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Author(s): Elliott Sober
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CONFIRMATION AND LAW-LIKENESS

Elliott Sober

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. But 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. . . . The difference is that in the former case the hypothesis is a lawlike statement; while in the latter case, the hypothesis is a merely contingent or accidental generality. Only a statement that is lawlike—regardless of its truth or falsity or its scientific importance—is capable of receiving confirmation from an instance of it; accidental statements are not (Goodman 1965, p. 73).

In this passage from Fact, Fiction, and Forecast, Nelson Goodman suggests that a generalization of the form “all A’s are B” is confirmable by an observed instance (that is, by something observed to be both A and B) only if the generalization is law-like.1 Although Goodman has a good deal to say about what makes a generalization law-like, I take it that the basic notion is that law-like generalizations “support counterfactuals”: if “all A’s are B” is law-like, then if the generalization is true, so is the counterfactual “if something were an A, it would also be a B.”

Jackson and Parry (1980, p. 423), endorsing an objection made by Pap (1958) among others, deny that confirmation requires law-likeness:

In any strict sense of ‘law’ very few of the generalizations we confirm in everyday life are laws. Surely we have (nonexhaustive) instantial confirmation of ‘All wines labelled “Sauternes” are sweet wines’, without having to suppose that this is a law of nature. One of Goodman’s own examples is the hypothesis ‘All men in this room are third sons’ . . . . He contends that this evidently non-law-like hypothesis is not confirmed by positive instances (short of an exhaustive

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1The view is also endorsed by Scheffler (1965) and Strawson (1952).
Jackson and Pargetter go on to argue that there is an important insight here, which Goodman’s formulation overstates:

Certain as being β confirming all as being β is of interest to the extent that it confirms the universal by confirming certain other as being β. But if the sample of as are all β purely by accident, how could this rationally lead one to suppose a continuation of the connection between a and β outside the sample? We urged that a sample of third sons might (weakly) confirm everyone in the room being a third son, despite the latter’s evidently non-law-like nature. But in taking such a sample to so confirm, you take it that its existence is not a fluke, that there is some reason for the third sons in the sample being in the room. You cannot take its existence both to confirm and to be a fluke. . . . The important insight then is that one can have no reason to expect the purely accidental to continue (p. 424).

They then formulate a nomological requirement on the characteristics of a sample, if that sample is to provide instance confirmation of a generalization.

Jackson and Pargetter propose a substitute condition, since they hold that these considerations suffice to discredit Goodman’s nomological requirement. However, the initial reaction that Jackson and Pargetter describe is subject to a natural reply by Goodman, one which they anticipate in the passage just quoted. If examining fifty individuals in the room and finding each to be a third son is to confirm the claim that all people in the room are third sons, there must be some reason that the two properties co-occur. For example, it would suffice if admission to the room caused an individual to be a third son. Or, more realistically, a non-accidental connection would be assured if people were admitted to the room only if they were third sons. In the absence of a connection of this sort between the two properties, it is hard to see how instances could confirm the generalization.

However, this train of thought makes the generalization start to


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look law-like. There is now an interpretation of “if X had been admitted to the room, X would have been a third son” on which this counterfactual comes out true. It isn’t that admission to the room would have turned an only daughter into a third son. Rather, the idea is that if X had been admitted, X would have had to have been a third son.

A similar story can be concocted for the coin case. If the contents of my left pocket are to count as evidence for what is in my right, then there must be something about the processes by which those two pockets were filled that licenses certain counterfactuals. Once those processes are acknowledged, the relevant generalizations start to sound law-like. It will now be true that if X had found its way into either pocket, X would have had to have been a franc. A similar line of reasoning presents itself for the generalization about Sauternes.

This reply provides no easy victory for Goodman, in that it is no determinate matter whether the required counterfactuals are true. If the mechanism of admitting only third sons is in effect, what becomes of the counterfactual “if X were admitted, X would be a third son”? One can argue that it is true and appeal to the mechanism. Or one can argue that it is false and say that the admission of certain individuals would have required the mechanism to break down. Some may see here an objective question. I see a pragmatic one in which both readings have their places. This strategy of argument gets Goodman out of trouble, not by turning defeat into victory, but by achieving a stalemate.

However, the objection that accidental generalizations can be confirmed by their instances is sustainable against this reply. One can know that a generalization is purely accidental and still have positive instances count as confirming.

Imagine an urn that is filled with a thousand balls by drawing from a source whose composition is known. Suppose the source contains 50% red balls and 50% green balls. By random sampling, the urn is composed. The inference problem is to sample (with replacement) from the urn and infer what percentage of red and green balls it contains.

Since we know that the urn was composed by draws from the source, we can assign prior probabilities to each of the possible compositions, from 1000 red and 0 green to 0 red and 1000 green. When we sample from the urn, we can use Bayes’s theorem to
compute the posterior probability of the various hypotheses about the urn's composition. Suppose I sample 250 times from the urn and find that each sampled ball is green. These observations make the hypothesis that all the balls in the urn are green more probable than it was initially.

