Strategy choice for physical reasoning is (partially) sensitive to cognitive costs

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Abstract

If we want to know whether a stack of blocks will fall, we might form our judgment by using mental simulation or simple heuristics. How do we know which strategy to use? Here, we test whether people's strategy selection is "resource rational," balancing their utilities and costs. We had participants judge how a balance beam will fall – a task that relies on both simulation and heuristics – and imposed visuospatial cognitive load to increase the cost of mental simulation, expecting the use of simulation to then decrease and the use of heuristics to increase. When cognitive load varied between participants, higher load led to less simulation. However, when load varied across trials for an individual participant, they instead used simulation at about the same rate as high-load-only participants. Thus strategy selection is sensitive to cognitive costs but it is also sticky, not accounting for rapidly fluctuating costs.

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