S. Siriwardena
Analytic B

CAUSATION & MANIPULATIONISM

Agency and Effective Strategies

A. Cartwright – "Causal Laws and Effective Strategies"

"I claim that causal laws cannot be done away with, for they are needed to ground the distinction between effective strategies and ineffective ones" (420)

Cartwright's characterisation of causation

> *C causes E* if and only if *C* increases the probability of *E* in every situation which is otherwise causally homogeneous with respect to *E*.
>
> Carnap's [3] notion of a state description can be used to pick out the causally homogeneous situations. A complete set of causal factors for *E* is the set of all C_i such that either $C_i \rightarrow +E$ or $C_i \rightarrow -E$. (For short $C_i \rightarrow \pm E$.) Every possible arrangement of the factors from a set which is complete except for *C* picks out a population homogeneous in all causal factors but *C*. Each such arrangement is given by one of the 2^n state descriptions $K_j = \bigwedge \pm C_i$ over the set $\{C_i\}$ (*i* ranging from 1 to n) consisting of all alternative causal factors. These are the only situations in which probabilities tell anything about causal laws. I will refer to them as *test* situations for the law $C \rightarrow E$.
>
> Using this notation the connection between laws of association and causal laws is this:
>
> *CC*: $C \rightarrow E$ iff $P(E/C.K_j) > P(E/K_j)$ for all state descriptions K_j over the set $\{C_i\}$, where $\{C_i\}$ satisfies
> (i) $C_i \in \{C_i\} \Rightarrow C_i \rightarrow \pm E$
> (ii) $C \notin \{C_i\}$
> (iii) $\forall D\ (D \rightarrow \pm E \Rightarrow D = C \text{ or } D \in \{C_i\})$
> (iv) $C_i \in \{C_i\} \Rightarrow \neg(C \rightarrow C_i)$.

Conditions (i) – (iv)

(i) All the members of $\{C_i\}$ causally influence E
(ii) C is not one of the causal factors in $\{C_i\}$
(iii) Anything (other than C) that causally influences E is in $\{C_i\}$
(iv) None of the causal factors in $\{C_i\}$ are effects of C

Cartwright's characterisation, (imprecisely) rephrased

- First, determine causal factors in the set $\{C_i\}$ according to (i)-(iv)
- Create a state description (i.e. a description of the background conditions) for every possible combination of causal factors in $\{C_i\}$
- C causes E iff C raises the probability of E in ALL of those state descriptions

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Simpson's Paradox and Why it Matters

We know that smoking causes heart disease. We also know that exercise prevents heart disease (i.e. causes one not get heart disease). Suppose (for the sake of the example) that most smokers exercise daily. Suppose also that the causal influence of exercise is stronger than the causal influence of smoking.

Moral: background conditions make a difference to probability-raising relationships.

Question: What do I consider when I am trying to decide what to do? Probability-raising relationships, or causal relationships?

According to Cartwright, you must consider causal relationships. And these *cannot* be reduced to probability-raising relationships.

Suppose for reductio that an action is an effective strategy iff it raises the probability of the desired outcome. In this case, smoking is an effective strategy for preventing heart disease in the example we sketched. But, smoking is *not* an effective strategy for preventing heart disease. Therefore, not all actions that raise the probability of the desired outcome are effective strategies.

Circularity?

Notice that Cartwright's refers to causation on both sides of her 'definition'. For this reason her account cannot be *reductive*. This is not an analysis of causation in terms of probability.

But neither is the account viciously circular. This is because it does not appeal to the causal relationship between C and E in order to characterise what it is for C to cause E.

Question to think about: What is the metaphysical upshot?

B. Price – "Agency and Probabilistic Causality"

"[…] a probabilistic account of causation is well able to evade the worst of the problems [it's standardly taken to face] provided that it invokes the notions of agency and effective strategy" (158)

Coco and the Mars Bar

In the case Price describes, the background facts are these: eating chocolate does not cause migraines; a pre-migrainous state (PMS) causes migraines; PMS causes chocolate consumption. (Further, let's assume that PMS raises the probability of its effects.) Against this backdrop, Coco—who loves chocolate—is deciding whether or not to eat a Mars Bar. A problem seems to arise: if Coco reasons strictly probabilistically, they should choose not to eat the chocolate, because eating the chocolate raises the probability of having a migraine. But, this seems irrational, since eating chocolate doesn't cause migraines.

Agent Probabilities

In his answer to the Mars Bar problem, Price argues that Coco's deliberations about which action to perform (eat or not-eat) themselves provide the solution. He explains that eating chocolate only raises the probability of getting a migraine when eating chocolate was caused by PMS (and conversely, not eating chocolate only raises the probability of not getting a migraine if the lack of PMS caused the failure to eat chocolate). But, in deliberating about what to do, Coco is deciding whether or not to eat chocolate based on their other beliefs (namely, based on their belief that eating chocolate raises the probability of getting a migraine). If Coco decides not to eat the chocolate, then the failure to eat chocolate will have been caused by their belief, and not caused by PMS. In this situation, the correlation between chocolate-eating and migraines disappears.

From this, Price concludes that the conditional probabilities relevant to effective strategies (and, eventually, causation) are *agent probabilities*: conditional probabilities, where the condition is conceived of as brought about by a free agent.

So, in the Mars Bar case, the conditional probability of getting a migraine given that you eat chocolate is greater than if you don't eat chocolate; however, the conditional probability of getting a migraine given that a free agent decides to eat chocolate is no greater than if the agent decided otherwise.

Price agrees with Cartwright that causes mark the difference between effective and ineffective strategies. But he does so because he thinks that we can characterise causation in terms of effective strategies (and so in terms of agent probabilities).

"From the agent's point of view probabilistic relevance and causal relevance cannot diverge" (169)