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CONSTRUCTAL INTERDISCIPLINARY AND THE CONCOMITANCE OF THE DYNAMIC VARIATIONS OF THE LIVING TO COGITO-DYNAMICS

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Abstract. Currently, the search for "meaning" in Human Sciences is of primary importance. This research is based on many strategies whose diversity leads the multiplication of models. Modeling is empiricism, the opposite of theory. Models are not theory." Allergic to the possibilities offered by the possible unifying theories, these academies cannot progress effectively. Thus, since the Constructal Theory is of a phenomenological nature, applicable from the tiniest to the largest, there is no obstacle for it to be applied to the benefit of the research fields of the "Sciences of Information and Communication". The objective of our work over these past thirty years has been to demonstrate, that based on a trifunctional approach of communications, the Constructal Theory of Human Communications is able to offer relevant answers to many questions put forward in a binary fashion by The Mental Research Institute of Palo Alto since the 1950's in psychology, psycho-sociology, linguistic, cognitive process and also in the Sciences of Information and Communication, in relation to the concepts of cybernetics. The cogitodynamics process begins with the bacteria and develops with the cell.

***Key words*:** Communication's Constructal law, Sciences of Communication and Information, Trifunctional Construction, Cogitodynamics, Systemic, Trikãla, Dynamic variations, Movement, Development, Evolution, Biofilm, Aggression, Inhibition, Escape, Unifying power, Economics, Exchange value, Cytoskeleton, Extra-cell matrix, Elastine organization in arteriole.

1. CONSTRUCTAL THEORY: A SINGLE LAW FROM THERMODYNAMICS TO THE COGITO-DYNAMICS

The structuralist and anthropologist, Claude Lévi-Strauss thought that it would be possible to arrive at "a sort of periodic table [...] where all real or simply possible customs would appear grouped into families and where we would no longer than to recognize those which societies have in fact adopted" (Tristes Tropiques, Paris, Plon, 1955, p.183).

The famous linguist Edward Sapir considered, in communication, the existence of "a secret and complicated code that is written nowhere that nobody knows, but heard by all". He thought possible, by logic, to update the operating rules and deduce the program, cf. Y. Walls, *Anthropology of the Communication*, Bruxelles, De Boeck, back cover, 1996.

Πάντα χωρεῖ καὶ οὐδὲν μένει
Everything flows and nothing stays.
Everything flows and nothing abides.
Everything gives way and nothing stays fixed.
Everything flows; nothing remains.
All is flux, nothing is stationary.
All is flux, nothing stays still.
All flows, nothing stays.

Fig. 1 – Design in nature from Wikipedia & brain.

Now it is time to present an overview of the unifying power of the constructality in communications. This article is intended to bring to your attention the existence of the constructal constant structure in cogito-dynamics at the service of evolution.

The broadcast point, where the physics of life gives birth to the cogito-dynamics by the bio living evolution (bio in Greek meaning "evolution"), invites us to abandon the matrix approaches at the profit of a triadic approach at the instant where the S-curve escapes and falls within the field of the cogitodynamics whose object is to create the evolution by this way.

2. FROM TRANSFORMATION TO INFORMATION

For Descartes the thinking substance opposes rationalism to empiricism. It includes intuition, conjecture and deduction. In this, the thinking substance internalizes its physical, thermodynamic substratum in order to take power and to produce not only new materials at the heart of time but to produce new knowledge capable of shortening time and optimizing matter. We can then speak of cogito-dynamics which, inserted within its thermodynamic substrate of a quantitative type, will, through the systemic constructal law, allow the qualitative evolution by the exchange and processing of information to the profit of the evolution as well as to slow down ravages of time by optimization.

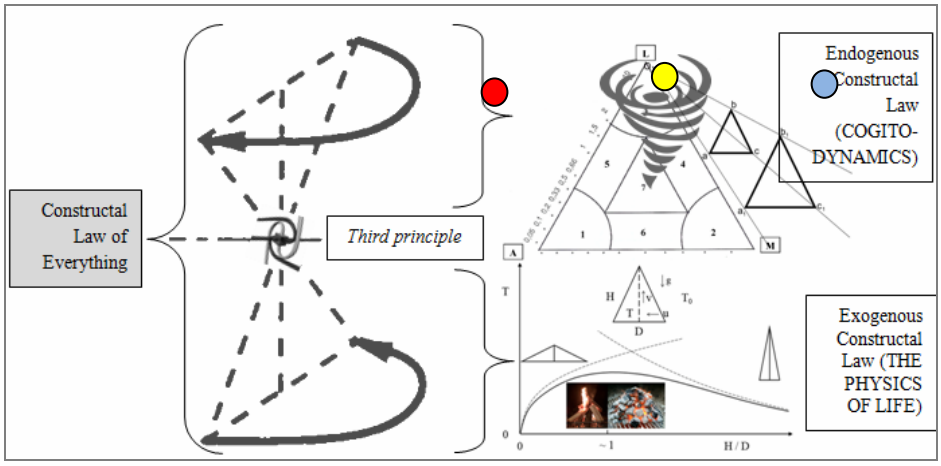


Fig. 2 – The third principle makes a constructal spin between exogenous and endogenous.

