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Modelling probability matching as a Bayesian sampling process

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Abstract

The mechanisms underpinning probability matching remain a disputed topic. Among common explanations of the effect is that people employ a win-stay, lose-shift (WSLS) strategy. We suggest an alternative framing of probability matching as the result of a Bayesian sampling process involving simulating a mental sequence of possible outcomes. In three within-subject tasks, we presented people with information about a six-sided die with four sides of one colour and two of another. Two of them involved predicting the next outcome in a series of die rolls, with and without feedback. The third explicitly asked participants to mentally generate sequences of rolls from the die. The patterns of autocorrelations in responses, the absence of an effect of feedback on the next response, and the elevated proportion of maximising responses on the first trial in all conditions are all consistent with a Bayesian sampling model but contradict the WSLS account of probability matching.