

A Critical Review of Nelson Goodman's Science of the New Riddle of Induction

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Abstract

Induction is a specific form of reasoning in which the premises of an argument support a conclusion, but do not ensure it. It came into limelight after the medieval period of philosophy. In this times, man witnessed a new era and change in his perception of the world and his place in it, which stemmed from the varied scientific movements. Following the scientific movement and discoveries of modern science during this period, there was a shift in man's quest for knowledge, from theology to science, god to man, which gave rise to different developments and advancements in science with induction being part of this development. David Hume in his discovery of the problem of the old method of induction argued that since no necessary connections exist between observed occurrences, it is always possible then that a future observation will prove our inferences wrong no matter how appealing past observations might appear to be. The problem however has been referred to as the uniformity principle, since due to the uniformity observed in nature that induction is held to have some grounding. Hence, Nelson Goodman in his work presents a different opinion of what he refers to as the new riddle of induction which sought to replace the old induction so as to be able to proffer a solution which is in distinguishing between law-like statements and accidental statements. Thus, this paper showed how Goodman dissolved the old induction and outlined a confirmation that ensures the safe arrival of the new riddle of induction, thereby generating a tentative solution to the problem through his method of projection which never eradicated the problem of induction but propounded new ones.

Keywords: Induction, Principle, Scientific, Riddle, Reasoning.

Introduction

The search for the proper method of philosophy has often preoccupied the minds of Early-renaissance, Inter-renaissance and Contemporary philosophers. It has often been the case as to whether deduction is the best method or induction. For while some philosophers support the method of deduction, others opted for the method of induction. Induction however, was fraught with uncertainties and considered to be a pointless stroll to knowledge since make valid its conclusion through proliferation of premises. Given that knowledge for him derives from sense experience, Hume observed that this process of inference raises difficulties because one could not simply imagine how knowledge of any number of past observed instances of an event can rationally justify the knowledge of future unobserved instances. This objection of Hume however, sets the basis for the formulation of the problem of induction as: "Are we justified in believing that the future will be like the past?" (Hume 342). In response to this problem, Goodman reformulated Hume's problem into the problem of distinguishing between valid and invalid inductive projections which led to his new riddle of induction. Hence, Goodman suggests a criterion for distinguishing between predicates that lead to valid projections and those that lead to invalid projections when used in scientific hypotheses. His solution makes projectibility essentially a matter of what language we use and have used to describe and predict the behaviour of our world. As such this thought of Goodman will be

reviewed to see its plausibility.

The Old Problem of Induction

On the old problem of induction which was confronted with the uniformity principle and its justification, Nelson Goodman considered the issue unsolved (Goodman 59). The problem that confronts us today was for him not the traditional ones that sees induction as the support or justification of inductive methods; methods that predict or infer, which in Hume's words, are "instances of which we have had no experience that resembles those of which we have had experience (Hume 89), but rather, the problem of the validity of judgments about future or unknown cases, which for him, are neither reports of experience or logical consequences of it. Predictions for him fell among these unobserved instances and cannot be logically inferred from that which is observed, "For what *has* happened imposes no logical restrictions on what will happen" (Goodman 59). Which Russell also in the same consonance claims that past experiences cannot be used to create general laws, but that they increase the expectation of the experience being repeated in the future (Russell 33).

Goodman was however inclined not merely to agree with Hume that there are no necessary connections of matters of facts, but to ask whether there are any necessary connections at all. Goodman therefore subjects Hume's answer to the question of how predictions are related to past experiences as being non-cosmic. Because for him, When an event of one kind frequently follows upon an event of another kind in experience, a habit is formed that leads the mind, when confronted with a new event of the first kind, to pass to the idea of an event of the second kind (60). By this Goodman simply meant that for instance, when an accident that occurred at Lagos is likeable to the same accident that happens in Abuja, the judgment placed on the consequences sustained from that of Lagos will also be subsumed to that which occurred in Abuja due to the experience gotten from Lagos which was already imprinted in the senses as an idea, which for Goodman, arises the idea of necessary connection from a felt impulse of the mind which led to such transition. For Goodman, justifying induction rests solely on the universal law of the uniformity of nature with serious inquiry in the justification of the universal principle, which for him, must be an accepted, and an indispensable assumption.

