IS NEW RIDDLE OF INDUCTION A FORM OF RULE-FOLLOWING SKEPTICISM?

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Kripke, while presenting and discussing his celebrated problem, "rule-following scepticism", and "quus" counter-example,[1] claims that the Goodman's new riddle of induction is "strikingly close to rule-following skepticism" and "deserves comparison." [2] He further, claims that, "Goodman's 'grue' would play the role of the 'quus'" and "Goodman's problem may prove impossible without consideration of rule-following".[3] However, despite this tall claim, Kripke has not elaborated, discussed and compared neither the new riddle nor grue predicate with his rule-following skepticism or quus rule. Even Goodman has not referred to this problem in his subsequent edition of his book or in any of his writing. There are a few works on this claim or to relate these two problems. In this context a very pertinent question naturally arises in our mind is: Is new riddle of induction really a form of rule-following skepticism?

In answering this question, we argue that Goodman's new riddle of induction poses a paradox of induction underlying the rule-following skepticism. The new riddle of induction on the face of it may not appear to be a version of rule-following skepticism and Goodmanian scholars may not agree with us in our interpretation of the new riddle. We believe that Goodman had anticipated the rule-following skepticism and he formulated the paradox rule-following pertaining to induction. Kripke's formulation of the rule-following skepticism raises the issue in the generalization of the future

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[1] Kripke, S. A., *Wittgenstein on Rules and Private Language (henceforth WRPL),* Oxford, Blackwell, 1982, p. 1-54.

[2] Goodman, N., *Fact, Fiction and Forecast* (henceforth *FFF*), 2nd edition, Bobbs-Merrill Co. Inc., Indianapolis, 1965, p. 59-122.

[3] *WRPL*, pp. 58-59

behaviour from the past observation, the problem of meaning and justification and the problem of other minds.

Goodman in his formulation of the paradox makes use of the rule-following consideration in generalizing observed from unobserved. The argument is based on the fact the projection of the predicate on the basis of the given evidence statement is similar to an act in accordance with a rule and the projection of the predicates and generalizations are only different aspects of the rule-following. The inductive inference similar to the functions of rules acts as the normative-constraints over infinite number of projections of the predicates. The possibility of the same evidence statement giving rise to incompatible hypotheses is similar to that of the multiple interpretations of the rules. Thus the new riddle of induction is nothing but the problem of rule-following skepticism, however in a different setting.

New Riddle of Induction:

Induction is a form of inference in which we argue that the predicate asserted to be true for the narrow universe of the evidence statements is confirmed for the whole universe of discourse. All emeralds examined so far are found to be green and none found to be non-green is a truth about "emeralds" examined so far. The predicate "green" states a truthfulness about narrow universe of the color of "emerald", for the truthfulness of the statement is restricted to the present time and the predicate "greenness" asserts about the color of "emerald" up to now. The whole universe of "emeralds" includes all cases of emeralds examined and non-examined, past and future. The narrow universe of discourse is given and is called the evidence statement and the wider universe is called the hypothesis. Since all the emeralds we have so far observed have been green, we project the predicate "green" to the wider universe of emeralds and adopt the hypothesis that all future emeralds probably are going to be green also.

The problem in such inductive projection of predicate, as Hume[4] has already conclusively argued, is not based on any logical principle because there is no contradiction involved in denying the statement of the inductive inference. Hume argues that the statements regarding wider universe are neither logical statements themselves, nor are they logical outcome of the evidence statements or inductive practices. The past instances or the evidence statements do not impose any logical compulsion over the occurrence of something yet to happen or on future events. There is no casual and logical connection found to be holding among the objects of the world. Hume's argument proves that the projection of a predicate like green about future emeralds may be correct, but is done without a proper justification. On the other hand, there is no logical compulsion to eliminate the projection of the unwanted predicates about the wider universe. We have neither any answer nor any logical clue to distinguish conformable hypotheses from accidental ones.

Given Hume's finding on the projection of predicate, Goodman argues that a paradox can be generated in the inductive rules. The paradox of induction proposes a contradiction in induction by arguing that the same evidence statement gives equal inductive support to two contradictory or incompatible predicates or hypotheses, i.e. the projections of predicates or adaptation of hypotheses may disagree or conflict for the unexamined instances of the wider universe. Goodman calls this paradox as "the new riddle of induction". [5] The new riddle of induction poses the paradox by arguing that it is possible to envision a system of predicates rival to our own, such that a finding by us that all examined emeralds possess greenness will be equivalent to a finding that all examined emeralds possess non-greenness up to the present time. On the basis of such findings, the inference that the remaining

