

Consciousness, cognition, and the hierarchy of context: expanding the global neuronal workspace

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Abstract

Adapting Dretske's approach on the necessary conditions for mental process, we apply a communication theory analysis of interacting cognitive biological and social modules to the global neuronal workspace, the emerging standard model for consciousness. Using an obvious canonical homology with statistical physics, the method, when iterated, generates a fluctuating dynamic threshold recognizably similar to phase transition in a physical system, but constrained to a manifold/atlas structure analogous to a tunable retina. The resulting 'General Cognitive Model' can be extended in a straightforward manner to include the effects of psychosocial stress, culture, or other cognitive modules which constitute a structured, embedding hierarchy of contextual constraints acting at a slower rate than neuronal function itself. This produces a 'biopsychosociocultural' treatment of consciousness that, while otherwise remarkably similar to the standard development, meets compelling philosophical and other objections to brain-only descriptions.

Keywords: consciousness, global workspace, information theory, mereological fallacy, phase transition, punctuated equilibrium

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