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DAMAGE TO OBJECT ORIENTED PROGRAMMING IN THE BRAIN EXPLAINS MANY OF THE PSYCHOPATHOLOGICAL FEATURES OF SCHIZOPHRENIA

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Introduction: Modern computers often use programs that incorporate a programming technique called Object Oriented Programming (OOP), allowing users to manipulate complex 'computational objects' such as menus, screen windows, etc with very little effort, say the click of a mouse. OOP deals with structures called objects and allows time and computational effort saving devices such as inheritance, polymorphism and encapsulation. We examine whether the brain itself may use OOP and if representation of objects suffers a breakdown in schizophrenia.

Review of literature: Previous models fail to provide a unifying explanation with a computational basis that could explain the psychopathology in schizophrenia. **METHODS** Using the object oriented programming language Java™ we designed a system of *self-objects* named 'hand', 'action monitor' etc interacting with *non-self* objects 'scissors', 'hammer', 'wall', etc. In computational experiments, we allow the 'action monitor' to fail; the features of disparate objects are allowed to merge, some features of an object are allowed to be shared with other objects, etc.

Results: By transposing only a few lines of code, it is possible to duplicate various features of the psychopathology of schizophrenia.

Discussion: Our model can demonstrate overinclusion (overabstraction), concrete thinking (underabstraction), loss of ego boundaries (conjoining of disparate objects), delusions (misattribution of object function), lack of insight (poor monitoring of object activity) and passivity (loss of monitoring and misattribution of object activity).

Conclusion: The brain must use the OOP model in its computations. Failure of object representation and manipulation must lie at the core of the psychopathology of schizophrenia.