Dissolution of the Old Problem

Nelson Goodman on the dissolution of the old problem of induction, tried to form a basis for the justification of inductive inferences in a bid to dissolve the old induction. In doing this, Goodman sought to know how deductions are justified and by that, form a basis for the justification of induction. However, any attempt to reduce all reasoning to deductive reasoning, Strawson argues will only generate more problems to the subject matter of induction (Strawson 12-13). By deduction, Goodman says they are justified by "plainly showing that it conforms to general rules of deductive inferences" (Goodman 61). It therefore requires no knowledge of the facts it pertains to, but is in itself justified. Thus, a deductive argument conforms to the rules of logical inference and is justified with further inquiry as to what justifies it.

However, Strawson contends that deductive standards are not the only standards of evaluating rationality (Strawson 233-234). Goodman subsumes however, that, inductive standards are to be used in evaluating inductive reasoning just as deductive standards are used to evaluate deductive reasoning. He therefore adjourns that the basic task in justifying an inductive inference is to show that it conforms to the general rules of induction which must eventually be justified, because for him, the validity depends not on the conformity of any rules but upon conformity to valid rules. Identifying this rules however for Goodman, goes a long way to solving the problem at hand. But the question here is, how can such rules be determined? Some philosophers base such determinations on self-evident axioms as evident in Karl poppers conjectures and refutations, of which statements are taken to be true, accepted and established (Popper 33), while others rather tried to show that the rules are grounded in the very nature of the human mind. Goodman however, injects that rules and particular inferences are justified by being brought into agreement with each other (Goodman 63-64).

Goodman therefore shows that the process of justification is a delicate one of making mutual adjustments between rules and accepted inferences which from the agreement of such adjustment, lies the only justification needed, which either applies well or not with induction and inductive

reason. Predictions for him, conform to the valid rules of induction, and the rules become valid if they are able to justify accepted inductive practices. The problem now for Goodman is not the guarantee of the use of inductive reasoning or how it seeks knowledge of that which cannot be obtained, but between justifying induction and describing ordinary inductive practices (65). Both Strawson and Goodman regard the problem as misconceived. For them, Hume was rather dealing with the question of inductive validity rather than, how normally inductive judgments are made. The problem however is not a problem of demonstration but a problem of defining the difference between valid and invalid predictions.

The Constructive Task of Confirmation Theory

Nelson Goodman in his constructive task of confirmation theory, sought to formulate rules that define the difference between valid and invalid inductive inferences through an established usage of the term. The problem Goodman sought to resolve in the task of a confirmation theory is to define the relation that obtains between any statement S1 and another S2, if and only if S1 may properly be said to confirm S2 in any degree (65).

For Goodman, we naturally assume that whatever confirms a given statement confirms also whatever follows from that statement. But if we combine this assumption with our proposed principle, we get the embarrassing result that every statement confirms every other which for Goodman “such innocent beginnings lead to such an intolerable conclusion” (67). The fault of confirming varied statements lies in the careless formulation of our first proposal. While some statements that confirm a general hypothesis are consequences of it, not all its consequences confirm it, which for Goodman is not immediately evident. However, Hempel proposes that “such criterion of determining such hypothesis rests solely on the idea that an object confirms a universal conditional, if and only if, it satisfies both the antecedent and the consequent statement of the conditional, and it is neutral or irrelevant with respect to the hypothesis if it does not satisfy the antecedent” (Hempel, 11).

In displacing the problem of justification Goodman enhanced with his method of definitions. Goodman says that, “A definition may modify as well as extend ordinary usage” (Goodman, 2). Using one of Hempel's infamous paradox of the ravens, which states that, “a given object, says this piece of paper, is neither black nor does a raven confirm the hypothesis that all non-black things are non-ravens, (Pollock 321) which for Hempel, is logically equivalent to the hypothesis that all ravens are black”. Hence we arrive at the unexpected conclusion that the statement that a given object is neither black nor a raven confirms the hypothesis that all ravens are black.

Simply put therefore, we naturally know that all ravens are black and the possibility of consecutively seeing a black raven is an undeniable fact. Hence, we do not need to confirm such visible evidences, for if two compatible evident statements confirm two hypotheses, then naturally the union of the evident statements should confirm the union of the hypotheses (Hempel 4). Thus the interplay observed between rules of induction and particular inductive inferences is simply an adjustment between definition and usage, whereby the usage informs the definition which in turn guides extension of the usage. However, the confirmation is not a problem of justification but instead it is a problem of precisely defining how evidence confirms generalizations (Conhitz and Rossberg 22).