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[4] Hume, David, *An Enquiry Concerning Human Understanding*, edit., L. A. Selby-Bigge, Clarendon Press, Oxford.
[5] *FFF,* pp. 59-122.

emeralds possess greenness is inconsistent with the inference that the remaining emeralds also possess non-greenness. Both the hypotheses have as much inductive support for both hypotheses as both of them have equal numbers of positive instances in favor of them and no negative instances against them up to now. However, the future projection or predicates about the wider universe of discourse will be inconsistent with the inference that remaining emeralds possess non-greenness.[6] There is no logical compulsion to exclude the unwarranted projections like "blue" and include the lawful projection "green" for the adaptation of the hypotheses that "all emeralds will be green" from the evidence statements that "all emeralds examined before a certain time is green". Goodman argues that this is possible if we can imagine a predicate such as "grue" which is to be understood as applying to a thing at a given time t if and only if either the thing is then green and the time is prior to time *t*, or the thing is then blue and the time not prior to *t*. He presents the grue counter-example as follows:

> Now let me introduce another predicate less familiar than "green". It is the predicate "grue" and it applies to all things examined before *t* just in case they are green but to other things just in case they are blue. Then at time *t* we have, for each evidence statement asserting that a given emerald is green, a parallel evidence statement asserting that the grue. And the statements that emerald *a* is grue, *b* is grue, and so on, will each conform the general hypothesis that all emeralds are grue. Thus according to our definition, the prediction that all emerald subsequently examined will be green and the prediction that all will be grue are alike confirmed by evidence describing the same observations. But if an emerald subsequently examined is grue, it is blue and hence not green.[7]

The grue predicate is defined commonly as "a predicate which applies to a thing x, if x is examined before a time *t* and found to be green or x is

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[6] Elder, C. L.: "Goodman's 'New Riddle'- A realist's Reprise", *Philosophical Studies*, 59, 1990, p. 116.

[7] *FFF*, p. 74.

examined after *t* and is blue". Schematically the predicate "grue" can be defined as:

x is grue =*df* (x is observed before the time t & x is green) V
(x is not observed before the time t & x is blue)[8]

The new riddle poses a paradox by revealing that incompatible and rival hypotheses can be inferred from the same evidence statement. Evidence statements, for example "all emeralds examined so far are green", leave us with no choice to select hypotheses of incompatibility, i.e. "all emeralds after *t* is grue (blue)" and "all emeralds examined after *t* is green". Though we know which of the predicates is genuinely confirmed, both the genuine predicate, i.e. green and its rival predicate, i.e. grue are equally confirmed according to the definition of grue. Thus Goodman says, "…it is clear that if we if we simply choose an appropriate predicate, then on the basis of these same observation we shall have equal confirmation for many predication whatever about other emeralds - indeed about anything else."[9] There is no satisfactory inductive principle to exclude the unwanted and unacceptable predicate "grue" and include the legitimate predicate "green" in the projection of the hypotheses. All adaptation of the hypotheses, based on the evidence statements is only unjustified leap. Our future moves and predictions are all indeterminate - there is no right or wrong projection of predicates *per se* and incompatible hypotheses are equally acceptable.

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[8] This is the common definition of the predicate "grue", but formulated differently by different philosophers. Philosophers who have defined grue in this way are: Barker, S. F. and Peter Achinstein,: "On the New Riddle of Induction", *Philosophical Reviews*, Vol. 69, 1960, p. 511, Hacking Ian,: "On Kripke's and Goodman's Users of 'Grue'", *Philosophy*, Vol. 68, 1993, p. 270., Jackson, 1975, Grue, p. 114-119 and Martin, M. R.: "It is not that Easy Being Grue", *The Philosophical Quarterly*, Vol. 40, 1990, pp. 300. See Elder, p. 116. Jackson, 1975, *Grue*, p. 113 gives a logical proof of the grue problem and argues that all interpretations of grue do not generate the paradox of induction, such as Martin's definition. Robert Martin defines Grue as follows is grue at time n if, and only if: (1) x is earlier than t and x is green at x, (2) x is at t or later, and x is blue at n.

[9] *FFF*, p. 76.

Rule-Following Skepticism:

Human behaviors and actions are rule-governed. They are explained and regulated in terms of some or other rules. The action and behaviors that are performed on the basis of the rules can be called as the applications of the rules. So our stopping at the red signal is an application of the traffic rule "do not cross the road when there is red signal". The applications of a given rule are the extensions of the rule and can be called as an action-type.[10] The action-type is an open-ended class having infinite members. For example, the applications of the rule "+ 2", such as 1002, 1004, 1006 etc. are unlimited and unbounded.

