# A model-based investigation into strategic variable behavior.

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**Résumé**

Everyday life requires variability. For example, in games (e.g., rock, paper, scissors), it is important to be variable or unpredictable. Behavioral experiments in which variable responding is rewarded show that humans and nonhuman animals are able to strategically increase response variability. However, it remains unclear what cognitive mechanisms underlie such variable behavior. One hypothesis, often assumed in computational models of decision-making, states that biological agents have access to a random generator. Alternatively, variable behavior may result from a dynamic reinforcement-extinction learning process. Yet another explanation assumes that biases against recently unchosen options can be learned. We tested human participants in three different reinforcing contexts, where each context required a different level of response variability. We looked at differences in behavior between these contexts by using a computational model in which parameter dynamics are linked to the three stated hypothesis above. This analysis showed that human participants upregulate the amount of randomness they inject into a decision when variability requirements increase, and, simultaneously, establish a choice-bias that values recently unchosen options in the adversarial context.

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