The Variety-of-Evidence Thesis and the Reliability of Instruments: A Bayesian-Network Approach

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Abstract

The variety of evidence thesis in confirmation theory states that more varied supporting evidence confirms a hypothesis to a greater degree than less varied evidence. Under a very plausible interpretation of this thesis, positive test results from multiple independent instruments confirm a hypothesis to a greater degree than positive test results from a single instrument. We invoke Bayesian Networks to model confirmation on grounds of evidence that is obtained from less than fully reliable instruments and show that the variety of evidence thesis is not sacrosanct when testing is conducted with less than fully reliable instruments: under certain conditions, a hypothesis receives more confirmation from evidence that is obtained from one rather than from more independent instruments. In the appendix, we prove certain convergence results for large numbers of positive test results from single versus multiple less than fully reliable instruments.

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