

# Review of: "The Evolution of Consciousness Theories"

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This is a well-written and useful survey of the theories of consciousness. I have a few comments:

- Some terms and concepts are introduced without proper introduction or explanation. E.g., SIBA, SCBA is used, but never spelled out or explained. This is also true for terms in the context of a particular theory; e.g., what exactly is sensation, and how is that different from other information (a sensor transforms a physical effect into information, and the output of a sensor is information just like any information generated in other ways)? So in which way does a theory (or a specific argument) distinguish between sensation and other information? This is just an example, but I feel the lack of more precise definitions is a shortcoming of this survey, which it arguably inherits from many of the surveyed theories. I realize that complete rigor is not possible for this topic (yet), but more effort in defining terms would still be an improvement.
- I lack a discussion of the distinction between process and content. E.g., the boxes in the shown figures are information processing processes, and it is equally important *how* they operate and *what* they process. E.g., if we have an agent that entertains an internal model of itself, processes and simulates this model, it may possess something resembling self-awareness. But if the same agent only processes models of other agents, then self-awareness seems less likely. Information has a syntactic aspect and a semantic aspect; the semantic aspect of information is the meaning of a symbol, and I think for the given discussion the semantics of information is crucial. If an agent uses a symbol "SELF" and it uses it as any other symbol such as "HOUSE" or "ROBOT" or "BOB", it is different from the situation where the agent knows that "SELF" refers to itself, and when it makes a decision to destroy "SELF," then there cannot be a perception or action after that event.
- More elaboration of the "hard problem of consciousness" would have been useful. Why is it hard, and what have been the attempts so far to understand it? Since the article surveys theories of consciousness, it feels incomplete if the *real problem* is not elaborated.