On Representational and Probabilistic Models of the Mind

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This lecture will be an attempt at philosophical reflection about the explanatory values of two competing models of the mind. The first model is based on the concept of mental representation and has constituted the mainstream of contemporary cognitive science for at least forty years. The second model explores the dynamic properties of mental processes and is more recent. The relation between the mind and objects in the world is not relevant in dynamic models as opposed to its predominant role in representation oriented models. On dynamic model all mental states are depicted as trajectories in multidimensional probabilistic state spaces. These trajectories are being approximated by modeling functions which do not imply any stable states to be interpreted as representations. We can speak of representations only in a sense of attractors in the state space. On dynamic models mental states are characterized as probabilities of bringing about certain behavior. In other words, mental states compete to get access to the motor centers. The competing process leads to increasing or decreasing the probability of a mental state to co-determine certain behavior. Such probabilities constitute an abstract space which can be modeled by aforementioned dynamic functions. The properties of these function can be further explored by means of recurrent probabilistic attractor networks. I will show the differences between the representational and dynamic models by analyzing their application in domain of visual perception, namely the competing accounts their offer for the process of searching the visual field in order to discriminate a previously characterized objects among the distractors. I will attempt to show that each of the two models has both advantages and disadvantages the other do not have. Whether a unified theory of mind (making the best of the two approaches) is possible remains to be seen. I should rather think of it as a remote possibility. Contrary to some claims of the proponents of the dynamic models, who interpret mental representations as attractors on probabilistic state space (thus making the dynamic model superior and encompassing the representational model) I do not thing the reconciliation of the two models is going to come about easily and any time soon.