

Cognition as management of meaningful information.
Proposal for an evolutionary approach.

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- A) Cognition for Agents Coping with their Environments (Animals, Humans, Robots).**
- B) Agents have Constraints to Satisfy.**
- C) Animals with “stay alive” Constraint. Starting point for an Evolutionary Approach.**
- D) Constraint Satisfaction by Generation of Meaningful Information. MGS Model.**
- E) MGS: Building Block for Agents and for Evolutionary Approach.**
- F) Evolutionary Approach to Cognition by Evolution of Meaning Generation.**
- G) Cognition as Management of Meanings. Evolution of Cognition.**
- H) Continuations**

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A) Cognition for Agents coping with their Environments

- * Cognition as a coordinated set of tools evolved for coping with environment.**
- * Cognition exists for agents. Cognition does not exist per se.**
- * Agents: Animals, Humans, Robots.**

B) Cognition for Agents that have Constraints to Satisfy

- * Agents cope with environment by constraints satisfaction.**
- * Animal: stay alive, reproduce, maintain group life, manage hierarchy, ...**
- * Human: be happy, efficient, rich, smart, add value, valorize ego, ...**
- * Robot: avoid obstacles, find best path, ... (as designed).**

C) Animal with “stay alive” Constraint. Starting point for an Evolutionary Approach

- * Animals sense their environment. Connection with “stay alive” constraint.**
- * => Meaningful information: presence of danger incompatible with staying alive.**
- * => Action implementation: get away from danger.**

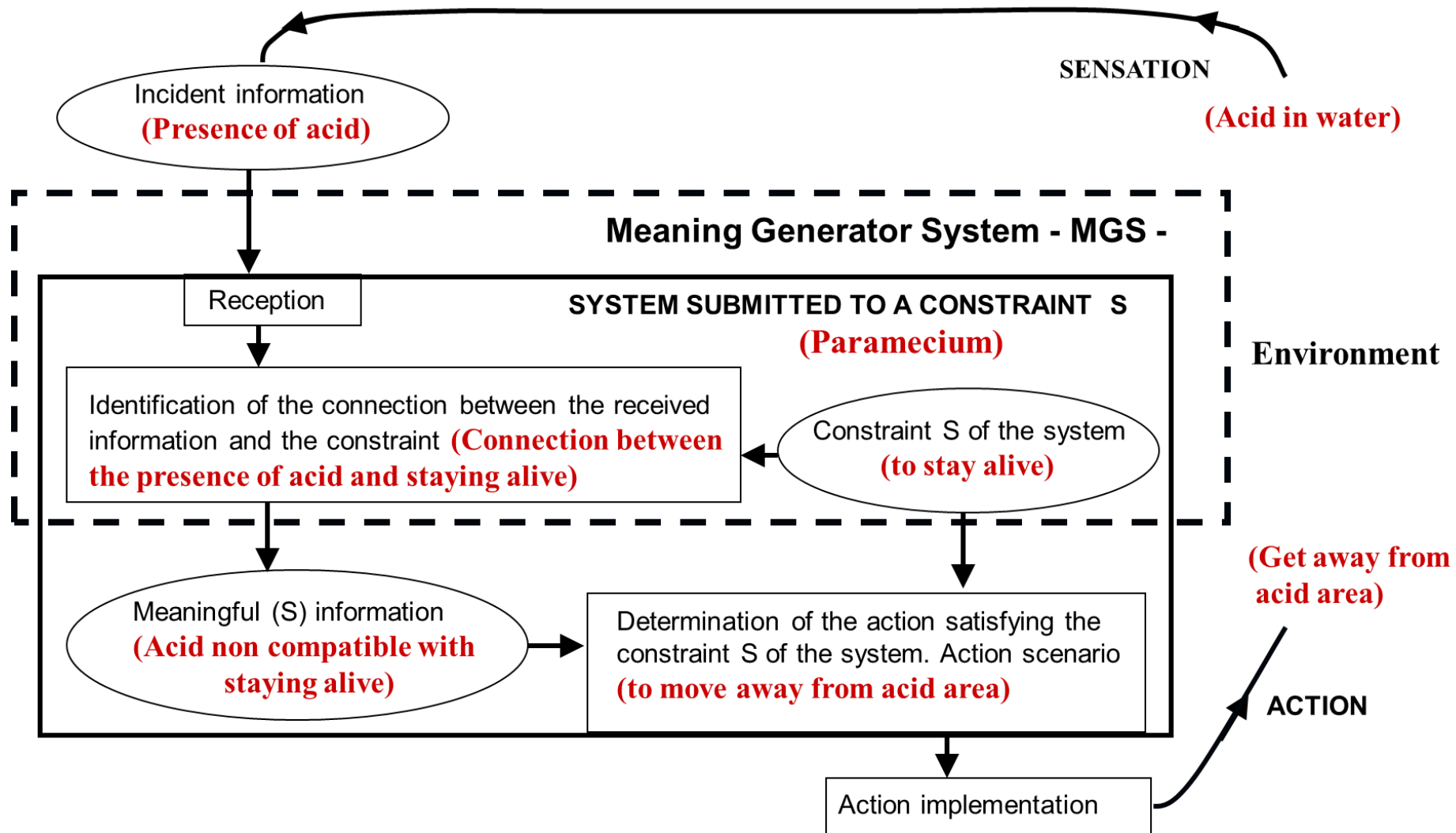
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D) Constraint Satisfaction by Generation of Meaningful information. MGS [1, 2]

