Heuristics in the forecasting of complex time series: Irrational or ecologically rational?

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Abstract: Prediction errors in time series forecasting tasks are usually attributed to the use of heuristics. These heuristics are described as irrational because they do not take into account all the information available. However, ecological rationality theory suggests that the rational standard should not be absolute, but rather defined in relation to environmental constraints. According to this view of rationality, heuristics can be more accurate than rational strategies such as linear judgment in certain conditions due to their robustness to noise and their minimal sampling requirements. Simulation results demonstrate that heuristics can perform better than a rational model of judgment and that this modulation depends in part on environmental constraints. Human experiments results suggest that individuals apply different strategies depending on environmental constraints and that the applied strategy is generally appropriate regarding the nature of the situation. Taken together, these results support an ecological vision of rationality.