

Singular Causation and Law¹

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1. Introduction

Humean accounts of law are at the same time accounts of causation. Accordingly, since laws of nature are nothing but contingent cosmic regularities, to be a cause is just to be an instance of such a law. It follows from this view that it is logically impossible that there be causally related events which are not law-governed. Any particular cause-effect pair instantiates some law of nature, where the law is understood as a regularity. The regularity itself may be understood phenomenalistically, that is, as holding between sense impressions, or realistically, that is, as holding between objective events or event-types. These days even empiricists are realists to some extent, so I will eschew the radically empiricist version and assume that when a Humean talks about regularities, he is referring to objective events, states or processes in nature, not to his subjective experiences.

I shall argue in this paper that identifying the account of law with that of causation must be resisted no matter how tempting it may be. Singular causation without law is logically as well as physically possible, and distinguishing between the two enables us to see the role and function of each in the corpus of scientific knowledge, especially in matters related to prediction and explanation.

2. Singular Causation Without Law

It seems to me perfectly conceivable that a particular event causes another without there being any law covering them. Imagine a universe consisting of a single particle which moves around in a totally chaotic way; the particle's state S_1 at a certain time in no way determines (not even probabilistically) its state S_2 at a later time. Since by assumption such a universe is totally chaotic, the particle's motion would not be law-governed. Yet S_1 could be the cause of S_2 .²

Indeed, Wesley Salmon's recent account of causation in terms of processes allows one to be able to say just that. According to Salmon, a particle in motion is the paradigm example of a causal process. What makes its motion causal is its ability to carry information and its own structure, not that the motion is law-governed. Of

course, this does not mean that causal processes cannot be governed by any laws. But whether they are or not is a different question from their being causal. Salmon's account enables us to speak of causal relationships without necessarily basing them on any laws.³

A notion of causality in terms of the (continuous) evolution of states is consistent with much of modern philosophy and science (perhaps with the exception of quantum mechanics where the continuity seems to break down). According to Margenau and van Fraassen, "Causality as evolution of states" is one of the four major conceptions and a special case of "causality as physical continuity of events". They point out that such a view "entails no logical difficulties and is accepted in most contemporary versions of causality" (1968, p.320). Now if "causality as evolution of states" is free of logical difficulties and if the distinctive character of a causal process is its ability to carry information and its own structure, then a conception of singular causation without law is free of logical difficulties as well.

A universe in which there are causal events without being determined by any law is not only logically possible, but also physically realizable as well. Why should we think that such a universe is determined by laws (deterministic or probabilistic) to its minutest detail? Why think that there are enough laws to cover every event, every state and process? As Cartwright (1983, p.19) says, God may have "the untidy mind of the English"; he might have created a world in which laws are scarce. In that case the Humean is committed to holding that because there are not enough covering laws, the uncovered events cannot be causally related to one another. Some events then must be uncaused. But it is equally plausible to hold, contra Humeans, that this event caused that event but that the causal relation was not determined by any law. (Why should God be *that* untidy?) The Humean therefore insists that the universe is either completely ordered in the sense that events are causally related only if they are law-governed, or else that if there are some events which are not determined by any law they must be uncaused. But surely there is a third alternative, namely, a universe in which there are at least some events which are causally related even though they are not law-governed. Such a universe is physically possible for the simple reason that we do not have any "higher-order law" which prohibits its existence, that is, a law which requires that there be a law for every cause-effect pair. Searching for covering laws then is at best a methodological maxim which guides our scientific practice, without carrying any ontological commitments.

3. Davidson and Singular Causation

Donald Davidson is an eloquent defender of the view I am criticizing here. He has suggested that "in any case, in order to know that a singular causal statement is true, it is not necessary to know the truth of a law; it is necessary only to know that some law covering the events at hand exists" (1968, pp. 93-94).

