

A multi-etiology mathematical model of systemic degeneration in schizophrenia

Anca Rădulescu, Applied Mathematics, University of Colorado at Boulder
UCB 526, Boulder, CO 80309-0526, *radulesc@colorado.edu*

September 11, 2008

Abstract

We discuss the possibility of multiple underlying etiologies of the condition currently labeled as schizophrenia and support this hypothesis with a theoretical model of the prefrontal-limbic system. We show how the dynamical behavior of this model depends on an entire set of physiological parameters, representing synaptic strengths, vulnerability to stress-induced cortisol, dopamine regulation and rates of autoantibody production. Malfunction of different such parameters produces similar outward dysregulation of the system, which may readily lead to diagnosis difficulties in a clinician's office. We further place this paradigm within the contexts of pathophysiology and of antipsychotic pharmacology. We finally propose brain profiling as the future quantitative diagnostic toolbox that agrees with a multiple etiologies hypothesis of schizophrenia.