Inform and persuade

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Abstract

Advice plays a central role in health, personal finance, and energy efficiency investments. How should a benevolent expert give advice to a biased agent, i.e an agent who misses relevant aspects of the decision problem or updates information irrationally? The expert faces two motives: to inform the agent to enable better decision-making, and to persuade the agent away from suboptimal choices that stem from their biases. In a Bayesian persuasion framework, we demonstrate that better information can be detrimental but full information disclosure is still optimal.

Keywords: advice; risky decisions; Bayesian persuasion; information design; bias; behavior; non-Bayesian updating

1 Introduction

We study settings in which a well-intentioned expert aims to improve an agent's decision by choosing what evidence becomes available, for example, whether to commission a diagnostic test of medium or high accuracy. The agent directly observes the test result but may be behaviorally biased in multiple ways, for instance misinterpreting evidence or failing to fully account for relevant consequences of the choice. Therefore, the expert must select evidence that is not only informative from her point of view, but also robust to the agent's bias.

For a concrete illustration, consider the clinical challenge of treating *Plasmodium vivax* ("vivax") malaria. Patients may be offered a *radical cure*—a course of antimalarial drugs that clears dormant parasites in the liver and thereby prevents relapses—but for some patients the same drugs can be dangerous. In particular, patients with an inherited enzyme deficiency (glucose-6-phosphate dehydrogenase, G6PD, deficiency) face a risk of severe hemolysis, i.e. a rapid breakdown of red blood cells, when exposed to these medications. Because a patient's G6PD status is typically unobserved, the clinician (the expert) may commission a diagnostic test that informs the patient's binary choice: to take the radical cure or not.

The clinician often has several diagnostic tests to choose from. In the malaria example, these include an intermediate-accuracy fluorescent spot test that can be implemented with basic laboratory capability and a highly accurate quantitative laboratory assay involving spectrophotometry (Devine et al. 2020).[1] The clinician is rational: she weighs

[1]For more information on this example, see Section 8 and Appendix E.