

Reciprocal Influences in Higher Order Cognition and Epileptogenesis

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Abstract

After stroke, epilepsy is the second leading brain impairment, affecting over 50 million people worldwide. Its persistent seizures often cause various sequelae such as momentary deviations in perception and behavior, mild convulsions, and temporary loss of consciousness, which are due to the spread of Epileptogenesis to various brain regions. A chief hypothesis for epilepsy posits that the disruption of homeostatic mechanisms underlies Epileptogenesis and, potentially, its globalization. Such models invoke nearest neighbor, synchronous activation with a progressive spreading that generates an evenly distributed hyper excitation. However, the variability in sequelae suggests that additional factors modify how Epileptogenesis is distributed. Unlike the influence of homeostatic perturbations, these latter are likely to involve operational and global structures of cognition, that is, top down as opposed to bottom up influences that affect seizure distribution in complex ways. Consistent with this, current studies show that several, prevalent, cognitive diseases affect the self-construct, diminishing the capacity to unify brain and bodily behavior and so suggesting that higher order cognition is susceptible to disruption. Schizophrenia, for example, is marked by disturbances of the self, manifest in such symptoms as an abnormal sense of the body, loss of ego boundary and a confused sense of agency. Likewise, Alzheimer's Dementia exhibits a progressive loss of control of default mode, self-circuitries. Global states like the self-construct relate constitutive operational features of stability, flexibility, and hierarchy, which are required for performance and that give rise to the construct for various behaviors. Accordingly, among key higher order cognitive operations affected by these diseases are those linking motor planning and execution to goal directedness and self-agency, operations which could modulate and be modulated by epilepsy; hence, features of these diseases are likely to provide insight into mutual influences between higher order cognition and Epileptogenesis. This talk will consider several aspects of how higher order motor planning may relate to epilepsy and epileptogenic spreading.

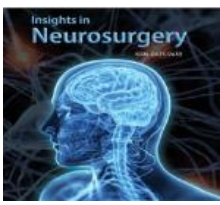


Biography:

Denis Larrivee is a Visiting Scholar at the Mind and Brain Institute, University of Navarra Medical School and Loyola University Chicago and has held professorships at the Weill Cornell University Medical College, NYC, and Purdue University, Indiana. A former fellow at Yale University's Medical School he received the Association for Research in Vision and Ophthalmology's first place award for studies on photoreceptor degenerative and developmental mechanisms. He is the editor of recently released texts on Brain Computer Interfacing, Alzheimer's' investigative strategies, and Neuroethics philosophical principles, with InTech Publishing of London and is an editorial board member of the journals *Annals of Neurology* and *Neurological Sciences* (USA) and *EC Neurology* (UK). He is currently a guest editor for a special issue of the journal *Frontiers Neuroscience*. An International Neuroethics Society Expert he is the author of more than 85 papers and book chapters in such varied journals/venues as *Neurology and Neurological Sciences* (USA), *Journal of Neuroscience*, *Journal of Religion and Mental Health*, and *IEEE Explore*. In 2018 he was a finalist in the international Joseph Ratzinger Expanded Reason award sponsored by the Francis Vittorio University of Madrid.

Speaker Publications:

1. Larrivee D, Farisco M; "Realigning the Neural Paradigm for Death"; *Journal of Bioethical Inquiry*. 2019/16(1).
2. Larrivee D. "Oscillatory Change in Motor Therapy: Enhancing fNIRS Imaging with Nanotechnology"; *Journal of Nanomedicine, Nanoscience and Technology*. 2019/2(5).
3. Larrivee D. "Techne in Affective Posthumanism and AI Artefacts: More (or Less) than Human?"; *Open Journal of Philosophy*. 2020/ 10(01):66-87.



4. Larrivee D. "In Pursuit of Non-Invasive Psychopharmacology: Developing fNIRS Repertoire"; Journal of Neuroscience and Cognitive Studies. 2019/3(1):1012.
5. Larrivee D. "Neurorehabilitation: Recovery Advances through CNS Neuromodulation". International Journal Psychiatry Research. 2019/ 2(7):1-4.

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