Evolution of Representations and Intersubjectivity as sources of the Self. An Introduction to the Nature of Self-Consciousness.

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Abstract: It is agreed by most people that self-consciousness is the result of an evolutionary process, and that representations may have played an important role in that process. We would like to propose here that some evolutionary stages can highlight links existing between representations and the notion of self, opening a possible path to the nature of self-consciousness.
Our starting point is to focus on representations as usage oriented items for the subject that carries them. These representations are about elements of the environment including conspecifics, and can also represent parts of the subject without refering to a notion of self (we introduce the notion of "auto-representation" that does not carry the notion of self-representation). Next step uses the performance of intersubjectivity (mirror neurons level in evolution) where a subject has the capability to mentally simulate the observed action of a conspecific (Gallese 2001). We propose that this intersubjectivity allows the subject to identify his auto-representation with the representations of his conspecifics, and so to consider his auto-representation as existing in the environment. We show how this evolutionary stage can introduce a notion of self-representation for a subject, opening a road to self-conciousness and to self. This evolutionary approach to the self via self- representation is close to the current theory of the self linked to representations and simulations (Metzinger 2003). We use a scenario about how evolution has brought the performance of self-representation to self-consciousness. We develop a process describing how the anxiety increase resulting from identification with endangered or suffering conspecifics may have called for the development of tools to limit this anxiety (empathy, imitation, language), and how these tools have accelerated the evolutionary process through a positive feedback on intersubjectivity (Menant 2004, 2005). We finish by summarizing the points addressed, and propose some possible continuations.

Key words: representation, primate, conspecific, evolution, self, auto-representation, intersubjectivity, self-representation, anxiety, self-consciousness, robots.

References: - Gallese, V. *The 'Shared Manifold' Hypothesis*. Journal of Consciousness Studies, 8, N° 5-7, 2001, pp33-50.
- Metzinger, T. *Being No One*. Cambridge, MA. MIT Press. 2003.
- Menant, C. *Performances of Self Awareness used to explain the Evolutionary Advantages of Consciousness*. TSC 2004. *Evolution and Mirror Neurons. An Introduction to the Nature of Self-Consciousness"*. TSC 2005.

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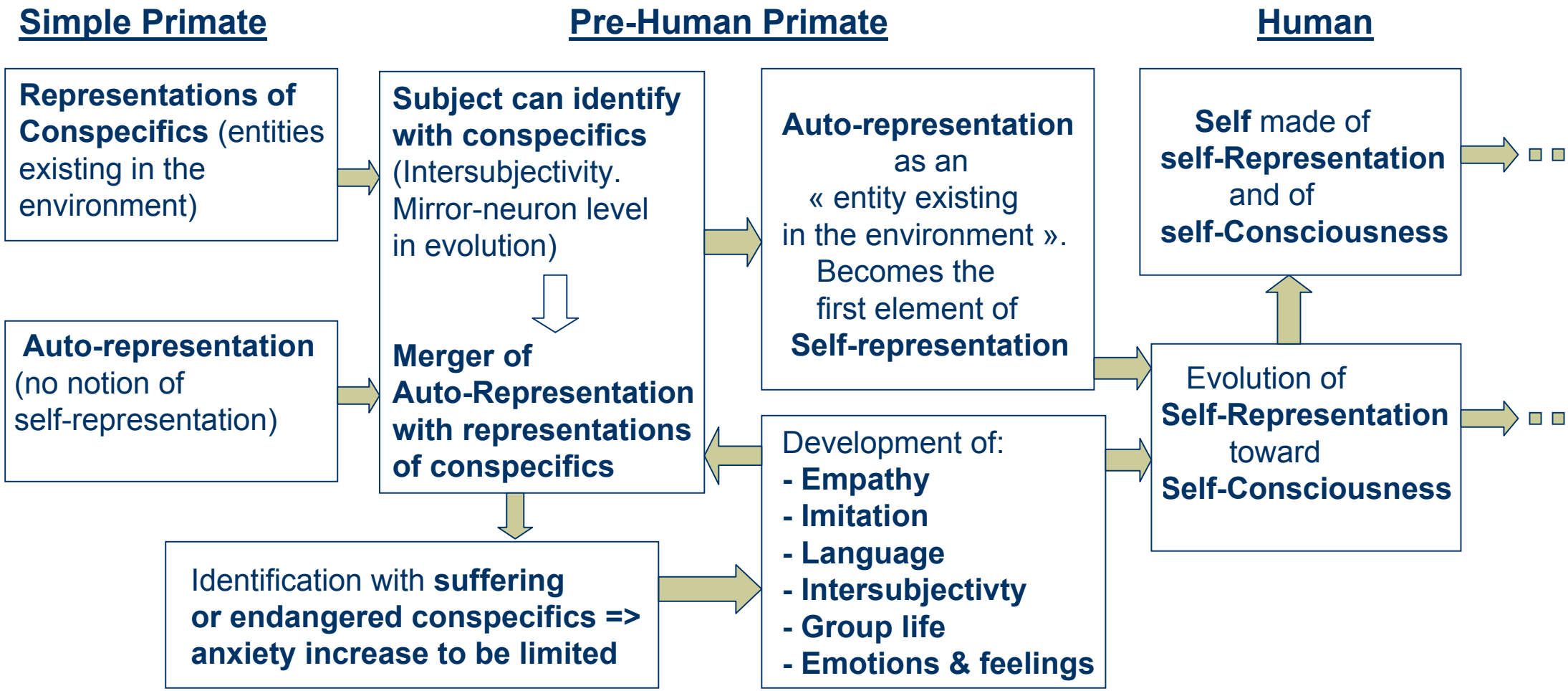
1) Introduction - Presentation:

