

Lecture 2: The new riddle of induction

Nelson Goodman's comments on Hume

Hume brought out that predictions about the future (the unobserved) cannot be logically inferred from what has been observed. It is puzzling how we can nonetheless be justified in making those predictions: What is the 'rational' relation between those predictions and past experience, if not a logical inference?

Now if we strip [Hume's] account of all extraneous features, the central point is that to the question "Why one prediction rather than another?", Hume answers that the elect prediction is one that accords with a past regularity, because this regularity has established a habit. (Goodman 1955, 60)

Many think this response confuses the descriptive problem and the normative problem of induction. Yet Goodman believes that Hume's response is at least on the right track.

A problem of deduction?

How do we justify a *deductive* inference? Recall our example:

1. If a bread contains rye, then it is nourishing
2. This bread contains rye
3. Therefore, this bread is nourishing

What entitles us to infer (3), the conclusion? Conformity with the rules of logical inference, e.g. *modes ponens*. We consider any argument that conforms to those rules justified, i.e. valid. But we can still ask: are we justified to use *those rules* to justify the deductive inferences we make? Why these rules, and not some others? What makes logic valid? Goodman's point here is that there's nothing peculiar about induction: the puzzle arises for deduction just as much.

The solution to the traditional problems

Goodman's solution to this 'problem of deduction' is meant as a clarification of Hume's solution to the problem of induction. Instead of thinking that the rules of inference are *a priori*, or suggesting that they are genetically hard-wired, Goodman points to our conventional practices (this is slightly broader than Hume's 'habits of mind').

Principles of deductive inference are justified by their conformity with accepted deductive practice. Their validity depends upon accordance with the particular deductive inferences we actually make and sanction. If a rule yields unacceptable inferences we drop it as invalid. Justification of general rules thus derives from judgments rejecting or accepting particular deductive inferences. (1955, 63-4)

The solution is circular, but not problematically so. The justification of deductive inference is a matter of what some philosophers call a *reflective equilibrium*.

A rule is amended if it yields an inference we are unwilling to accept; an inference is rejected if it violates a rule we are unwilling to amend. (1955, 64)

What this shows is that justification is a contingent practice, a process that depends on how we in fact reason; it is not some kind of ahistorical and necessary fact that makes some patterns of inference special or that makes some set of rules the right ones.

It dawns upon us that the traditional smug insistence upon a hard-and-fast line between justifying induction and describing ordinary inductive practice distorts the problem. And we owe belated apologies to Hume. For in dealing with the question how normally accepted inductive judgments are made, he was in fact dealing with the question of inductive validity. (1955, 64-5)

A new riddle

The solution to Hume's problem means that we *are* justified to follow our established deductive and inductive practices. Hurrah! But Goodman has bad news:

Argument A

1. Emerald₁ is green
2. Emerald₂ is green
3. Emerald₃ is green
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- n*. Emerald_{*n*} is green

Therefore, all emeralds are green

Argument B

1. Emerald₁ is grue
2. Emerald₂ is grue
3. Emerald₃ is grue
-
- n*. Emerald_{*n*} is grue

Therefore, all emeralds are grue

Argument A clearly conforms to standard inductive practices. But then so does argument B. 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. All observed emeralds are green and so are grue.

Thus according to our definition, the prediction that all emeralds subsequently examined will be green and the prediction that all will be grue are alike confirmed by evidence statements describing the same observations. But if an emerald subsequently examined is grue, it is blue and hence not green. Thus although we are well aware which of the two incompatible predictions is genuinely confirmed, they are equally well confirmed according to our present definition. (1955, 74)

This is puzzling: it shouldn't be okay to predict that the next emerald we will encounter is blue on the basis of only having seen green emeralds. Moreover, the inductive conclusions of A and B contradict each other: Argument A predicts that any emerald you later encounter is green, while Argument B predicts that it is grue, i.e. blue.

Hume's problem was to explain the validity of certain inferences or patterns of reasoning. The new riddle is about how to explain why some empirical hypotheses are legitimate and others are not.

Is there something wrong with 'grue'?

You might think there's something wrong with the predicate 'grue'. But what? Perhaps it's semantically artificial or unnatural. Perhaps here's why: it is defined 'relationally', i.e. its definition includes reference to *times* of observation.

But this can't be the problem, because 'grue' is, just as 'green', not *itself* a relational predicate (compare '... is grue' with the predicate '... is the time before ...'); and also 'green' has a definition that includes reference to *times* of observation:

- A. 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
- B. An object is **bleen** if and only if it is either (1) blue, and has been observed before now, or (2) green, and has not been observed before now
- C. An object is **green** if and only if it is either (1) grue, and has been observed before now, or (2) bleen, and has not been observed before now

So should we accept that, semantically, 'green', 'grue' and 'bleen' are on a par? This seems uncomfortable. Only 'green' describes a *quality*, green; there surely is no quality grue or bleen?

But the argument that the former but not the latter are purely qualitative seems to me quite unsound. True enough, if we start with 'blue' and 'green', then 'grue' and 'bleen' will be explained in terms of 'blue' and 'green' and a temporal term. But equally truly, if we start with 'grue' and 'bleen', then 'blue' and 'green' will be explained in terms of 'grue' and 'bleen' and a temporal term; 'green', for example, applies to emeralds examined before time *t* just in case they are grue, and to other emeralds just in case they are bleen. Thus qualitateness is an entirely relative matter and does not by itself establish any dichotomy of predicates. (1955, 79-80)