

# COMMENT:

## Is induction rationally justified?

By Duncan Rickelton

Inductive reasoning is used everyday, by nearly everyone. Generally, the premises of inductive arguments are statements about observations (they have an empirical basis), and the conclusions inductively inferred from these are statements about unobservables such as predictions about the future, generalisations or natural laws.

The following are examples of inductive arguments:

The sun has risen every day

The sun will rise tomorrow

No man has ever been known to be immortal

All men are mortal

Although they do not involve logical entailment, the arguments above still appear to have a certain degree of *strength*. Given the truth of the premises, it seems probable, if not certain, that the conclusions are true. Often the conclusions of inductive inferences seem so certain that they are seen as fundamental truths – scientific laws are the conclusions of such inferences.

But are we rationally justified in employing induction as a method of inference at all? It would appear that induction cannot be justified *a priori* because the premises of inductive arguments do not analytically or logically entail their conclusions, but neither can it be justified empirically because that would need an inductive argument, thus begging the question.

Hume first raised this problem, concluding that induction is not justifiable as a method of inference. In this essay I will look at various proposed solutions to the problem of induction – the pragmatic justification, the reliabilist justification, and the ordinary language dissolution – and assess whether they succeed in providing a justification for induction.

### The pragmatic justification

A proponent of this justification of induction accepts that it cannot be shown that inductive reasoning will result in true conclusions, or even conclusions that are likely to be true. After all, perhaps nature is not uniform. How are we to know that it is? We can't go by what we have observed, because inferring the uniformity of nature from that would itself be an instance of inductive reasoning, and therefore rule circular (using inductive reasoning to justify inductive reasoning).

However, the pragmatic justification of induction holds that induction is at least as good as any other non-deductive method of reasoning, and is therefore justified. Reichenbach (1949) uses the following *deductively valid* argument to vindicate induction pragmatically:

1. Either nature is uniform or it is not.
2. If nature is uniform, the inductive method will be successful.
3. If nature is not uniform, no method will be successful.
4. If any method will be successful, then the inductive method will.

The first premise is logically true, and most philosophers seem to accept the second, but in my opinion it is dubitable. Firstly, it is not clear what would constitute uniformity of nature. We could hypothesise that if all of nature were governed by strict laws, there would be as good a case as any for calling it uniform.

However, it seems to me that there are plenty of possible worlds governed by strict laws of nature where all sorts of inductive arguments would fail. For instance, consider a possible world completely governed by these strict laws and in which one of the laws was that every two million years gravity would reverse.

If humans had only evolved within a period of positive gravity, induction would lead them to get the law wrong and think that gravity was constant. Not only that, but at the point where gravity reversed, all sorts of further common inductive inferences would fail – careful parents would push their children off swings into outer space, experienced tea-ladies would pour boiling water from the kettle into their own faces; a whole host of difficulties because of an ill-founded faith in the success of induction.

There are some possible responses to this objection. It could be argued that the humans in the above example did not employ the inductive method correctly. It is commonly accepted that for an inductive argument to be successful it is necessary that the premises (i.e. observations or evidence) fulfil two criteria: there must be a large enough number of them and they must be sufficiently diverse. It is said that when the premises fulfil these criteria induction will reach the truth. But how diverse is *sufficiently* diverse and what is a *large enough* number?

It seems that this question is impossible to answer in any particular case, and it is difficult to see how any general normative rule could be formed. Furthermore, if the humans in the above example did not even have enough evidence to support their conclusion that gravity is constant, could anyone ever have enough evidence to make any inductive inferences?

Objections have also been made to the third premise of the argument. In a chaotic world where nature was not uniform perhaps there could be another successful method, for instance a clairvoyant able to predict the

future. Reichenbach's response to this is, firstly, that would not be a chaotic world – there would be an outstanding uniformity—namely the uniform success of the clairvoyant.

Moreover, it would only be by inductive inference that people in that world could discover that uniformity and have any reason to believe that the success of the clairvoyant would recur, no matter how many times it had occurred.

