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The New Riddle of Induction and the New Riddle of Deduction

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Abstract Many believe that Goodman's new riddle of induction proves the impossibility of a purely syntactical theory of confirmation. After discussing and rejecting Jackson's solution to Goodman's paradox, I formulate the "new riddle of deduction," in analogy to the new riddle of induction. Since it is generally agreed that deductive validity can be defined syntactically, the new riddle of induction equally does not show that inductive validity cannot be defined syntactically. I further rely on the analogy between induction and deduction in order to explain why some predicates, such as "grue," are unprojectible.

Keywords Deduction · Induction · Nelson Goodman · New riddle of induction · Projectibility

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In his "New Riddle of Induction" Nelson Goodman (1946; 1983) raises the difficulty of defining the difference between valid and invalid inductive inferences. Goodman shows us that it is possible to construct allegedly unprojectible predicates, which would lead to absurd and unacceptable conclusions if used in inductive inferences. This is true even in the case of a "straight rule" of induction (following Jackson (1975) terminology, using SR as an abbreviation), according to which instances, for example, "some *A*s are *B*" confirms a general statement, that is, "all *A*s are *B*." Even in this simple case of

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inductive inference, it is possible to construct deviant predicates that would allow us to make any statement confirm any other statement.

Although there are those who challenge this conclusion (notable among them is Frank Jackson (1975)), they are also many who believe that Goodman's riddle amounts to a proof of the impossibility of a purely syntactical theory of confirmation (for a recent example, see McGowan 2002). Obviously, there are other reasons why many philosophers believe that there cannot be a purely syntactic theory of confirmation (whose discussion is beyond the scope of this paper). However, the new riddle of induction played an important role in convincing philosophers that formal criteria for inductive validity are impossible. Most notably, Hempel (1965b) has conceded, in a postscript to his "Studies in the Logic of Confirmation" (1965a), that Goodman's paradox refutes his attempt to provide general criteria of confirmation that are similar to the criteria of deduction validity which are supplied by formal logic.

The importance of the question of whether inductive validity can be defined syntactically is obvious. The alleged impossibility of a purely syntactical theory of inductive validity constitutes a fundamental difference between induction and deduction and casts a shadow on the rationality of induction. Hempel (1965a), for example, argues that rationality requires formal criteria, similar to formal criteria of deductive validity, and that the impossibility of such criteria implies a refutation of the objectivity of confirmation, and so, forces people to resort to subjective feelings of conviction. Obviously, these are not the only options. For example, Goodman himself puts forward a pragmatic solution to the new riddle of induction, which relies on the concept of "entrenchment," that refers to the history of the predicates which were employed in specific hypotheses, so identifying objective criteria for confirmation. However, a pragmatic solution might not satisfy those who dispute the rationality of induction, which has been suspect since Hume (1978) adumbrated the (old) problem of induction.

Interestingly, Goodman (1983) himself relies on an analogy between induction and deduction in order to dissolve the (old) problem of induction, which allegedly requires the justification of induction. However, he argues that the analogy between induction and deduction breaks down at the level of formal criteria for validity.

In this paper, I shall employ the analogy between deduction and induction to support my claim that the new riddle of induction does not prove that formal criteria for inductive validity are impossible. The claim that the new riddle of induction does not prove that formal criteria for inductive validity are impossible is not new and was argued for most notably by Frank Jackson (1975). Jackson contends that there is no "new riddle of induction" and that all (consistent) predicates are projectible, that is, can be used legitimately in inductive reasoning. Although I agree with Jackson that the new riddle of induction does not show that formal criteria for inductive validity are impossible, I disagree with his claim that all predicates are projectible.

