



Prifysgol Cymru
Y Drindod Dewi Sant
University of Wales
Trinity Saint David

Postgraduate/Distance Learning Assignment coversheet & feedback form

**THIS SHEET MUST BE THE FIRST PAGE OF THE ASSIGNMENT YOU ARE
SUBMITTING (DO NOT SEND AS A SEPARATE FILE)**

For completion by the student:		
Student Name: <u>Faramarz Ipchi</u>		
Module code: <u>KPPH7010</u>	Student ID number: <u>2212443</u>	Educational support needs: Yes/No
Module title: <u>KRR</u>		
Module tutor: <u>RH</u>		
Assignment due date:		
If your module has multiple submissions please indicate which piece of work this is.		
1 st ☐ 2 nd ☒ 3 rd ☐ 4 th ☐ 5 th ☐ 6 th ☐		
I confirm that this is my original work and that I have adhered to the University policy on plagiarism. Signed		
Email submission: if you are submitting this form via email, please tick this box ☐ (as a substitute for your signature) to confirm that you agree to the above declaration.		
Assignment Mark		
1 st Marker's Provisional mark	<u>50.</u>	
2 nd Marker's/Moderator's provisional mark		
Agreed Internal Mark:		
External Examiner's mark (if relevant)		
Final Mark		
NB. All marks are provisional until confirmed by the Final Examination Board.		

While this essay contains many plausible ideas, claims and arguments, it is not clear that the reading material has been utilised in any depth to answer the question. You draw on Holmes' work, but not in sufficient depth, & there are no references which leads me to believe that the module material has not been incorporated into the essay. That said, this is actually a good piece of work &

Marker's signature: interesting too, but it Date:

needs to be an academic piece as for completion by Marker 2/Moderator: an MA level essay. For

Comments: you next essay, incorporate reading, insert references & a bibliography, & give time to write a conclusion. Please

Marker's Signature: do not hesitate to contact me Date: if you want to discuss further.

AGREED INTERNAL MARK (where necessary):

Comment on process on arriving at agreed mark:

23/12/22

DW.

External Examiner's comments (if relevant)

External Examiner's Signature:

Date:

Can scientists prove that a formulation of a law of nature is true?

My short answer to this question is No.

In this essay I reason in two ways for my answer.

Before entering the discussion, we must agree on what we mean by a formulation of a law of nature **being** true. It's not far-fetched to assume that

- we agree that by nature here we mean something out of our minds, and
- we agree that nature exists independent of our mind, and it's the same as what is being studied by scientists.

Also assumed in the question is that nature has a law (i.e., its behaviour follows a certain pattern throughout its existence) and that this law can be formulated by scientists. By formulating a law, we mean making a mathematical model ^{by which} that its elements correspond to elements of nature and then expressing relations between the elements of the mathematical model in a mathematical formula. The scientists should be able to share the model and the formula with other scientists or members of public. All these assumptions and their components can be discussed and investigated further, but here we consider them agreed.

Based on these assumptions a formulation of a law of nature (a formula) is true if and only if

- 1) The model and the formula are consistent and explicit (i.e., they do not change randomly, and they are not ambiguous) over the scope of the model and the formula. By the scope, I mean all the situations that relation between nature and the model/formula holds, for example, a cosmological formula can have a time scope from The Big Bang (beginning of the time) to the end of the Universe (end of the time) and a space-scope of whole universe, thus this model and the formula should be consistent and explicit throughout the whole universe from The Big Bang to the end of the Universe.
- 2) The model and the nature keep the correspondence between the elements throughout the scope of the formula, i.e., if the formula shows that Entropy is ever-increasing in the universe as time passes, then every time Entropy in the universe is measured it should show a value higher than previous measurement. If the formula also gives a certain rate for this increase, the measured rate should also correspond to the value given by the formula.

