

In his essay *The nature of mental states* Hilary Putnam outlines his concept of functional states, which, he proposes, should supersede the brain-state theorists or behaviorists view on mental states. In the following paragraphs I will explain what Putnam thinks makes the latter views obsolete (I shall focus on the brain-state theorists) and why functional states could do a better job in explaining the ontology of sensations.

Brain-state theorists claim that sensations actually *are* brain states. Putnam argues, much like Smart in *Sensations and Brain Processes*, that semantically there is nothing wrong with stating that sensations are brain states. Then, why does he reject this theory nevertheless? The brain-states, Putnam assumes, must be meant physical-chemical in nature, since, among other reasons, he cannot find a statement to the contrary. If a philosopher defines for example “pain” as a certain physical-chemical brain-state, then the brain-state description would need to be as general in application as the word “pain”. But we tend to ascribe pain to animals as well, and in this domain not only to vertebrates. So if the brain-state description (and the ones for all the other sensations) was to fit all of them, there would need to exist some physical-chemical foundation that is common to all of them. This, Putnam continues, is very improbable. He adds that the mistake of the brain-state theorist must have been to take the correlation of “pain” with a certain behavior as a reason to suspect similar physical-chemical organization. This inference is obviously not justified.

Putnam believes to have found a better way to model psychological states. He calls it “functional states”. His model is based on the computer science theory of probabilistic automatons. These models consist of a number of states and connections between them resembling the probabilities that the system moves from one state to another. Additionally Putnam allows sensor inputs, modifying the probabilities for state changes and for motor outputs. Motor outputs resemble side effects of the system. Different realizations of the probabilistic automaton can have the same functional organization in terms of states and probabilities: the *machine table*. A *description* of an arbitrary system would need to include the states and a *machine table*, which can then be compared across *descriptions*.

I will now explain the hypothesis Putnam advances with these notions. He himself uses the example of “pain” and splits up the hypothesis into four statements (p. 434): First, as we might have guessed from the definitions above, every organism capable of feeling pain can be modelled with a probabilistic automaton. Second, there is a *description* for pain which includes a *machine table*. Every automaton from the first statement contains at least this *machine table*. It serves as the definition of pain, that is, the machine table *is* pain. Third, pain cannot be reduced to components of the organism. With this Putnam rules out swarms which might be seen as organisms, too. Last, pain is felt always and only when the input sensors are in a certain state. This fourth statement can be used for characterizations of sensations: They are defined by their inputs.

What are the advantages of this hypothesis, especially considering the problems of the brain-state theory? Putnam argues that a functionally defined sensation is not dependent on its physical-chemical realization. Indeed, it is so independent that the automaton model’s real counterpart can anything from different physical-chemical based nervous systems to a “soul”. Another advantage is that it now becomes possible to partially infer the model from the behavior. As I have stated above, the probability of certain motor outputs of the system are modified by its input sensors. These motor outputs can be observed by psychologists and careful inferences can be drawn

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from their combination with the inputs to build up the probabilistic automaton model. This research scheme now substitutes the criticized inference mechanism of the brain-state theorists who directly infer the existence of common physical-chemical states of the brain from its output. Putnam concludes, that it is now the task of psychology to find *descriptions* of sensations in terms of sensory inputs.

In my opinion Putnam's theory is too superficial. There are numerous problems why the theory could be just useless: He does not ground his theory in anything, the large number of probabilities is unknown and constantly changing with the inputs and the number of states is not known. Additionally it is not clear to me why it should be possible to produce a *discrete* probabilistic automaton model of a human being at all, since sensations can change gradually and might overlap with others.

I think Putnam's main achievement in his essay is making a point about brain-states being not general and in proposing a model of sensations that is independent from individuals and species. Whether his model gives us a better grip on what pain is is also questionable: Even if we can then say "it is pain what this organism feels" – we could have done that using folk psychology without using Putnam's theory – the next step will still need to be to find out why this *particular* organism has this sensation. And due to the superficial nature of functional states one cannot infer the realization from the model.

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