Rule acts as a constraint over an indefinite number of cases; therefore, it is relevant for an indefinitely large number of action-types. The employment of the rule presupposes the independent identification of its infinite applications or laying down the conditions of its application in advance. This characterization of rule makes it a normative issue. Hence, rule is a "normative-regularity" or "normative-constraint"[11], which regulates our actions and behaviors by providing *the necessary* and *sufficient* condition to fit a particular action as the extension of the given rule.

Rule as a normative regularity to govern and explain our actions has to satisfy two conditions: First, rule should help us to pick up the appropriate and correct action among the available set of behaviors. This condition can be called the *correctness* condition of rule. The explanation of certain action-type by subsuming it under a rule is dependent on the successful identification of the action-type. The correct identification naturally helps us to eliminate the incorrect and inappropriate applications of a rule. Thus for example, the rule "plus" instructs the users not only to select the action-type "2 plus 2 equals to 4", but also it eliminates the action-type "2 + 2 equals to 5". The correctness condition of rules also signifies that the rules are universal in character having

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[10] See Pettit, P., "The Reality of Rule-Following", *Mind*, Vol. 99, 1990, p. 2.

[11] Pettit, P., *op. cit.*, p. 4.

open-ended applications. If one follows a given rule, then one always does the same thing when the appropriate occasion arises. However, the correct and successful identification or determination of the applications of rule is not enough. This does not provide the reason that whatever is correct is also reasonable or warranted. This is the reason the appropriate and correct chess-move made by the computer cannot provide the adequate explanation as to why it moves the chess piece as it made.

Secondly, rule should provide justification for the action-type so selected. This condition can be called the *adequate*[12] condition of the rule. The adequate criterion of rule not only helps us to choose the correct action-type, but also it provides the reason as to why a particular action-type is the correct one or is the only one in accordance with the given rule. The adequate condition predetermines in some unique way the application of a rule. Rule does not help us to simply identify objects fall under its scope, but it also compels us to adhere to the norms set by it for our future use. The algebraic formula "plus" should "determine my answer for indefinably many new sums that I have never previously considered... my past intention/use determines a unique answer for indefinably many new cases in the future".[13] The adequate condition helps one to justify and defend oneself at the time of conflict and criticism and helps one to remove confusion and inconsistency. This condition also explains the necessary change and meaningful deviation of rule whenever required.

Kripke has raised serious doubt whether a follower can really follow the rule considering the requirement of its following. They challenge that the follower cannot identify a rule that can satisfy the normative constraint with his limited cognitive capacities. The object of infinite requirement does not affect our senses as a physical object and we are not causally related to its

[12] Boghossian, P.A., "The Rule-Following Consideration", *Mind*, Vol. 98, 1989, p. 508 ff.
[13] *WRPL,* p. 11.

infinite applications in the ordinary way.[14] In following a rule we always go beyond the given. The past experiences, though successful and correct, are always finite and do not provide the license to go beyond. We are neither omniscient to identify the unlimited applications which are yet to take place. If our accumulated practice of the rule-following is not enough to keep track of the future applications of the rule, and if we do not have control over the future operation of the rule, it is quite possible that we may not be following the same rule which we used to follow in earlier cases to justify the same action. This possibility will give rise to the problem of multiple interpretations of the rule. On the one hand, there may be more than one contradictory action-types fitting to a given rule and on the other hand, the same action-type can be accounted for by two contradictory rules. Rule-following seems to be an irrational act.

To understand the problem, let us discuss the thought-experiment designed by Kripke. He asks us to imagine a person who has applied the plus-rule successfully and correctly involving numbers up to 57. Now we can say that, since the person has fulfilled the correctness criterion, he has grasped the plus-rule and can employ it in infinite cases. Thus, for example, if he is asked to operate the plus-rule between the numbers 57 and 68, he will come with the number 125, though he has never applied the plus-rule to the number 68 before. At this juncture, Kripke introduces the concept of "quus-rule"[15] which, according to him, is identical to plus-rule if the numbers involved are less than 57, otherwise it is 5.[16] That means, the function "68+57 = 125" is correct according to plus-rule and at the same time the function "68+57 = 5" is also correct as per quus-rule. The skeptic is asking "how do we know that 68 plus 57 as we meant "plus" in the past should denote 125 and not "5"? We cannot

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[14] Pettit, P., *op. cit.*, pp. 7-8.

[15] Kripke symbolized 'quus' as ⊕ and defines 'quus' as: $x \oplus y =_{df} x + y$, if $x, y < 57 = 5$ other wise, *WRPL*, p. 9.

