PROBABILISTIC ANALYSES AND THE HUMEAN CONCEPTION OF THE RELATIONSHIP BETWEEN LEVELS OF CAUSALITY[1]

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1. INTRODUCTION

It is now usual to distinguish between different causal relations. The distinction I shall be more specifically interested in here is between generic causality and singular causality. Generic causality is the relation one refers to in (e.g.) "Exposure to asbestos causes cancer" whereas singular causality is the relation one refers to in (e.g.) "Peter's being exposed to asbestos caused him to develop cancer". Generic causality is a relation between properties whereas singular causality is a relation between possessions of properties by some individuals. Generic causality and singular causality are commonly described as two, different "levels" of causality and I shall stick to this lexical usage. Distinguishing levels of causality immediately raises a question: how do these levels relate? This is an important, open question in contemporary philosophy of causality.

Quite differently, an extensive part of philosophy of causality since the 1970s at least has been dealing with probabilistic approaches. According to probabilistic analyses, a cause C may be characterized by its making its effect E more probable once the causes of E that are not caused by C (the "independent" causes of E) have been taken into account, that is conditionalized upon. Here, the central question is whether causality can indeed be analyzed along those lines. This question can be asked for both generic and singular causation, and it may receive different answers at the two levels.

I aim at determining how answers to the two questions that I have just stated relate. In other words, my interest is in the commitments that may be conveyed by conceptions of the relationship between levels of causality, with respect to analyzing generic and/or singular causality in probabilistic terms.

The question, however, is far too broad to be tackled in the present paper. Let me, then, narrow it from both its sides. On the one hand, I will consider only one basic conception of the relationship between levels of causality: the Humean conception according to which singular causal relations are causal due only to their relationship with generic causal relations. More explicitly, under the

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Humean conception, Peter's being exposed to asbestos singularly causes him to develop cancer only inasmuch as exposure to asbestos generically causes cancer. On the other hand, I will focus on a position that many have found appealing, that generic causality, but not singular causality, can be given a probabilistic analysis.

My claim will be that this position is not compatible with the Humean conception of the relationship between levels of causality. More precisely, I will show that someone who assumes both the Humean conception and that generic causality can be given a probabilistic analysis is committed to considering that singular causality can be given a probabilistic analysis too. First, this will be shown on special case that, arguably, is particularly tough for the claim. Second, and relying on this case study, I will offer a general argument.

2. SPECIAL CASE

The special case that I shall consider is in fact an example that was introduced in Good (1961). As initially depicted by Good, the case goes as follows:

> Sherlock Holmes is at the foot of a cliff. At the top of the cliff, directly overhead, are Dr Watson, Professor Moriarty, and a loose boulder. Watson, knowing Moriarty's intentions, realizes that the best chance of saving Holmes's life is to push the boulder over the edge of the cliff, doing his best to give it enough horizontal momentum to miss Holmes. If he does not push the boulder, Moriarty will do so in such a way that it will be nearly certain to kill Holmes. Watson then makes the decision (event F) to push the boulder, but his skill fails him and the boulder falls on Holmes and kills him (event E).[2]

The now very usual analysis of this case has it that Watson's pushing the boulder lowered the probability of Holmes's death and yet caused it. In other words, the case is commonly described as one involving a singular cause-effect relation that cannot be given a probabilistic analysis. My claim is that this description cannot be endorsed by one who assumes both the Humean conception of the relationship between levels of causality and that generic causality can be given a probabilistic analysis. In order to show this, I shall bring into light what this description presupposes.

Let me start with the description of the case as one involving singular causality. In other words, let me unfold what is presupposed by the claim that Watson's act is a singular cause of Holmes's death. Under the Humean conception of the relationship between levels of causality, this description requires to consider Watson's act as a possession of a property C and Holmes's death as a possession of a property E which are such that C generically causes E. The most natural reading, then, is as follows: C is the property of standing down a cliff from the top of which a boulder is pushed and E is the property of being killed. Both properties are possessed by Holmes in the case under study, and these possessions are what one should focus on in order to describe the case in terms of Watson's act singularly causing Holmes's death.

Let me now turn to the second aspect of the usual description of the case, namely the idea that Watson's act lowered the probability of Holmes's death – and hence that the posited singular cause-effect relation cannot be given a probabilistic analysis. This description can be given only by one who takes into account both the fact that the boulder is pushed *by a friend of Holmes* and the presence of an enemy of Holmes on top of the cliff (and next to the loose boulder). As a consequence, describing the case in terms of probability-lowering requires in particular to consider Watson's act as a possession (by Holmes, again) of the property C' of standing down a cliff from the

[2] Good (1961) p. 318.

top of which a boulder is pushed by a friend. This description is different from the one that is required for the case to be one in which Watson's act singularly causes Holmes's death.