Two questions are relevant here: First, how do we come to know this law whose existence we are assured of? Second, what reason is there to think that some such law exists? To the first question, Davidson replies, "among other things, by induction." This is curious given Hume's scepticism concerning induction. Indeed, the Humean account of laws *is* committed to inductive scepticism (Armstrong 1983). Hence, Humeans cannot have the cake and eat it too. Davidson writes that induction is not the only way we might come to know a law. Now our knowledge of things is either inferential or non-inferential (e.g., perceptual). Induction leading nowhere, surely Davidson is not suggesting that our knowledge of laws and causes is non-inferential? Obviously, this would be devastating for the whole Humean position.

Let me now turn to the second, more crucial question: why does the Humean insist that a singular causal statement entails the existence of a law covering it? What reasons does he have? I was able to find two. First, Humeans think that a law is necessary for connecting causes to their effects. Hempel, for instance, writes that “by virtue of thus presupposing general laws which connect ‘cause’ and ‘effect’, causal explanation conforms to the D-N model” (1970, p.348). So the Humean admits that something is needed to connect a cause to its effect and believes that the law does the job. But what exactly is the sense in which a law provides a connection between a particular cause and its effect? If it means establishing a physical link between them through a discernible mechanism, then an account of law, according to which the law merely expresses a constant conjunction of the form “Whenever A, then B” between event-types, does not help to establish any inner connection between this A and that B. As long as the law is construed as a pure regularity, it amounts to no connection at all. On the other hand, if the sense of connection Hempel has in mind is one which enables us to distinguish between genuine causal relations and merely accidental ones, then the Humean account fares no better here either. The counterexamples which show that constant conjunction is not sufficient for causation are already well known. The connection Hume and his followers have long sought for between a particular cause and its effect is not a general law, but a particular causal process. As I argued above, a particular causal process (its propagation as well as its interaction with other processes) need not be law-governed to count as causal.

Davidson suggests another reason for the existence of a law which underlies a causal relationship: “And very often, I think, our justification for accepting a singular causal statement is that we have reason to believe an appropriate causal law exists, though we do not know what it is” (1967, p.701). The difficulty with this sort of reasoning is that the postulation of the existence of a covering law is not the only justification we have for accepting a singular causal statement. Often we rely on the elimination of other possible causes. Thus, if we are not sure whether A caused B, we carefully review the circumstances to see if some factor other than A could have produced B. Failure to find it justifies the conclusion that A caused B.

4. Explanation versus Prediction

I would like to argue further that a universe in which some causes do not entail the existence of any laws is no more unintelligible than its Humean rival. Admittedly, in such a universe some events will be unpredictable. But notice that if the covering laws are not known, the Humean universe will be just as unpredictable. The insistence on the presence of some unknown laws does not help us predict anything.

Consider the issue of explanation now. It is almost universally believed that laws are necessary for giving explanations. Thus, in typical fashion Hempel writes that “reliance on general laws is essential to a D-N explanation; it is in virtue of such laws that the particular facts cited in the explanans possess explanatory relevance to the explanandum phenomenon” (1970, p.337). Hence it might seem that we can explain effects in Humean worlds, but not in those worlds where causes occur without being governed by any laws.

I claim that causes are explanatory even if they instantiate no laws at all. An effect is explained by citing its causes and describing how these causes contribute to its production through various mechanisms. This is causal explanation. Surprisingly, Davidson concedes to this point: “The most primitive explanation of an event gives its cause; more elaborate explanations may tell more of the story, or defend the singular causal claim by producing a relevant law or by giving reasons for believing such

exists. But it is an error to think no explanation has been given until a law has been produced" (1968, p.92). So, laws or no laws, causes explain. It is "the most primitive explanation" according to Davidson, but an explanation nevertheless. But can Davidson consistently hold both that a cause is simply an instance of some law where the law is just a regularity and that the cause explains its effect even though we do not know what the law is? Again the insistence on the mere existence of an unknown law without giving any reason for believing in its existence surely adds nothing to the explanatory power of the causes cited in the explanation. I conclude therefore that the Humean cannot consistently explain how causes can be explanatory.

Davidson's remarks can be taken to suggest an important distinction between explanations and their justifications. To explain is one thing, the justification of this explanation by whatever means is another. Specifying the causes of an event is an explanation. How do we justify it? No doubt, giving laws or citing evidence for their existence might be a good justification. My point is simply that this is not the only justification we have. Elimination of alternative explanations is another one, for instance. When laws are unknown or simply do not exist, this might be our only justification. As we shall see in section 5, this situation is almost the rule rather than the exception in social science.

