

# Ballot Results

Coding:

**13** score

R = registered student vote (2 points)

A = auditor vote (1 point)

Results (highlighted in green below)

Inference to the best explanation (2 weeks)  
Simplicity (1 week)  
Dawid: Non-Empirical Confirmation (1 week)  
Principle of Indifference (1 week)

Norton, new ms Chapters  
3 Circularity  
4 The Uniqueness of Domain-Specific Inductive Logics  
6 The Problem of Induction

Name: \_\_\_\_\_

HPS Student for credit: \_\_\_\_\_ HPS Student auditor: \_\_\_\_\_ Welcome visitor: \_\_\_\_\_

Instructions: Vote for as many topics as you like by inserting an "x" in the blank space "\_\_\_ Topic". Please also insert suggestions for further topics (although they now will be outside the vote.)

Please send completed ballot to jdnorton@pitt.edu by 11:59pm Thursday January 21.

Topics already scheduled in *italics*.

Topics open for voting indicated as "\_\_\_ Topic"

Schedule: 14 weeks = 2 Introductory meetings + 4 Bayesian meetings + 5 open meetings decided by a vote + 2 material theory meetings + 1 closing discussions

*Topics*

*Introductory survey. Review of topics.*

*Evidence as conceived outside philosophy of science; reports on case studies.*

*Bayesian Confirmation Theory*

*Jan Sprenger*

*Michael Titelbaum*

*Carl Hoefer*

*Why Not Bayes (Norton)*

## Possible topics to be decided by vote (allow 5 weeks)

### **13** RRRRRAAA [IBE: Inference to the best explanation](#)

Over the last few decades, accounts of inductive inference and confirmation have come to be dominated by the quantitative Bayesian account and the qualitative account of IBE. With the death of Peter Lipton, IBE's most prominent proponent, the presence of IBE has been slipping. A recent collection of papers in IBE indicates a revival. (Kevin McCain and Ted Poston, eds. *Best Explanations: New Essays on Inference to the Best Explanation*. Oxford University Press.) A search in philsci-archive shows that an uncommonly large number of recent IBE papers. I think this is well worth spending time on.

### **11** RRRRAAA [Simplicity](#)

The importance of simplicity considerations in theory assessment has been revived by Elliott's Sober's recent *Ockham's Razors: A User's Manual*, Cambridge University Press, 2015. It is an important work and has attracted some critical responses.

### **4** RAA [Unification](#)

The idea that hypotheses or theories that unify disparate parts of science has seen a revival in several papers over the last half dozen years.

### **10** RRRR [Dawid: Non-empirical confirmation](#)

Richard Dawid has defended the view that "non-empirical confirmation" can significantly increase our confidence in a science theory through means that do not involve any new empirical evidence. The case of greatest interest is string theory. We are to trust it in spite of it lacking any novel empirical support. The claim has triggered considerable controversy amongst both philosophers of science and physicists.

### **3** RA [Proofs of probabilism](#)

Bayesian analysis is distinctive in that its literature has taken seriously the task of demonstrating that it is the One True Way. There are several traditions of proof attempted: representation theorems, Dutch book arguments and accuracy measure dominance arguments.

## 2 R\_\_ Learning theoretic approaches

An alternative to the whole approach of confirmation theory is found in learning theoretic approaches. They model scientific inquiry as the world providing us a stream of data. We propose hypotheses in response and revise them as the data continues. As a surrogate for ideas in confirmation theory, learning theory asks which of the criterion that guide hypothesis choice are best able to get us to true hypotheses. Recent work includes a vindication of simplicity as a guide to truth (Kevin Kelly) and a pragmatic solution to the problem of induction (Gerhard Schurz).

## 7 RRA\_\_ Interpretations of probability: objective vs subjective accounts.

A long-standing topic of debate in Bayesian analysis has been the nature of the probabilities employed. Are they subjective, so that prior probabilities are merely freely chosen opinions. Or are they objectively determined by the world, so that in any one situation there is unique choice of the correct prior probability?

\_\_ The replication crisis in present science

A substantial portion of the accepted results in various sciences, especially psychology, are delivered by studies whose results are not replicable. What are we to make of this circumstance?

## 2 R\_\_ Imprecise probabilities

Probabilistic representations of credence have trouble representing ignorance as opposed to disbelief. A solution is to stop representing credences by single-valued probability measures. They are replaced by something imprecise: sets of probability measures or interval valued probability measures.

## 12 RRRRAA\_\_ Principle of indifference

The principle of indifference asserts that we should assign equal credence or equal inductive support to propositions over which we are indifferent. It is incompatible with a probabilistic representation of credence or evidential support. Should we abandon it or modify our notions of credence or inductive support?

## 4 RR\_\_ Grue

Goodman's proposal of "grue" has been a long-standing obstacle to optimistic ideas about evidence and in confirmation theory. What is it? Is its import serious?

## 5 RRA\_\_ Underdetermination

The underdetermination thesis, in its strong and interesting form, asserts that no amount of evidence can ever point to a unique theory. For every such candidate there are arbitrarily many others, empirically equivalent to it, and equally well supported by the evidence.

