

Representing Heuristics as Misspecified Models

Aislinn BOHREN and Daniel N. HAUSER

Abstract :

A growing literature in economics seeks to model how agents process information and update beliefs. In this paper, we link two common approaches: (i) defining an updating rule, or heuristic, that specifies a mapping from the true Bayesian posterior to the agent's subjective posterior, and (ii) modeling an agent as a Bayesian learner with a misspecified model. The heuristic approach has a more transparent conceptual link to the underlying bias being modeled, while the misspecified model approach is 'complete,' in that no further assumptions on belief-updating are necessary to analyze the model, and has well-developed solution concepts and convergence results. We first establish conditions under which a heuristic can be represented as a misspecified model and vice versa. In fact, there are often a multiplicity of misspecified models that represent a given heuristic. We then show that a heuristic together with a forecast over how the agent will form future beliefs uniquely identify a misspecified model. This provides conceptual guidance for which model to select to represent a given bias. Finally, we consider two natural ways to form forecasts: introspection-proofness and naive consistency. We demonstrate how introspection-proofness places a natural bound on the magnitude bias in an application with motivated reasoning, and how naive consistency impacts a firm's ability to screen consumers in a credit market application.