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Neuronal bases of perception

**Abstract**

We will discuss investigations of how the brain perceives stimuli, stores them in memory, and recalls them. The strategy is to compare the perceptual capacities of rats to those of humans. Each has advantages as an object of study. Human subjects easily give an overt description of the sensory experience, while rats must be trained to give nonverbal responses. On the other hand, in rats we are able to examine the neuronal coding of sensory experience, impossible in humans. The species comparison gives insights into how the simpler brain can carry out complex computations.

We have found that the perceptual and cognitive capacities of rats are surprisingly advanced and, by some measures, rival those of human subjects. Measurements of neuronal activity in the rat brain reveal that in the cerebral cortex the complex task is subdivided into a sequence of computations. The same computations are likely to be the substrate for sensory perception in humans.