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Differential Utilization of a Hippocampal Learning Strategy as a Source of Individual Variability and Psychiatric Risk Gene Phenotype

Inter-animal variability is a common aspect of behavior; however, we have limited understanding of its causes. Part of the challenge comes from the difficulty of characterizing the behavior of individual animals. I will present on the way individual rats learn a spatial alternation behavior. We find that lesioning the hippocampus leads to changes in the way rats learn, likely leading to the use of a different strategy. We then use those different strategies to characterize how individual wild-type rats learn, finding that even with an intact hippocampus some rats utilize the hippocampal lesion learning strategy. Additionally, I will show that this distribution of learning strategies is shifted toward the hippocampal lesion strategy in a population of rats with a mutation in a high-risk autism spectrum disorder risk gene. Taken together, our data leads to the hypothesis that a source of individual variability can be due to the differential utilization of the hippocampus for behavior.

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