## 2 R\_\_ Epistemic values

According to Kuhn's account of epistemic values, theory choice is not guided by the evidence alone but in addition by various values that scientists happen to like. Some--me--think this is a pernicious form of inductive skepticism that masquerades as a benign treatment of scientific practices.

Classics in theories of induction and confirmation:

## 3 RA\_\_ Mill's methods

## 4 RR\_\_ Whewell on consilience of inductions

## 2 R\_\_ Hempel's satisfaction criterion

## 1 A\_\_ De Finetti on subjective probability

## 4 RR\_\_ Savage on decision theoretic methods

## 4 RR\_\_ Lipton on Inference to the Best Explanation

\_\_ **Your proposal?** \_\_\_\_\_

Case Studies

## 2 AA\_\_ Newton's Principia

## 4 RR\_\_ Phlogiston vs Oxygen

## 5 RRA\_\_ Darwinian Evolutionary theory

\_\_ Your proposal? \_\_\_\_\_

\_\_ **YOUR ADDITIONAL PROPOSAL**

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(2 weeks) **Large-scale structure of inductive inference** (Norton, new book ms)

### 1. *The Material Theory of Induction, Briefly*

### 2. *Large-Scale Structure: Four Claims*

- (i) Relations of inductive support have a non-hierarchical structure.
- (ii) Hypotheses, initially without known support, are used to erect non-hierarchical structures.
- (iii) Locally deductive relations of support can be combined to produce an inductive totality.
- (iv) There are self-supporting inductive structures.

## 13 RRRRAAA\_\_ 3. Circularity

The non-hierarchical relations of inductive support in science admit circularities of large and small extent. These circularities are benign. They do not force contradictions or assured underdetermination of facts on the structure. Here they are no different from other benign circularities.

**7 RRA** 4. The Uniqueness of Domain-Specific Inductive Logics

That a single body of evidence might support factually competing theories equally well is precluded by an instability in the competition between such theories. A small evidential advantage by one secures more favorable facts that amplifies its advantage.

**6 RRA** 5. Coherentism and the Material Theory of Induction

While the large-scale structure of inductive relations of support appear similar to relations in a coherentist epistemology, the similarities are superficial. Coherentism concerns beliefs and the mental operations that connect them. Inductive inference concern logical relations among propositions independent of our thoughts and beliefs. The resources of coherentist epistemology prove to be of little help or relevance to the material theory of induction.

**8 RRAA** 6. The Problem of Induction

The problem of induction lies in the failure of universal rules of induction to be justified. They must either justify themselves or enter into an infinite regress of justification by distinct rules. The material theory of induction dissolves the problem since it eschews universal rules of induction. Attempts to resurrect the problem in the regresses and circularities within the non-hierarchical relations of support fail.

Case Studies

**5 RRA** 7. The Recession of the Nebulae.

Hubble's 1929 result that nebulae recede with a velocity proportional to their distance may appear to be a simple generalization from measurements of specific nebulae to a generalization over all nebulae. However, Hubble's 1929 analysis did not respect a hierarchy of generalizations since he lacked distance measurements for nearly half the nebulae. He recovered his general result through a complicated set of inductive inferences that respected no hierarchy of generality.

**4 RAA** 8. Newton on Universal Gravitation

Newton's celebrated argument for universal gravitation contains two cases of pairs of propositions that mutually support each other in an arch-like structure. That is, one member of the pair supports the other; and vice versa.

**R** 9. Mutually Supporting Evidence in Atomic Spectra

The atomic spectra were observed in the nineteenth century and early twentieth century as grouped into distinct series. By means of the Ritz combination principle, evidence of the structure of some series supported the structure of others; and vice versa. The Ritz combination principle itself was first an observational result and then recovered from the newly emerging quantum theory. Each supplied evidence for the other in a higher lever relation of mutual support.

**R** 10. Mutually Supporting Evidence in Radiocarbon Dating.

Historical artefacts can be dated by traditional methods or by radiocarbon dating. The results of each method support the other, illustrating the arch-like structure of relations of support.

**\_\_\_** 11. The Determination of Atomic Weights

It took over half a century after Dalton proposed his atomic theory of the elements for chemists to break a circularity in molecular formulae and atomic weights and establish that water is H<sub>2</sub>O, and not HO. Their analysis employed relations of inductive support of bewildering complexity, illustrating the complex, non-hierarchical character of relations of inductive support.

**R** 12. The Use of Hypotheses in Determining Distances in Our Planetary System

As late as the eighteenth and nineteenth centuries, astronomers still struggled to provide exact values for distances within our planetary system. Triangulation, the only direct method available, was too weak. Since antiquity, astronomers arrived at more precise values by basing their analyses on hypotheses that would in turn require subsequent support.

**R** 13. Dowsing: The Instabilities of Evidential Competition

The instability of competition between competing theories is illustrated by the rivalry between proponents and critics of dowsing, leading to a decisive victory by its critics.

**6 RRAA** 14. Stock Market Prediction: When Inductive Logics Compete

Four systems are routinely used to predict future price on the stockmarket, each comprising a small inductive logic. Their competition is unstable and only one would survive if investors and pundits took proper notice of the evidence.