In section 2 I discuss in detail Goodman's new riddle of induction as well as Jackson's answer to this riddle. I show that, contrary to Jackson's position, the counterfactual condition which he posits for application of the SR actually implies that there are unprojectible predicates. My identifying of the shortcomings of Jackson's solution to the new riddle of induction leads me to an insight for identifying the correct answer to the new riddle of induction,

In section 3 I shall formulate the "new riddle of deduction," in analogy to the new riddle of induction. If the new riddle of induction proves that inductive validity cannot

be defined syntactically, the new riddle of deduction proves that deductive validity cannot be defined syntactically either. However, it is generally agreed that deductive validity can be defined syntactically. Thus, the "new riddle of deduction" sheds light on the "new riddle of induction" and shows that it does not prove the impossibility of purely syntactic laws of induction. I shall rely on the analogy between induction and deduction in order to explain why some predicates, such as "grue" are unprojectible. In section 4 I shall summarize the conclusions of this paper.

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Goodman (1983) formulates the new riddle of induction in terms of a distinction between a lawlike statement, that is, a hypothesis which is confirmed by its instances, and an accidental statement, which is not confirmed by its instances. Hence, the SR, according to which instances of *A*s which are *B*, confirms the hypothesis that "All *A*s are *B*," applies if and only if "All *A*s are *B*" is a lawlike statement. The difficulty is to formulate the criteria that define the difference between lawlike and accidental statements and thus define the difference between valid and invalid inductive inferences.

The difficulty of defining the difference between valid and invalid inductive inferences is demonstrated by Goodman (1983) with the help of two predicates, "green" and "grue." The predicate "grue" applies to "all things examined before *t* just in case they are green, but to other things just in case they are blue." Goodman's definition is ambiguous and so often misinterpreted in ways which fail to raise the new riddle of induction. For clarity I rely in what follows on Jackson's definition of grue, in which *T* is interpreted as a moment in the near future, such that "examined by *T*" amounts to "examined to date" (Jackson 1975, 118):

> D_3. *x* is grue at *t* iff *x* is examined by *T* and *x* is green at *t* or *x* is not examined by *T* and *x* is blue at *t*.

Suppose that all the emeralds which are examined to date are green. These instances confirm the general hypothesis that all emeralds are green, in accordance with the SR. However, our evidence that all the emeralds which have been examined to date are green also supports the hypothesis that all emeralds are grue. Thus, our evidence supports two incompatible predictions, that is, that all (previously unexamined) emeralds which will be subsequently examined will be both green and grue (and therefore blue). Goodman argues that although both predictions are allegedly equally well confirmed, "we are well aware which of the two incompatible predictions is genuinely confirmed" (1983, 74). After examining several suggestions that could be used to distinguish between lawlike and accidental hypotheses or between well-behaved predicates and ill-behaved predicates, Goodman concludes that the distinction between valid and invalid inductive inferences cannot be made purely on syntactical grounds. The difference between "green" and "grue," Goodman suggests, lies simply in the fact that "green" is better entrenched, as it has been projected more times in the past than "grue." The hypothesis that "all emeralds are grue" should be rejected because it conflicts with the projection of a better entrenched predicate.

Frank Jackson has issued one of the most prominent answers to the new riddle of induction. In his paper, "Grue" (1975) Jackson argued that there is in fact no "new problem of induction," and that the all predicates are projectible. The view that we need a distinction between projectible and unprojectible predicate, argues Jackson, arises among the rest because of a failure to acknowledge a counterfactual condition that governs the applications of the SR.

Jackson argues that while the grue paradox is supposed to show that the SR can be used to reach two incompatible conclusions from the same evidence, there is a counterfactual condition for the application of the SR: "certain *F*s which are *H* being *G* does not support other *F*s which are not *H* being *G* if it is known that the *F*s in the evidence class would not have been *G* if they had not been *H*" (1975, 123). The difference between "green" and "grue" is according to Jackson is that we know that the emeralds which were previously examined would still have been green even if they had not been examined, while we know that they would not have been grue if they had not been examined. Hence, the use of the SR in order to predict that unexamined emeralds are grue violates the counterfactual condition. The SR therefore does not imply incompatible predictions, even with predicates like "grue".

