

## Probability, Counterfactuals & Causation

- Administrative Stuff
  - Course Website — All course materials are on-line
  - Seminar Usenet Discussion Group + In-Class Discussions
  - Term Paper — One (approximately) 5,000 word essay
- Brief Overview of Course Material
  - (Humean) Regularities and Causation (1 week)
  - Counterfactuals and Causation (2 weeks)
  - Probability and Causation (3 weeks)
  - Structural Equations, Graphs, and Causation (4 weeks)
  - Progress in this progression?
  - Hopefully, some guest speakers (Suppes, perhaps others).
- Begin Talking about “Humean Causation”

## Administration I: Course Website

- All (requisite) Course Materials are on the Website:
 

<http://philosophy.wisc.edu/fitelson/269/>  
or  
Just type ‘phil269’ in your browser ...
- In particular, the *Syllabus Page* contains a schedule
 

<http://philosophy.wisc.edu/fitelson/269/syllabus.htm>

 as well as all required (and almost all optional) readings.
- **You do not need to buy any reading materials for the course.**
- There are also lots of interesting **links** to explore.
- The seminar will make fairly heavy use of the web (including email) as a means to facilitate discussion and to distribute information. If this presents a problem for you, please see me immediately.
- **Class Roster:** Please submit electronic pictures (camera anyone?).

## Administration II: Seminar Usenet Discussion Group

- The seminar has a Usenet discussion group, at: `su.class.phil269`.
- Use of `su.class.phil269` is *mandatory* for enrollees. Each week (by Monday noon), students must post a question to the newsgroup. And, student(s) must lead an in-class (Thursday) discussion once during the quarter.
- Discussion leaders will be responsible for summarizing and organizing the questions posted the newsgroup, and, where appropriate, for sketching some answers to the posted questions.
- Presentations of discussion leaders should take about 15 minutes.  $\frac{1}{8}$  of quarter grade: web postings and discussion leadership,  $\frac{1}{8}$  contributions to seminar discussions,  $\frac{3}{4}$  term paper. See *Syllabus Page* for details & schedule.
- See the website for links to instructions for Usenet. Here are some tips on etiquette and technique for postings (see also my first posting).

- First: The newsgroup is only for discussion of the readings and content of the course — it is not to be used for administrative or social purposes. I will use email and the website to disseminate announcements, materials, information etc.
- I recommend that you compose your message in your word processor or text editor offline, save a copy on your hard drive, and then copy and paste into the dialog box when you are online.
- Stick to a single point in single message. If you have more than one point to raise, then post more than one message.
- Do a thorough and careful job in composing messages. You should go through several drafts just as you do in writing an essay (that’s one reason you should compose it offline).
- Keep it short and concise. Think long and hard about how to make your point, or raise your question, in a simple and clear way. You should spend twice as long and make it half the length.

- However, you should not skimp on words when it leads to vagueness and ambiguity. Try to make the message as self-contained as possible, even if it is threaded to another message. Also, try to make it understandable to someone who has not read exactly the same articles as you have. That is, it should be easily understood by well-trained philosophers outside of our class.
- It's okay to hedge your claims. Instead of saying "Branden is wrong when he says ...", it's better to say: "There is a point at which I find Branden's argument hard to understand. Is the following example a counterexample to his claim that ..., or am I misunderstanding the claim?"
- Try not to make it personal. We are not refuting people. Instead of saying "Branden is wrong" how about saying "One premise in Branden's argument has an important exception", or "The argument that Branden used has a missing premise, which is false in the present context." Or better still, leave me out of it altogether. Our concern is with the arguments, not the people who invented them.

### Administration III: Term Paper

- In addition to participation in class, and participation in the course newsgroup, students will be required to write one term paper for the seminar.
- The papers should be around 5,000 words. One should aim for concise, analytical pieces which focus on a relatively small set of issues and arguments.
- The papers will be **due March 20** (end of exam period).
- Students should aim to settle on paper topics **no later than February 20**, and students should try to discuss possible topics with me in advance, so that we can circumscribe a clear project.
- Feel free to write short papers along the way, to get feedback from me. I'm always happy to read and comment on drafts.
- Please try not to leave term papers to the last-minute ...