3. THE CONSTRUCTAL LAW OF LIFE'S COMMUNICATION IS OF RARE TRIADIC SUBTLETY

This would simplify things by declaring the constructal law would be merely the third law, since it is also the law of the whole, including that of the cogito-dynamics. The cogito-dynamics is the direct immaterial consequence of the telescoping of the first two laws of thermodynamics and the raison to be of the constructal law.

We arrived, as Sanders Peirce, at the system of three categories after a thoroughgoing study of many predecessors, with special reference to the categories of Aristotle, Kant, Hegel, Dumézil. The names that they used for categories varied with context and occasion. Peirce's distinctive claim is that a type approach of three levels is generative of all that we need in logic. According to Peirce's Reduction Thesis:

- Triads are necessary because genuinely triadic relations cannot be completely analyzed in terms of monadic and dyadic predicates,
- Triads are sufficient because there are no genuinely tetradic or larger polyadic relations all higher-arity, n-adic relations can be analyzed in terms of triadic and lower-arity relations and are reducible to them.
- Others, notably Robert Burch (1991) and Joachim Hereth Correia and Reinhard Pöschel (2011), have offered proofs of the Reduction Thesis.

4. THREE SCHEMES COMPOSE THE ELEMENTARY STRUCTURE OF THE COGITODYNAMICS

The constructal method follows three steps: to determine the elementary form, to assemble several and to bring out the global form.

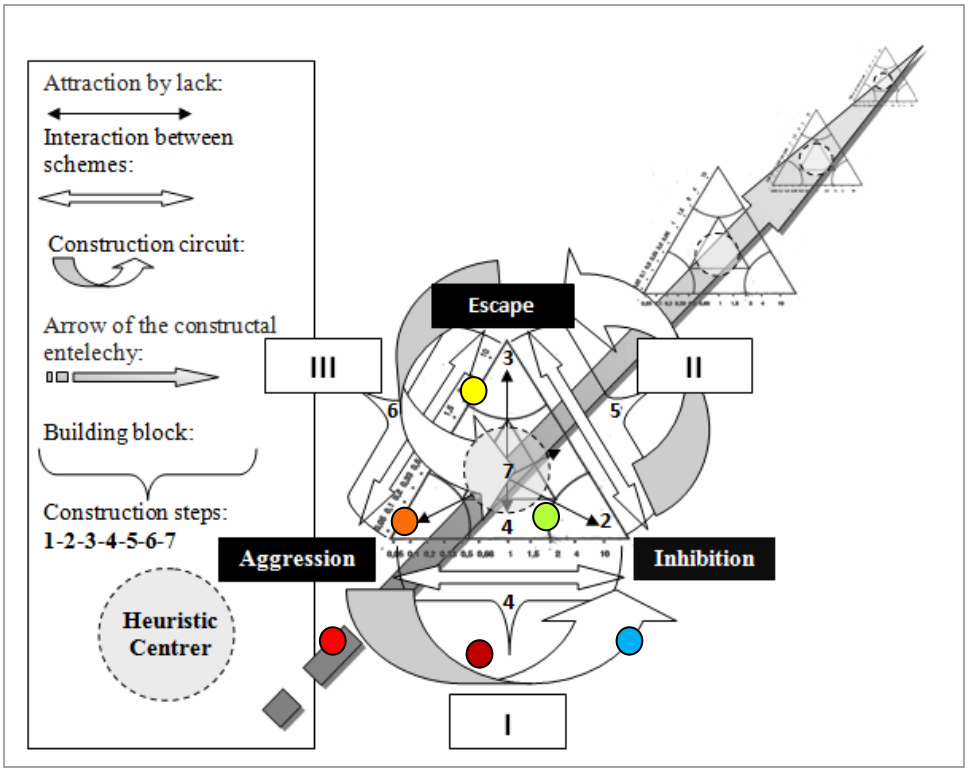
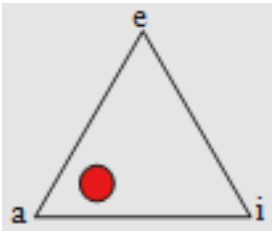


Fig. 3 – Triadic monad of the constructal entelechy in cogitodynamics.