Jackson's conclusion is that "grue" is not intrinsically unprojectible, and the absurdity which is apparent in the new riddle of induction is explained by the violation of the counterfactual condition. Jackson demonstrates his claim by asking us to imagine a world in which all examined emeralds were green and in which "investigation of the crystalline structure of these emeralds reveals that they are naturally blue; this structure being affected by the light necessarily involved in examining them in such a way that emeralds turn green instantaneously on being examined" (Jackson 1975, 126). In this world, argues Jackson, we ought to believe that unexamined emeralds are blue and hence that all emeralds are grue, rather than green.

Although some believe that Jackson solved the new riddle of induction (for example see Okasha 2007), his solution to Goodman's riddle is not universally recognized. Some accept his claim that there are no unprojectible predicates but reject the claim that he solved the new riddle of induction (Roskies 2008). Although I agree with Jackson that the new riddle of induction does not show that inductive validity cannot be defined syntactically, I also believe that his solution for this riddle is untenable and that, contrary to his claim, not all predicates are projectible.

Jackson's solution of the new riddle of induction raises several difficulties. To begin with, examples can be found in which the counterfactual condition is not violated, while we would not accept an inference according to the SR as supporting a general hypothesis (Chihara 1981). However, these examples only show that the counterfactual condition is not a sufficient condition for application of the SR and so does not undermine Jackson's general answer to the new riddle of induction. Jackson himself refined the counterfactual condition in response to other versions of the grue paradox (Jackson and Pargetter 1980), and others have suggested further revisions for this condition (see, for example, Godfrey-Smith 2003).

A more substantial concern is that Jackson's solution begs the question, due to the fact that the application of the counterfactual condition seems to assume that we already know that all emeralds are green, and not grue (Roskies 2008). In order to know that the emeralds that we examined would not have been grue if they had not been examined, we assume that we already know the color of the unobserved emeralds. However, the new

riddle of induction arises exactly because all the evidence in our possession equally supports the conclusion that all the emeralds which to date have been examined are green as well as the conclusion that all the emeralds which to date have been examined are grue. While Jackson does attempt to answer a circularity objection in his paper (1975), I agree with Roskies that he fails to address this particular objection (2008).

Furthermore, Jackson's counterfactual condition only requires that one need *not know* that the examined emeralds would not have been grue if they had not been examined. This epistemic condition severely limits the efficacy of the counterfactual condition. In fact, this solution applies only to cases in which one already knows which of the two predictions is confirmed (which brings us back to the objection that the counterfactual condition begs the question).

Jackson was apparently well aware of this problem, and in a subsequent paper, he, together with Robert Pargetter, attempted to strengthen the counterfactual condition (Jackson and Pargetter 1980). While the original condition demanded that one should not know that *F* would not have been *G* if it had not been *H*, the new "nomological condition" requires that it is *reasonable to believe* that if the things which are *F*, *G*, and *H* had not been *H*, they would still be *F* and *G*. This condition requires that one has a warranty for the legitimacy of the inference and supposedly eliminates the problem of inconsistent predictions (which Jackson identifies as one of the problems which is raised by the new riddle of induction). The inconsistency is prevented because the nomological condition requires that it would be reasonable for one to believe, for example, both that "if the sampled objects had not been examined they would have been green emeralds" and that "if the sampled objects had not been examined they would have been grue emeralds." However, argue Jackson and Pargetter, "it is plausible that they cannot both be true, for they are counterfactuals with identical consistent antecedents and inconsistent consequents" (427).

Unfortunately, the nomological condition sets a problematic requirement for induction. It requires that one will always have background knowledge of the nomological independence of the properties which are involved in induction. This raises the problem of accounting for the knowledge of the nomological facts which are required by the nomological condition, which again seems to rely on background knowledge of nomological facts and so on ad infinitum, unless resorting to circularity. Jackson and Pargetter reject the idea that this is an incarnation of the old problem of induction. However, even if it is not a reincarnation of the old problem of induction, it is difficult to see how it is possible to explain our ability to make legitimate inductive inferences while escaping both the dangers of infinite regress and circularity.

