Mind: meet Network

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Language reflects the psychological experience of man (Radden and Dirven, 2007). One model of language and cognition is connectionism, often regarded reductive. However, in the course of a network simulation properties emerge that were neither inbuilt nor intended by its creators (Elman, 1998). The whole is more than just the sum of its parts. Insight is not only drawn from the network's output, but also the means that the network utilizes to arrive at the output. Let us then postulate a network mechanism for concept formation present in the human mind and initially developed to cope with the world directly accessible to the early human (i.e. tangible). The network would convert external inputs to form an internal, multi modal representation of a perceived object in the brain. The sheer amount of available information and the computational restrictions of the brain would force some sort of data compression, or a computational funnel. It has been shown that a visual perception network of this kind learns to accurately label patterns (Elman, 1998). Also, data compression facilitates the recognition of prototypes of a given pattern category rather than its peripheral representations, an emergent property that supports the prototype theory of the mental lexicon (cf. Radden and Dirven, 2007). The present project proposes that, in the domain of cognition, the process of objectification, as defined by Szwedek (2002), would be an emergent property of such a system, or that if an abstract notion is computed by a neural network designed to cope with tangible concepts the data compression mechanism would require the notion to be conceptualized as an object to permit further processing. Thus, an evolutionary neural mechanism is proposed for categorization of the world, that is able to cope with both concrete and abstract notions and the by-product of which are the abstract language-related phenomena, i.e. metaphors. The model presented in this paper aims at providing a unified account of how the various types of phenomena are categorized in the human mind.

References:

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