What is it for event $e_1$ to cause event $e_2$? Explain and discuss the regularity theory, the conditional theory, and the natural necessity theory.

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The role that causality plays in our understanding of the world is immense. It is through the concept of causality that we are able to synthesize our visual experience and create a narrative for ourselves. It stands to reason that analyzing the structure and composition of what we treat as causality and causation will give us more information on the structure of the world. This essay will explore various theories of causation, starting from Hume’s regularity theory and discussing other conceptions of causations such as counterfactual causality and a natural necessity approach.

1 Hume’s Theory of Causality

Hume begins by stating the straightforward claim that we all have a concept of causality. The question to investigate is how exactly we come to have this notion and what exactly the notion of causality is in the first place. To start with, Hume discusses single impressions. A single impression is the easiest case to deal with, because it is impossible to create any sort of causal relationship from a single event. The first time we experience a completely new thing we can make no claims at all as to what sort of thing might come next. We simply have no framework or expectations whatsoever. All we can learn from our senses are the physical properties that will not help us in our causal aims, for “these qualities are all complete in themselves, and never point out at any other event which may result from them.” (Inquiry 7:1) However, he then moves on to make the much stronger claim that no matter how many times we get multiple impressions of events, we cannot extrapolate out to create new ones. If we were to watch for a few days endless games of billiards, we would soon enough gather a very large set of “ball striking ball” experiences. We would learn that a ball striking another ball in all of these cases has resulted in the other ball quickly rolling away. However, Hume insists, we have no rational basis for saying that all balls must move away when struck. We can simply point out that it has done so at all previous opportunities, but nothing in our physical inspection of the situation can lead us to empirically predict the consequent motion of a struck ball. The problem here is in making rational assumptions, because we must find some physical basis from which to state our claim that the ball that is struck will move. But, unable to find one, “we only learn by experience the frequent Conjunction of objects, without being ever able to comprehend anything like Connexion between them.” (Inquiry, 7:1).

As we cannot find any reason for causation in our experience, we are forced to look elsewhere. What remains to be investigated is the mind, and it is here that Hume rests. For Hume, the locus of causation is the imagination. It is our mind that gets used to seeing a pair of events occur in sequence, and after many repetitions on seeing the first event it will move on by itself onto the imagined successor. The mind develops a habit, and begins to expect a certain event to follow another one. In other words, a connection between the two events is felt.

Hume’s theory, by taking a strict view of what we can and cannot learn from experience, is open to some criticism. First, Kant famously rejected Hume’s position on causality, and pointed out that his philosophy of causality is really the same as the problem of a priori synthetic judgements, which form one of the foundations for his whole philosophy. However, a discussion of Kant’s full response to Hume is out of the scope of this paper and will for now be put aside. Another objection, brought up by Anscombe, is that the way in which Hume sets up his “search” for causality in the physical realm is flawed. He claims that in the very setup of the search he excludes that which he does not find—a “reason” for causality. For example, in the billiard ball example, if we are to not take causality for
granted but rather seek it in experience, should we not describe our visual sensation as a sequence of red splotches on a green background with the red splotch in a slightly different place each time? In Hume’s explanation he carefully sets aside our notion of causality when it comes to a ball hitting another ball, but is willing to accept the causality of a ball moving in a straight line. Furthermore, our own language is in many ways tied up with causal concepts. Many verbs, such as “throw,” “jump,” “bend,” all contain within them a causal relationship that we use naturally in our lives (Anscombe, 1993). Hume here would respond that these concepts merely reference our imagination, and that we have learned them through experience to be correlated with other acts—much in the same way as causality is imagined.

2 Natural necessity

A theory of causality that is based on natural necessity takes a completely opposing view to a Humean regularity theory. This causality is rooted in the idea that there are certain events that will necessarily arise out of their causes, due to the state of the world and the functioning of nature. An argument for natural necessity is one that attempts to involve an understanding of the world as a basis of a cause preceding an effect. If there were a man in a wooden house, smoking a cigarette, and this man then tossed the lighted cigarette onto a pile of dry newspapers, someone who believed in natural necessity would be able to state that this will cause the house to start burning. For Hume, this is a claim that we are simply not allowed to make as nothing in our experience tells us that this is what will happen. In its most basic form, natural necessity requires belief of a certain state of things, while Humean regularity theory assumes nothing and attempts to proceed simply from what is experienced.

