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Reverse Law of Effect in Sequential Parlay Gambling

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Abstract

This study reports a counterintuitive reversal of Thorndike's Law of Effect in human sequential decision-making. Participants in a parlay gambling task chose between banking their current wager or betting it on a risky gamble, where winning would increase the next wager while losing or banking would reset it. We observed improving payoffs across runs, indicating learning. However, contradictory to the Law of Effect, participants were more likely to choose betting after losses rather than wins. We further developed computational models incorporating prospect theory and reinforcement learning. Consistent with our model-free analyses, models incorporating reverse updating of subjective probabilities (negative learning rate) not only significantly outperformed traditional learning models in fitting human data, but also led to higher payoff than models with positive learning rate. These findings highlights the complexity and adaptability of human learning, despite not fitting within the framework of the Law of Effect.

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