I thereby have obtained instance confirmation of the generalization. But knowledge of the process whereby the contents of the urn were assembled assures me that this generalization, if true, is only accidentally so. It is a mere fluke if all the balls in the urn happen to be green. There is nothing about being a ball in this urn that makes something green, nor is it true that a ball would not have been put into the urn unless it were green.

It makes all the difference whether the mechanism whereby the population is assembled is known in advance or is inferred in the process of sampling. When fifty individuals in the room are sampled and are found to be third sons, the suspicion naturally arises that this is not an accident. The same may be said when the balls sampled from an urn are all found to be green. However, the fact that nomological connections are reasonably suspected in such cases does not show that law-likeness is a presupposition of instance confirmation. Simply replace prior ignorance of process with a substantive process assumption (of the kind just sketched for the urn problem) and the composition of a population known to be fortuitously assembled can be confirmed by random sampling.

In the passage quoted at the beginning of this article, Goodman enunciates a second thesis about confirmation. Besides connecting confirmation and law-likeness, he also claims that if observed instances confirm a generalization, they also must confirm claims about unobserved instances. A small modification in the inference problem just sketched will now show that these two confirmational relationships sometimes part ways.

Let us proceed exactly as before, except that we now sample without replacement. In this case, the probability that the next ball will be green is 0.5, regardless of what the previously sampled balls were like. In spite of this, a generalization about the whole urn can be confirmed. Observing 250 green balls confirms the hypothesis that all the balls in the urn are green by raising its probability; but this observation does not raise the probability that the next ball drawn from the urn will be green. The simple case in which the
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urn contains just two balls illustrates the general point. When the balls are drawn without replacement, there are four equiprobable sequences of green (G) and red (R) draws—GG, GR, RG, and RR. If the first ball sampled is green, then the probability of GG increases from 0.25 to 0.5. However, the probability that the second ball will be green is 0.5, just as it was before any ball was drawn. I conclude that confirming a generalization and confirming a claim about the next instance are not always as intimately connected as Goodman suggests.

It remains to show that Jackson and Pargetter’s substitute nomological condition fares no better than Goodman’s. Suppose I sample from objects that are all $Y_1$ and use my observations to infer what the objects in $Y_2$ are like. Jackson and Pargetter (p. 424) require that “All $Y_1$ A’s are B” confirms “All $Y_2$ A’s are B” only if the objects sampled would still have been both $A$ and $B$ even if they had been $Y_2$ instead of $Y_1$.

It is worth noting that this condition is not really an explication of the intuition that Jackson and Pargetter earlier noted—namely, that a sample cannot confirm if its existence is a fluke. In the case of random draws from a heterogeneous urn, the composition of a sample may be said to be a “fluke” if it is improbable enough, even though the objects sampled would have had the same characteristics had they not been sampled. The case to be noted next exhibits the nonequivalence of these two conditions in the other direction: the sample is no fluke, but the objects sampled do not have the nomological property that Jackson and Pargetter demand. The example now to be constructed also shows that their nomological condition is not necessary for instance confirmation.

Warm-blooded organisms regulate their temperature physiologically; cold-blooded creatures do not, but achieve the same result by moving from one micro-environment to another. So, for example, human beings perspire when placed in the hot sun, whereas lizards simply crawl into the shade. Suppose I believe that human beings and lizards have the same body temperature, whose exact value I wish to confirm by observation. I then measure some lizards in their normal environments and find that all of them have a body temperature of 98.6°F. My background beliefs lead me to expect that human beings will have the same body temperature. However, I then note that the lizards were all measured in the shade, whereas some human beings spend a great deal of time
in the blazing sun. This difference does not confound my inference, even though Jackson and Pargetter's condition goes unsatisfied; it is false that the lizards would have exhibited the same temperature if they had been measured in the sun. "All organisms living in the shade have a temperature of 98.6°" can confirm "All organisms living in the sun have a temperature of 98.6°," even if the shaded organisms would not have had that temperature if they had lived in the sun.

I very much doubt that fine-tuning Goodman's proposal or the one Jackson and Pargetter suggest will improve matters. Observations have confirmatory significance only within the context of a set of background assumptions (Good 1967; Rosenkrantz 1977). Stipulate a nomological condition on instance confirmation and a background context can be invented that shows that condition to be unnecessary. This is not to say that matters of modality are irrelevant to questions about confirmation. Rather, what I doubt is that there is a single "nomological condition" that each and every act of confirmation must obey. The multiplicity of possible background assumptions means that there will be many ways that observed instances may confirm generalizations (and many ways in which they may fail to do so). The nomological conditions just discussed should be viewed as parts of such sufficient conditions. But this is a far cry from identifying the nomological assumptions underlying every case of instance confirmation.

University of Wisconsin, Madison

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