Once Jackson's conditions for the application of the SR are rejected, it is impossible to defend his claim that all predicates are projectible. Jackson gives examples for cases in which he believes there are prima facie unprojectible predicates that are legitimately used in applications of the SR. However, close examination of these examples shows that if a predicate is legitimately projected in these cases, it is not the predicate which Jackson claims to be projected. For example, Jackson (1975) attempts to show that there are possible circumstances in which the predicate "grue" is projectible by asking us to consider the possibility of a world in which emeralds are naturally blue but change their color to green if they are examined, due to the effect of the light which is necessarily involved in examining them on their crystalline structure. In this world, argues Jackson, we ought to believe that emeralds are grue, and not green.

To begin with, it should be noted that Jackson's example ignores the temporal determination which is included in the predicate "grue." Recall that Jackson himself defined the predicate "grue" applies to "all things examined *before T* just in case they are green, but to other things just in case they are blue." Hence, this example does not show that in this possible world, we ought to believe that emeralds are grue.

Furthermore, this example of Jackson raises again the charge of circularity. For we know that the application of the SR is legitimate in this case only if we already know that all the emeralds are grue. If the SR is therefore legitimately applied in this case, it is in the transition from "all emeralds examined so far have a crystalline structure z" to "all emeralds have a crystalline structure z." Hence, the conclusion that all emeralds are grue is not the conclusion of an inductive argument but rather a deductive implication of the conclusion of an inductive argument. This shows that the necessary conditions for satisfaction of the counterfactual condition ensure that there are no circumstances in which the predicate "grue" is projectible.

I believe that part of the explanation for the shortcomings of Jackson's solution for the new riddle of induction lies in the fact that Jackson misidentifies the problem which is raised by the new riddle of induction. According to Jackson, the problem is that application of the SR leads both to absurd results and to inconsistency (Jackson and Pargetter 1980). Although I agree that the conclusion that all emeralds are grue is absurd, I fail to see the problem in the possibility to infer inconsistent conclusions from one and the same body of evidence. It is of the nature of induction that it can lead to inconsistent conclusions, and it is due to Jackson's attempt to prevent this implication that his condition for the application of the SR involves circularity.

Interestingly, Jackson and Pargetter rely on the analogy of a finite number sequence which can be continued in indefinitely many different ways in order to introduce the new riddle of induction. If this analogy holds, then the possibility of supporting inconsistent conclusions based on the same body of evidence is not the problem raised by the new riddle of induction.

Okasha (2007), who defends Jackson's solution to the new riddle of induction, rejects the similarity between the new riddle and the curve-fitting problem, that is, the problem of making predictions by fitting curves to finite past data. Okasha argues that the curve-fitting problem is different from the new riddle of induction because the premises of the two inferences are different, so it is not surprising that they lead to incompatible predictions. In Okasha's example, these premises are supposed to include "all examined cases satisfy the relation $y=x^2+2x+8$" and "all examined cases satisfy the relation $y=8x$," which are clearly not logically equivalent (2007, 499). However, an alternative description of the evidence and a more accurate one are "point$_1$ ($x=2$, $y=16$); point$_2$ ($x=4$, $y=32$)" which fit both equations and support inconsistent predictions about any other point on the curve. Similarly, the evidence in Goodman's paradox is, for example, "emerald$_1$ is both examined (to date) and green; emerald$_2$ is both examined (to date) and grue," which confirms both the conclusion that all emeralds are green and the conclusion that all emeralds are grue, which, in turn, entails inconsistent predictions about the color of the next examined emerald.

The application of the SR can lead to inconsistent predictions. However, this is not the problem raised by the new riddle of induction. If I see an apple tree in the autumn and observe that the apples, which are not ripe yet, are green, I have supporting evidence for (at least) two conflicting predictions: that these apples will be green come

winter and that these apples will be red come winter. These conclusions are not absurd and as such do not exemplify the problem raised by the new riddle of induction. In fact, it is of the nature of induction that it can confirm inconsistent conclusions, otherwise the conclusion of an inductive inference would follow logically from its premises, which would make it a deductive inference rather than an inductive inference.