In reality the complexity begins from the bacterium and leads to the productions of human thought. It is at the heart of this system that the constructal arrow of cogitodynamics operates to give rise to heuristic thought. In all cases, from bacteria to heuristics, heuristic thinking is always the product of the interactions between Aggression–Inhibition–Escape. Thus, against the winds and tides, the heuristic thought of evolution always goes ahead.

Based on these three schemes, the social's trifunctionality is found in the sediment of myths, but also in the narrative structure, and in the organization: theory of the three orders. It can be summarizing by: – "those who pray" (Oratores), Escape (Yellow color) – "those who fight" (Bellatores), Aggression (Red color) – and "those who work" (Laboratores), Inhibition (blue color).

5. SEVEN FORMS OF INTELLIGENCE, SEVEN VERBAL ATTITUDES, AT THE SERVICE OF HEURISTIC FROM COGITODYNAMICS

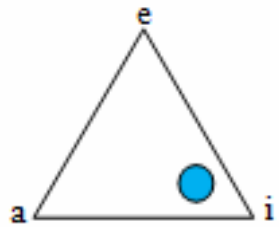


The *raison d'être*, of cogitodynamics is to produce consistency, coherence and congruence in favor of innovation to the benefit of evolution. Seven cognitive forms will contribute to this heuristic production. They are generated from and by interactions between Aggression, Inhibition and Escape:

Analogical thought: A relation of resemblance, of partial identity between different realities previously subjected to comparison – Common traits to the realities thus compared – well-established resemblance – correspondence allowing establishing taxonomy: a method of reasoning which consists in passing from a partial resemblance to a general resemblance:

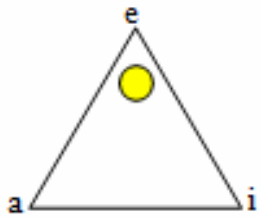
- Constructally the analogy is associated with aggression in the sense of aggregate. To carry out taxonomy is an analogical and academic approach.
- Its reference color is red.
- ***Judgment Attitude***: The ability to give considered opinions or come to sensible conclusions. "What you are telling me is true, but yet ..."? "You are wrong...","Be careful next time, it is dangerous...", "You'd better...".

Normative thought: "Normative" comes from the Latin "norma": square, ruler. Normativity is the state or character of what makes it conform to the norm, the rule to practice, prescriptions for expected results:



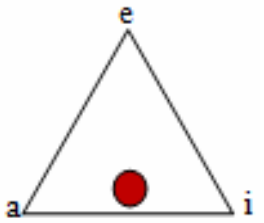
- Social normativity is what constrains a person to do a thing or to adopt a behavior within the society where he lives, without leaving him the choice to oppose. The social normativity varies in different periods and contexts.
- Constructally, the normativity consists of referring to instructions. For this reason normativity enters in the field of inhibition.
- Its reference color is blue.
- ***Investigative Attitude***: to search out and examine by questions the particulars of in an attempt to learn the facts about something hidden, unique, or complex, especially in an attempt to find a motive, cause, law or origin, to know how to practice. "How much, how many...?", "Why...?", "But who...?", "Where...?", "Is...?" .

Logical thought: Logic, from the Greek λογική [logikê], is a term derived from λόγος [lógos] (meaning "reason", "language", and "reasoning"), since Antiquity, was one of the great Disciplines of philosophy, with ethics (moral philosophy) and physics (science of nature). Since the twentieth century, it has found numerous applications in engineering, linguistics, cognitive psychology, analytical philosophy or communication:



- Constructally the cognitive space of logic is assimilated to escape. Isn't it said that the scientist is locked up in his ivory tower?
- The reference color is yellow, that of science.
- ***Information Attitude***: The attitude of information, neutral, is assimilable to the behavior of escape insofar as it is an external contribution, coming to the service of dialogue and likely to come from logic. "The formula is as follows...", "The temperature outside is of...", "The book says…"

Intuitive (Abductive) thought: from Latin "abducĕre" –"to take action, action to remove" with the meaning of "captivity". The abduction is an Aristotelian syllogism in which, most being certain, but the only likely minor, the conclusion is itself likely:



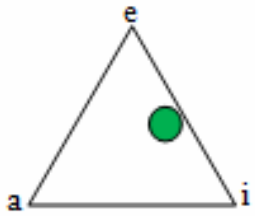
- The term "conduction" would also be appropriate to this cognitive form. In cognitive psychology, the abduction is a form of intuitive reasoning that is to remove the improbable solutions. We're in empiricism.
- Intuitive cognitive space is the result of an interaction between analog thinking [aggression] and normative thought [inhibition].
- Its color is land of Siena (Brown).
- ***Support Attitude***: The key words that characterize the supportive attitude are: "Do not worry...", "It's going to work out...", "It's not serious ...", "There is hope..."