The New Riddle of Induction

Following from the confirmation hypotheses as laid down by Hempel and adopted by Goodman, Nelson Goodman sought to apply it to the formulation of a new induction which he termed the new riddle of induction through his defined *grue* and *bleen* theories, in a bid to evade the epistemological justification of the question of how inductions are justified. Although we must carefully describe how it is spelt in relation to the world, determining whether it is actually written in English or not (Goodman 22). Goodman's *grue* and *bleen* predicates are examples of logical predicates coined by Goodman himself to illustrate the new riddle of induction (Gillispie 149). These predicates are unusual because their application is time-dependent which lies in his theory of what is observed at a time through supervision and unobserved instances. Goodman makes use of the predicate *grue* in place of *green* which applies to all things examined before a particular time. (73). Simply put therefore, an object is *grue* if and only if the object is either green, and has been observed

before now, or blue, and has not been observed before now.

Goodman restating what Hempel already allotted to the confirmation of a hypothesis but in a more synthetic form and more elusive way says that;

Confirmation of a hypothesis by an instance depends rather heavily upon features of the hypothesis other than its syntactical form. That a given piece of copper conducts electricity increases the credibility of statements asserting that other pieces of copper conduct electricity, and thus confirms the hypothesis that all copper conducts electricity (Goodman 68).

Thus, with a practical explicable example says that, the fact that a given man now in this room is a third son does not increase the credibility of statements asserting that other men now in this room are third sons, and so does not confirm the hypothesis that all men now in this room are third sons. Yet for him, in both cases our hypothesis is a generalization of the evident statement (73). For Goodman, only a statement that is law-like, regardless of its truth or falsity or scientific importance is capable of receiving confirmation from an instance of it; accidental statements are not. Hence he moved to devise a means of distinguishing law-like statements from accidental statements. In doing this Goodman places a legible example to buttress his point. He says;

Suppose that all emeralds examined before a certain time *t* are green? At time *t*, then, our observations support the hypothesis that all emeralds are green; and this is in accord with our definition of confirmation. Our evidence statements assert that emerald A is green, that emerald B is green, and so on; and each confirms the general hypothesis that all emeralds are green (74).

By this, Goodman simply meant that, let us assume that an individual sitting outside a class observes that the human persons coming out of that class are putting on white garments, and after a period of observation have confirmed that the possibility of seeing a human person coming out of that same class, putting on a white garment, is likely due to succeeding observations from past till the present time. For him therefore, every human person coming out of that class puts on white garment. And the possibility of always seeing a human person coming out of the class in white garment is highly possible.

Our goal therefore for him, would be to determine whether we would be justified in believing that everyone in that class is wearing a white garment, or at least in predicting that the next human person we see will be putting on a white garment. However, Let us now suppose that we have seen enough human persons to be confident that the next human person will also be wearing a white garment, and we have checked that the procedure we followed to reach this conclusion meets all the rules of our inductive framework, it therefore means for Goodman that what was drawn from the first will be applicable to the second (74).

Hence, the examined human persons coming out of the class wearing white garments Goodman refers to as *grue*, which only becomes blue or *bleen* when we enter the class and find another human person in the same class putting on black garment, which for Goodman is an unexamined instance, hence not green, which presupposes induction by simple enumeration as stated by Francis Bacon in Uduigwomen's work (Uduigwomen 37). Ndubuisi in lieu with this thought opined that the truth or falsity of a statement can follow only the testing of a statement, that is, our statement depend on what we have observed which is subjective (Ndubuisi 70).

The predicates For Goodman best illustrate the problem of projectible predicates and ultimately which empirical generalizations are law-like and which are not. Goodman's construction and use of *grue* and *bleen* illustrates how philosophers use simple examples in conceptual analysis (68). Thus, Goodman argues that the basic problem is one of distinguishing "law-like" statements from "accidental" statements. However, this does not really resolve the issue but only shifts the discussion a step down, to whether statements are law-like, which it is not possible to know unless one has information that would only be available after successful inductive inference.

The Persuasive Problem of Projection

Nelson Goodman's solution to his new riddle of induction stems from his persuasive theory of projection whereby he expressed the opinion that the problem of induction is still unsolved, but that the difficulties that face us today are not the old ones; but rather the problem of justifying induction, which has been displaced by the problem of defining confirmation and has left us with the problem of distinguishing between projectible and non-projectible hypotheses (81).

