

Bayesian Inductive Logic

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Science infers general statements and predictions from limited bodies of empirical evidence, and it therefore faces the problem of induction. Statistical inferences play an important role in how science tackles this problem. This thesis makes precise what role these inferences can play, investigates the use of statistical hypotheses in these inferences, and discusses their relation with a number of problems in the philosophy of science.

The first part of this thesis presents a reformulation of Carnapian inductive predictions in terms of Bayesian inductive logic. This logic accommodates the use of frequentist statistical hypotheses, which function as a tool for choosing premises in the inductive inferences. In the second part, this function is illustrated with a study on the form of premises that express considerations of relevance and independence. The third part employs Bayesian inductive logic to shed new light on some problems in the philosophy of science, including theory change and underdetermination.

Jan-Willem Romeyn (1975) studied at Utrecht University, where he graduated cum laude in physics and philosophy. Following these studies, he was employed as a statistician in financial consultancy. Since the autumn of 2000 he has worked on this thesis to attain a doctorate in philosophy at the University of Groningen. As of January 2005, he is employed at the Psychology Department of the University of Amsterdam, where he lectures in philosophy of science and statistics.

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