### Brief Overview of Course Material

- Week 1: Humean Causation (Hume's Theory of)
  - *Enquiry*, sections 1 – 7
  - Hausman's *Causal Asymmetries*, Chapter 3
  - Irzik's recent paper "Three Dogmas of Humean Causation"
- Week 2: Counterfactuals and Causation (Lewis)
  - Menzies' SEP survey "Counterfactual Theories of Causation"
  - Lewis' "Causation"
  - Lewis' "Causation as Influence"
- Week 3: A Few Problems for Counterfactual Accounts
  - Hall's "Two Concepts of Causation" (transitivity)
  - Hausman's *Causal Asymmetries*, Chapter 6 (symmetry)
  - Menzies' "Probabilistic Causation and the Pre-emption Problem" (pre-emption)

- Week 4: Probability and its Objective Interpretation
  - Pearl's *Causality*, chapter 1 (introduction to probability theory)
  - Eells' "Objective Probability Theory Theory"
- Week 5: Type *versus* Token Probabilistic Causation
  - Hitchcock's SEP survey "Probabilistic Causation"
  - Sober's "Two Concepts of Cause"
  - Hitchcock's "The Mishap at Reichenbach Fall"
- Week 6: Type-Level Probabilistic Causation
  - Cartwright's, "Causal Laws and Effective Strategies"
  - Salmon's "Probabilistic Causality"
  - Hitchcock's "A Generalized Theory of Probabilistic Causal Relevance"
- Weeks 7–10: Structural Equations, Graphs, and Causation
  - Papers by Pearl, Woodward, Hausman, Hitchcock, Cooper, Cartwright, Spohn, and perhaps others ...
  - Technical innovations and perhaps even philosophical progress?

## Humean and Neo-Humean Causation: Rough Sketch

- We begin with Hume's discussion of causation, not only because of its historical significance, but because many of the problems facing contemporary theories of causation also plagued Hume's theory.
- I will follow, and discuss, Hausman's development in chapter 3 of *Causal Asymmetries*.
- Hume's (metaphysical) account of causation, understood as a relation between event *tokens*, is (roughly):
  - When  $a$  causes  $b$ , "events similar to  $a$ " are invariably followed by "events similar to  $b$ ."
- The way Humeans typically unpack this slogan is by appeal to *regularities* (or *laws*) of the form  $(\forall x)(Ax \rightarrow Bx)$ , where  $a$  instantiates  $A$  and  $b$  instantiates  $B$ .
- This presupposes that  $A$  and  $B$  capture the relevant senses of "similar to  $a$ " and "similar to  $b$ " (*i.e.*, they pick out the right *tropes*).

- Even if it is granted that we have identified the relevant senses of "similarity", we still face the problem that the relation between cause and effect seems not to be strictly invariable. [Turning the switch causes the bulb to light, but the bulb does not always light when the switch is turned.]
- One move to make at this point is to give up determinism as a feature of the causal relation. One could, for instance, move to a probabilistic account of causation [*i.e.*, 'smoking causes cancer' merely asserts that smoking raises the probability of cancer].
- Hume does *not* make this move. Instead, he suggests that in such cases we have misidentified the cause — we have only identified "part of" the cause. Many neo-Humeans have worked hard to try to be more precise about what this could mean.
- Mackie (in *The Cement of the Universe*) suggests that in such cases we have identified an INUS condition for the effect: "an insufficient but nonredundant part of an unnecessary but sufficient condition" for the effect. This requires a little clarification!

- Mackie then makes a distinction between causes and effects on the one hand, and the "causal field" in which they operate on the other. Then, he gives a formal (second-order) definition of INUS condition:
  - $A$  is an INUS condition for  $B$  in causal field  $F$  iff for some  $G$  and for some  $H$ , all  $F(AG \vee H)$  are  $B$  and all  $FB$  are  $(AG \vee H)$ .
- On Hausman's reconstruction,  $G$  ranges over "conjunctions of" causal factors, and  $H$  ranges over "disjunctions of conjunctions of" them.
- Apparently, the idea here is supposed to be that  $G$ , together with  $A$ , make up a "minimal sufficient condition for  $B$ " (in  $F$ ) in the sense that "none of the conjuncts" of  $AG$  is redundant.
- This part of Hausman's analysis is unclear to me. He argues that the  $A$  and  $B$  must be *properties* (not propositions or event tokens). But, then, he talks about "conjunctions" and "disjunctions" which seem to be collections of *predicates*. Doesn't the decomposition of something into "conjuncts" depend on what language we express things in? Then, isn't this reconstruction of INUS language variant?

- Two problems for the INUS reconstruction of Humean causation:
  - $A$  could *accidentally* be an INUS condition for  $B$ . Suppose that a coin is flipped only twice before it is melted down, and it lands heads both times. So, in the circumstances, tossing the coin is necessary and sufficient for the coin to land heads. INUS conditions linking cause and effect must be "nomological" or "lawlike".
  - INUS conditions exhibit an undesirable symmetry. There are nomological connections (in standard circumstances  $F$ ) between the height of a flagpole  $h$ , the length of its shadow  $s$ , and the angle of elevation of the sun  $a$ . The value of  $a$  is INUS for the value of  $s$  in  $F$ , and this does correspond to an intuitive "necessary connection." But, the value of  $a$  is also INUS for the value of  $h$  in  $F$ . This does *not* correspond to an intuitive "necessary connection."
- The first problem can be addressed by requiring a *modal* relationship (not just material bi-implication) in INUS.
- The second seems unavoidable, and indicates that INUS is, at best, a necessary condition for the existence of a "necessary connection."