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Global workspace theory of consciousness: toward a cognitive neuroscience of human experience

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Abstract

Global workspace (GW) theory emerged from the cognitive architecture tradition in cognitive science. Newell and co-workers were the first to show the utility of a GW or “blackboard” architecture in a distributed set of knowledge sources, which could cooperatively solve problems that no single constituent could solve alone. The empirical connection with conscious cognition was made by Baars (1988, 2002). GW theory generates explicit predictions for conscious aspects of perception, emotion, motivation, learning, working memory, voluntary control, and self systems in the brain. It has similarities to biological theories such as Neural Darwinism and dynamical theories of brain functioning. Functional brain imaging now shows that conscious cognition is distinctively associated with wide spread of cortical activity, notably toward frontoparietal and medial temporal regions. Unconscious comparison conditions tend to activate only

local regions, such as visual projection areas. Frontoparietal hypometabolism is also implicated in unconscious states, including deep sleep, coma, vegetative states, epileptic loss of consciousness, and general anesthesia. These findings are consistent with the GW hypothesis, which is now favored by a number of scientists and philosophers.



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