

8.3 Do neural processes accurately represent the world?

If one accepts that neural processes do represent the world, a further question is: do they accurately represent the world? Many of the approaches to ascribing content to neural processes assume that is what they are doing. In characterizing what different visual areas do researchers presented stimuli with a given feature and treated the neurons that responded most strongly as representing that feature. One might also wonder what would be the point of a perceptual system that didn't accurately represent the world since that would seem to defeat the goal of successful interaction with the world.

Using temperature perception as an example, Akins (1996) argues that our sensory systems do not accurately represent the world. Rather, she characterizes our temperature receptors as narcissistic—they respond when the temperature of objects we are touching is too hot or too cold. Moreover, they do so in a nonlinear fashion: as temperature increases, the hot receptor will first generate spikes at a greatly increased frequency before gradually dropping to a frequency slightly above what it was at the outset. When the stimulus terminates, it stops spiking altogether before gradually increasing to its default rate. The cold receptor operates similarly. Such a system signals major changes in temperature, but unlike a thermometer, it does not give a readout that corresponds to the temperature of the object touched. Moreover, responses are contextually sensitive to immediately preceding experiences, as illustrated in a familiar demonstration: put one hand in hot water, the other in cold, and then move both to water of intermediate temperature. It will feel like the hand previously in cold water is in warmer water than the one originally in hot water.

While such a sensory system does not generate accurate representations of temperature, Akins argues it does alert the organism to what it needs to know—is something too hot, such that I should drop it or avoid touching it? Receptors that acted like a thermometer would be less efficient—the nervous system would have to incorporate the temperature information into a plan for action rather than responding directly. Does Akins' argument support treating the senses and the neural processing systems downstream from them as generating narcissistic representations or alternatively, as “nonrepresentational systems”? In fact, Akins has argued for the stronger, non-representationalist, conclusion: sensory systems are not only narcissistic but function through non-representational feedback processes. However, it is not clear why one cannot view the activity of the sensors as constituting context-sensitive narcissistic representations. Consider again the Watt governor—one may argue that it does not represent the speed of the flywheel per se, but only represents, narcissistically, that it is moving too quickly or too slowly.

8.4 Summary

We have characterized different views about whether brain processes count as representations. What is worth highlighting is how these views tie to views of explanation discussed in section 6. If one adopts the view that the nervous system embodies control mechanisms, one needs to characterize it as making measurements, and hence talk of

representations seems motivated. If one adopts a dynamical system view that eschews mechanisms, then one can view these processes as elements of dynamical systems without treating them as representations.