

Philosophy 148 — Announcements & Such

- Branden will have office hours on Tuesday May 13 from 2-4.
- Raul will have a review for the final on Thurs. 5/15 @ 6pm (room TBA).
- Before next Tuesday, I will distribute some extra-credit problems (which will be due at the final). These will be worth 100 homework points.
- The final exam is **Tuesday, May 20 @ 8am @ 20 Barrows**.
 - I will hold a review session for the final exam — the day before the final (May 19). It will take place **May 19 @ 4-6pm @ 122 Wheeler**.
 - Before next Tuesday, I will be distributing a “sample” final exam.
- Today's Agenda
 - The Grue Paradox (aftermath — and consequences for IL and IE)
 - Farewell
 - Course Evaluations

“Carnapian” Counterexamples to (NC) and (M)

- (K) Either: (H) there are 100 black ravens, no nonblack ravens, and 1 million other things, or ($\sim H$) there are 1,000 black ravens, 1 white raven, and 1 million other things.
- Let $E \stackrel{\text{def}}{=} Ra \ \& \ Ba$ (a randomly sampled from universe). Then:

$$\Pr(E \mid H \ \& \ K) = \frac{100}{1000100} \ll \frac{1000}{1001001} = \Pr(E \mid \sim H \ \& \ K)$$
- \therefore This K/\Pr constitute a counterexample to (NC), assuming a “Carnapian” theory of confirmation. This model can be emulated in the later Carnapian λ/γ -systems [13].

- Let $Bx \stackrel{\text{def}}{=} x$ is a black card, $Ax \stackrel{\text{def}}{=} x$ is the ace of spades, $Jx \stackrel{\text{def}}{=} x$ is the jack of clubs, and $K \stackrel{\text{def}}{=} a$ is sampled at random from a standard deck (where \Pr is also standard):
 - $\Pr(Aa \mid Ba \ \& \ K) = \frac{1}{26} > \frac{1}{52} = \Pr(Aa \mid K)$.
 - $\Pr(Aa \mid Ba \ \& \ Ja \ \& \ K) = 0 < \frac{1}{52} = \Pr(Aa \mid K)$.

A “Carnapian” Counterexample to (\ddagger)

- (K) Either: (H_1) there are 1000 green emeralds 900 of which have been examined before t , no non-green emeralds, and 1 million other things in the universe, or (H_2) there are 100 green emeralds that have been examined before t , no green emeralds that have not been examined before t , 900 non-green emeralds that have not been examined before t , and 1 million other things.
- Imagine an urn containing true descriptions of each object in the universe ($\Pr \stackrel{\text{def}}{=} \text{urn model}$). Let $\mathcal{E} \stackrel{\text{def}}{=} “Ea \ \& \ Oa \ \& \ Ga”$ be drawn. \mathcal{E} confirms H_1 but \mathcal{E} disconfirms H_2 , relative to K :

$$\Pr(\mathcal{E} \mid H_1 \ \& \ K) = \frac{900}{1001000} > \frac{100}{1001000} = \Pr(\mathcal{E} \mid H_2 \ \& \ K)$$
- This K/\Pr constitute a counterexample to (\ddagger), assuming a “Carnapian” theory of confirmation. This probability model can be emulated in the later Carnapian λ/γ -systems [13].

Is “Grue” an Observation Selection Effect? Part I

- Canonical Example of an OSE:** I use a fishing net to capture samples of fish from various (randomly selected) parts of a lake. Let E be the claim that all of the sampled fish were over one foot in length. Let H be the hypothesis that all the fish in the lake are over one foot $[(\forall x)((Fx \ \& \ Lx) \supset O x)]$.
- Intuitively, one might think E should evidentially support H . This may be so for an agent who knows *only* the above information (K) about the observation process. That is, it seems plausible that $\Pr(E \mid H \ \& \ K) > \Pr(E \mid \sim H \ \& \ K)$, where \Pr is taken to be “evidential” (or “epistemic”) probability.
- But, what if I *also* tell you that (D) the net I used to sample the fish from the lake (which generated E) has holes that are all over one foot in diameter? It seems that D *defeats* the support E provides for H (relative to K), because D *ensures* O . Thus, intuitively, $\Pr(E \mid H \ \& \ D \ \& \ K) = \Pr(E \mid \sim H \ \& \ D \ \& \ K)$.

Is “Grue” an Observation Selection Effect? Part II

- Note: the “grue” hypothesis (H_2) entails the following claim, which is not entailed by the green hypothesis (H_1):

(H') All green emeralds have been (or will have been) examined prior to t . $[(\forall x)((Ex \ \& \ Gx) \supset O x)]$.
- Now, consider the following two observation processes:
 - Process 1.** For each green emerald in the universe, a slip of paper is created, on which is written a true description of that object as to whether it has property O . All the slips are placed in an urn, and one slip is sampled at random from the urn. By *this* process, we learn (\mathcal{E}) that $Ea \ \& \ Ga \ \& \ Oa$.
 - Process 2.** Suppose all the green emeralds in the universe are placed in an urn. We sample an emerald (a) at random from this urn, and we examine it. [We know *antecedently* that the examination of a will take place prior to t , i.e., that Oa is true.] By *this* process, we learn (\mathcal{E}) that $Ea \ \& \ Ga \ \& \ Oa$.
- Goodman seems to presuppose Process 2 in his set-up.