Why does citing a cause explain its effect? There is a very simple anti-Humean answer: a cause makes its effect happen. Causes produce their effects. According to the Humean, causes have explanatory power only in virtue of the laws they entail. I urge for just the opposite view: causes are more fundamental in explanations of *particular* events than laws. Laws would not be explanatory had they not invoked any causes. Theoretical explanations, where we embed the phenomenon to be explained into a theoretical framework of a few fundamental laws, would be empty in the absence of a description of actual causal mechanisms, for in such cases the production of the phenomenon would be a complete mystery. By contrast, genuine causes are explanatory (at least to some extent) even in the absence of laws because causes are responsible for their effects.

The sine-qua-non function of a law is not explanation but prediction (and, perhaps, unification). Robust regularities are the essence of predictability, and laws would not have any predictive power if they did not entail any uniformity. By making causes instances of laws, Humean accounts mistakenly attribute both explanatory and predictive power to laws. But I claim these are quite different and distinct virtues which must be kept apart. Causes explain, laws predict. Naturally, *causal laws* explain and predict. It is perhaps because many fundamental laws of physics (such as Newton's second law and Maxwell's laws) are causal that we erroneously believe both virtues must necessarily coexist. The Humean reinforces and rationalizes this misconception by giving the same account for both causation and law.

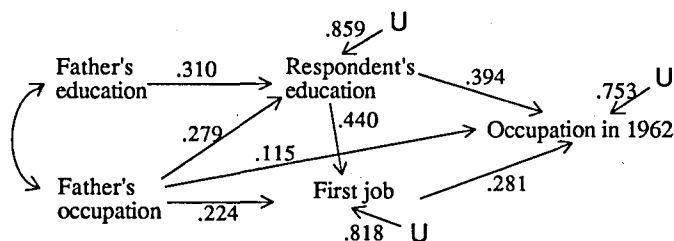
David Armstrong's recent work on the nature of laws supports my conviction that singular causation without law is possible. It is instructive to see how. Armstrong rejects the regularity accounts of natural laws. He believes that laws are necessary relations holding between universals. So suppose that a's becoming F caused b's becoming G. Are we committed to the existence of a law such as $F \rightarrow G$? Armstrong reluctantly admits that we are not, for he has no way of showing that a's becoming F caused b's becoming G "*in virtue of the universals F and G*" (Armstrong 1983, p.95). Armstrong does not have a positive theory of causation. But there is strong evidence in his book that it will not be identical with his account of law. The moral is that once the Humean account of law is rejected, the grounds for giving the same account for both causation and law disappears, and the view that causes entail the existence of covering laws loses its grip.

5. Implications for Social Science

The separation of causes from laws has important implications for social science. Consider the following argument Clark Glymour (1983) attributes to Jurgen Habermas and Alexander Rosenberg:

1. No activity is science unless it provides explanations.
2. Laws are necessary for scientific explanations.
3. There are no general laws of society.
4. Therefore, there is no social science.

Debates in the philosophy of social science almost exclusively centered around the third premise, the other premises being taken for granted. While the defenders of the argument tried to justify it, the opponents concentrated all their efforts to refute it. But (2) was hardly questioned. Regardless of the truth or falsity of (3), I believe this argument can be shown to be unsound since (2) can be rejected. If I am right in my view that causes explain even if they do not entail the presence of any law, then (2) is clearly false.⁴ Indeed, Glymour gives some excellent examples where we have quite satisfactory explanations of particular phenomena which invoke no laws at all. One of them deserves special attention. Using statistical techniques such as regression and path analysis, Peter Blau and Otis Duncan (1967) develop a theory of the male American occupational structure as of 1962. The basic linear causal model they propose is given below:



The double-headed arrow means there is a correlation between father's education and occupation. Single-headed arrows indicate both the presence and the direction of causal influence. Numbers (path coefficients) measure the strength of causal influence. U's represent all causal factors not included in the model explicitly. There is of course a different U-term for each dependent variable. The model describes the most significant causal determinants of variations in occupational status; these are respondent's first job and education, respondent's father's education and occupation. Their effect can be direct or indirect (or both as in the case of father's occupation). Most of the variation in occupational status is caused by outside and thus unknown factors. In the course of their book, Blau and Duncan modify and enrich the basic model by including other factors such as community of origin, marriage status, number of siblings and so on.

