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# IS PSYCHOSIS CAUSED BY DEFECTIVE DISSOCIATION? AN ARTIFICIAL LIFE MODEL FOR SCHIZOPHRENIA

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## Abstract

**Introduction:** Mental disorders can be described at multiple levels (psychological, neurobiological, genetic) but multi-level models are relatively uncommon. Moreover, within the psychological level, the landscape of available theories is quite fragmented. Schizophrenia is a complex condition in which both genetic and environmental factors are known to play a role, but few models have been proposed that account for both. These are limits of current approaches, that the present work tries to address.

**Objective:** In this work we present a holistic model of normal and traumatic mental functioning, which seeks to merge into a single theoretical framework various theories used to explain different aspects of trauma: psychodynamic theory, attachment theory, theory of dissociation as response to trauma. The insight gained from the model is subsequently used to provide an interpretation for schizophrenia.

**Method:** We do not contribute new data to the field of study: the method used is purely theoretical. Our toolset includes the concept of artificial neural networks and, more in general, borrows ideas from the fields of Artificial Intelligence and Artificial Life.

**Results and Conclusion:** We argue that dissociation is a standard tool used by the mind to protect itself from painful emotions. In case of repeated traumas, the mind learns to adopt selective forms of dissociation to avoid pain without losing touch with external reality. We conjecture that this process is defective in schizophrenia, where dissociation is either too weak, giving rise to positive symptoms, or too strong, causing negative symptoms.

## 1 Theories on schizophrenia

Mental disorders can be described at multiple levels: psychological, neurobiological, genetic. In this work we explore another level, that we call functional, situated between the psychological and the neurobiological levels. The functional level aims to characterise the structure of the system under investigation and the function of each component, regardless of its neurobiological implementation. This is the scientific approach of Artificial Life: study life as it could be, to understand life as we know it (Langton, 1989).

Another Artificial Life keyword is *emergence*, defined as the manifestation of properties of the collective behaviour of a complex system, that were neither explicitly designed, nor deducible from the properties of single components. Inspired by this idea, we present a holistic model of the mind, composed of many building-blocks, well aware of the inadequacy of each of them, but

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