The Evolution of the Impact Bias

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Objective

There is robust evidence that prior to an anticipated event, people systematically fail to accurately predict their feeling after the event. They predict more intense emotions compared to their actual affective experiences, a phenomena known as *impact bias*. Furthermore, individuals do not improve their predictions by learning, despite previous experience. Many explanations for impact bias have been hypothesized, including biased memories, over-emphasis of one's current focus (focalism bias), and limitations in imagining future events. These account for the bias' mechanism (proximate explanation), but not how the bias survives natural selection (ultimate explanation). We hypothesize an ultimate explanation: impact bias helps humans navigate decision making in noisy environments.

Method

Extending Error Management Theory through stochastic evolutionary game theory, we evaluate whether agents with the impact bias can outperform unbiased agents. In Experiment 1, agents choose between actions by predicting the utility of the actions. This is tested in environments with differing quantities of noise. In Experiment 2, we evaluate when it is advantageous not to update predictions from past experience.

Results

In noisy environments there is selective pressure for the impact bias. Furthermore, under noise it can be suboptimal to learn from previous experiences. Additionally, we show that the consequences of the model match previously unexplained experimental data. The model predicts that impact bias will increase as 1) the affective intensity of an event rises, and 2) the amount of noise increases. Both correlations are found in the experimental literature.

Conclusion

Our evolutionary simulations support the hypothesis that the impact bias has evolved to navigate decision-making under noise. Our model demonstrates the hypothesis is theoretically coherent and logically plausible. Further, it accounts for previously unexplained findings of empirical experiments. This supports the model's likelihood as an account of this affective bias.