Inductive thought: In its most general meaning, induction is a mental operation consisting in generalizing reasoning or an observation from singular analogous cases. In philosophy, induction is an intellectual approach which consists in proceeding by probable inference, which is to say to deduce laws by generalization of observations:

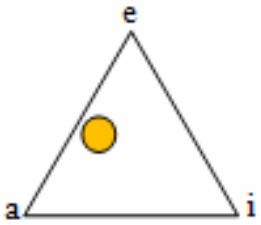
- Constructally "inductive space" is the result of an interaction between normative thinking

[inhibition] and logical thought [escape].

- Its color is green, which is often attributed to the prophets.
- ***Interpretation Attitude***: The words that characterize the attitude of interpretation are: "It's because…", "It seems to me that...", "It is likely that...", "Here's how I see things...", "It's certainly due to this or to that .."



Deductive thought: Reasoning by which the logical consequence that it contains implicitly comes out of a truth or a supposition admitted as truth. In mathematics: it is a traditional mathematical demonstration which leads from principles to consequences (...) as opposed to experimental reasoning which leads to laws based on facts (Legrand 1972). In logic: it is a type of reasoning which leads from one or several propositions, called premises, to a "necessary" conclusion, that is to say, inevitable if one accepts the rule of the game (Legrand 1972). In mathematics we can assign probabilities to abduction, statistics to induction and analysis to deduction. At the barycenter will be the congruence.



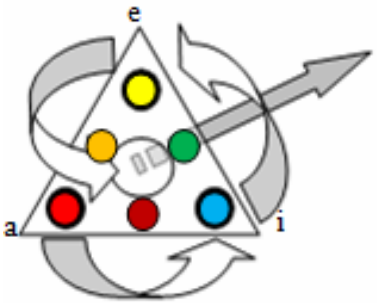
- ***Decision Attitude***: The key words that characterize the decision-making attitude are:

  "I suggest you...", "I advise you to...", "In your place I will do...", "In my opinion you should...", "You have to..."

Heuristic thought: Heuristic (from ancient Greek είρίσκω, eurisko, "I find", is a term of didactics which means "the art of inventing, of making discoveries".

- In mathematical logic: this is successive approaches that proceed by gradually eliminating the alternatives and by retaining a restricted range of solutions tending towards the optimal one: heuristic method as opposed to algorithmic method.
- Art to find, to discover. There is indeed a critique of the values and means of science, but the art of finding (although it has been baptized as heuristic) remains as personal as all other arts (Valéry, Entretiens [with F. Lefèvre], 1926, 133). It was also possible to designate what Bacon called "the increase of science". Through this broader definition, heuristics constitutes a true theory of the elaboration of science as much as the state of exaltation which is its culmination.
- ***Reformulation Attitude***: This central attitude to the quality of an interview demonstrates an effort to sincerely understand an interlocutor or to seek a solution with him, to make progress, to contribute to innovation from different points of view. The key words that characterize the reformulation attitude are: "If I understand you correctly...", "So, according to you...", "In your opinion, therefore ...", "In other words...", "According to your sense..."

Heuristics is as much an instrument of innovation as a state of mind. Therefore it is conceivable to think that the increase of science, which leads to evolution, might be the fruit of answers issues from three inferences: abductive, inductive and deductive. Thus, heuristics is creation of new information contributing to the evolution. The evolution is the consequence of the interactive movement between the different cognitive forms we talk about.



To sum up: unconsciously, we would like to think of human creativity as if it should be the outcome of a divine particle, rather than a production coming from the chance, the rationality, or from the necessity. Creativity is both innovation and evolution but they cannot operate without the trifunctional schemes of cogitodynamics themselves governed and animated by the constructal law.