[16].*WRPL*, p. 9.

know whether the person is following plus-rule or quus-rule since both the rules will hold valid, though, we know that the person who used to follow the plus-rule in the past, the answer he indents for 68+57, should be 125 rather than 5.

Kripke argues that the person cannot provide the reason to choose between plus-rule and quus-rule. Kripke argues that the quus rule is incorrect and we know that we do not misinterpret plus-rule with quus-rule, but it does not seem to be *a priori* impossible. This is possible because his calculation by hypothesis does not go beyond the numbers involving 57 and thus by the same hypothesis he does not explicitly instruction that 125 is the result. The hypothesis is true for the infinitely large number of the cases of plus rule is not in the follower's mind. The applications so far made are always limited. Thus, Kripke argues that there is no way one can say whether plus or quus rule is being followed. It is possible that by plus I always mean quus, I should misinterpret all my past uses of the plus rule. The skeptic argues that there are equally compelling reasons for both plus and quus functions having been applied in this case.

What is skeptical about here is that, as Kripke says, "we follow the rules as we do without reason or justification."[17] "Plus" as we understand it forces us to say that "68+57" equals to "125", but the rule of plus function has nothing in it to identify the plus-rule as distinct from quus-rule. Skepticism doubts two things: First that, there is any "fact about past history - nothing that was ever in my mind, or in my external behavior - establishes what I mean by a word."[18] Second, even if we have meaning, we are not justified in having it. There is no logical justification that a particular word would necessarily mean this and not anything else, for, "there is no justification for one response rather than others."[19]

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[17] *WRPL*, p. viii

[18] *WRPL*, p. 13.

[19] *WRPL*, P. 21.

New Riddle and Rule-following:

While discussion his rule-following skepticism, Kripke has claimed, without elaboration, that new riddle is not only a form of rule-following skepticism, but can better be understood in the context of rule and its following. He further says that there is a parallel between the 'grue' predicate and 'quus' rule. Here we want to substantiate his claim.

The new riddle of induction presents a paradox similar to the problem of rule-following skepticism. The evidence statements like the accumulated practice of following the rule are not enough to keep track of the future projection of the predicates. If we do not have control over the future operation of the rule, it is quite possible that rules will have consequences independent of the followers. The follower may not be following the same rule which he used to follow in earlier cases to justify the same action. The follower who used to follow the green-rule earlier is confused to differentiate it from that of the grue-rule. Now this possibility will give rise to the problem of multiple interpretations of the inductive rules. There may be more than one contradictory action-type, viz., grue-action type and green-action type, fitting to the same given rule. The follower commits a contradiction if he chooses both the interpretations of the rules. The paradox of induction arises because the given evidence statement imposes no restriction over the future projection of the predicate. According to the function of "plus", the sum of `57 and 68 should be 125', but it can also be 5, provided the condition that follower of the plus rule has not computed the plus function beyond number involving 57. But the plus rule cannot support both 125 and 5.

Compare the "grue" predicate with the "quus" counterexample of Kripke. "Quus" function proves that different and contradictory interpretations can fit into the "plus" function. We see that Kripke and Goodman's problem are the same problem but applied to two different areas only, i.e. one to the issue of justification and the other to meaning. Kripke himself has argued that his problem is the same as that of Goodman's grue

problem. Kripke has expressed his rule-following skepticism by using "grue" counter-example. In Kripke's words: "who is to say that in the past I did not mean grue by "green", so that now I shall call the sky, not the grass, "green"?"[20]

In fact, the import of the new riddle of induction can best be understood in the light of the understanding of the nature of rules and their following. Once we see the problem of the new riddle of induction in the context and light of "rules" and their following, there is some sound reason for treating Goodman's riddle as holding the rule-following skepticism. The inductive rules have infinite applications over infinite time and space. The projection of the predicate "green" about the wider universe is open-ended. The emeralds even found in the distance planet will be green. The follower of the inductive rules should be able to identify the emeralds as green found in the remote place. However, the problem of induction is that the infinite applications of the rules are not present in the mind of the followers. The external behaviours of the follower do not give any indication that the future would remain the same. The predicate "green" does not exhibit any inherent characteristic that all unobserved sample of emeralds would be green as well. The follower has to have some mechanism to know the applications of the inductive rule prior to the projection of the predicates in advance. Therefore, the task of the inductive rule is twofold. First the inductive rule should contain a mechanism to provide the legitimatimacy in projectible hypotheses that have been actually projected and second, the inductive rule helps us to rule out all those projected hypothesis that are not to be considered projectible, and thus "the two folds problem of projected unprojectable and unprojected projectable."[21] The first condition is concerned with the question of when, how and why the inductive generalization from a given evidence statements to the wider set is possible? In other words, how we acquire, modify and

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[20] *WRPL*, 20 fn. Also see, pp. 20-54.

