The Wrong Problem
Relevance and Irrelevance in Bayesian Confirmation Theory

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Two Problems of Irrelevant Conjunction
Irrelevant Conjunction

Evidence $e$ confirms hypothesis $h$

Hypothesis $j$ irrelevant (intuitively)

Bayesianly, $e$ will tend to confirm $hj$

**Irrelevant conjunctions** are confirmed

Why worry?
Converse consequence  If $e$ confirms $h$, then $e$ confirms any entailer of $h$.

Special consequence  If $e$ confirms $h$, then $e$ confirms any entailee of $h$. 
Hypothetico-Deductivism

1. Implies converse consequence

2. Converse consequence implies confirmation of irrelevant conjunctions (since $hj$ entails $h$).

3. Special consequence and confirmation of $hj$ implies confirmation of $j$. 
Two Problems

1. Irrelevant conjunctions are confirmed.

2. Wherever there is special consequence, irrelevant conjunctions may be confirmed.
Form of a Bayesian Approach

1. Probabilistic definition of relevance, thus irrelevance

2. Demonstration that irrelevant conjuncts are not confirmed
Relevance and Confirmation Flow
Aim

To understand and predict the “flow of confirmation” as a (partial) consequence of a relevance relation
Flow in Irrelevant Conjunct Disaster
Flow in Ampliative Inference

\[\text{Law} \quad i \quad j\]
Flow in Glymour Cases

Kepler's laws

2 3

e
An Understanding of Relevance Might...

1. Allay worries about irrelevant conjuncts,
2. Solve Glymour’s relevance problem,
3. Show when confirmation should “flow” from one consequence of a theory to another.
Bayesian Solutions to the Real Problem
Strong Irrelevance

Hypothesis \( j \) is irrelevant to \( h \) and \( e \) if 

\( j \) is probabilistically independent of 

\( h, e, \) and \( he \)

so that \( P(h|j) = P(h) \) etc.
Strongly Irrelevant Conjuncts

Are not confirmed because the definition of strong irrelevance requires that

\[ P(j|e) = P(j) \]

No explanation!
Weaker Irrelevance

For example (Fitelson and Hawthorne):

\[ P(e|hj) = P(e|h) \]

Claim: captures case where \( j \) (and “interaction” of \( h \) and \( j \)) contain no information about \( e \) not contained in \( h \).
Two Paths to Weak Irrelevance

1. The weakly irrelevant conjunct $j$ says nothing about $e$ that $h$ doesn’t say.

2. The weakly irrelevant conjunct $j$ says a lot about $e$, both on its own and through interaction with $h$, but it all cancels out.

*Not* an intuitive irrelevance relation
Bold Conjectures

True for all kinds of weak irrelevance:

1. No mathematical condition captures intuitive relevance/irrelevance

2. No interesting mathematical condition for irrelevance guarantees non-confirmation
Abandon All Hope?

Bayesians have nothing interesting to say about irrelevant conjuncts?
The Wrong Problem—Again
Irrelevant Conjuncts Often Confirmed

All ravens are black
The provost of Stanford is infallible
Black raven

Newton’s law of gravitation
Coulomb’s law
Observation of comet
Morals

1. Irrelevance in the intuitive sense does not guarantee non-confirmation

2. No interesting, systematic facts about which conjuncts are not confirmed—all depends on background
No Formal Theory of “Special Consequence”

No interesting “local” fact about probabilistic relevance can be leveraged to gain information about (global) confirmation relations
No Probabilistic Definition of Relevance

Need a definition of relevance that goes beyond probability: defines a structure through which probability (ceteris paribus) flows.