

It's only a game of chance

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The validity of a leading theory that has held a glimmer of hope for unraveling the intricacies of the brain has just been called into question. Dr. Ilan Lampl of the Weizmann Institute of Science's Neurobiology Department has produced convincing evidence to the contrary. His findings recently appeared in the journal *Neuron*.

Cells in the central nervous system tend to communicate with each other via a wave of electrical signals that travel along neurons. The question is: How does the brain translate this information to allow us to perceive and understand the world before us?

It is widely believed that these electrical signals generate spikéd patterns that encode different types of cognitive information. According to the theory, the brain is able to discriminate between, say, a chair and a table because each of them will generate a distinct sequence of patterns within the neural system that the brain then interprets. Upon repeated presentation of that object, its pattern is reproduced in a precise and controlled manner. Previous experiments had demonstrated repeating patterns lasting up to one second in duration.

But when Lampl and his colleagues recorded the activity of neurons in the brain region known as the cortex in anaesthetized rats and analyzed the data, they found no difference in the number of patterns produced or the time it takes for various patterns to repeat themselves, compared with data that was randomized. They therefore concluded that the patterns observed could not be due to the deterministically controlled mechanisms posited in the theory, but occur purely by chance.

The consequence of this research is likely to contribute significantly to the ongoing debate on neuronal coding. Lampl: "Since the 1980s, many neuroscientists believed they possessed the key for finally beginning to understand the workings of the brain. But we have provided strong evidence to suggest that the brain may not encode information using precise patterns of activity."

Source: American Committee for the Weizmann Institute of Science

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