I think that natural necessity asks too much of us, and that we cannot hold blind beliefs about the functioning of nature that may or may not be true. While Hume completely discredits natural necessity because it poses even the smallest demands on knowledge outside direct experience, I think we should at least hold sceptical the notion of how nature works. For there is no logical contradiction in the man in the house tossing his cigarette on a stack of newspapers and nothing happening—in fact, we could possibly even imagine a situation where this is so. So an analysis that takes this approach seems to me to be misleading.

3 A Counterfactual approach

A newer approach to analyzing causality stems from the second definition that Hume gives to causality. He alternatively defines a cause as an event “Where, if the first object had not been, the second never had existed.” (Inquiry 7:2) This takes a completely different approach to the problem, because now for an event to be a cause it must be necessary but not sufficient for an event to occur. David Lewis defines causality in terms of counterfactual conditionals, that is, in the form “If it were the case that A, then it would be the case that C.” (He symbolizes this as $A \square \rightarrow C$) Lewis uses the comparative similarity of possible worlds in his account of counterfactuals. A counterfactual conditional is true iff either the antecedent is false in all possible worlds, or the world in which both A and C are true is closer to our actual world than a world in which A is true but C is not. The first possibility is the vacuously true option, as we are then talking about a conditional with a false antecedent. However the second possibility does all the work—it “makes more sense” (or the world is closer to ours) that C be true when A is true than C not being true when A is true. So $A \square \rightarrow C$ means C depends counterfactually on A.

Having defined counterfactual dependence, which deals with propositions, Lewis goes on to explain what causal dependence is, which deals with events. Here O is a predicate meaning Occurs. e causally depends on c iff:
(1) $O(c) \Box \rightarrow O(e)$

(2) $\neg O(c) \Box \rightarrow \neg O(e)$

(1) is evidently true, for if both $c$ and $e$ exist, then the closest world to our world where $c$ and $e$ are true is our own world, which is clearly the closest possible world. (2) makes the important claim that had $c$ not occurred, the $e$ would also not have occurred. This is then what it means for $e$ to causally depend on $c$, and is the central claim of Lewis’ counterfactual theory. Furthermore, if event $a$ causally depends on event $b$, and $b$ causally depends on $c$, then there is a causal chain between them—and Lewis defines causality as the existence of a causal chain. So, for Lewis, an event $e$ depends on a cause $c$ if there is a causal chain that links them. (Lewis, 1973)

The final step that Lewis takes to flesh out his picture of causality and causal dependence is stating that causal dependence implies causation, but not vice versa, because causation is transitive while causal dependence is not. This is important, because if causal dependence were transitive you could end up with weird statements. Say I and my partner are both setting up our guns to shoot the president, simultaneously, in order for another person to stage a revolution. If I at the last second decided not to shoot, the president is still killed by my partner and the revolution still happens. So had I shot the president, I would have caused the revolution to be staged. But in the closest world that I do not shoot the president, it is not the case that there is no revolution.

Lewis’ theory of causation provides a completely different approach, however, it is somewhat susceptible to arguments dealing with pre-emption—when there are two or more possible causal pathways but only one is chosen as the “true” cause. Take the case where both a senior and a junior officer shout “Advance” at their troops, in the exact same way. The cause of the troops advancing is the fact that the senior officer gave them the command. But had he not given the command, the troops would have advanced anyway, so there is no causal dependence between the two events and hence no causality. (Menzies, Winter 2008) This example is different from the previous assassination example because it is possible to explain away the assassination example by adding a causal chain of events between the shot being fired and the president being killed. The president being killed is causally dependent on some event, which is in turn causally dependent on me firing my rifle. However, there is no causal chain to be broken in this last example of shouted orders, so it is harder for Lewis to avoid.

4 Conclusion

We have investigated three theories of causation, all leading us in radically different directions. I think that the natural necessity theory is the easiest to reject, as it relies too much on our imperfect and impossible knowledge of nature, and is susceptible to Hume’s arguments against it. However, I also think that Hume’s regularity theory tries to wrongfully scrape our experiences bare of any sort of causal connections. To say that causality is simply our imagination at work, predicting future imaginary acts with no concrete basis for believing in them, goes too far in the opposite direction from natural necessity. Lewis’ construction of counterfactual conditionality seems to be the most resistant to fundamental critique, although not immune from criticism either. By separating the necessity of a cause from its sufficiency, it allows for a straightforward discussion of causation in all but the most contrived of examples.
References


Hume, 1993