

Goodman’s new riddle of induction

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1 Goodman on the classical problem of induction

We have already discussed Hume’s problem of induction. Goodman thinks that no answer to this problem is really possible, but also that none is really necessary. He argues for this by first asking how we can justify deductive, rather than inductive, inferences:

“How do we justify a *deduction*? Plainly, by showing that it conforms to the general rules of deductive inference. . . .when a deductive argument has been shown to conform to the rules of logical inference, we usually consider it justified without going on to ask what justifies the rules.” (63)

When we do try to justify the rules of deduction, Goodman thinks, we can do no better than to cite our deductive practices:

“Principles of deductive inference are justified by their conformity with accepted deductive practice. . . .This looks flagrantly circularBut this circle is a virtuous one. The point is that rules and particular inferences alike are justified by being brought into agreement with each other.”

He thinks that we can say the same thing about the justification of induction:

“All this applies equally well to induction. . . .Predictions are justified if they conform to valid canons of induction; and the canons are valid iff they accurately codify accepted inductive practice.

A result of such analysis is that we can stop plaguing ourselves with certain spurious questions about induction.” (64)

A reason to be dissatisfied with an explanation of justification in terms of accepted practice.

Suppose that we accept Goodman's treatment of the classical problem of induction. This still leaves us with a question: what are the valid canons of induction? As Goodman says,

“As principles of *deductive* inference, we have the familiar and highly developed laws of logic; but there are available no such precisely stated and well-recognized principles of *inductive* inference.” (65)

The task of giving canons of inductive inference is the task of explaining when a certain set of premises can provide a good inductive argument for a given conclusion.

2 The new riddle

Goodman discusses a number of attempts to formulate canons of inductive inference in §3. We will not pay much attention to the details of these, but instead will just focus on inductive arguments of the form:

1. Emerald₁ is green.
 2. Emerald₂ is green.
 - ⋮
 1000. Emerald₁₀₀₀ is green.
-
- C. All emeralds are green.

It seems clear that inductive arguments of this form are often good arguments. And what makes them good seems, intuitively, to be that the conclusions of arguments of this form are generalizations, and the premises are instances of that generalization. It seems like this is a good first step in putting together a logic of induction: a generalization is confirmed by its instances.

Goodman's new riddle of induction shows that this is a false step: not all generalizations are confirmed by their instances. He shows this by inventing the predicate 'grue.' It is defined as follows:

An object is grue if and only if the object is either (1) green, and has been observed before now, or (2), blue, and has not been observed before now.

This is a perfectly fine definition, in the sense that it gives us clear conditions on when the word 'grue' applies to an object. But it poses a problem when we use it in inductive arguments. Consider, for example, the following argument:

1. Emerald₁ is grue.
 2. Emerald₂ is grue.
 - .
 - .
 1000. Emerald₁₀₀₀ is grue.
-
- C. All emeralds are grue.

This argument seems, by the standard suggested above, to be a perfectly good inductive argument. But it cannot be, since it does not give us good reason to believe that all emeralds which have not been observed till now are blue.

Another way to see the problem is that the example of ‘grue’ seems to show that exactly the same evidence — observation of 1000 green emeralds — provides good evidence for believing both that the next emerald to be observed will be green, and that it will be blue. But this is absurd.

Why the assumption of the uniformity of nature seems only to make the problem worse.

But if, as seems clear, there is something wrong with the inductive argument involving ‘grue’, we have only two options: (i) say that there is also something wrong with the inductive argument involving ‘green’, in which case we are rejecting the rationality of induction, or (ii) find some relevant difference between the two arguments.

3 What’s wrong with ‘grue’?

It is natural to respond to this puzzle by claiming that something must be wrong with the word ‘grue.’ If we could show that there was something wrong with it, then we could restrict the canons of induction to apply only to inductive arguments which do not contain terms which are defective in this way.

3.1 Reference to time and place

A first thought is that ‘grue’ is illegitimate because it makes reference to a specific time; it is defined in terms of what color something is if observed before *now*. This is part of what makes the predicate seem so artificial, so it is natural to think that it is also part of what makes its use in inductive arguments illegitimate. So maybe we should restrict the terms involved in inductive arguments to ones which do not involve any reference to a specific time and place. The difference between a term which includes reference to a time and place and a term which can be analyzed into other terms which include reference to a time and place. The problem that ‘grue’ is not in the former category, and that every predicate is in the latter category.

3.2 *Definability constraints*

A second intuitive thought is that ‘grue’ is somehow unnatural, because it is defined in terms of two other predicates, ‘green’ and ‘blue.’ But, as Goodman points out, things are not so simple. Consider the new predicate, ‘bleen’, defined as follows:

An object is bleen if and only if the object is either (1) blue, and has been observed before now, or (2), green, and has not been observed before now.

Again, this seems like a perfectly comprehensible, if unusual, definition. The problem is that we can now see that ‘green’ is also definable in terms of ‘grue’ and ‘bleen’: something is green if and only if it is either (1) grue and has been examined before now, or (2) bleen and has not been examined before now.

3.3 *Unnatural properties*

A third response to Goodman’s problem is to appeal not to the way in which ‘grue’ is defined, but to differences between the properties of being grue and being green. The idea that inductive inferences are only reliable if they are restricted to properties which are in some sense natural. The idea that grue, but not green, is observation-dependent.