6. MODELING THE VALUE OF HUMAN CAPITAL IN ECONOMICS BY THE THREE-WAY CONSTRUCTAL APPROACH

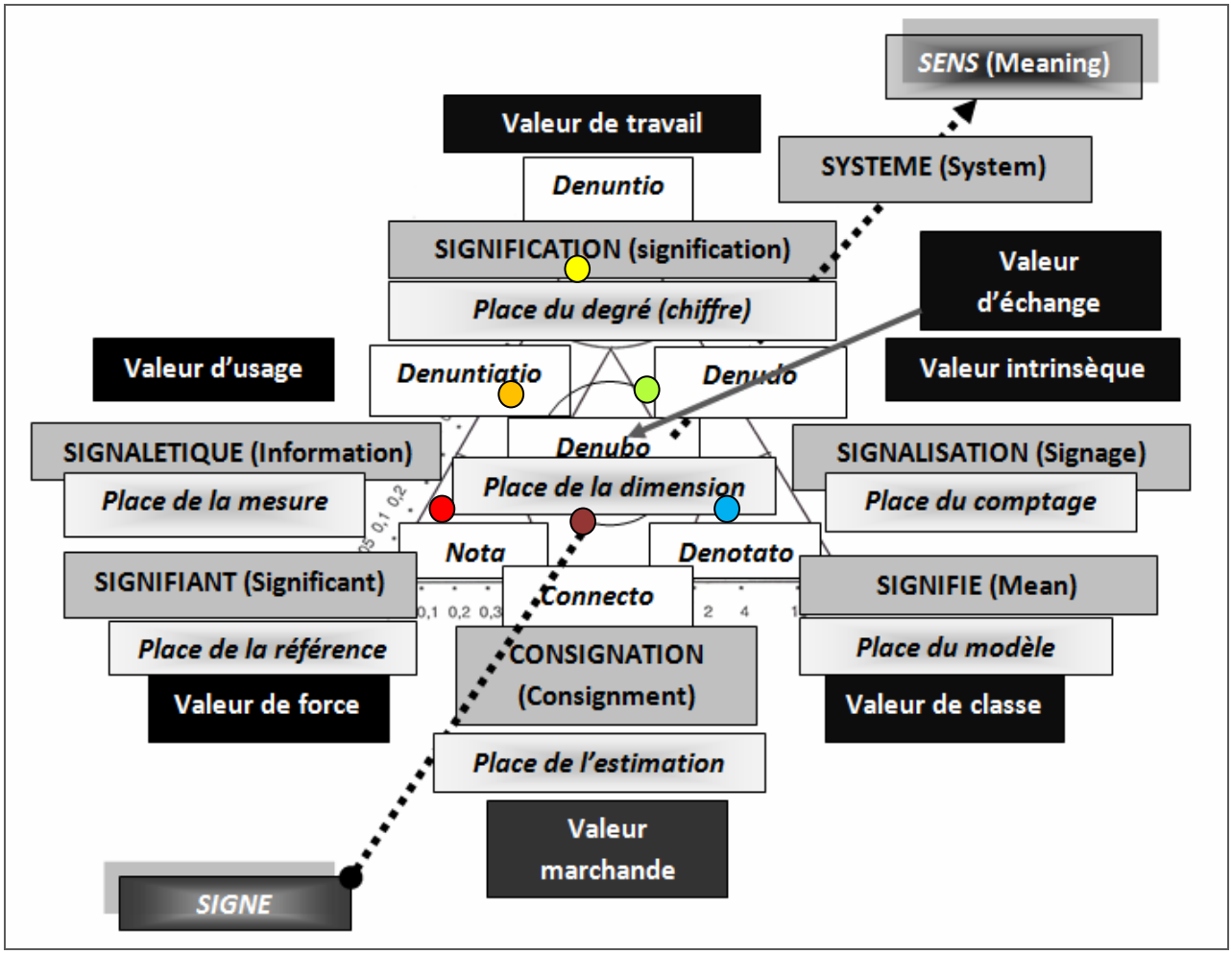


Fig. 4 – Three functional abacus (trikãla) for management of the value in economics.

7. THE THIRD LAW FOR SERVING THE TRIFUNCTIONAL BIODYNAMICS EQULIBRUM OF THE CELL

Thus, the mechanical modelling of the cytoskeleton endothelial cells established by physicists reveals that trifunctional constructal law is at the heart of the structure in order to offer, on time, the best possible circulation of energy for the benefit of the organelles, molecules etc. In the end, the thought emerges from thermodynamics laws. Two laws are enough to thermodynamics but three constraints are necessary to cogitodynamics's evolution.

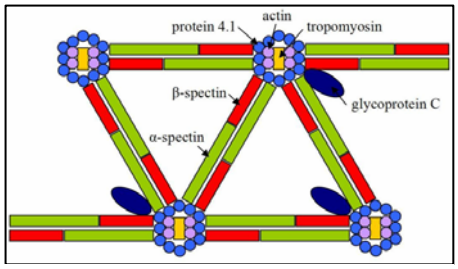


Fig. 5 – The spectrin complex binds one actin filament in each end and is a critical part of forming the triangles that make up hexagons in the cell cortex.

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