* **Self-consciousness** and **self** are mysterious **results of evolution**.
* Our proposal is to consider them as **results of an evolution of representations.**
* **Simple primates** carry **representations of conspecifics and auto-representation** (with no component of self-representation).
* **Pre-human** primates can identify with theirs conspecifics and **merge** their **auto-representation with** the **representations** they have **of their conspecifics.** The former gets access to the characteristics of the latter, i.e. an « element existing in the environment ».
* **Auto-representation** becomes an **« element existing in the environment ».**
  => first element of **self-representations.**
* **Evolutionary advantages** bring self-representation to **self-consciouness** and to **self.**
* Anxiety/anxiety limitation considered as an **evolutionary engine.**
* **Self** considered as made of **self-representation and of self-consciousness**.

2) Evolutionary Scenario:



Notes:

* **Auto-representation** is made of perceived parts of the body and of interactions with the environment. Auto-representation is considered as containing no notion of self-representation.
* **Merger of auto-representation with representations of conspecifics** brings to the former the characteristics of the later. **Auto-representation becomes an « entity existing in the environment »** and by so becomes an element of **self-representation within the subject**.
* Identification with **suffering or endangered conspecifics => Anxiety increase to be limited.**
* Actions resulting of anxiety limitation produce a positive feedback on intersubjectivity => **Evolutionary engine.**

3) Summary and continuation:

Summary:

* Proposal of a **scenario** where **self-consciousness and self** are the result of an **evolution of representations** in organisms living in group life.
* **Self-representation** as an **evolution of auto-representation** and identification with conspecifics (miror neuron level in evolution).
* **Self** as made of **self-representation** and of **self-consciousness**.
* **Evolutionary engine** based on anxiety/anxiety limitation creates a positive feedback on the **development of intersubjectivity.**

Continuation:

* Analyze the process of merger of representations (1). **Definition of a representation.**
* Position **Human** in **evolutionary engine.**
* Introduce a corresponding **phylogenesis of emotions/feelings.**
* Consider the **evolution of consciousness beyond today human nature.**
* Look at the nature of **phenomenal consciousness** as a result of **evolution.**
* Consider the cases of today **great apes** and **dolphins.**
* Analyse **applicability** of scenario **to robots.** Introduction to **self-conscious robots.**

Notes:

(1) The merger of representations has already been introduced by relating a representation to a meaningful information defined in a systemic approach where a system submitted to a constraint creates a meaningful information in order to satisfy the constraint (Menant TSC 2006).