Jared Jolton

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Reading Response

Response to Baars and Franklin 2003:

How Conscious Experience and Working Memory Interact

This paper outlines a framework for working memory called Global Workspace Theory, which considers the role of consciousness as a broadcasting hub for the brain. The ability to modulate and control behavior clearly requires a central executive, but there is no inherent aspect of this process that requires consciousness. Rather, these researchers suggest that to control behavior, conscious parts of the brain (such as the prefrontal cortex and the anterior cingulate cortex) are used to support goal-directed functioning. These areas receive all kinds of relevant information from various parts of the brain, and use this information to delegate various goal-oriented tasks to other, more specialized regions.

Studying working memory is a particularly efficient way of probing the contents of the conscious mind, because in order for a subject to accurately report events stored in working memory, they must in fact be conscious of these events. As Baars and Franklin mentioned in this paper, all aspects of a working memory task require consciousness. In order to perform well on these tasks, subjects must have conscious representations of the input stimuli, the rehearsal process, and the recall/report processes. Global Workspace Theory suggests that these conscious representations are used to direct unconscious processes, such as specific behaviors or internal phonological loops. In a recurrent process, these unconscious artifacts are picked up by the conscious representation, which is then broadcast throughout the brain - allowing the entire brain to be aware of this representation.

There are several aspects of the Global Workspace model which I find particularly intriguing and confusing. For example, the researchers noted how conscious representations must maintain temporal order, while unconscious processes can proceed in parallel. This seems particularly problematic, because the conscious parts of the brain have no control over when the unconscious processes will complete and return their information. This is akin to a computer program which utilizes parent and child processes - it is often very difficult to get the parent processes to wait for their child processes to terminate (or to continue with these child processes running in the background), and unpredictable behavior is unavoidable if these relationships are not carefully specified. Seriality seems particularly important for working memory tasks, as maintaining the order of stimuli and their associated percepts is often half the battle with these tasks (i.e. remembering an ordered list of numbers or words in order). Either the conscious buffer is very precise in its delegation of tasks, or it is capable of maintaining a temporal order regardless of when its various unconscious processes are completed. For example, after recruiting unconscious resources throughout the brain, the conscious broadcast might wait for the result of the unconscious processes to become conscious again before continuing to update the goal-context and perform further relevant actions. Without this waiting period, the conscious broadcast might select irrelevant or inappropriate goals and actions.