

Modeling Higher-Order Evidence with Imprecise Probability *

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In this paper I consider an application of imprecise probability to a much-discussed problem in mainstream epistemology: the problem of higher-order evidence (HOE) [2, 1, 3]. HOE is evidence which does not concern the primary subject matter of one's epistemic states but rather concerns our own abilities to process certain first-order evidence rationally or reliably. We may for instance learn that our reasoning is compromised in some way, or that others in similar circumstances have not been capable of making reliable inferences. A typical example in this literature concerns a doctor who prescribes a particular medicine to her patient, but then gains HOE to the effect that she has been slipped a drug which generally tends to compromise doctors' diagnostic abilities in similar circumstances. Cases like these have puzzled epistemologists. Is there a rational response to such HOE, and if so, what is it? HOE seems to induce a certain kind of self-doubt. It looks as though it should make one unsure of one's own ability to judge certain matters. But what are then the implications for the beliefs one has formed on the basis of those judgments? Should HOE precipitate belief revision about the primary subject matter of the beliefs, as well as inducing doubt about one's own capacities?

HOE is widely discussed in a Bayesian framework where the main suggestion has been that HOE produces a kind of recalibration of one's credences to match empirically measured reliabilities [6, 4, 5]. This treats the role of HOE as primarily constructive: to produce a change in the credences. HOE has also been conceived, in a framework of a full-belief model, as having a destructive effect, operating as an undercutting defeater which results in suspension of belief [2]. The destructive role is an important dimension of the effect of HOE which has behavioural consequences, such as inducing hesitation to act.

I argue first that in a precise-probability set-up, dealing with HOE does not require any special principles of recalibration, but can be handled as a case of regular Bayesian updating, where some of the events in the algebra are credences of the agents concerned. An imprecise probability model provides a way to model the destructive effect of HOE. HOE may have the effect of increasing the imprecision of the agent's credal state. When there is imprecision in the agent's credal state, decision theories associated with imprecise probabilities typically recommend choosing the option with the least bad worst outcome. This means that they may recommend the act of hesitating, or doing nothing, in situations where this would be prohibited by the precise probabilist. Thus using imprecise probabilities helps to model how HOE may induce the behavioural effect of hesitation, which appears to be an appropriate and rational response to learning about one's own lack of reliability.

References

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