I proposed the above 2 conditions as necessary and sufficient conditions for a formula to be true. It's quite easy to see the necessity of these conditions. If condition 1 is not met it means that the formula can change haphazardly, or it may be ambiguous. Any of these would make evaluation of the trueness of the formula pointless, as any discrepancy between the formula and the nature can be attributed to the formula being inconsistent or vague. Condition 2 is necessary as it seems to be the definition of trueness of a formula. Condition 2 seems to be sufficient in itself for a formula to be true, and condition 1 is only added to close the loophole and prevent some vague and inconsistent formula being evaluated as true. I don't know of any other loopholes that need closing, so I assume the above 2 conditions to be sufficient.

Now based on all this, here are my reasons for saying that scientists can never prove a formula to be true:

Reasoning 1:

Satisfying condition 2 above, would require running measurements throughout the proposed scope. There are three situations based on the time-scope:

- Infinite time-scope: If the model and the formula claim to be valid infinitely and assume that nature exists indefinitely, then this itself indicates that satisfying condition 2 will take infinite time/effort and is impossible, so the formula cannot be proved true.
- Finite time-scope (predicting an end to the time): In this case satisfying condition 2 would require waiting for the end of the time (end of scope). By then, either the time ends as predicted, and thus the proof is pointless as our life would not continue beyond end of time, or if the end doesn't happen as predicted, then the formula is proved wrong.
- Limited time-scope: A formula that restricts its time-scope to a limited time or some period in past can hardly claim to be a formulation of a law of nature unless it can explain why the concerned law has/had such a limited time-scope. This would result in a second formula for the change of law out of the limited scope. This formula itself can be of the first two categories or if of the third category, would result in a third formula. We can continue in this way till we have a formula of first two

categories. To explain further, let's say that we are presented with a formula F which is claimed to be true during period A . Such a claim implies that the concerned rule of nature is different outside of period A , and such an implied claim is for the whole time-scope of the nature. (The implied claim can be expressed as: law of nature for period A follows formula F , and outside period A follows something other than F . The scope given as "outside period A " is the whole time-scope of the nature except for A .)

One important point is to be aware of any hidden elements/assumptions in model/formula. Lots of times we assume causation, or infinite continuation of time or space, or such assumptions, as given. But these should be investigated in their own terms. The problem of induction is one of these hidden conditions claiming that since all measurements till now has been consistent with a formula, then it's accepted that the formula will be consistent throughout the scope of the formula. Sometimes such an induction is based on some chain of causation. Presenting the formula as a result of such a chain make it harder to dispute the formula, as it would bring under question the whole chain of causation. But anyway, the rule of induction, or a causation chain implied in a formula need to be investigated on themselves and evaluated to be true or not. Proving rule of induction to be true runs into the same problem stated above. i.e., to show that our induction was true we must wait for end of time and measure for the whole scope of inducted formula.

But besides taking measurements and comparing nature and the formula as presented above, there might be another way of satisfying condition 2, that is to show that the formula is intrinsically true based on the model chosen. This would require showing that (a) the elements of the model/formula correctly represent their real-world counterparts and this would take us back to the above problem. For example if the formula has mass of objects as one of its elements, we have to show that relevant elements of real world had/has/will have a mass and that their mass have been behaving and will behave as we define in our formula (e.g. mass can be represented by a real positive number and it has certain relation with energy, another element of the formula in this example.) If we succeed in proving (a), which is impossible as mentioned above, then we must show that (b) our formula is a fully consistent relation between the elements. Proving (b) is not an easy task either. It would require a deep analysis of all assumptions implicit in the system and formula and proving that changing any of the assumption would lead to an inconsistent system.

