

Comments on "Post-Classical Phase Transitions and Emergence in Psychiatry: Beyond George Engel's Model of Psychopathology" by Donald Mender

Mark Germine, M.D., M.S.

Abstract

Donald Mender's "Post-Classical Phase Transitions and Emergence in Psychiatry: Beyond George Engel's Model of Psychopathology" is an important and valuable contribution, and a starting point for our exploration of Quantum Paradigms of Psychopathology. Here I make some brief commentary on the paper that introduces some different elements to the discussion: 1) Experience is primary, the source of all observations, and may be taken as a given. As such, it is a fundamental property of nature, 2) Experience is always relational, and is based on internal relations, 3) Unconscious experience underlies conscious experience, representing the potential of the wave function, which is reduced in consciousness to actuality, 4) Volition is both a cause and a manifestation of this reduction. Identity arises from the sense of agency in volition, 5) Chaotic dynamics in the brain amplifies quantum uncertainty, providing a quantum basis for a freely-willed, goal directed conscious process, 6) Psychopathology involves the function of this process, 7) The neural correlates of consciousness are fairly well understood, and seem to involve activation of the cerebral cortex by the brainstem reticular activating system in a cyclical fashion, and related changes in neuronal membrane polarity, 8) In the cerebral cortex, activation by glutamate and inhibition by GABA are the primary mechanisms of changes in neural membrane polarity, and 9) Anesthesia is a critical phenomenon to our understanding of consciousness, and seems to involve hyperpolarization of the neural membrane, mediated primarily by GABA.

Key words: quantum mind, psychopathology, experience

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As a fellow psychiatrist involved in the field of quantum mind, I would like to make a few comments on Donald Mender's target paper in this issue of NeuroQuantology (Mender, 2010).

Our new effort to generalize quantum mind models to the domain of psychopathology faces the daunting task of attempting to create practical applications in a highly uncertain theoretical area. It is laudable that Dr. Mender has taken the first steps in that direction.

This is an excellent and very well written paper. However, I do see a need to make a few additional points, some of which Dr. Mender may not have covered, and

Corresponding author: Mark Germine

Address: Psychoscience, P.O. Box 1654, Mount Shasta, California USA

e-mail: mgermine@hotmail.com

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others of which might be subject to divergent opinions:

1) Experience as the source for all of our observations is the most fundamental reality within the framework of empirical philosophy. Therefore, experience must be accepted as an epistemological given.

2) All attempts to derive the emergence of experience from matter have failed. Eliminative materialism cannot be used as a framework to explain away experience. Human experiences, including those of scientists, are qualitatively different from the matter and energy in our brains, and it is the interface between those dual aspects of reality that is the proper subject of science. In that sense, experience is a fundamental property of nature.

3) Experience is always relational, e. g. it relates a subject to object, to another subject, etc. These relations, I believe, are internally latent and hence fundamentally quantum precisely because of this internal latency. The psychiatrist does not relate to the patient based on some objective construct external to his or her mind. The experience of the patient is internal to the psychiatrist, and, hopefully, vice-versa. The opposing theory of external relations leads ineluctably to self-contradictory refutation whose only alternative is the counter-therapeutic stance of solipsism.

4) Most experience relevant to psychotherapy is unconscious. In support of this principle, if we look at the event related potential (ERP), we see unconscious events earlier than conscious recognition of a stimulus occurring at perhaps 275 ms. Hence, it appears that we are only conscious of a portion of the information we take in through the senses, and are very often unconscious of our own emotions and motivations.

5) Anatomically the emergence of consciousness necessarily involves the reticular activating system (RAS) in the brainstem and thalamus. There is a process that goes up the neuroaxis to the cerebral cortices and back and which is thought to be manifested in the ERP positive and negative wave forms. The process seems to involve successive functions of figure/ground separation, emotional valence, awareness,

meaning, and action. Thus, the emergence of consciousness has clear neurological underpinnings, which are fairly well understood.

6) The paradigm of consciousness emerging from the unconscious has a striking parallel to the selective genesis of an observed particle from the collapse of the quantum wave function. The multilayered unconscious is potentially decomposable, like the Fourier-superpositionality of the wave function.

7) Free will is one of the primary reasons for thinking consciousness is quantum, insofar as Von Neumann's interpretation of the quantum operator entailed by the uncertainty principle implies the volition of a measuring subject. Volition according to Sartre and others is also a major hallmark of consciousness. In order to safeguard the well-being and relieve the suffering of a patient, unspoken assumptions about volition, not only under girding praxis in the philosophy of mind but also intimately related to quantum measurement, must be examined with respect to unconscious transferential and countertransferential motivations.

8) The problem of identity is of paramount importance to the problems of mind, free will and psychopathology. We view ourselves as existentially separate entities, each with his or her own sense of agency or volition. Again, classical eliminative materialism can't help us here. The experience of authentic individual being entails volitionally directed doing. To the extent that the experience of being implies praxis via free will, the quantum underpinnings of existential experience in terms of the Von Neumann framework would be quite a fruitful area of exploration for students of psychopathology.

Apart from these interrelated considerations, I have a few wider ranging comments.

1) It has been an assumption that consciousness is a process in time that proceeds causally from the past to the future. It is possible that the process can also work in the opposite direction, i. e. teleologically, without violating physical laws such as quantum unitarity. Such a process, if

it exists, could make the genesis of conscious states goal-directed. This could provide some level of control over the actualization of conscious states from the system, placing volition independent of Von Neumann measurement in an important role with respect to psychopathology.

2) The brain seems to exist largely in a mode of self-organizing criticality. This can make brain processes unpredictable and potentially subject to abnormalities coextensive with psychopathology. It could also potentially amplify quantum uncertainty on a global level in the brain, without any explicit need for reference to which particular microscopic quantum processes at the basis of consciousness have been so amplified.

3) Regarding various neural correlates of consciousness, our guidance comes, in large

part, from biochemistry and pharmacology. We know that most of the excitatory activity in the cerebral cortices is due to glutamate, and most inhibitory activity is due to GABA. GABA acts to open the chloride channels in the neural cell membrane, thereby hyperpolarizing the membrane. Extreme shutdowns along such lines should lead to loss of consciousness. This is a highly plausible mechanism of general anesthesia (Orser *et al.*, 2002). I know of no unambiguous competing evidence indicating that microtubules, the cytoskeleton, or associated proteins are central to the action of general anesthesia, or, by implication, that their quantum-superposed states play a special role in conscious processes. Theories invoking such a microtubular role are, in my view, likely to prove unproductive.

References

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