

## RESEARCH BRIEF

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# Unpacking the Dynamics of Bias, Decision Revision, and Performance in Human-AI Collaboration

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### Brief overview of the research

This study develops a stage-based decision funnel model to reveal how perceptual biases and AI explanations shape human-AI decision making. Two experiments show that cognitive biases have stage-specific, sometimes nonlinear effects, particularly during decision revisions, while illusion of control improves performance and concrete explanations enhance the accuracy of decision revisions.

### Why this research matters

As AI increasingly becomes a partner in human decision making, understanding its impact requires looking beyond final outcomes to how decisions evolve throughout human-AI interactions. This study advances AI bias and explainable AI research by introducing a stage-based perspective that reveals when and how perceptual biases and AI explanations shape decision behavior and performance across the decision process. It further identifies decision transitions as critical points for understanding human-AI collaboration and shows the importance of accounting for nonlinear effects. Practically, the study informs the design of AI systems and explanations that account for users' cognitive tendencies and support effective decision revision.