Perhaps Reichenbach's response is sufficient to quell such objections to the third premise, but I believe the real problem lies with the second premise. In my opinion Reichenbach arrives at the second premise by inductive inference from experience in the actual world, which he assumes is uniform. In this case, his argument is circular.

### The reliabilist justification

The reliabilist justification for induction is that a belief-acquiring process that produces more true beliefs than false beliefs is reliable, and reliability is sufficient justification for employing a belief-acquiring process. Induction is a belief acquiring process that produces more true beliefs than false beliefs; therefore induction is justified in virtue of it being a reliable process.

According to David Papineau, a proponent of reliabilism, just because a process isn't guaranteed (like a deductive argument) to yield true beliefs, does not mean we cannot be justified in using it in order to acquire beliefs. The reliabilist defence of induction explicitly uses an inductive argument to justify induction. Papineau (1992) formulates argument *A* (see box).

This argument is itself clearly inductive, and so is immediately susceptible to the criticism that it is circular. However, Papineau claims that although premise circularity is 'clearly... a vice in an argument', rule circular arguments are not viciously (or epistemically) circular.

He supports this claim by pointing out that any attempt to justify *deduction* would also be rule circular, as this must itself be done deductively. However, by saying this he seems to be revealing a distinct lack of faith in the process he intends to defend – deduction could be justified inductively, if anything could. To do this would not obviously be rule circular.

#### [Argument A]

When person<sub>1</sub> induced, from *N* observations of *A* going with *B*, that 'All *As* are *Bs*', this conclusion<sub>1</sub> was true.

When person<sub>2</sub> induced, from *N* observations of *A* going with *B*, that 'All *As* are *Bs*', this conclusion<sub>2</sub> was true.

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When person<sub>*N*</sub> induced, from *N* observations of *A* going with *B*, that 'All *As* are *Bs*', this conclusion<sub>*N*</sub> was true.

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Whenever someone induces, his or her conclusion is true.

It may be challenged that a justified belief in the reliability of induction is needed before it can succeed in justifying deduction. However, Mellor (1991) has noted that the demand for warrant to be 'self-intimating' in this way inevitably leads to an infinite regress and so should be abandoned.

So Papineau's defence of rule circularity may not be sufficient to protect argument *A* from attack on these grounds. But in my opinion, this is not where the real weakness in his position lies.

Papineau uses more than argument *A* to establish the validity of induction. Remember, he is using the standard of reliability to establish induction as a valid method of inference, *but it is only because the validity of induction is presupposed that the standard of reliability can be used to establish it*. I believe the full argument Papineau uses in his attempt to justify induction is in fact the deductive argument, argument *B* (see box), and it is this that should be assessed for circularity.

Papineau is cornered. He cannot abandon premise 2, otherwise his full argument will be invalid. However, if premise 2 is assumed, this results in premise circularity, and, to reiterate Papineau's own words, 'Clearly, premise circularity is a vice in an argument.'

The above seems to me sufficient to refute Papineau's reliabilist justification of induction.

#### [Argument B]

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|--|----------------------------------|
| 1. If induction is a valid belief forming process, then: if a belief forming process has generally yielded true beliefs in the past, then that belief forming process generally yields true beliefs. | Assumption                       |
| 2. Induction is a valid belief forming process.  | Assumption                       |
| 3. If a belief forming process has generally yielded true beliefs in the past, then it generally yields true beliefs.  | 1, 2 --> E                       |
| 4. If a process generally yields true beliefs, it is a reliable process.   | Reliabilist assumption           |
| 5. Induction has generally yielded true beliefs in the past.   | Assumption (from <i>Arg. A</i> ) |
| 6. Induction generally yields true beliefs.  | 3, 5 --> E                       |
| 7. Induction is a reliable process.  | 4, 6 --> E                       |
| 8. If a belief forming process is reliable, then it is a valid process for forming beliefs.  | Reliabilist assumption           |
| <hr/>  |                                  |
| 9. Induction is a valid belief forming process.  | 7, 8 --> E                       |

Before moving on, however, there is a further objection to reliabilism that is worthy of discussion.

