Causal reasoning under time pressure: testing theories of systematic non-normative reasoning patterns

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Abstract

While research indicates that people are skilled causal reasoners, systematic deviations from the normative causal Bayesian network model have been observed. These include Markov violations, failures to 'explain away', and conservative responding. Different processes have been posited to account for these violations: sampling, associative reasoning, and heuristics. These processes entail effects of response time. To test the relationships between these theories, normative violations, and reasoning time we conducted a causal reasoning study employing time pressure manipulations and response time measurements. Our results show that time pressure decreases overall accuracy. Crucially, we find that time pressure does not affect the magnitude Markov independence violations. This is not what many existing explanations would predict. We find evidence that participants' responses result from two separate cognitive processes and that time pressure modulates their relative contribution to responses. Hence we provide an explanation of non-normative reasoning patterns based on a mixture of cognitive processes.