The Problem of Induction

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Introduction

- The problem of induction is a problem about the justification of inductive reasoning, attributed to David Hume.
- This is an original lecture, not a presentation of something that has been published.
- However, I'll refer to Laurence Bonjour's article "Problems of Induction," in *A Companion to Epistemology*, Blackwell 1992.

The problem

- For concreteness, I'll focus on a particular inductive inference.
- Suppose a person has observed the sun to rise every day for many days, and has no other relevant evidence. *The problem: Show that the person is justified in having a high degree of belief that the sun will rise tomorrow, and explain why.*
- I'll assume that a person's degree of belief in H is justified (in the relevant sense) iff it equals the inductive probability of H given the person's evidence.
- *The problem becomes: Show that the inductive probability that the sun will rise tomorrow, given only that the sun has risen every day for many days, is high; and explain why.*
- Symbolism: Let $ip(A|B)$ be the inductive probability of A given B. Let S_i be that the sun rises on day i. *The problem: Show that* $ip(S_{n+1}|S_1 \ldots S_n)$ *is high, and explain why.*

My solution

- Almost everyone agrees that $ip(S_{n+1}|S_1 \ldots S_n)$ is high.
- Since inductive probability is logical in Carnap's sense, an error in this matter would be an error about a simple application of a concept of ordinary language.
- People are not usually mistaken about simple applications of concepts of their language.
- Therefore, $ip(S_{n+1}|S_1 \ldots S_n)$ is high.
- The reason why: It is analytic.

Hume's fork

Hume challenges the proponent of induction to supply a cogent line of reasoning that leads from an inductive premise to the corresponding conclusion and offers an extremely influential argument in the form of a dilemma (sometimes referred to as "Hume's fork") to show that there can be no such reasoning. Such reasoning would, he argues, have to be either a priori demonstrative reasoning concerning relations of ideas or "experimental" (i.e. empirical) reasoning concerning matters of fact or existence. It cannot be the former, because all demonstrative reasoning relies on the avoidance of contradiction, and it is not a contradiction to suppose that "the course of nature may change," that an order that was observed in the past will not continue in the future; but it also cannot be the latter, since any empirical argument . . . would be question-begging. (Bonjour p. 391)

Response to Hume's fork

- My solution takes the first horn of the dilemma: It uses "a priori demonstrative reasoning."
- The objection to this is: "it is not a contradiction to suppose that the course of nature may change."
- That claim is *true but irrelevant*.
  - The solution is that

    $$ip(S_{n+1}|S_1 \ldots S_n) \text{ is high}$$

    is true and analytic.
  - This doesn't say the course of nature won't change.
  - In fact, since $ip(S_{n+1}|S_1 \ldots S_n) < 1$, the solution implies that the course of nature *may* change.

The principle of induction

An alternative version of the problem may be obtained by formulating it with reference to the so-called Principle of Induction, which says roughly that the future will resemble the past . . . An inductive argument may be viewed as enthymematic, with this principle serving as a suppressed premiss, in which case the issue is obviously how such a premiss can be justified. Hume's argument is then that no such justification is possible. (Bonjour p. 391)

Reply

- Inductive arguments don't have the Principle of Induction as a suppressed premise; if they did, they would be deductive, not inductive.
- The issue is whether $ip(S_{n+1}|S_1 \dots S_n)$ is high. Since that is analytic, it can't depend on the Principle of Induction, which is synthetic.

Truth

Objection: It's all very well to show that $ip(S_{n+1}|S_1 \ldots S_n)$ is high, but what I want is a proof that beliefs with high inductive probability will be *true*, at least most of the time, and you haven't shown that.

Reply

- That can't be shown; the world can frustrate even reasonable expectations.
- But the problem of induction was about whether certain beliefs are *justified*. Beliefs can be justified even if they turn out to be false.
  - Suppose that tomorrow the laws of nature change and most of our expectations are falsified. It doesn't follow that those expectations weren't justified, even though they turn out to be massively wrong.
- Therefore, the objector has changed the subject.

Questions

1. Maher formulates (a particular instance of) the problem of induction in terms of (i) justification and (ii) inductive probability. State both formulations and Maher's reason for regarding these as equivalent.
2. Suppose the problem of induction is to show that $ip(S_{n+1}|S_1 \ldots S_n)$ is high, and to explain why. What is Maher's solution to this problem?
3. Hume argued that the problem of induction can't be solved with "a priori demonstrative reasoning" because "it is not a contradiction to suppose that the course of nature may change." Is this a sound argument? Explain.
4. Does a solution to the problem of induction need to show that beliefs with high inductive probability are usually true? Explain.