For Goodman, The amount of effort expended on the problem of induction in modern times has “altered our afflictions” but hardly relieved them. The original difficulty for him arose from the recognition of Hempel's confirmation hypotheses that anything may follow upon anything. Thus, efforts put into defining confirmation proved drifting as we found ourselves with similar difficulty that our definition would make any statement confirm any other. Thus modifying our definition, we still get the same result that any statement will confirm any statement. Thus Goodman, “Until we find a way of exercising some control over the hypotheses to be admitted, our definition makes no distinction whatsoever between valid and invalid inductive inferences” (82).

The insufficiency of Hume's account was for him, not in his descriptive approach but in the imprecision of his description. For him, Hume overlooks the fact that some regularity do and some do not establish such habits; that predictions based on some regularities are valid while predictions based on other regularities are not. For Goodman, in our case of emeralds, we have been made aware that emeralds examined before time T are green; and this leads us to expect, and confirms the prediction, that the next one will be green. But also, all those examined are *grue*; and this does, nor lead us to expect, and does not confirm the prediction, that the next one will be *grue* (82). Regularity in greenness for him confirms the prediction of further cases; regularity in *grueness* does not. To therefore say that valid predictions are those based on past regularities, without being able to say which regularities is quite pointless.

Hence, Hume's failure to recognize and deal with this problem for Goodman, led to the inadequacy of Hume's solution to the problem of induction. Thus, what we have in the current confirmation theory is for him a definition that is adequate for certain cases in so far they can be described only as those for which it is adequate. The theory however, works where it works, provided it is so confirmed (83). For Goodman therefore, we must find a way of distinguishing law like statements, to which our definition of confirmation applies, from accidental statements, to that which it does not. Hence, the new riddle of induction is more broadly the problem of distinguishing between projectible and non-projectible hypotheses.

Critical Review of Goodman's thought

In responding to the supposed riddle of induction, many philosophers in this second golden era, responded to Goodman's idea of the new riddle of induction with special interest in his *grue* and *bleen* predicates. Prominent amongst these philosophers were Richard Swineburne, Willard Quine, and Rudolf Carnap. For while Swineburne supposed that there should be a distinction between qualitative predicates, which like green for him, can be assessed without knowing the temporal relation of x to a particular time, place or event (Swineburne 123-128). And locational predicates, which like *grue* for him, cannot be assessed without knowing the temporal relation of x to a particular time, place or event, in this case whether x is being observed before or after time t. Thus for him, if some emeralds under examination satisfy both a qualitative and a locational predicate, it will yield conflicting predictions. Hence, for him we should project the qualitative predicate, in this case *bleen*. Willard Quine however discusses an approach to consider only "natural kinds" as projectible predicates (Orman 14). He relates Goodman's *grue* paradox to Hempel's raven paradox by defining two predicates F and G to be projectible if all their shared instances count toward confirmation of the claim that every F is a G (Wilder 263-270). For Quine, Hempel's paradox shows that the complements of projectible predicates, such as "is a raven", and "is black" need not be projectible, while Goodman's paradox shows that "is green" is projectible, but "is *grue*" is not (264). Quine however reduces projectibility to the subjective notion of similarity. Two green emeralds are usually considered more similar than two *grue* ones if only one of them is green. Observing a green emerald makes us expect a similar observation next time. For him, Green emeralds are natural kind, but *grue* emeralds are not (Quine 42).

In response to these varied suppositions, Goodman contends that the fact that 'green' has been used far more often than '*grue*' in induction, provides the answer, not because it increases our odds of being right, but because of its pragmatic advantages (Goodman 10). Goodman exposes his paradox as follows. Consider an urn containing a hundred balls. A ball is drawn each day from the urn, during ninety-nine days, until today. At each time, the ball

extracted from the urn is red. Intuitively, one expects that the one hundredth ball drawn from the urn will also be red. For him, this prediction is based on the generalization according to which all the balls in the urn are red. However, if one considers the property S “drawn before today and red or drawn after today and non-red”, one notes that this property is also satisfied by the ninety-nine instances already observed. But the prediction which now ensue, based on the generalization according to which all the balls are S, is that the one hundredth ball will be non-red. This however, contradicts the preceding conclusion, which conforms to our intuition (383-385).

