

How did Homo Heuristicus become ecologically rational?

Maria Otworowska

Radboud University Nijmegen, Donders Institute for Brain, Cognition, and Behaviour

Marieke Sweers

Radboud University Nijmegen, Donders Institute for Brain, Cognition, and Behaviour

Robin Wellner

Radboud University Nijmegen, Donders Institute for Brain, Cognition, and Behaviour

Todd Wareham

Department of Computer Science, Memorial University of Newfoundland

Iris van Rooij

Radboud University Nijmegen, Donders Institute for Brain, Cognition, and Behaviour

Abstract: Gigerenzer and colleagues have proposed the ‘adaptive toolbox of heuristics’ as an account of resource-bounded human decision-making. According to these authors, evolution has endowed such toolboxes with ‘ecological rationality’, defined as the ability to make good quality decisions in their specific environments. Here we explore to what extent the mechanisms of evolution alone are sufficient to explain the emergence of ecologically rational toolboxes. It is not clear how evolution can lead to ecologically rational toolboxes within the space of possible toolboxes. That is, even if one assumes a very simple environment (e.g., 10 cues and 50 decisions), the number of possible toolboxes (10^{72}) is still astronomical. By using artificial evolution simulations we investigated the evolvability of ecologically rational toolboxes. We present preliminary results showing that evolution can produce toolboxes of heuristics that are “good enough” to survive, but those toolboxes are not ecologically rational.