When it comes to learning and memory, the brain is a co-operative continuum

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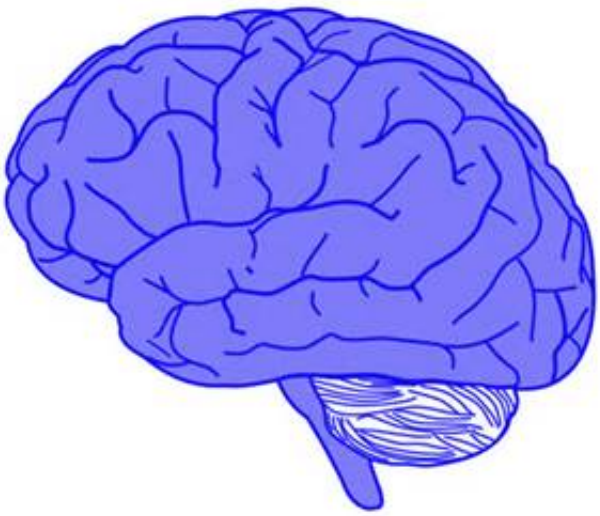

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Tim Bussey and his co-investigator wife Lisa Saksida at Western University have opened our eyes to some ground-breaking ideas about how memory is organised in the brain. Various brain regions may not be solely carrying out specialised functions, but instead, and more importantly, are working to resolve the ambiguity, or interference, generated by other brain regions. In essence, the brain is a co-operative continuum. Their results were presented at the 2017 Canadian Neuroscience Meeting, the annual meeting of the Canadian Association

for Neuroscience - Association Canadienne des Neurosciences (CAN-ACN).

Up until now, people have equated the brain as a Swiss army knife for memory. Different tools serve different purposes. Memory for facts and events are handled in the temporal lobe of the brain. Other areas in the cortical regions are involved in slow "perceptual" learning such as having an eye for art or an ear for music.

Yet for Bussey and Saksida, the brain may not be so segregated. "We have seen in our experiments, all these regions are capable of all types of learning and memory," said Bussey. "The difference is that complex things such as faces and places depend on the temporal lobe, but simpler features such as colour and angles depend on cortical regions outside of the temporal lobe." Based on their findings, only when brain regions co-operate simultaneously to reduce ambiguity can we effectively learn and store memories.

Their findings suggest a need to alter how we think about memory and disease. "Take for example, memory loss," Bussey states. "Our results reveal this condition may not be due to forgetting, but to interference." This may add significant value in the study of cognitive diseases such as Alzheimer's disease. "If we can figure out how to reduce the interference, we may be able to improve the memory signal and help people to maintain at least some of their function."

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