

CONFIRMATION AND EXTRA INFORMATION

LAWRENCE FOSTER
University of Massachusetts.
Boston

When we are asked to consider whether evidence *E* confirms a hypothesis *H* we are often told to imagine that we have no relevant evidence for *H* other than that included in *E*. Hempel has argued that failure to follow this methodological fiction has been responsible for mistaken arguments in confirmation theory and in part for the raven paradox.¹ For this paradox arises, so Hempel argues, when we consider not simply the stated evidence *E* and the hypothesis *H*, but, in addition, some extra information. And at least on this point Goodman appears to be in agreement with Hempel.² I wish to raise here some problems for Hempel's proposed methodological fiction for confirmation theory. In so doing I will be raising problems both for Hempel's solution to the raven paradox and more generally for a commonly accepted aspect of confirmation theory.

Suppose we consider whether an evidence sentence *E* confirms a hypothesis *H*. According to Hempel we must observe the methodological fiction that we have no evidence for *H* other than *E*. Failure to abide by this fiction has led us to find paradoxical the claim that a white shoe confirms the hypothesis, "All ravens are black." And Goodman has suggested that it has led as well to our mistaken rejection of the

¹ For Hempel's analysis of one such argument see Hempel, "The White Shoe: No Red Herring," *The British Journal for the Philosophy of Science*, 18 (1968), pp. 239-240. For Hempel's claims about the raven paradox see Hempel, "Studies in the Logic of Confirmation," *Mind*, 54 (1945), pp. 1-26 and pp. 97-121. Reprinted in Hempel, *Aspects of Scientific Explanation* (New York: The Free Press, 1965). See pp. 19-20 in *Aspects*.

² Nelson Goodman, *Fact, Fiction, and Forecast*, 2nd ed. (Indianapolis: Bobbs-Merrill, 1965), pp. 70-71, 75-76. Hereafter *FFF*.

claim that a white shoe confirms the hypotheses, "Nothing is black," and "Everything that is not a raven is not black." Goodman's point is that we do not take seriously the confirmation of the latter two hypotheses by a white shoe because we know from additional information that both are false. However, if we abide by the necessary methodological fiction and ignore all such extra information, then clearly the white shoe is seen to confirm both hypotheses.

What about this methodological fiction? Is it plausible to require that we ignore all extra information in our confirmation judgments? I think that the answer is clearly no. And if this answer is correct then some serious modifications need to be made in our understanding of confirmation judgments, and some serious problems remain to be resolved. Let me explain.

Only projectible hypotheses are confirmed by their instances. So argues Goodman, and, I believe, correctly. Hence if we find that a hypothesis is not projectible then it follows that its instances do not confirm it. But whether a hypothesis is projectible or not depends upon a number of factors, for example, whether it overrides all conflicting hypotheses.³ So, although confirmation is a relation holding between an evidence sentence and a hypothesis, our judgment about whether this relation holds or not needs to be informed by information not contained in either the evidence sentence or the hypothesis. If we observe the methodological fiction and assume that *nothing* is known about the world except what is explicitly stated in the evidence sentence and the hypothesis, we then have no grounds for judging that, say, a green emerald confirms the hypothesis, "All emeralds are green," while a grue emerald fails to confirm the hypothesis, "All emeralds are grue." Similar remarks obviously apply to the claim that a white shoe confirms the hypothesis "All ravens are black." Hence, the methodological fiction needs to be abandoned if

³ See Robert Schwartz, Israel Scheffler, and Nelson Goodman, "An Improvement in the Theory of Projectibility," *The Journal of Philosophy*, LXVII, 18 (1970), pp. 605-608; and Robert Schwartz, "Confirmation and Conflict," *The Journal of Philosophy*, LXVIII, 18 (1971), pp. 483-497.

we are to have a plausible account of our confirmation judgments.⁴

This point can be brought home in other ways. Suppose we are considering whether an evidence sentence E confirms a hypothesis H where E is a positive instance of H , yet H contains some very unfamiliar predicates. Surely, from the fact that E is a positive instance of H it does not follow that E confirms H . Goodman demonstrated this point in his famous grue paradox. But neither does it follow from the fact that H contains unfamiliar predicates that H is not projectible and not confirmed by E . For H 's unfamiliar predicates may very well be co-extensive with some familiar well-entrenched predicates. Or H 's unfamiliar predicates may gain entrenchment from their parent predicates. And, if so, H may override all conflicts, be projectible, and be confirmed by E .