What Could “Carnapian” Inductive Logic Be? Part I

- The early Carnap dreamt that probabilistic inductive logic (confirmation theory) could be formulated in such a way that it *supervenes* on deductive logic in a *very strong* sense.
 - **Strong Supervenience (SS)**. All confirmation relations involving sentences of a first-order language \mathcal{L} supervene on the deductive relations involving sentences *of* \mathcal{L} .
- Hempel clearly saw (SS) as a *desideratum* for confirmation theory. The early Carnap also seems to have (SS) in mind.
- I think it is fair to say that Carnap’s project — understood as requiring (SS) — was unsuccessful. [I think *this* is true for reasons that are *independent* of “grue” considerations.]
- The later Carnap seems to be aware of this. Most commentators interpret this shift as the later Carnap simply *giving up* on inductive logic (*qua logic*) altogether.
- I want to resist this “standard” reading of the history.

What Could “Carnapian” Inductive Logic Be? Part II

- I propose a different reading of the later Carnap, which makes him much more coherent with the early Carnap.
- I propose *weakening* the supervenience requirement in such a way that it (a) ensures this coherence, and (b) maintains the “logicality” of confirmation relations in Carnap’s sense.
- Let \mathcal{L} be a formal language strong enough to express the fragment of probability theory Carnap needs for his later, more sophisticated confirmation-theoretic framework.
 - **Weak Supervenience (WS)**. All confirmation relations involving sentences of a first-order language \mathcal{L} supervene on the deductive relations involving sentences *of* \mathcal{L} .
- As it turns out, \mathcal{L} needn’t be very strong (in fact, one can get away with PRA!). So, even by early (*logician*) Carnapian lights, satisfying (WS) is all that is *really* required for “logicality”.
- The specific (WS) approach I propose takes confirmation to be a *four-place* relation: between E , H , K , and a function Pr .

What Could “Carnapian” Inductive Logic Be? Part III

- Consequences of moving to a 4-place confirmation relation:
 - We need not try to “construct” “logical” probability functions from the syntax of \mathcal{L} . This is a dead-end anyhow.
 - Indeed, on this view, inductive logic has nothing to say about the *interpretation/origin* of Pr . That is *not* a *logical* question, but a question about the *application* of logic.
 - Analogy: Deductive logicians don’t owe us a “logical interpretation” of the truth value assignment function v .
 - Moreover, this leads to a vast increase in the *generality* of inductive logic. Carnap was stuck with an impoverished set of “logical” probability functions (in his λ/γ -continuum).
 - On my approach, *any* probability function can be part of a confirmation relation. Which functions are “suitable” or “appropriate” or “interesting” will depend on *applications*.
 - So, some confirmation relations will not be “interesting”, *etc*. But, this is (already) true of *entailments*, as Harman showed.
 - Questions: Now, what *is* the job of the inductive logician, and how (if at all) do they interact with *epistemologists*?

What Could “Carnapian” Inductive Logic Be? Part IV

- The inductive logician must explain how it is that inductive logic can satisfy the following Carnapian *desiderata*.
 - The confirmation function $c(H, E | K)$ quantifies a *logical* (in a Carnapian sense) relation among statements E , H , and K .
 - (\mathcal{D}_1) One aspect of “logicality” is ensured by moving from (SS) to (WS) [from an \mathcal{L} -determinate to an \mathcal{L} -determinate concept].
 - (\mathcal{D}_2) Another aspect of “logicality” insisted upon by Carnap is that $c(H, E | K)$ should *generalize* the entailment relation.
 - This means (at least) that we need $c(H, E | K)$ to take a maximum (minimum) value when $E \& K \models H$ ($E \& K \models \sim H$).
 - Very few *relevance* measures c satisfy this “generalizing \models ” requirement. That’s another job for the inductive logician.
 - (\mathcal{D}_3) There must be *some* interesting “bridge principles” linking c and *some* relations of evidential support, in *some* contexts.
 - (\mathcal{D}_2) implies that *if* there are any such bridge principles linking *entailment* and *conclusive evidence*, these should be *inherited* by c . This brings us back to Harman’s problem!

Three Salient Quotes from Goodman [7]

☞ The “new riddle” is *about inductive logic (not epistemology)*.

Quote #1 (page 67): “Just as deductive logic is concerned primarily with a relation between statements — namely the consequence relation — that is independent of their truth or falsity, so inductive logic ... is concerned primarily with a comparable relation of confirmation between statements. Thus the problem is to define the relation that obtains between any statement S_1 and another S_2 if and only if S_1 may properly be said to confirm S_2 in any degree.”

Quote #2 (73): “Confirmation of a hypothesis by an instance depends ... upon features of the hypothesis other than its syntactical form”.

☞ But, Goodman’s *methodology* appeals to *epistemic* intuitions.

Quote #3 (page 73): “... 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.”