The new riddle of induction arises because of an absurd conclusion, according to which although all the emeralds that we examined to date were green, all the other emeralds are blue. This conclusion is due to the fact that the predicate "grue" arbitrarily groups two distinct types of things, things that are "green and examined up to date" and "blue" things. This is why Goodman presents the new riddle of induction as the problem of distinguishing between lawlike statements and accidental statements rather than a problem about inconsistent predictions about the color of previously unexamined emeralds.

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Many agree that the new riddle of induction amounts to a proof of the impossibility of a purely syntactical theory of confirmation. This conclusion constitutes a fundamental difference between induction and deduction because it is generally agreed that deductive validity can be defined syntactically. In order to determine whether the new riddle of induction does indeed show that inductive validity cannot be defined syntactically, I shall attempt to formulate an analogical riddle for deduction.

I shall examine the following valid deductive argument:

1. a. All emeralds are green.
   b. The Duke of Devonshire is an emerald.
   Therefore,
   3. The Duke of Devonshire is green.

I shall now introduce a more exotic predicate, "gubs," which applies to all things green when this predicate appears in a universal proposition but to blue things when this predicate appears in a singular proposition. Substituting "gubs" for "green," we get the following argument:

2. d. All emeralds are gubs.
   e. The Duke of Devonshire is an emerald.
   Therefore,
   f. The Duke of Devonshire is gubs.

Both arguments share the same syntactical form. If the first is valid, so allegedly is the second. However, although they share the same premises, their conclusions are incompatible. For according to the conclusion of the first argument, the Duke of Devonshire is green, while according to the conclusion of the second argument, the Duke of Devonshire is blue. Although it is obvious which of the two arguments is valid and which is invalid, it seems that it is impossible to distinguish between them syntactically. If the new riddle of induction implies that inductive validity cannot be

defined syntactically, the new riddle of deduction implies that deductive validity cannot be defined syntactically either.

An anticipated objection to the new riddle of deduction is that what is involved here is a simple case of ambiguity. The term "gubs" is ambiguous because it has different meaning in different propositions. However, although this claim is true, it does not solve the new riddle of deduction because it does not explain how it is possible to distinguish between ambiguous and unambiguous terms.

It might be argued that it is not necessary, in order to distinguish between ambiguous and unambiguous terms, to show that argument (a) is deductively valid while (b) is invalid. It suffices to admit that "gubs" in the premise of (b) has *a different meaning* from "gubs" in the conclusion. However, although this claim is true, this supposed solution to the new riddle of deduction equally applies to the new riddle of induction. If one believes that a solution to the new riddle of induction requires formulating a criterion for distinguishing between well-behaved predicates and ill-behaved predicates, the same is needed in order to solve the new riddle of deduction. Some may attempt to solve this problem by addressing the fact that the meaning of the predicate "gubs" involves reference to the type of proposition in which it appears. This fact would allegedly indicate that the term is ambiguous and therefore illegitimate for deductive inferences. According to the definition of "gubs," it seems not only possible but also necessary to distinguish between "gubs" in the first premise of argument (b) and in the argument's conclusion by way of indexing the expression "gubs" as "$gubs_1$" and "$gubs_2$," respectively.

Notwithstanding the prima facie attractiveness of this suggestion, it runs into the same difficulties of the attempt to solve the new riddle of induction by referring to the fact that the meaning of the predicates "grue" and "bleen" (the latter predicate applies to all things examined before time *T* just in case they are blue and to other things just in case they are green) involves a reference to a specific temporal position. For, as Goodman (1983) points out, if we start with the predicates "grue" and "bleen," the predicates "green" and "blue" will also be defined in terms of "grue," "bleen," and a temporal expression. Similarly, if we start with the predicates "gubs" and "bugs" (the latter predicate applies to all things blue when this predicate appears in a universal proposition but to green things when this predicate appears in a singular proposition), the predicates green and blue will be defined in terms of "gubs," "bugs," and the type of propositions in which it appears. For example, the predicate "green" applies to all things bugs when it appears in a universal proposition, but in all appearances of predicate "green" in singular propositions, it applies to gubs things.

