A Psychologist Looks Hopefully to Logic

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The development of science is among the most distinctive accomplishments of the human species. To help clarify how science is achieved, psychologists would like to understand the kind of reasoning that underlies empirical discovery. A natural hypothesis is that such reasoning is based on elements of deductive and inductive logic, in something like the form these disciplines take today. However, if "inductive logic" is interpreted in the sense of (Bayesian) probability, the hypothesis runs into a problem: most people appear to lack even the most elementary ability to distribute probabilities over logically related statements.

This mental lacuna calls for elucidation in its own right. A potential explanation is suggested by recent psychological data. If correct, the explanation makes it implausible that basic scientific competence rests on probabilistic inductive logic.

As a starting point for understanding scientific discovery, therefore, the psychologist needs an alternative perspective on inductive logic. One alternative starts from the all-or-none concept of acceptance as opposed to graded belief. The inductive logic of acceptance is governed by principles of hypothesis selection and revision rather than probability. This theory of inductive logic has already seen development, but many questions remain.

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