

Consciousness² Squared



Amy Du Beau, PhD | Matanuska Forensic Science, LLC | November 2020

The brain vs conscious mind | Let me reveal a secret: brain surgery is, in theory, actually pretty straight-forwardly simple. Being pragmatic, the brain has no more cachet than any other bodily organ. Yet the brain represents a synergy that is more than the sum of its parts.

The brain can be investigated at the level of the molecule → neuron → circuits of neurons → anatomical regions. These various entities (= X) occupy space and are therefore measurable and quantifiable: orders of magnitude ranging from pico to micro to millimeters, respectively: $10^{-9} \leq X \leq 10^{-3+}$

Neuroscience characterizes such X factors to better understand the brain. The brain's function is especially dazzling because neuronal axons and dendrites project both proximally and distally, innervating disparate regions, even spanning hemispheres. This tangled spaghetti complexity somehow translates into behavior, and, by extension, thoughts, motivation, imagination, emotion that is the totality of our

psychology. Our very mind that confers our identity. Let this set of qualitative factors = consciousness = Y.

The outstanding problem is that these various neurochemical/anatomical X factors never linearly translate into who we are. Imagine going from ordinary base 10 counting to geometric Eigen vectors, then to the abstraction of imaginary numbers! This fantastical math is akin to how the brain's various parts and pieces translates into the conscious mind.

The definition of consciousness remains still elusive, neuroscientists like me advised instead to conservatively call it "awake behaving." So how do we get to Y (= consciousness) from X (= brain)? What is this intermediary function? And you thought quadratic functions were hairy!

As an aside, theologians and philosophers might opine that consciousness (= Y) transcends our very life, which effectively meets the criteria for being a ghost, sans any quantifiable properties. (Except if you happen to be a Ghostbuster with a fancy ectoplasm detector).

Mulling over the alchemy that converts X to Y, the solution is that the question itself is moot. The conscious mind is not a tangible thing like the brain, but rather an elegant conceptual process.

Analogously, the location of an electron orbiting an atom cannot be exactly known, so too is consciousness. How an avalanche occurs by sheering layers of aggregate snow and ice. Even how colorful brushstrokes create imaginative paintings or words create memorable stories.

Processes are temporal constructs rather than tangibly quantitative. The process of consciousness might be better akin to the conceptual models of photosynthesis, evolution, decomposition, weathering, etc. Such processual models are understood not so much through categorical definition, but rather by observation.

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I am an independent forensic science consultant, a neuroscientist (PhD) and criminal behavioral analyst/profiler (D-ABP) with expertise in bloodstain pattern analysis.

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