*** Definition of “Meaning”:** connection between received information and constraint.

- Concepts of “truth” or “autonomy” not needed at MGS level.



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E) MGS: Building Block for Agents and for Evolutionary Approach [2, 4]

- * **Meaningful (S) Information.** MGS grounds meaning in sensorimotor process.
- * **Meaningful information generation , transmission, storage., ... IP.**
- * **MGS for meaningful representations in agents (networks of meanings).**
- * **Meaning generation embeds agents in their environments.**

F) Evolutionary Approach to Cognition by Evolution of Meaning Generation [4]

* **Evolution of agents:**

- Animal, human, robots (products of humans).

* **Evolution of constraints /meanings from Animals to Humans. Evolution of cognition:**

- Problem of unknown nature of human mind. Human constraints difficult to define (free will).
- Maslow pyramid needs / Freudian drives.
- Anxiety limitation processes from evolutionary approach to self-consciousness (next page).
Links language to self-consciousness [5].

* **Derived constraints for Robots.**

- Robot as agent with derived constraints/meanings/intentionality.

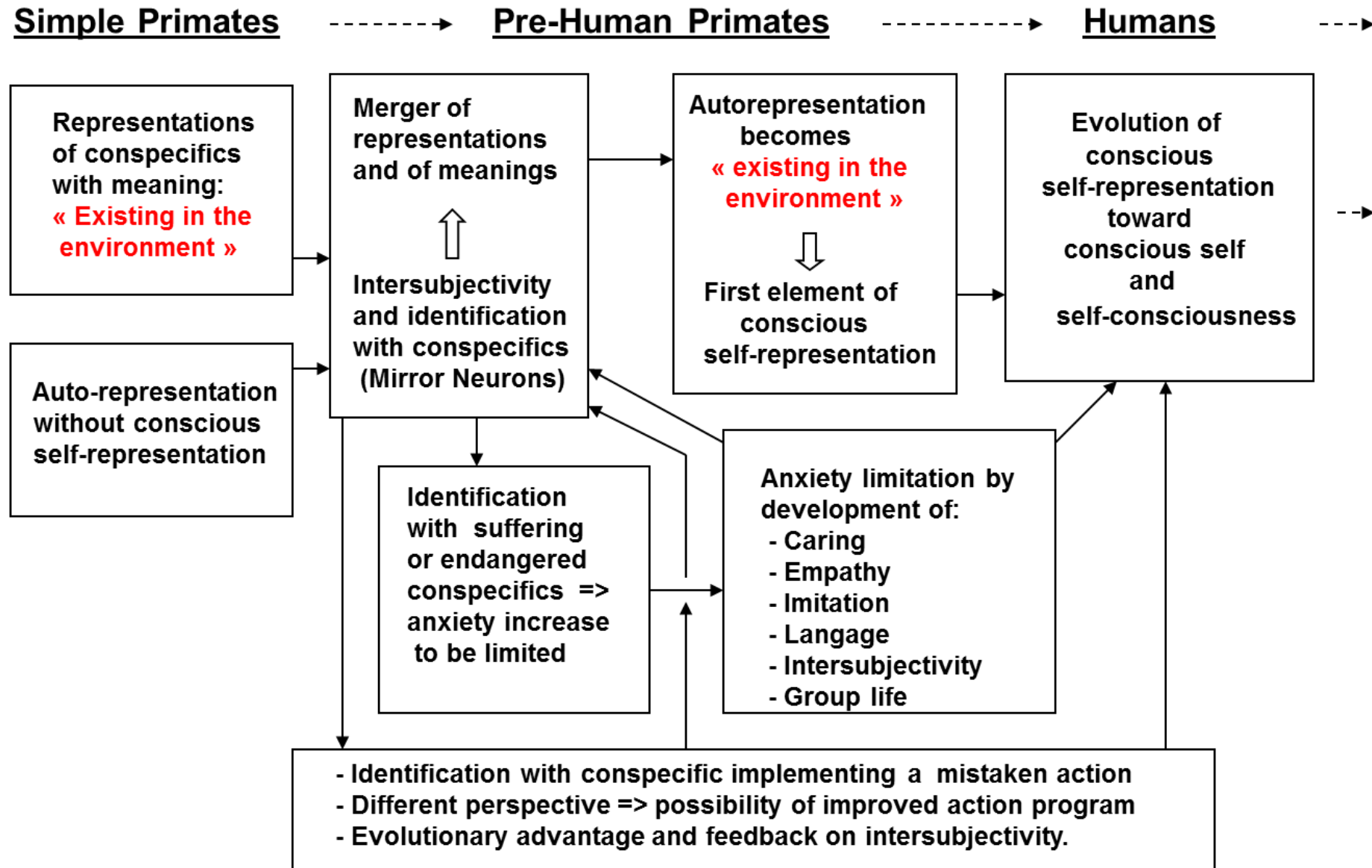
* **Proposal for evolutionary approach to cognition. From animal to humans & robots:**

- Evolution of agents, constraints and meaning generation => evolution of cognition.

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* Evolution of constraints from Animals to Humans [4]:

- Anxiety limitation processes from evolution of auto-representation-



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G) Conclusion: Cognition as Management of Meanings. Evolution of Cognition

Cognition {
* For agents submitted to constraints. Does not exist per se
* Management of meanings
* Embed agents in their environments

<u>Agent</u>	<u>Constraints</u>	<u>Agent's characteristics</u>
Animal	<ul style="list-style-type: none">* Stay alive- Metabolic- Individual- Group life- Species	<ul style="list-style-type: none">* Alive* Autonomous* Bio-intentional* Generates meaning- Organic self -
Human	<ul style="list-style-type: none">* Maslow pyramid needs* Freudian drives* Limit anxiety* Look for happiness	<ul style="list-style-type: none">* Self Conscious* Capable of free will- Self Conscious Self -
Robot	Designer's choice	<ul style="list-style-type: none">* Derived intentionality* Artificial autonomy & consciousness- Artificial Self -

*Cognition as Management of Meanings
Evolution of Cognition as Evolution of Meanings*

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H) Continuation

- * Formalize “constraints“ relatively to the nature of agents (animal, humans, robots).
- * Address nature of life, consciousness, bio and robots intentionality [3, 6, 7].
- * Look at a possible evolutionary approach to the notion of self [8].

References

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