But whether this is so depends upon information not contained in either the evidence E or the hypothesis H . For whether the predicates in H are co-extensive with well-entrenched predicates surely requires additional information, e.g., information about the extensions of these predicates. And knowledge of their co-extensiveness cannot always be obtained solely by consideration of their interpretation. Similar remarks apply to the effect of parent predicates on unfamiliar predicates. So, once again, the methodological fiction must be violated in order to determine whether E confirms H . *A fortiori*, the raven paradox cannot be resolved simply by showing that the methodological fiction has been violated.⁵

Problems are easier to find than solutions. On the one hand I have claimed that some extra information must be brought in when considering whether evidence E confirms a hypo-

⁴ Cf. *FFF*, pp. 84-85.

⁵ Hempel writes, "In the seemingly paradoxical cases of confirmation we are often not actually judging the relation of the given evidence E alone to the hypothesis H (we fail to observe the methodological fiction, characteristic of every case of confirmation, that we have no relevant evidence for H other than that included in E); instead, we tacitly introduce a comparison of H with a body of evidence which consists of E in conjunction with additional information that we happen to have at our disposal...". *Aspects*, p. 19.

thesis *H*, or else we are left without a satisfactory account of our confirmation judgments. The grue paradox showed this. On the other hand I agree with Goodman and Hempel that some extra information clearly cannot be brought in if we are to have a satisfactory account of our confirmation judgments. This point is clearly made by Hempel in his reply to I. J. Good.⁶ Good argues that *in certain circumstances* a black crow fails to confirm the hypothesis that all crows in our world are black. Hempel points out that Good's argument rests upon the illegitimate introduction of extra information. This extra information changes the evidential situation. Hempel notes that Good's argument does not touch upon the contention that if our *sole* evidence consists of a black crow then this surely confirms the hypothesis that all crows are black. In short, Hempel's point is that if to the evidence sentence *E*, "*c* is a crow and is black," we conjoin the evidence sentence *E*₁, "*d* is a crow and is non-black," then the conjunction fails to confirm the given hypothesis. But, Hempel notes, this is irrelevant to the claim that if our sole evidence is *E*, then we have a confirming instance of the *crow* hypothesis.

The crucial question becomes: what marks the distinction between legitimate and illegitimate extra information? In considering whether a black crow confirms the hypothesis "All crows are black" why is it illegitimate to bring in information about the existence of a white crow, but legitimate to appeal to information about the entrenchment of the antecedent and consequent predicates of the hypothesis, or about the conflicts which the hypothesis overrides, etc.?

Unfortunately, the answer which immediately comes to mind turns out to be unsatisfactory. The distinction seems to rest upon the difference between background information about the hypothesis and evidence sentences. Thus, in the remarks of both Goodman and Hempel on the raven paradox,

⁶ Hempel, "The White Shoe: No Red Herring," *op. cit.* Cf. I. J. Good, "The White Shoe is a Red Herring," *The British Journal for the Philosophy of Science*, 17 (1967), p. 322.

the illegitimate information turned out to be additional evidence sentences while the legitimate information required in the grue examples turned out to be background information about the hypothesis, for example, information about the entrenchment of predicates, etc.⁷ So one is tempted to try to define the difference between evidence sentences and background information, and to argue that additional sentences of the latter type but not of the former type are legitimate sources of extra information.

This suggestion, however, can be dismissed quickly. Consider the grue paradox again. Suppose we consider whether the sentence E_1 , " a is an emerald and a is grue," confirms the hypothesis H_1 , "All emeralds are grue." Our negative answer to this question depends, in part, upon our appeal to extra background information, for example, information about the conflict between H_1 and the better entrenched H_2 , "All emeralds are green." But even here, strictly speaking, we need to appeal to additional evidence sentences. For in order for H_1 to be in genuine conflict with, and overridden by H_2 , H_2 must be supported. But for H_2 to be supported it must have some positive instances. And the positive instances of H_2 are evidence sentences such as E_2 , " a is an emerald and a is green."⁸ So, even our determination that E_1 does not con-

⁷ That this is the source of the distinction is suggested by one of Goodman's remarks when he writes, "In other words, while confirmation is indeed a relation between evidence and hypotheses, this does not mean that our definition of this relation must refer to nothing other than such evidence and hypotheses. The fact is that whenever we set about determining the validity of a given projection from a given base, we have and use a good deal of other relevant knowledge. I am not speaking of additional evidence statements, but rather of the record of past predictions actually made and their outcome.... That some were made and how they turned out is legitimately available information." *FFF*, pp. 84-85.