Does the model contain any laws or generalizations? Does it assume the existence of any laws? The answer is an emphatic "no":

The form of the model itself, but most particularly the numerical estimates accompanying it, are submitted as valid only for the population under study.

No claim is made that an equally cogent account of the the process of stratification in another society could be rendered in terms of this scheme. . . . The technique of path analysis is not a method for discovering causal laws but a procedure for giving a quantitative interpretation to the manifestations of a known or assumed causal system as it operates in a particular population (Blau and Duncan 1967, p.177).

Nevertheless, Blau and Duncan's causal model, if valid, gives us valuable explanatory information. It describes the causal determinants of occupational structure, does a fairly good job of accounting for correlational data collected and shows how much of the variation in occupational structure is explainable by explicit factors considered. The standard objection that there must be some (yet unknown) laws underlying the causal model is particularly unconvincing here for two reasons. First, such causal models make *singular* causal claims about the average or aggregate behavior of individual processes in a *particular* population. Very seldom can they be applied to other populations or even to the sub-populations of the population under study. Hence, such models cannot be interpreted as providing some rough empirical generalizations which summarize our evidence for the existence of social laws. Second, social laws presumed to underlie particular causal processes were not discovered despite much effort. At least in some cases, the failure is inductive evidence for the absence of laws which cover every conceivable social phenomenon.

How do Blau and Duncan justify their model? Not by laws since they do not know any or claim to discover one, but in part by elimination of alternative causal models: "The principal justification for the model is that it explains the correlation data for these variables very well, and *no alternative linear model seems available which gives a comparably good explanation of the correlations* (Glymour et al. 1987, p.35).

Social science is notorious for providing many post facto explanations, but few (if any) successful predictions. But perhaps this is no reason to degrade it. As Glymour points out, the complaint may result from a poor understanding of social science as social physics. And the situation in social science is easily explained by the fact that causes, even though they do not entail any laws, are explanatory nevertheless. The presence of causes explain why social science can explain; the absence of laws explains the absence of successful prediction. It seems that it is not always possible to have the best of all possible worlds. Failure to predict is not sufficient reason to underestimate causal explanation. Where laws are scarce, the explanatory value of causes becomes evident. To deny it is to deny much of contemporary science.

Notes

¹I wish to thank Arda Denkel for his helpful comments on an earlier version of this paper.

²Throughout this paper I am using a fairly broad notion of event which covers not only such familiar things as collisions but also states. Following Jaegwon Kim (1973, p.219), by event I mean the exemplification of a property by an object at time *t*. A classical particle's having a certain momentum, for instance, fits this description. Thus, states can be taken as events without any difficulty.

³However, I do not mean to suggest that Salmon would agree; for he believes that causal processes are a species of constant conjunction (1984, p.147). His distinction

between causal propagation and causal interaction might also be relevant here. Causal processes are capable of propagating causal influence from one space-time point to another. The transmission of causal influence provides the link between a cause and its effect. Causal interactions on the other hand result from the intersection of two (or more) causal processes. They are responsible for qualitative changes in processes. Perhaps one can argue that although causal propagation need not be law-governed, causal interactions always are. This is a possible intermediate position, but I think similar objections can be raised against it as well. Although it is true that many causal interactions are law-governed (typically by conservation laws), I do not see why they must always be so. Indeed, Salmon himself admits that most but not all causal interactions are actually governed by laws (1984, p.179).

⁴Notice how Humeanism gives indirect support to the argument above: suppose (3) is indeed true. Then, since causes entail the existence of laws, the absence of laws means the absence of causes. Where there are no laws, there are no causes which one can cite to explain either.

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