

Irreducible Complexity and the Problem of Modelling Abductive Reasoning

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In a recent book [J. Fodor, *The Mind Doesn't Work That Way*, MIT Press, 2000] Fodor argues that computational modeling of global cognitive processes, such as abductive everyday reasoning, has not been successful.

A typical approach to this problem has been to develop better models and modeling paradigms, but the problem seems to go deeper into the model- invariant computational complexity. In this paper the problem is analyzed from a framework of the algorithmic information theory, concentrating to computational complexity, algorithmic simplicity and rationality. It is argued that the failed approaches are characterized by *shallow reductionism*, which is rejected in favor of deep reductionism and anti- reductionism. Deep reductionism states that our cognition is a product of logically deep principles, supporting evolutionary psychology and related computational approaches, such as genetic algorithms, as a viable research strategy. Anti-reductionism posits that cognition is a high entropy system, supporting abstraction instead of reduction and simulation as a research strategy. Both hypotheses are defined within the context of algorithmic information theory.