

Letter

One, not two, neural correlates of consciousness

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Although we admire Ned Block's effort to include cognitive neuroscience in his philosophical work, we cannot agree with his interpretation of the evidence [1]. Block has long argued that there are two kinds of consciousness: 'phenomenological consciousness' (what we experience) and 'access consciousness' (roughly, the information we can access via conscious experiences). In Baars' theoretical work on Global Workspace Theory [2, 3] that point is made more simply: the contents of visual consciousness, for example, clearly require visual cortex. But activity in visual cortex, although necessary, is not sufficient for conscious qualities, as the brain evidence so clearly shows. Without parietal and prefrontal activation, researchers such as Dehaene *et al.* [4] find no correlation of visual cortical activity with consciousness. Similarly, Laureys *et al.* [5] have shown that when frontoparietal regions are impaired, there is no evidence for sensory consciousness, despite activation of sensory cortices [6, 7]. The obvious inference is that *unconscious* brain mechanisms interact with visual cortex to make visual qualities possible. But why should such interactions be said to involve 'access consciousness'?

For example, we know that some parietal neurons act as egocentric visuospatial maps, and that without those neurons, visual objects disappear phenomenally from the contralateral visual field. But direct stimulation of these parietal egocentric map neurons does not evoke conscious experiences at all: they do not directly support visual qualia. That is, they are *necessary* for visual contents but not *sufficient*, just as brainstem arousal systems are necessary but not sufficient. Why then should they be thought to involve 'access consciousness'?

We are afraid that Block has fallen victim to his own theory. There is no need for 'access consciousness'. All we need is consciously-mediated access to brain capacities, most of which are simply not conscious.

References

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- 5 Laureys, S. *et al.* (1999) *Impaired effective cortical connectivity in vegetative state*. *Neuroimage* 9, 377-382

- 6 Laureys, S. et al. (2000) *Auditory processing in the vegetative state*. *Brain* 123, 1589-1601
- 7 Laureys, S. et al. (2002) *Cortical processing of noxious somatosensory stimuli in the persistent vegetative state*. *Neuroimage* 17, 732-741