An ecological perspective to cognitive limits: Modeling environment-interactions with ACT-R

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Contrary to the common belief that more information is always better, Gigerenzer et al. (1999) showed that simple decision strategies which rely on little information can be quite successful. The success of simple strategies depends both on bets about the structure of the environment and on the core capacities of the human mind, such as recognition memory (Gigerenzer, 2004). However, the interplay between the environment and the mind's core capacities has rarely been precisely modeled. We illustrate how these environment-mind interactions could be formally modeled within the cognitive architecture ACT-R (J. R. Anderson et al., 2004). ACT-R is an integrated theory of mind that is tuned to the statistical structure of the environment, and it can account for a variety of phenomena such as learning, problem solving, and decision making. Here, we focus on studying decision strategies and show how the success of theses strategies in particular environments depends on characteristics of core cognitive capacities, such as recognition and short term memory.
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