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On Robustness: An Undervalued Dimension of Human Rationality

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Abstract

Human rationality is predominantly evaluated by the extent to which the mind respects the tenets of normative formalisms like logic and probability theory, and is often invoked by appealing to the notion of optimality. Drawing on bounded rationality, there has been a surge in the understanding of human rationality with respect to the mind's limited computational and cognitive resources. In this work, we focus on a fairly underappreciated, yet crucial, facet of rationality, robustness: insensitivity of a model's performance to miscalculations of its parameters. We argue that an integrative pursuit of three facets (optimality, efficient use of limited resources, and robustness) would be a fruitful approach to understanding human rationality. We present several novel formalizations of robustness and discuss a recently proposed metacognitively-rational model of risky choice (Nobandegani et al., 2018) which is surprisingly robust to under- and over-estimation of its focal parameter, nicely accounting for well-known framing effects in human decision-making under risk.