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:

$$\Pr(E \mid H \,\&\, K) = \frac{100}{1000100} \ll \frac{1000}{1001001} = \Pr(E \mid \sim H \,\&\, K)$$

- ∴ 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 card 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 (‡)

(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 $\stackrel{\text{def}}{=}$ urn model). Let $\mathcal{E} \stackrel{\text{def}}{=}$ "$Ea \,\&\, Oa \,\&\, Ga$" be drawn. $\mathcal{E}$ confirms H_1 but $\mathcal{E}$ *dis*confirms 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 (‡), 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 $[(\forall x)((Fx \,\&\, Lx) \supset Ox))]$.
- 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. $[(\forall x)((Ex \,\&\, Gx) \supset Ox))]$.
- 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*** $\boldsymbol{\mathcal{L}}$.
- 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 $\mathfrak{L}$ 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*** $\mathfrak{L}$.
- As it turns out, $\mathfrak{L}$ needn't be very strong (in fact, one can get away with PRA!). So, even by early (*logicist*) 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 $\mathfrak{c}(H, E \mid K)$ 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 $\mathfrak{L}$-determinate concept].

    ($\mathcal{D}_2$) Another aspect of "logicality" insisted upon by Carnap is that $\mathfrak{c}(H, E \mid K)$ should *generalize* the entailment relation.

    - This means (at least) that we need $\mathfrak{c}(H, E \mid K)$ to take a maximum (minimum) value when $E \,\&\, K \vDash H$ ($E \,\&\, K \vDash \sim H$).
    - Very few *relevance* measures $\mathfrak{c}$ satisfy this "generalizing $\vDash$" requirement. That's another job for the inductive logician.

  ($\mathcal{D}_3$) There must be *some* interesting "bridge principles" linking $\mathfrak{c}$ 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* $\mathfrak{c}$. 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."