Hypothetico-Deductivism Is Hopeless

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DISCUSSION:

HYPOTHETICO-DEDUCTIVISM IS HOPELESS*

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An attractive and apparently indestructible idea about confirmation is that a hypothesis h is confirmed by evidence e if h is a logical consequence of e, or of h and the right sort of other stuff. This idea was advanced in various ways by Ayer (1936), Hempel (1965), Carnap (1959), and still recurs constantly in discussions of confirmation; recently for example, in Schlesinger (1976) and Horwich (1978). The typical modern version of the idea goes like this: a sentence h is confirmed by a sentence e with respect to a theory T if e is true and h & T is consistent and h & T entails e (hereafter, h & $T \vdash e$) but T does not entail e (hereafter, $T \nvdash e$).

The outstanding problems with an analysis of this kind are that, first, e can never confirm any consequence of T; second, if h is confirmed by e with respect to T, then so is h & A, where A is any sentence whatsoever that is consistent with h & T; and third, if e is true and not valid and S is *any* consistent sentence such that $\sim e \nvdash S$, then S is confirmed by e with respect to a *true* theory (namely $(S \rightarrow e)$).

The first difficulty might be tolerated were it not for the other two; together, they show that the popular account is untenable. Three responses seem possible: that nothing syntactic works (a view sometimes known as Hempel's theorem); that the hypothetico-deductive idea which the account embodies is hopelessly mistaken; or, finally, that the account is basically correct, but requires additional constraints so as to remove the second and third difficulties, as well as related problems. Logical syntax is not the villain, for logical semantics does no better for confirmation. I believe the second response is the only correct one, and that it is as great a mistake to abandon structural accounts of confirmation as it is to pursue the hypothetico-deductive phantasm. There is no way to argue for this belief save, on the one hand, to actually provide an alternative structural account of confirma-

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tion (which I have attempted in Glymour (1980)) and, on the other hand, to show that attempts to save the hypothetico-deductive idea by adding additional constraints only lead to other disasters. The latter can only be done case by case. Gary Merrill's recent essay in this journal (1979), entitled "*Confirmation and Prediction*," provides a new case.

Merrill's idea is a natural and plausible one: h will only be confirmed by e with respect to T if h cannot be divided into two strictly weaker sentences, k and l say, at least one of which is confirmed by e with respect to T. That is not only a natural idea, it is so natural that if it fails to work, one is hard-pressed to believe that anything plausible will. I claim that it does not even come close to working. Merrill's account is equivalent to the following:

> Let e, h and T be sentences. Then e *directly confirms* h on T if and only if either:
>
> 1. (i) $h \,\&\, T$ is consistent
>   (ii) $h \,\&\, T \vdash e$
>   (iii) $T \nvdash e$
>
>   and there do not exist sentences k, l, m such that:
>   (iv) $\vdash h \equiv k \,\&\, l$
>   (v) $k \nvdash h$
>   (vi) $l \nvdash h$
>   (vii) $m \nvdash h$
>   (viii) $\nvdash m \equiv l$
>   (ix) $k \,\&\, m \,\&\, T \vdash e$
>   (x) $k \,\&\, m \,\&\, T \nvdash p \,\&\, \sim p$
>
> or:
>
> 2. $e \vdash h$
>
> e *indirectly confirms* h on T if and only if there exists a sequence $k_1, \ldots, k_n$ of sentences such that $k_1 = e$, $k_n = h$ and for all i, k_i confirms k_{i+1} on T. e confirms h on T if and only if e directly confirms h on T or e indirectly confirms h on T.

I claim that, like any other attempt to make the hypothetico-deductive idea precise, this one is disastrous. The particular form of disaster is the following:

> e confirms h on T in virtue of 1 or 2 or the indirect confirmation clause only if $e \vdash h$.

Proof:

lemma: If e directly confirms h on T by clause 1 or 2, then $e \vdash h$.

We need prove the lemma only for clause 1. Let h, e, T satisfy (i), (ii), and (iii) above, and suppose that (*) $\nvdash h \equiv (T \rightarrow e)$. I claim that there exist k, l, m satisfying (iv) through (ix). Let k be $(T \rightarrow e)$; let l be $((T \rightarrow e) \rightarrow h$; let m be any tautology. Then $\vdash h \equiv k \& l$ from (ii) and the definitions of k and l, hence (iv) holds. $k \nvdash h$ because k is $(T \rightarrow e)$ and if $(T \rightarrow e) \vdash h$ then since $h \vdash (T \rightarrow e)$ by (ii), it follows that $\vdash h \equiv (T \rightarrow e)$, contradicting (*); thus (v) holds. $l \nvdash h$ because l is $((T \rightarrow e) \rightarrow h)$ and if $((T \rightarrow e) \rightarrow h) \vdash h$ then $\vdash ((T \rightarrow e) \rightarrow h) \rightarrow h$ and hence $\sim h \vdash \sim ((T \rightarrow e) \rightarrow h)$ and so $\sim h \vdash (T \rightarrow e) \& \sim h$, whence $\sim h \vdash (T \rightarrow e)$; but $h \vdash (T \rightarrow e)$ by (ii) and so $\vdash (T \rightarrow e)$, or equivalently $T \vdash e$, contradicting (iii); thus (vi) holds. (vii) holds because m is a tautology and by (ii) and (iii) h is not a tautology; for analogous reasons (viii) holds. Clause (ix) is immediate by *modus ponens* from the definition of k. (x) is obvious.

Thus if e directly confirms h on T by clause 1, then $\vdash h \equiv (T \rightarrow e)$. But $e \vdash (T \rightarrow e)$, and the lemma is proved.

The general claim is now immediate. For if e indirectly confirms h on T, then there is a sequence $k_1, \ldots, k_n$ such that $e = k_1$, $h = k_n$, and for all i, k_i directly confirms k_{i+1} on T. By the lemma, then, $k_i \vdash k_{i+2}$ and hence $e \vdash h$. End of proof.

Eliminating m from clause 1 will not help, for choosing m to be a tautology is the same as eliminating it. Requiring that m not be a tautology will not help either, since the proof will go through if m is *any* sentence such that $\nvdash m \equiv l$ and $m \nvdash h$ and m is consistent with $k \& T$.

The anonymous referee has proposed to me an obvious remedy to the problem with Professor Merrill's account, namely that the sentences k and l into which h is decomposed be an "atomisation of h in the sense that all four possibilities $\pm k \& \pm l$ be consistent." The sentences $(T \rightarrow e)$ and $((T \rightarrow e) \rightarrow h)$ used in my proof for k and for l, respectively, do not satisfy this additional condition, since when $(T \rightarrow e)$ is false, $((T \rightarrow e) \rightarrow h)$ cannot be false. The theorem I state remains true nonetheless. Let S be any sentence whose truth value is not uniquely determined by any assignment of truth values to the members of the set $[T, e, h]$. In the proof of the claim let k be $(T \rightarrow e)$ as before, and let l be $(S \rightarrow h) \& ((T \rightarrow e) \rightarrow h)$. Sentences k and l are now an "atomisation" of h, as required (provided $(T \rightarrow e)$ does not entail h), and $l \nvdash h$ because if $(S \rightarrow h) \& ((T \rightarrow e) \rightarrow h) \vdash h$ then $\sim h \vdash S \vee (T \rightarrow e)$ and, since h entails $(T \rightarrow e)$, $\vdash S \vee (T \rightarrow e)$, which requires that S be true when T is true and e is false, contradicting the assumption governing the choice of S. The proof goes through, with these observations, much as above.

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