As should be clear at this stage, the new riddle of deduction is analogical to the new riddle of induction. However, I doubt whether many, if any, would readily accept the conclusion that the distinction between ambiguous and unambiguous terms is purely a pragmatic one or that deductive validity cannot be defined syntactically.

To begin with, although it is true that "green" and "blue" can be defined by "gubs" and "bugs," and vice versa, it does not follow that they are semantically symmetrical. How is it possible to determine that "green" and "blue" are unambiguous and that "gubs" and "bugs" are ambiguous? The answer is simple. We know that "green" and "blue" are unambiguous and that "gubs" and "bugs" are ambiguous because we understand their meaning. We know that the former predicates have the same meaning in every proposition in which they appear, while the latter predicates have different

meaning in different propositions. We do not need any criterion in order to determine this, because we rely on our understanding of our language. Explanations must come to an end, and this is exactly where they do (see also Wittgenstein 1958).

We know that the use of "gubs" in deductive inferences can lead us astray and that the conclusion that "The Duke of Devonshire is gubs" will not be accepted. However, we do not know this because of a conflict with the conclusion of an inference which includes a better entrenched predicate. We know this because we know that it is ambiguous. We know, on the other hand, that "green" is unambiguous and legitimate for deductive inferences.

The solution to the new riddle of deduction requires identifying the features of predicates which makes them unsuitable for deductive inferences. Deductive validity is truth preserving, that is, the truth of the premises guaranties the truth of the conclusion. It is therefore necessary for the terms which are used in deductive inferences to have the same meaning both in the premises and in the conclusion. Terms like "gubs" and "bugs" have different meanings in different propositions and so are illegitimate for use in deductive inferences (obviously, this claim does not imply that the predicate "gubs" cannot be used univocally in some deductive inferences, for example, "*a* is gubs and *b* is not gubs, therefore *a* is gubs." However, in this respect it is similar to the predicate "grue," which can be used in some inductive inferences without paradox.)

Similarly, it is possible to define a predicate whose meaning depends on whether it appears in the premise of a deductive argument or in its conclusion. For example, let us introduce the predicate "gpbo," which applies to all things green if it appears in the premise of a deductive argument, but to blue things in other circumstances. Obviously, this predicate is illegitimate for deductive inferences. However, this fact has no bearing on the question whether deductive validity can or cannot be defined syntactically.

The new riddle of deduction is thus easily solvable. Its importance lies not in challenging our understanding of deduction but in its analogy to the new riddle of induction. For if the new riddle of deduction does not show that deductive validity cannot be defined syntactically, then neither does the new riddle of induction show that inductive validity cannot be defined syntactically.

I shall now apply the same type of answer to the new riddle of induction. With the help of the SR I shall attempt to project a property from a sample to a population. The SR applies to a case in which we know that "some *A*s are *B*" and that there might be other instances of *A*s that we have not examined. This is made possible by time and space, which extend beyond our limited experience, and allows the existence of distinct instances of *A*. Our limited knowledge of reality, which is made possible by the fact that time and space extend beyond our experience, is therefore the reason for the use of inductive inferences. We generalize, based on several instances of *A*s, to all *A*s, that is, to *A*s in other places and times.

The SR therefore necessarily involves an inference from examined instances to unexamined instances in other places and times. Jackson and Pargetter (1980) use the term "differentiating property" to designate the property which marks off the sample from the things that one is proposing to project about. Jackson's counterfactual condition requires that the property which is projected is independent of the differentiating property. Indeed, it is a reasonable demand to make. However, Jackson fails to see that this condition disqualifies any predicate of which the question as to whether or not it applies to an object depends on the spatiotemporal location per se of this object or

on the question whether it has or has not been examined. It is of the nature of the SR that it does not allow us to project properties like "grue," which depend on arbitrary temporal and epistemological properties.