[21] *FFF,* p. 92.

eliminate our hypothesis on the basis of the given set of beliefs? The question is: how the hypothesis which is always more than the given, gets conformation from the evidence statements? This condition of the inductive rules is similar to the correctness criterion of the rule.

The inductive rule takes care of not only the fact that "when, how and why the proceeding from a given set of beliefs to a wider set is legitimate."[22], but also it explains "why one prediction rather than another,"[23] from a given evidence statement. The issue of justifying induction involves the description of "an accurate and general way of saying which hypotheses are confirmed by or which projections are validly made from, any given evidence."[24] The inductive rule provides a general and accurate mechanism to license or justify such projection of the predicates. On the one hand, the inductive rules guide us to project the appropriate predicate among the rival and available predicates, on the other, these rules provide the justification for such selection.

The issue of the projection of the genuine predicate or the adaptation of the hypotheses, therefore, is essentially a normative issue, similar to the problem of rules and their following, because its basic task is to find out the correct prediction by prescribing the appropriate inductive rule. The regulative rules of induction permit the right kind of projection of hypotheses from a given set of evidence statement and prohibit the projection of unwarranted, conflicting and unfamiliar predictions. The question is different from the descriptive question: how do we project beliefs or how exactly are the new beliefs formed from the given set of beliefs? Goodman himself seems to approve such an interpretation of the inductive rules in arguing that the inductive projection is concerned with issue of validity and normativity. The normativity of the inductive rules is similar to the function of the rules and inductive inference to that of applications of the rules.

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[22]*FFF,* p. 58.

[23]*FFF,* p. 60.

[24]*FFF*, p. 84.

Thus, the process of projection of the predicate or adaptation of hypotheses is very similar to the process of ascertaining the applications of the rules in advance. In the context of induction, we can very much ask the question how we know that the predicate which we are projecting so far will hold in the future. Or how do we grasp all the predicates of a particular inductive rule on the basis of the given evidence? How much evidence is enough to enable us to say that now we can validly adopt the hypotheses? The projection of the predicate on the basis of the given is very much similar to the fact of having expectation and the fulfillment of the expectation. We form beliefs, build expectation and act accordingly on the basis of the inductive prediction. The riddle of induction is, in other words, is how to gap the bridge between the evidence statements and projection of the infinite and open-ended hypotheses on the basis of the given evidence statements. The new riddle of induction basically is a problem of the bridging the gap between the evidence statement on the one hand, the adaptation of the hypothesis or the projections of the predicates on the other. The problem, therefore, is the problem of bridging the gap between the rules and their extensions on the basis of the some principle. This is to find out a normative rule which satisfies the correctness and adequacy condition.

Conclusion:

However, skepticism may not be the direct concern of Goodman. Goodman himself may not agree to present or interpret his riddle as a piece of philosophical skepticism. He may not like to be tagged as a skeptic, more so a rule-following skeptic. In fact, Goodman has not used the word ‘skepticism’ in the discussion of the “grue” counter-example. As one Goodmanian scholar argues, as the traditional problem of induction can be interpreted to be arguing, “the impossibility of deducing any universal proposition from any evidence which can be provided by experience”, so “what Goodman presents here is...the demonstration that there can be no purely formal logic of

induction."[25] Barry Allen[26] says he sees "a precise analogy" between Goodman's riddle and Kripke's skeptical question. He says, "the skeptical argument is Goodman's riddle of induction, tailored to field linguistics rather than mineralogy."[27] Even if we do not say that the new riddle of induction does not pose a skeptical paradox, his theory of projection as an answer to the riddle is similar to the skeptical-solution in more than one ways. Thus, Ian Hacking rightly says, "It can be said that Goodman prompted the rule-following skepticism without his officially taking a skeptical stance himself."[28] However, there are some superficial dissimilarity between what Goodman characterizes the problem of induction and the issues involved in rules and their following because induction is a problem of induction whereas the rule-following is mainly a problem in meaning.

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[25] Shoemaker, S., "On Projecting the Unprojectible", *Philosophical Review*, 84, 1975, p. 179.

[26] Allen, Barry, "Gruesome Arithmetic: Kripke's Sceptic Replies", *Dialogue*, p. 12.

[27] Allen, Barry, *op. cit*. 12.

[28] Hacking, Ian, *On Kripke's and Goodman's uses of 'Grue',* p. 274.