The objection is that counter-induction (i.e. drawing the opposite conclusions to induction from the same evidence) could be justified in the same way as the reliabilist attempts to justify induction. Consider:

Counter-induction has been unsuccessful in the past

Counter-induction will generate correct predictions

If the reliabilist justification is fine as a justification for a belief acquiring process, then it can be used to justify employment of counter-induction as a belief acquiring process. This seems to indicate that there must be a problem with the reliabilist justification.

Papineau responds to this in his article by saying that the reliabilist does not need to convince those imaginary induction-sceptics who do not already make inductions, to make them. Reliabilism only seeks to provide a justification of induction for those who already do make inductions. However, this response doesn't seem to hold much water – it could equally well serve as a defence of the counter-inductive method.

Mellor's (1991) pragmatic response is that induction is justified, whereas counter-induction is not, because if there is a law (for example, all swans are white) induction will suggest this law to us with ever increasing force as more observations are made (because ever more swans will be observed that are white, and none that are not), whereas counter-induction will lead us directly away from the law (to conclude that all swans are not white).

However, Mellor's response also supports counter-induction, here in cases where the law is not universal: for example, if the proportion of swans that are white is 95 per cent, but there are 5 per cent of swans that are black. There is a distinct possibility that even after observation of many swans, only the white ones are seen, leading the inductivist to conclude that all swans are white, which is wrong in this case, and the counter-inductivist to conclude that not all swans are white, which is right.

### Ordinary language dissolution

The final attempt at a justification for induction that I will consider is sometimes known as the "ordinary language" *dissolution* of the problem of induction, because it aims to show that there is no real problem in the first place, by consideration of the way language works (e.g. Strawson, 1952).

The traditional problem of induction is that induction cannot be rationally justified by any means. The ordinary language dissolution says that, in fact, it is analytically true that any given *particular* inference is rationally justified if it meets inductive standards, because inductive inferences are just the kind of things we take as defining the notion of rational justification.

As Strawson (1952) puts it, 'to call a particular belief reasonable or unreasonable is to apply inductive

standards'. Furthermore, to ask whether the *process* of induction itself is rationally justified is nonsensical – we have no standards to assess such processes.

Skyrms (2000) has objected to this theory by way of a thought experiment. He asks us to consider the Omegas, a tribe who base their predictions of future happenings on the predictions of witch doctors who are sometimes right, but often wrong. If we tell them that this is irrational, they say that it can't be because faith in the witch doctors is part of what they mean by the term "rational".

Obviously what we mean by rational is different to what they mean by rational, so let's use the word "brational" for their concept. Skyrms asks how we are to convince them that rationality is superior to brationality, and this leads us back to the problem of induction.

This debate between Skyrms and Strawson is an instance of the more general debate as to whether the meaning of a word (or a term) is given by its use.

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Some have objected to Strawson's defence of induction because they object to the general thesis that a practice like induction can be justified by appealing to the way we use the term "induction" and related notions.

Perhaps there are not sufficient grounds for the thesis that meaning is given by use *in all cases*, but rejection of this general thesis does not entail rejection of Strawson's claim, which has its own particular merits.

Given that humans are not able to see the "grand scheme of things", cannot take a bird's eye view of the world and what we do, justificatory standards that require us to see from this point of view are unattainable, therefore useless in thinking about justifying induction.

However, thinking about how we use terms like "rationally justified", "reasonable", and "beyond all reasonable doubt" is useful because such notions enable us to distinguish claims/arguments that live up to our inductive standards, from claims/arguments that don't.

The case of the clairvoyant, discussed earlier, illustrates that, even if there was a successful non-inductive method, faith in the method would only be deemed rationally justified if it satisfied inductive standards. For these reasons, I conclude that reflection on our use of language is the right approach to dissolving the problem of justifying induction.