

Manipulating Causal Priors Affects the Outcome-Density Bias

Outcome-Density – Irrational Causal Illusion or Rational Bayesian Inference?

The Outcome-Density Bias

$\Delta P = 0$ but Perceived Causality > 0 , especially if $P(e)$ (i.e., outcome/effect density) is high



Missing Proof: Can we experimentally manipulate the prior to make the bias disappear?

Manipulating Causal Priors via Visual Mechanisms

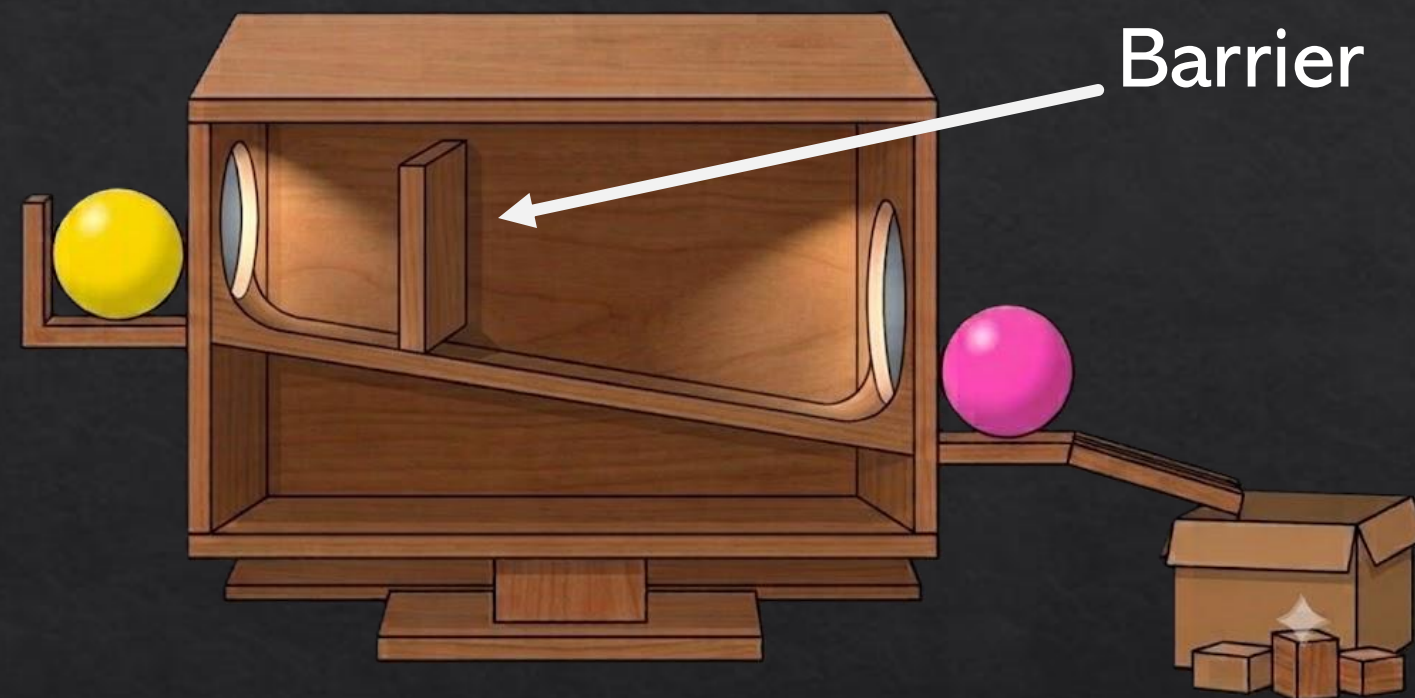
Can the yellow ball move the pink ball?

Mechanism opaque



Hidden mechanism leaves room for a causal link
↳ Uninformative causal prior

Mechanism revealed



Hidden mechanism makes causal link improbable
↳ Low causal prior

The Task: $N = 300$ participants answered the causal question twice, before (prior) and after (posterior) 8 trials with $\Delta P = 0$ across varying density of the effect (4/4, 2/4, 0/4)

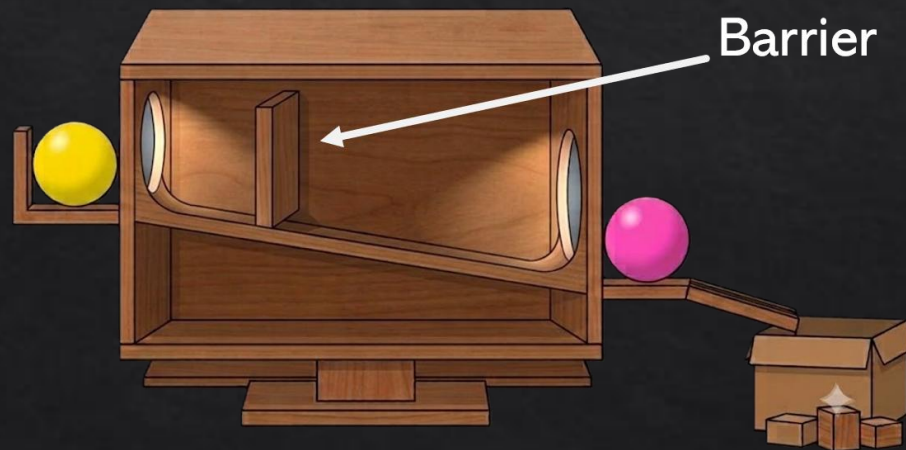
Results: Low Priors, No “Causal Illusion”



Higher prior causal ratings (close to 0.5)

Higher posterior causal ratings, ratings increased with outcome density

Replicates previous findings



Low prior causal ratings (around 0.1)

Lower posterior causal ratings, not dependency on outcome density

Novel finding

See CogSci Paper
ID: 3311
for more