

On this day of July 7, 2012, a prominent international group of neuroscientists gathered at The University of Cambridge to reassess the neurobiological substrates of conscious experience and related behaviors in human and non-human animals (I would continue to use the term non-human animals because using “humans” and “animals” only further propagates the idea of a discontinuity between humans and other animals and the (misconception that humans are not part of the animal world.) While comparative research on this topic is naturally hampered by the inability of non-human animals, and often humans, to clearly and readily communicate about their internal states, the following observations have been made:

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- The field of Consciousness research is rapidly evolving. Abundant new techniques and strategies for human and non-human animal research have been developed. Consequently more data is becoming readily available, which calls for a periodic reevaluation of previously held preconceptions in this field. With research on non-human animals, homologous brain circuits correlated with conscious experience and perception can be selectively facilitated and disrupted to assess whether they are in fact necessary for those experiences. In humans, new non-invasive techniques are available to survey the correlates of consciousness.
- The neural substrates of emotions do not appear to be confined to cortical structures. In fact, subcortical neural networks aroused during affective states in humans are critically important for generating emotional behaviors in non-human animals. Artificial arousal of these same brain regions generate corresponding behavior and emotional feeling states (use of the word “feeling” is likely to inflame unnecessary controversy – the term is not well defined scientifically, even for humans, and is not accepted by many behavioral researchers as currently useful) in both humans and non-human animals. Wherever in the brain one evokes instinctual emotional behaviors in animals, many of their behaviors are consistent with experienced feeling affective states in humans, including those internal states that are rewarding and punishing. Deep brain stimulation of these systems in humans can also generate similar affective states. The systems are concentrated in subcortical regions where neural homologies abound. Young humans and other animals without neocortices retain these brain-mind functions. Furthermore, neural circuits supporting behavioral/electrophysiological states of attentiveness, sleep and decision making appear to have arisen in evolution as early as invertebrates, being evident in insects, and octopuses and jumping spiders.
- Birds appear to offer, behaviorally, neurophysiologically and neuroanatomically a striking case of parallel evolution of consciousness. Evidence of high levels of consciousness near human-like (I think this is an overstatement) levels of consciousness have been most dramatically observed in Grey Parrots. Mammalian and avian emotional networks and cognitive microcircuitries appear to be far more homologous than previously thought. Certain species of birds have been found to exhibit similar neural sleep patterns as mammals, including REM sleep. Magpies have been shown to exhibit striking similarities to humans, great apes, dolphins and elephants in studies of mirror self-recognition. in the case of dolphins however, this ability manifests itself at an even earlier age

Commented [P4]: Another substitution from Jaak. Jaak has been using that word in his work, including in his abstract, so I would defer to him here.

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than in humans and chimpanzees. (This statement should not be included, as it is unpublished, not precisely accurate, and adds nothing to this argument.)

- In humans, the effect of certain hallucinogens appears to be associated with a disruption in cortical feedforward and feedback processing. Pharmacological interventions in non-human animals with compounds known to affect conscious behavior in humans can lead to similar perturbations in behavior in non-human animals. In humans, there is evidence to suggest that awareness is correlated with cortical activity, which does not exclude possible contributions by subcortical or early cortical processing, as in visual awareness. Evidence that human and non-human animal emotions arise from homologous subcortical brain networks provide compelling evidence for evolutionarily shared primal affective qualia.

The undersigned declare the following: *“The absence of a neocortex does not appear to preclude an organism from experiencing affective states. Convergent evidence indicates that animals have the neuroanatomical, neurochemical and neurophysiological substrates of conscious states along with the capacity to exhibit intentional behaviors. Consequently the weight of evidence currently indicates that humans do not alone possess the neurological substrates that generate consciousness and that animals, including all mammals and birds, and probably other creatures, possess these neurological substrates.”*

Commented [P6]: It came straight from your abstract, in which you state MSR emerges in children between 18-24 months, and evidence of MSR emerges in dolphins at 14-18 months. The Declaration contains summary of the conference. If this detail is not important, we can remove it and I would not make a big point about that in the talk.