⁸ Thus, the evidence for H_1 differs from the evidence for H_2 . For Goodman and Hempel the evidence is a *sentence* or statement. Hempel writes, "Reasons for construing a hypothesis as confirmed or disconfirmed by evidence sentences rather than by objects were offered in section 6 of my article in *Mind* ["Studies in the Logic of Confirmation," *Mind* 54 (1945)]; to these, there may be added the consideration that one and the same object may have properties that make it confirmatory, and others that make it disconfirmatory for a given hypothesis. A particular bird may be a crow and black, but may also have an albino crow for a sister; in virtue of these properties, it would

firm H_1 depends upon an appeal to the additional evidence sentence E_2 . The distinction between legitimate and illegitimate extra information is not to be found in the distinction between background information and evidence sentences.

The question remains: what distinguishes legitimate from illegitimate extra information? Until an answer to this question is found, an important problem in confirmation theory remains unresolved.

both confirm and disconfirm the hypothesis 'All crows are black'. This consideration suggests that an object can be said to confirm or to disconfirm a hypothesis only *under a particular description*, and it is descriptions, therefore, that should be counted as confirmatory or as disconfirmatory for a hypothesis." *Op. cit.*, p. 239. Cf. Goodman, *FFF*, pp. 88-89 and *Problems and Projects* (Indianapolis and New York: The Bobbs-Merrill Company, 1972), p. 359.

RESUMEN

Hempel propone una ficción metodológica para evitar la paradoja de los cuervos y otros argumentos erróneos relacionados con la teoría de la confirmación de hipótesis. Si tenemos una hipótesis H y un conjunto de datos D , Hempel nos pide que imaginemos que no disponemos de ninguna otra información que pudiera alegarse en favor o en contra de H , al discutir si D confirma H . La paradoja de los cuervos, según Hempel, se debe a que se toma en cuenta información colateral. Pero la ficción que propone Hempel no puede justificarse. Goodman ha mostrado que no todas las hipótesis admiten la confirmación al través de sus ejemplificaciones. ("Esta esmeralda es verzul" no confirma "Todas las esmeraldas son verzules".) Cuando una hipótesis se confirma por sus ejemplos, Goodman nos dice que tenemos una hipótesis "proyectable". Pues bien, una de las cosas que tenemos que saber para poder concluir que D confirma H es que H es proyectable. Pero esto depende de factores ajenos a D . Luego, la teoría de la confirmación no puede atenerse a la ficción que propone Hempel. Sin embargo, Hempel tiene razón al afirmar que no podemos tomar en cuenta cualquier información colateral en la explicación de la confirmación de hipótesis. I. J. Good afirma que en ciertas circunstancias la existencia de un cuervo negro no confirma la hipótesis de que todos los cuervos del mundo son negros. Hempel muestra que el argumento de Good depende de que se tome en cuenta indebidamente alguna información colateral. Good no muestra que la existencia de un cuervo negro no confirme la hipótesis cuando éste sea el único dato considerado. " C es un cuervo negro" confirma la hipótesis aunque " C es un cuervo negro y D es un cuervo blanco" no la confirme.

Ahora bien, ¿cómo distinguir la información colateral legítima de la ilegítima? Una primera respuesta: la legítima está constituida por la información general que nos permite decidir si la hipótesis es proyectable; la ilegítima es la que podría alegarse en favor o en contra de cualquier hipótesis, una vez aceptado que es proyectable. Pero esta sugerencia es inadmisibile. De hecho, para decidir si una hipótesis es proyectable, tenemos que acudir a datos del mismo orden de los que podrían confirmar la hipótesis. Nuestra decisión de que "Todas las esmeraldas son verzules" no es proyectable se debe a que "Todas las esmeraldas son verdes" ha sido reiteradamente confirmada. Así, necesitamos apelar a oraciones de confirmación, que, por tanto, no pueden ser ilegítimas. Queda, pues, el problema de separar la información legítima de la ilegítima.

(Resumen de Hugo Margáin)