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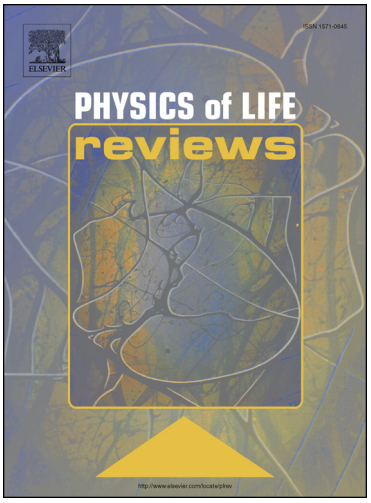

A bridge towards a mathematical theory of living systems

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A bridge towards a mathematical theory of living systems
Comment on "Physics of mind: experimental confirmations of theoretical predictions" by Schoeller, F., Perlovsky, L., and Arseniev, D.

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Our comment is addressed to the review [1] which is devoted to design a unified framework on the physics of mind, where this challenging a new area of science based on the common methodology of all areas of physics. Namely, starting from a few fundamental laws the approach moves to the development of a mathematical theory to achieve predictions supported by empirical data. Predictions can even include unexpected events that might be called *black swans* according to Taleb's allegoric definition [2].

This topic refers to one of the most challenging scientific adventures of this century, namely a theoretical formalization of living systems by tools of the so called hard sciences, specifically mathematics, physics, and computer sciences. This paper, as a few others, goes far beyond an artificial separation between the so called soft and hard sciences which has been often object of intellectual conflicts up to negation that soft sciences can be considered real sciences. This conflict developed after August Comte's the conceptual visit over sciences [3]. Nowadays, the definition *science of living systems* appears to be appropriate according to our own bias, but new paradigms have to be searched whenever a specific theory is the objective of a research program. Indeed, the contents of [1] are developed within this conceptual framework.

The authors of [1] provide an interesting presentation of the evolution of the philosophical approach to understand and reproduce the dynamics of living systems. The starting milestone can be referred to Immanuel Kant (1724–1804) who proposed, in the celebrated "Critics of the Power of Judgement" [4], the following definition: *Living Systems: Special structures organized and with the ability to chase a purpose.* However, this definition has not been sufficient to proceed towards the categorization followed by the assessment of a scientific method he proposed in his fundamental "Critique of Pure Reason" [5].