially avoided by an illusion of control
- Risk spectrum: short-term de-risking may cause a longer-term risk barrier ("tipping point") by ignoring accumulation of longer-term risks

# The challenge

- If narrative is high-dimensional, it includes many values, if low-dimensional it reduces the group's representation of reality
- Proliferation of closed categories has reduced dimensionality of Western perception of reality
  - Gestalts simplified, sometimes to caricature
  - Since the Industrial Revolution, technology has been a major driver
  - The reductionist perspective has over the last 70 years reinforced (the sense of) control over life and environment
- Can the West open up its narratives to enrich its understanding?
  - A major challenge to the Western world view, including its science
    - The role of science in shaping the sustainability conundrum
    - Are other 'truths' possible?
  - Can we go from an Aristotelian to a Heraclitan perspective?
  - An *ex-ante* historical perspective is necessary
    - Focus on emergence of novelty rather than origins of what exists

# We must face the future

- The Royal Society and the Academies (1660 ...) focus scientific *careers* on relating past and present because
  - You need to prove or demonstrate, and for the future this is impossible
- We must now face the future and concern ourselves with it at all levels.
  - Building a science that deals with change, uncertainty and risk rather than an illusion of stability and control
- Complexity Science is a first step.
  - Bourdieu (1972): CS interaction between entities and habitus is not fully predictable
  - Study of emergence rather than origins, combining history and unpredictability
  - Learn *from* the past *about* the present *for* the future
  - Change is permanent and irreversible; illusion of stability to be explained
  - The flow (of matter, energy and information) is the structure

## Jens Beckert: Imagined Futures

- “Feedback loop creates ‘imagined futures’, develops ‘fictional expectations’ into which actors project themselves”
- The fictional expectations are anchored in narratives that are continually adapted.
- Implicates the future in shaping the present, rather than the reverse
  - NB: not a fully constructivist perspective, as the future is not controlled or controllable.
  - Elaborates a vision on the economy that is based on this
- Exchange between imagined futures and present conditions shapes narratives
  - Present conditions formulated in interactions between (past) closed and (present) open categories



Beckert

# Loss of trust in the dynamics

- Imagined futures only valid as long as there is trust in system
  - Long-term second order dynamics can quickly change short-term dynamics
  - Leads to loss of trust: What may seem unimaginable can rapidly become reality
  - Absence of trust can rapidly destroy confidence and change positive into negative feedback
- 14<sup>th</sup> Cty. plague: from cyclical to linear vision of life, from relational to topical interactions
- End 18<sup>th</sup> Cty. demographic and social pressures combine with new ideas into Enlightenment and Industrial Revolution
- We must actively search for ways to break open the closed categories behind the illusion of control.
  - AI sooner a danger than climate change (Social Sustainability ... 2019)

# How to change narratives

# Perception and narratives?

- Is the illusion of control built on perception of phenomena or vice-versa?”
- Hume (1738): impossible to move from statements about observations to statements including norms - but it is possible to move in the opposite direction
- Bonchek (2016) Unlearning an approach that one has already acquired is more difficult than learning a new one
  - Persistence of “capitalism” and “progress” due to this?
- Kahneman (2021): *People believe the reasons because they believe in the conclusions.*” Belief comes first, reasons for it are secondary
- How to change narratives:
  - (1) crush them by brute force,
  - (2) provide a different narrative to replace illusion of control
  - (3) change an existing illusion by tinkering with the narratives sustaining it

# Crushing by Force

- Most stringent conditions for success
- In business, done by old, established corporations w. existential momentum (e.g., IBM)
- Positive feedback loop may emerge in which two or more illusions of control compete, reinforcing both. Leads to escalation: *fossil vs. renewable energy; Russia (authoritarian) vs. Ukraine (democratic)*
- Company takeovers: 1/3 of company personnel is in favor, 1/3 is against (has to be removed), 1/3 is on the fence (has to be won over)
- F2F (Neubauer) glass ceiling hinders implementation of new approach
  - Problem awareness can be favored, but solution implementation cannot



## Build a new model

- Buckminster Fuller: “You never change things by fighting the existing reality. To change something, build a new model that makes the existing model obsolete.”
- Lane & Maxfield (2005): Echelon experience
  - Distributed vs. central control
  - Generating new approach relatively easy, convincing prior opinions of it, difficult
- Echelon vs. Honeywell et al.
  - Costly in energy and funding: social scaffolding structures essential to reinforce innovating community
  - Worked in Italy, not US
- Requires:
  - Strong intellectual and practical leadership with a coherent focus.
  - Intellectual fusion of a wide range of disciplines and perspectives,
  - Overcoming comprehension to competency shift and identity issues it provokes.

## Re-defining “noise” as “potential structure”

- In Western science noise is seen as an aberration or error in perception (Kahneman 2021).
- We’d rather see noise as signals for which no interpretative theory has been developed (yet?)
  - This assumes multiple futures, of which only one has been identified in our reductionist narratives
- To open up narratives and categories, look at noise (Tett 2021: anthro-vision) to enhance dimensionality
- Will quantum computing enable this (see Iriki)?

# Tinkering with narratives

- Closed categories as roadblocks
  - Sheng: “moral hazard”, “debt and over-consumption”, “valuing capital over labor”
  - “Fossil” vs. “renewable” visions roadblock each other, so that realistic, reliable, mixed, and staged approach risks being lost in the debate.
- Relationship between top and bottom of organization important
  - Human societies will always bump into a complexity limit.
  - Unintended consequences will overwhelm a society’s whole information processing system – hence Ostrom’s polycentric approach
- Identification of changeable and fixed parts of narrative
  - Expected/observed entropy relationship indicates degree of fixedness
- We must better identify closure dynamics to know how to open categories: historical approach
- Democracy makes changing narratives difficult
  - Difficult for leaders to emerge

# Conclusion

# The edge of criticality

- Upper limit of processing capacity is closely and dynamically linked to the number of available cognitive dimensions in the society's knowledge system
- The balance between unknown, open and closed is essential
- Time is a critical factor in self-regulating the system's dynamics
  - With lack of time, categories and narratives will be closed around a simplified set of dimensions
- From comprehension to competency
- Our societies have undergone 250 years of such simplification
- That has seriously reduced the adaptability of our world view

# The distribution of information processing

- Some process more per unit time than others
- This leads to silo-ing and dominance of rapid processors
- That ('elite') section of society will be more prone to cognitive reductionism
- It develops an illusion of control, loses interaction with the remainder of society
- When there is no longer connection, the society will likely fracture
  - Gurri (2014) shows this over the last decade
- Depending on relative proportions of open and closed categories and narratives this may lead to tipping points

# Re-opening closed categories

- This is an essential and urgent task
- 3 approaches:
- Crushing existing narrative
  - Difficulty – the narrative does not easily cede to reasons and arguments
- Developing alternative narratives
  - Difficulty – high cost in energy to maintain scaffolding structures
  - Re-assessing noise to create new narratives
- Tinkering with narratives
  - Difficulty – identifying the emergence of the narrative and inserting new elements
  - Entropy relationship as possible solution

Thank You