SPIELMAN AND LEWIS ON INDUCTIVE IMMODESTY*

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An inductive method $\mathbf{C}_\lambda$ in the λ-system of Carnap [1] is *immodest*, on evidence *e*, iff its estimate, on *e*, of its own accuracy is higher than its estimate, on *e*, of the accuracy of any rival method $\mathbf{C}_{\lambda'}$. Immodesty seems to be a condition of stable trust: if you trusted a modest $\mathbf{C}_\lambda$, you should start by trusting its advice to replace it by a rival that it estimates to be more accurate. One might guess that any $\mathbf{C}_\lambda$ would be immodest on any evidence. But in [2] I proved that, under a certain accuracy measure taken from Carnap [1], §§ 20–21, there would be exactly one immodest $\mathbf{C}_\lambda$. Unfortunately, that one sometimes turns out to be $\mathbf{C}_0$ (the straight rule); and since nobody in his right mind would trust $\mathbf{C}_0$ we are then left with *no* acceptable $\mathbf{C}_\lambda$. Stephen Spielman [3] has proposed a remedy: an estimate of accuracy, on evidence *e*, should disregard accuracy under circumstances that are ruled out by *e*. Spielman proves that if this change is made, any $\mathbf{C}_\lambda$ is immodest on any evidence.

But Spielman forbears to mention that his remedy is exactly the one that I considered in the next-to-last paragraph of [2], and there rejected for a reason that turns out to be a bad one. So it is up to me to explain why it is that Spielman's remedy *does* succeed, despite what I said.

What if *e* is null evidence: a sample of size zero? Then *e* does not rule out any circumstance whatever, so Spielman's remedy makes no difference. But the case of null evidence is one of the cases in which I had proved that $\mathbf{C}_0$ alone is immodest. So I wrote of the remedy that Spielman has now endorsed: "This change might be appropriate on other grounds, but it will not solve our difficulty: $\mathbf{C}_0$ is still uniquely immodest [on null evidence]" ([2], p. 63).

Since the remedy makes no difference in the case of null evidence, Spielman's results and mine seem to be in flat contradiction, casting doubt on both. He has proved that every $\mathbf{C}_\lambda$ is immodest on null evidence; I proved that none but $\mathbf{C}_0$ are. But the discrepancy is explained away if we keep track of the different approximations used by Spielman and myself. Approximations are not innocent here—not even if they become as good as you please in a large enough universe. If $\mathbf{C}_\lambda$ estimates $\mathbf{C}_{\lambda'}$ to be the most accurate method, then $\mathbf{C}_\lambda$ is immodest iff $\lambda' = \lambda$ exactly. An approximation that turns this exact equality into an approximate equality for all but one $\mathbf{C}_\lambda$ will radically distort the outcome. My approximations cause just such distortion, in the case of null evidence. Spielman's do not.

Carnap proposes in [1], §§ 20–21, that the (in)accuracy of a method may be measured by its mean square error in estimating relative frequencies of *Q*-properties on the basis of samples of a fixed (arbitrarily chosen) size. Call this accuracy-measure $\mathbf{A}*$. But since $\mathbf{A}*$ itself is mathematically intractable, Carnap derives a

* Received February, 1973.

convenient approximation to A*, given in his equation (21-3), by using two large-universe approximations. (He mentions the first on page 58, lines 7–8, and the second on page 62, lines 25–27.) Call this second accuracy-measure A. In practice, Carnap uses A as a substitute for A*. So did I. What I proved in [2] is that C_0 alone is immodest, on null evidence, under A. (I stated explicitly that I was working with A rather than A* itself.) It is harder to tell just what Spielman has proved in [3], since there is a suspect large-universe approximation within his proof (see his footnote 2). But when we get rid of this approximation, as is easily done, we are left with an exact proof that every C_λ is immodest, on null evidence, not under A but under A*. This result does not contradict mine. But Spielman's result is philosophically significant and mine is not, since the accuracy-measure A is unmotivated except as a convenient approximation to A*.

My results about A stand, for what they are worth. But there is one outright falsehood in [2]: on page 62 I wrote that it would not help to use "an exact expression for mean square error" in place of A, since we would get the same unwelcome conclusion that C_0 is uniquely immodest on null evidence. The "exact expression" I had in mind was not fully exact; it is obtained by removing the first but not the second of the two large-universe approximations that took Carnap from A* to A. It would indeed help to use the fully exact A*, as Spielman's proof shows.

To conclude: the difficulty of the unique immodesty of C_0 on null evidence does not arise until A is substituted for A*, wherefore we cannot disparage Spielman's remedy for failing to solve this nonexistent difficulty.

REFERENCES

[1] Carnap, R. *The Continuum of Inductive Methods.* Chicago: University of Chicago Press, 1952.
[2] Lewis, D. "Immodest Inductive Methods." *Philosophy of Science* 38 (1971): 54–63.
[3] Spielman, S. "Lewis on Immodest Inductive Models." *Philosophy of Science* 39 (1972): 375–377.