I stress that I am not arguing that every predicate that includes temporal or spatial distinctions is unprojectible. To resort to a previous example, some apples have the property that they change their color and are green in autumn and red in the winter. Let us call this property "garw." The predicate "garw" is projectible, and if I see an apple tree at the autumn, I have supporting evidence for the conclusion that these apples are "garw." However, I do not have supporting evidence for the conclusion that these apples are "gred," a predicate which applies to "all things before *T* just in case they are green, but to other things just in case they are red." The latter predicate is unprojectible because of the arbitrary temporal determination, which undermines any attempt to project this property. The statement that all the apples on the tree are gred is an accidental statement, rather than a lawlike statement because it assumes that all the apples on that tree will change their color at an arbitrary point in time. However, this undermines the reason which supports inductive inference. The statement that all the apples on that tree are garw, on the other hand, is a lawlike statement, because it links the color of apples with other properties in nature, rather than with a spatiotemporal position *per se*.

To clarify my position, let me state that I accept a version of Jackson's counterfactual condition as a necessary condition for the projectibility of predicates. However, contrary to Jackson, I do not see this condition as entailing an epistemic constraint on any individual who would draw the inductive inference. Jackson's counterfactual condition begs the question because it relies on empirical knowledge of the subject about the independence of a property which is projected on the differentiating property. The condition that I put forward, on the other hand, is a constraint on the projectibility of predicates. I do not argue that it is a sufficient condition for the projectibility of predicates, but I do argue that it is a necessary condition for the projectibility of predicates.

A possible objection to the position that I develop in this paper is represented by a claim which is put forward by Frank Jackson. The objection can be seen to relate to my claim that there are unprojectible predicates, a position which Jackson flatly denies. In section 2 I discussed and criticized his claim that "grue" may have been projectible if our world was different. Jackson (1975) further argues that the predicates "examined," "sampled," and similar predicates are in fact projectible. His example for the projectibility of these predicates is as follows: Suppose that my reason for thinking that all the marbles that I draw from a barrel have been sampled by Jones is that they each have Jones's finger prints on them. In this case, the evidence supports the conclusion that the remaining marbles have been sampled.

However, Jackson's example fails to constitute a counterexample to my claim that these predicates are unprojectible. For in his example, the predicate "being sampled (by Jones in the past)" does not apply to the process by which the evidence for the inductive inference was attained but rather to another process that was previously undertaken by Jones. Obviously, the implication of my analysis of the SR is that the predicates "examined" and "sampled" and similar predicates are unprojectible only when they apply to the process by which the evidence for the inductive inference was achieved.

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My discussion shows that the analogy between induction and deduction can be extended to include Goodman's paradox. The new riddle of deduction is analogical to the new riddle of induction and therefore implies an analogical conclusion. If the new riddle of induction therefore proves that inductive validity cannot be defined syntactically, the new riddle of deduction equally proves that deductive validity cannot be defined syntactically. There are few, if any, who will accept the latter implication, according to which deductive validity cannot be defined syntactically. In the present context, I hence assume the (the generally accepted) truth of the premise that deductive validity can be defined syntactically.

The new riddle of deduction shows that there are predicates which are illegitimate for deductive inference. Similarly, the new riddle of induction shows that there are predicates that are illegitimate for inductive inference, that is, unprojectible. These are predicates which undermine inductive inference, as exemplified in the SR, which relies on an examined sample to draw a conclusion about a population, which extends in time and space beyond the sample. Only predicates which are insensitive to the temporal and spatial limits of the sample, and to the property of being sampled, are legitimate for use of the SR.

The conclusion of my paper has an obvious affinity to a familiar interpretation of the "the uniformity of nature," which implies that space and time are causally inert. The inertness of space and time supposedly enables us to formulate laws of nature, which apply equally to an indefinite number of cases, regardless of their spatiotemporal position. Unfortunately, any venture into this thought-provoking subject, which links the new riddle of induction with the old riddle of induction, implies turning from epistemology to metaphysics and lies beyond the scope of this paper.

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