

NOTEWORTHY, PHILOSOPHY

THE GREAT CONSCIOUSNESS DEBATE

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The [most recent discussion](#) about consciousness was going in circles, having now a dozen of competing theories as summarized by chatGPT and reworked by me for omissions. Not sure if all the summaries and references are good, but maybe this is a good starting point to understand the background of [a new paper](#).

1. 1. Global Workspace Theory (GWT) proposed by Bernard Baars.
 - Suggests that consciousness arises when information is “broadcast” to a global workspace in the brain, allowing different cognitive processes to access and use it.
 - Compares the brain to a theater, where only information in the spotlight of attention becomes conscious.
 - Baars, B. J. (1988). A Cognitive Theory of Consciousness. Cambridge University Press.
2. Integrated Information Theory (IIT) developed by Giulio Tononi.
 - Proposes that consciousness is linked to the amount of integrated information (Φ) in a system.
 - Suggests that the more a system is capable of integrating information across different parts, the more conscious it is.
 - Tononi, G. (2004). An information integration theory of consciousness. BMC Neuroscience, 5(1), 42.
3. Higher-Order Theories (HOT)**
 - Suggests that consciousness arises from thoughts about thoughts.
 - A mental state becomes conscious when there is a higher-order representation of that state in the brain.
 - Championed by researchers like David Rosenthal and Hakwan Lau.
 - Rosenthal, D. M. (2005). Consciousness and Mind. Oxford University Press.
4. Attention Schema Theory (AST) proposed by Michael Graziano.
 - Suggests that the brain creates a simplified model (a schema) of its own attention processes, which gives rise to subjective awareness.
 - Consciousness is a type of self-monitoring mechanism.
 - Graziano, M. S. A. (2013). Consciousness and the Social Brain. Oxford

University Press.

5. Predictive Processing & Bayesian Brain Theories
 - Suggests that the brain is constantly generating predictions about sensory input and updating them based on new information.
 - Consciousness arises from how well the brain models the world and resolves prediction errors.
 - Friston, K. (2010). The free-energy principle: a unified brain theory? *Nature Reviews Neuroscience*, 11(2), 127-138.
6. Quantum Theories of Consciousness like Penrose & Hameroff's Orchestrated Objective Reduction (Orch-OR) - suggest that consciousness arises from quantum processes in microtubules in brain neurons.
 - Highly controversial, as many neuroscientists doubt quantum effects play a significant role in brain function.
 - Penrose, R. (1989). *The Emperor's New Mind: Concerning Computers, Minds, and the Laws of Physics*. Oxford University Press.
7. Panpsychism
 - Suggests that consciousness is a fundamental feature of the universe, present in all matter at some level.
 - Variants include ****Integrated Information Panpsychism**** (which aligns with IIT) and ****Cosmopsychism**** (which suggests the universe itself is conscious).
 - Philosophers like Philip Goff and Galen Strawson support versions of this idea.
 - Strawson, G. (2006). Realistic monism: Why physicalism entails panpsychism. *Journal of Consciousness Studies*, 13(10-11), 3-31.
8. Enactive and Embodied Theories
 - Consciousness is seen as emerging from the interaction between the brain, body, and environment.
 - Rather than being purely brain-based, it depends on active engagement with the world.
 - Varela, Thompson, and Noë have been key contributors.
 - Varela, F. J., Thompson, E., & Rosch, E. (1991). *The Embodied Mind: Cognitive Science and Human Experience*. MIT Press.
9. Recurrent Processing Theory (RPT) proposed by Victor Lamme.
 - Suggests that consciousness arises from recurrent (looping) activity in cortical networks.
 - When neural activity is only feedforward, it remains unconscious.
 - Lamme, V. A. F. (2006). Towards a true neural stance on consciousness. *Trends in Cognitive Sciences*, 10(11), 494-501.
10. Interactionist Dualism Theory (IDT) proposed by Eccles and Popper
 - consciousness has a non-physical reality that interacts with the brain.

- influences the brain by intervening at specific synapses
 - unlike materialist views, this theory suggests that the mind and brain are distinct but interact causally.
 - criticized for lacking a clear mechanism for how a non-physical mind could affect a physical brain.
 - Popper, K. R., & Eccles, J. C. (1977). *The Self and Its Brain*. Springer.
11. Recurrent Processing Theory (RPT) proposed by Victor Lamme.
- Suggests that consciousness arises from recurrent (looping) activity in cortical networks.
 - When neural activity is only feedforward, it remains unconscious.
12. Orchestrated Objective Reduction (Orch-OR) proposed by Penrose and Hameroff
- suggests that consciousness arises from quantum processes within microtubules in brain neurons.
 - claims that quantum coherence and reduction of wavefunctions within microtubules play a fundamental role in conscious experience.
 - highly controversial
 - Hameroff, S., & Penrose, R. (1996). Orchestrated reduction of quantum coherence in brain microtubules: A model for consciousness. *Mathematics and Computers in Simulation*, 40(3-4), 453-480.

No single theory is universally accepted. Some researchers believe that an integrated approach combining multiple theories may be necessary to fully explain consciousness. I am still intrigued by John [John Eccles and Karl Popper](#) book that I read in 1989 which may still be valid although containing “unscientific” [metaphysical elements](#).

A new paper now just identifies the unscientific elements in the [IIT / integrated information theory](#)

One well-known proposal — integrated information theory — has recently been labeled as ‘pseudoscience’, which has caused a heated open debate. Here we discuss the case and argue that the theory is indeed unscientific because its core claims are untestable even in principle.

While I agree that IIT is not scientific for limited empirical support, I have doubts if this is a sufficient cause to deny the validity of the argument. Also metaphysically *a priori* methods are justified even if the [rely](#) only “on rational intuition and abstract reasoning from general principles rather than sensory experience.”

Independent of that, I am sharing the concerns of the authors if some untested theories like IIT is leading to serious consequences

By promoting to the general public the untestable idea that ' $\Phi =$ consciousness', proponents of IIT may ultimately have an unjustified effect on law and policy, including on decisions that involve measures of quality of life, clinical triage, abortion, the rights of non-responsive patients, and welfare considerations for insects (?), organoids and artificial intelligences.

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