The last paragraph leads us to the inherent problem with induction of a law of nature. We know of mathematical induction and agree that it works well in mathematical formulas containing natural numbers. But when we try to apply the same rule to real-world, we must first show that the real-world thing that we assign a natural number to it, can actually be represented in that way and that proves impossible in itself. For example, when we say that sun came up in day 1, sun came up in day 2, etc. We are assigning a natural number to each day and stating that the difference between day 1 and day 2 is just in the passage of day 1, and when we move from day 2 to day 3, the time passed is just same as day 1 (just like in maths when we say that $1+1=2$ and $2+1=3$) but we know that it's not correct and day 1 and day 2 have a lot of differences. And the only way to justify this assignment truly is to go through all days, till the end of days and show that the differences can be negligible. (We are not mentioning here the inherent problem that, rising of the sun is embedded in the definition of day indeed. We can say that sun always come up on next day, as if it doesn't, the next day wouldn't start, would it?) In other words, the main problem is that we have built mathematical systems in our mind and as they are products of our mind we can be quite certain about correctness of a formula expressed in the system (ignoring the famous paradoxes and Gödel's incompleteness theorem for the moment) and we try to project such mathematical systems to the real world and in this projection we ignore a lot of possible differences between our mathematical system and real world and assume a one-to-one correspondence and build on it. We cover the shaky foundations of our theory/formula with the big facade of laws and formulas we build and try to forget that in fact we never addressed the main assumption that our mathematical system corresponds to real world correctly. And this is after seeing throughout history so many failures of the systems, theories and formulas proposed by great scientists, accepted and used for long periods of time before finding out that they were fundamentally wrong.

Reasoning 2:

Scientific formulations are models of the world created in the mind and since we are part of the same world then our mind is also a product and part of the same world and same rules govern it, thus we can never have a perfect model, perfectly true to nature. If we believe that there is a single law of nature, then the nature itself and the model in our mind (our scientific formulation of the nature) cannot correspond perfectly, as this would require law of nature having the same outcome in two totally different situations: the

nature and it is not mine. To solve this, we must either accept that law of nature is not explicit, or that the nature is all in our mind. Each of these "solutions" is contrary to assumptions and conditions stated above.

Final conclusion.

APPENDIX GA36d

LEVEL 7 ASSESSMENT SPECIFICATION

Student name:	Faramarz Ipchi	Student ID number:	2212443
Programme:	MRes PHILOSOPHY		
Module:	KNOWLEDGE, REASON AND REALITY		
Module code:	HPPH7010	Contribution to Overall Module Assessment (%):	50
Lecturer:	RH	Internal Verifier:	TN
Assignment Title:	Essay – ass 2	Word count (or equivalent):	4,000 WORDS
Submission deadline:	TBA	Return date of provisional marks & written feedback:	4 WEEKS AFTER SUBMISSION
Submission method:	All written assessments, where practical and possible, must be submitted via Turnitin unless otherwise instructed by the Lecturer. (Please DO NOT put this assessment specification into Turnitin or it will match many similarities with other students' submissions.) Alternative submission method (if applicable): Late submission of the assessment will result in a late penalty mark. Penalties for late submission: Up to one week late, maximum mark of 50%. Over one week late, 0%. Only the Extenuating Circumstances Panel may approve a change to submission dates.		
Academic honesty / referencing:	Academic honesty is required. In the main body of your submission you must give credit to authors on whose research and ideas your work is based. Append to your submission a reference list that indicates the books, articles, etc. that you have used, cited or quoted in order to complete this assessment.		

**Module Learning Outcomes
(from module syllabus)**

Upon the successful completion of this module, the student should be able to:
Demonstrate a sophisticated critical awareness of various views on truth, belief, knowledge, and the possibility of knowledge;

- Demonstrate an advanced understanding of the importance of epistemology in the development of the history of ideas;
- Demonstrate an advanced level of knowledge of the ideas and positions of key philosophers central to epistemology.

TASK DESCRIPTION

Choose one of the following essay questions:

1. How (if at all) is knowledge possible in the light of the Heraclitean doctrine of flux?
2. 'Although the work of Plato has been criticised by many philosophers, both early and contemporary ones, there is no doubt that his work has played a central role in the history of ideas and the development of contemporary philosophy. A great many of the issues and concerns of modern philosophers were originally taken up by Plato, some 2,300 years earlier' (RH, Lecture for CSPH7040). Discuss. In your discussion, you should incorporate an assessment of Plato's contribution to epistemology.
3. Can scientists prove that a formulation of a law of nature is true? Provide reasons / support for your answer and discuss with reference to the problem of induction.
4. What are the chief problems that philosophers have confronted in providing a definition of knowledge that would stand firm against the threat of sceptical doubt?