[Research Note] A note on Hempel’s paradox

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Abstract

In this paper, Hempel’s paradox is revisited, a paradox that arises from the observation of a black raven which inductively confirms the generalization “All ravens are black”, but can also be interpreted as supporting the statement “All swans are white”. The proposed resolution leverages the non-monotonic nature of inductive inference, suggesting that two distinct inferences from the same observation are not required to yield the same outcome. This exploration underscores the importance of the non-monotonic nature of induction, hinting at its reflection of the contextual and situated nature of human knowledge. There are many underlying epistemological questions that I do not consider here for the sake of simplicity. I have dealt with them in previous works. Of course all these remarks are only a sketch of a better developed theory that is still to be realized.

In this paper I aim to summarize some results presented in several preceding works[1].

In this context my interest will be only on a specific topic, Hempel's paradox.

Here's the enunciation of the paradox:

Let's imagine that I have seen a raven and it was black. If we apply a form of inductive inference, this observation confirms the generalization “All ravens are black”. Actually, at the same time, it is an instance even of the description “It is not white and it is not a swan”, that confirms “All non-white things are not swans”, that is logically equivalent to “All swans are white”. Then the paradox is that I can see a black raven and consider what I am observing as an inductive confirmation of the generalization “All swans are white”.

My strategy of analysis is the following.

An assumption of the previous argument is that the observation of an individual a, that is a black raven, allows us to say “a is not white and a is not a swan”. In the case in hypothesis, this description is certainly correct, but it is not a correct description of the whole set of what we know if we see a black raven. It is to be considered that in whatever inductive inference, it is an obvious requirement that the set of premises must remain the same. In an Aristotle's syllogism, for example, if I add new premises, all the same the previous syllogistic inference is certainly still correct: this kind of inference is “monotonic”. In an inductive inference, if the former premises describe some ravens and say that they are black, I can conclude that all ravens are black, but if afterwards I see some other ravens and they are white, the previous

conclusion is contradicted. Inductive inference is non-monotonic. Adding new premises we can obtain a conclusion that is in contradiction with the former one. This possibility does not entail that the former inference was formally uncorrect. In a syllogistic inference, if a conclusion is correct, it is “always” correct (it is not “temporally” conditioned). In an inductive inference, this does not happen. (If we use a probabilistic theory of induction, all the same we should admit that new evidence can modify the degree of probability of a previous conclusion.)

A fortiori, if a previous inductive inference brings some outcome, if afterwards we cut the set of the premises and we use only a part of the precedent set (namely we do not add new premises, but we give away some of the old ones), we cannot be granted that the previous conclusion will still be admissable.

For this reason. we should say that the inductive inference taking as its premise “black (a) Λ raven (a)” is exactly a *different* inference from the one taking as it premise “non-white (a) Λ non-swan (a)” (I use “Λ” and not “→” because it is clear that the exact form of what we observe is better expressed in this form). In other terms, we are dealing with *two* different inferences, and it is not required that both of them lead to the same outcomes.

The main point is that induction is a non-monotonic form of inference, therefore its formal constraints are different from the monotonic ones. We should consider if this circumstance is a reason to put in discussion its epistemological status. My point of view is that it is to be admitted that human knowledge is always contextual and “situated”. Therefore this property of induction seems to be a reason to consider it a conceptual tool useful to grasp some basic characteristics of our knowledge.

I have developed a more detailed framework concerning this kind of insight in my previous works. In this paper my goal is only to discuss Hempel's argument in defence of his paradox.

My first exposition of this strategy of solution has been presented in “Un'analisi dei paradossi della conferma di Carl Gustav Hempel” (“Itinerari”, 2003, 3, pp. 121-134).

Many scholars have tried to deal with the paradox by means of a probabilistic theory of induction (Janina Hosiasson-Lindenbaum has been one of the most influential ones). I retain that there are some relevant limits in these models of analysis, but it is not a goal of this paper to discuss them.

Footnotes

[1] “Gli smeraldi sono blerdi? Un'obiezione contro il paradosso di Goodman”, “Itinerari”, 2001, 3, pp. 129-139; “Un'analisi dei paradossi della conferma proposti da Carl Gustav Hempel”, “Itinerari”, 2003, 3, pp. 121-134; “Art, Knowledge and induction”, “Rivista Italiana di Filosofia del linguaggio”, 2017, 2, pp. 147-163; “Esperienza estetica, giustizia e inferenza induttiva”, “Discipline filosofiche”, 2021, 31, pp. 219-242; “La forma del significato”, Aracne, Roma 2020; “Linguaggio e ordine del mondo”, Il Sileno, Cosenza 2020. A brief exposition of my way of conceiving of the issue of induction is “Conoscenza e pluralità dei punti di vista”, “Daimon”, 2022, 85, pp. 7-22. In the works that I have cited there are references to other publications that I have realized, that are relevant for this topic.