Hence for him, the predicates *grue* and *bleen* are not the kinds of predicates used in everyday life or in science, but they apply in just the same way as the predicates green and blue up until some future time (t). From the perspective of observers before time (t) it is indeterminate which predicates are future projectible green and blue or *grue* and *bleen* (Goodman 83).

A usual question to ask about The New Riddle of induction is that, why do we need to worry about the predicate *grue*, since they don't appear in our daily lives? Does the whole enterprise of *grue* not presuppose Knowledge by preposition? (Jimoh 15). Or what processes are involved in the acquisition of knowledge and human Justification for the new riddle of induction? (140). Attempts to resolve the New Riddle has often taken a wrong turn because their proponents misread how *grue* and other predicates are applied. To label an emerald *grue*, before or after (t), is not to claim that the emerald or any emerald ever changes its color from green to blue. The role *grue* plays here is simply to separate the examined from the unexamined rather than suggest if it turns green or blue. That I walk into refectory and I see a chair painted brown and assume that every chair in the refectory is brown based on a warranted generalization is not physically necessary (9-23).

However, the Epistemological framework often associated with subject matters as such as this comes from the skeptics, who pose the question on how we do in fact know that what appears visible before us is not a fluccity of the senses? That a person is justified in believing P just in case he has adequate reason to believe P and does not have any defeaters at his immediate availability does not in any way act as reason for the justification of our claims (13). The riddle does not depend essentially on considerations of time. It however uses names for each examined case and makes no reference to time in separating items in the evidence class from those in the projected class.

The New Riddle is not meant to restate Hume's thesis of inductive indeterminacy, but asks' how is it that we project some past regularities and not others, and what guides and justifies such practices? The real significance of the New Riddle is that it forces an examination of the way every day and scientific concepts and vocabularies shape practices of inquiry. In particular, it focuses attention on how the choice of concepts and vocabularies play a role in warranting the acceptance of some hypotheses and rejecting others. However, what Goodman merely applied was simply a principle of statistical induction, whose principles tells us how to estimate probabilities on the basis of observed relative frequencies in finite samples (Pollock 150). And the problem often associated with this sought, is that of an inverse inference which are similar in certain respects.

Conclusively, the possibility of distinguishing between regularities that do and do not yield valid inductive predictions is not possible since the specification of such necessitates the formulation of inductive inferences. Goodman fails to account for the process of induction, but rather contends that induction begins with regularity. Rubinstein however notes that, “Induction does not begin with regularity but it ends with it” (Rubenstein 37-49). It is important to note therefore that there are two grounds for induction which are causality and law of nature which opines that experience of reality does not necessarily start with regularities but rather with individual observations. The role of

induction, in this sense lies in providing us with justified methods that allows us to posit the observations that we will account for as regularities. Goodman, however, failed to account for this.

Conclusion

From the foregone discussions about the varied notions of induction and its problem, one is able to note therefore that there is a problem with the subject matter of induction. However, despite the many attempts made by different philosophers to solve this problem, no one successfully solved this problem as laid down by Hume, simply because, none has been able to show the existence of a necessary link between cause and effect. However, with the emergence of Nelson Goodman, induction took a new toll into the solving of riddles. Nelson Goodman made groundbreaking contributions to the subject matter of induction with aesthetics, epistemology, metaphysics and the philosophy of science amongst the host of many other things and was formidable with his varied theories with his new riddle of induction as being part of it. However, Goodman's New Riddle of Induction was concerned with finding a way to separate possible regularities in the world that would be the rational basis for the formation of possible habit of expectations.

Hence, Goodman's work *The New Riddle of Induction* leaves one wondering how he will be able to solve the problems which the new predicate *grue* brings to table, though there are several errors within Goodman's conception of *grue*, which upon proper examination, allows us to escape from the paradox as laid down by Goodman by firstly understanding the nature of Goodman's statement that there is no qualitative difference between *grue* and *green*, and that the only difference lies in their use in our language, seeing that the two have completely compatible results in practical use, and their only difference is how they are used in language. So, using *grue* and *bleen*, green or blue does not in any way affect the desired result. But the clear problem with this is that to be able to tell *grue* and to be able to tell green when one sees them involves two completely different skill sets.

Thus, Goodman's supposition in relation to his conception of the new riddle in induction may be seen as based upon a mistaken assumption of the justification process of beliefs which gives rise to other ideas. An analysis of Goodman's supposed riddle of induction thereby leaves one wondering if such may be considered as a valid concern for the advocates of induction as a method of science.

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