

Making Organizations Like Brains

Arrows represent "train of thought" not "causation"

Organization "Meta-Theory"

Functionalism

Organizations exist prior to and independently of their members

Intepretivism

Organizations are the result of the interaction and communication among their members – their meaning is socially constructed

Structurationism

Organizations change because of human agency (action) constrained by existing structure – itself a product of prior human action

Organizational Evolution
Among Organizational Populations Within Individual Organizations
(Multi-Level)
Ecological Processes "Genealogical" Processes

Some change is top-down, rooted perhaps in "greater knowledge" or perhaps in "power and privilege."
Some change is "emergent" (When a new phenomenon rises in a system that wasn't in the system's specifications to begin with – may be intended or unintended)
How might such phenomena emerge?

Complex Adaptive Systems

"...worlds where many players are all adapting to each other and where the emerging future is extremely hard to predict."
-- Axelrod and Cohen, *Harnessing Complexity* (2000)

Physics and
Evolutionary Biology

Distributed Computing

Social Design

A Complex Adaptive System has....

- **Agents** of various types who..
 - Have mental models
 - Share a physical and/or conceptual space
 - Have capabilities of interacting with artifacts
 - Use a variety of strategies to respond to the environment and achieve their goals.
- A collection of **strategies** agents can use or can envision, which can change over time.
- **Interaction patterns and methods** among types of agents and types of strategies (e.g. communication systems)
- **Selection Processes** based on success criteria that promote the copying or recombining of types of agents and types of strategies.

Its Key Processes are...

- **Variation** in Types of Agents and Types of Strategies (intended or unintended)
- Strong **Interaction Patterns**: communications systems and capabilities, formal and informal networks.
- Methods of **Selection** including ways of attributing credit for success – to determine what goes forward – what is "learned." (e.g. Fitness, or Power)

Its Key Processes are...

- Handling **Variation** in experience. Constrained by the results of evolution over a long time, each brain must be able to respond to and incorporate (learn from) an almost infinite variety of novel and unpredictable environmental signals.
- Learning through **Interaction Patterns**: Experience is recorded through changes in the "weight" (strength) of signals among neurons and the formation of "neuronal groups"
- **Selection**: Neuronal groups of 1000s or 10,000s of neurons, distributed across the whole brain. Emerge as the result of "differential amplification," – the tendency of axons carrying correlated signals to groups together. "What fires together, wires together."

What is the analogue?

?

Result:

An Intelligent,
Evolving Organization

Result:

An Intelligent,
Evolving Human
Being

- **Reentry**: the ongoing, recursive interchange of parallel signals between reciprocally connected areas of the brain that continually coordinates the activities of these areas across space and time...allowing for a unity of perception and behavior that would otherwise be impossible, given the absence in the brain of a unique computer-like central processor ... [Reentry] is the most unique feature of human brains and appears in no known human communication system or network....

--Edelman and Sporns,
Consciousness: How Matter Becomes Imagination
(2000)