On the ecologically rational inference and memory-based judgment errors

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Abstract

Human memory has various deficits such as forgetting. Such deficits are generally regarded as human irrationality. However, superficial deficits in human cognition can be understood differently as rational aspects in terms of the interaction between human cognition and the environmental feature. Based on this idea, the present study analyzed the nature of memory-based judgment errors. We hypothesized that systematic errors are produced when ecologically rational inferences based on statistical regularity in the environment are performed in uncertain situations. To verify this hypothesis, we proposed a benchmark for a rational inference model of memory-based judgments under uncertainty, and tested it by analyzing real-world data, computer simulations, and a behavioral experiment. We found that the error patterns participants showed in the memory-based judgment were consistent with those predicted by the rational inference benchmark. These findings provide new insights into the errors produced by memory-based judgments from the rational side of cognition.

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