Going now step further, I shall examine, on the one hand, whether Watson's act considered as a possession of property *C* lowers the probability of Holmes's death. Quite straightforwardly, the answer is that it does not. Indeed, considering that Watson's act is a possession of *C requir*es to assess its probability accordingly, and standing down a cliff from the top of which a boulder is pushed undoubtedly raises the probability of being killed.

On the other hand, it is my contention that Watson's act does not singularly cause Holmes's death if it is considered as a possession of the property *C′* of standing down a cliff from the top of which a boulder is pushed by a friend. Under the Humean conception of the relationship between levels of causality, Watson's act considered as a possession of property *C′* (by Holmes) counts as a singular cause of Holmes's death only if *C′* is a generic cause of the property *E* of being dead. But this is not the case if one assumes that generic causality can be given a probabilistic analysis. Indeed (and as already stated), for probabilistic analyses to support the claim that *C′* causes *E*, *C′* has to raise the probability of *E* once the causes of *E* that are not caused by *C′* have been taken into account. Now, recall that describing the case under scrutiny in terms of probability-lowering requires to take into account the fact that there is an enemy of Holmes's standing on the top of the cliff (and therefore near the loose boulder). Let *C″* be the corresponding property, that of standing down a cliff on the top of which an enemy stands together with a loose boulder. *C″* is a cause of *E* (it raises its probability once the independent causes of *E* have been taken into account) that is not caused by *C′*. Therefore in order to determine whether *C′* is a cause of *E,* one has to take *C″* into account, that is to conditionalize on it. But then *C′* fails to raise the probability of *E* : given the presence of an enemy on the top of the cliff together with a loose boulder, standing down this cliff from the top of which a boulder is pushed by a friend lowers the probability of being killed. *C′* is not a generic cause of *E* if (as is assumed for the sake of the present argument) generic causality can be given a probabilistic analysis.

All in all, the situation is as follows:

- if considered as a possession of *C* by Holmes, Watson's act causes Holmes's death, but it fails to lower its probability;
- if considered as a possession of *C′* by Holmes, Watson's act lowers the probability of Holmes's death, but it cannot count as one of its causes.

Assuming the Humean conception of the relationship between levels of causality and assuming that generic causality can be given a probabilistic analysis, no uniform description of the case licences the claim that it is one of singular causation that cannot be given a probabilistic analysis.

3. GENERAL ARGUMENT

Now that I have deflated the supposedly typical case of a singular cause-effect relation that cannot be given a probabilistic analysis, I shall try to draw a general argument from what I have said concerning this particular case. In other words, I now aim at establishing the following general claim: together with a Humean conception of the relationship between levels of causality, a probabilistic analysis of generic causality commits to a probabilistic analysis of singular causality.

Here, a first step will consist in highlightling two coherence requirements that were at work, although unexplicated, in my analysis of the special case. These two requirements may be expressed through the following maxims:

1. if you consider that the *relata* of singular causality are possessions of properties, then consider that the arguments of singular probabilities also are possessions of properties and evaluate singular probabilities with reference to the corresponding properties;
2. when tackling the question whether singular causality can be given a probabilistic analysis, compare the situation with respect to causality and the situation with respect to probabilistic relations for ordered pairs of possessions of properties that are identical.
I take it that these two requirements are uncontroversial and that they do not call for further justification.

Quite differently, it may be that the claim according to which the *relata* of singular causality are possessions of properties now calls for some kind of justification. On the one hand, it appears that the analysis of the special case of Holmes's death as well as the general argument that I shall now draw from it rely heavily on this claim. On the other hand, this claim has not been properly justified although it is disputable. The justification I shall propose is twofold. First, one who thinks (as I do) that causality at one level is *not* a reality that is completely independent from causality at the other level must admit a reference to universals in the definition of the *relata* of singular causality. Second, properties seem to be the best candidate *relata* for generic causality, while any claim about possessions of properties may be straightforwardly translated into a claim about any of the other entities that compete for the title of *relata* of singular causality.[3] Therefore, the antecedent of the first maxim can be accepted.

Coming back to the main argument, let me combine the two coherence requirements that have just been explicated with the Humean conception of the relationship between levels of causality. What I get is that whatever the relationship between causality and probability may be at the generic level, it also holds at the singular level. Indeed:
- the Humean conception implies that causal relations at the singular level are inherited from the generic level;
- the first coherence requirement implies that probabilities at the singular level are inherited from probabilities at the generic level;
- the second coherence requirement prevents the link between causality and probability at the generic level to be untied at the singular level due to a shift in the objects that are considered.
A consequence of the fact that the singular level inherits the relationship between causality and probability that holds at the generic level is as follows: if generic causes raise the probability of their effects once independent causes have been taken into account, then singular causes do too. In other words, if generic causality can be given a probabilistic analysis, then singular causality can too.

4. CONCLUSION

In the present text, I have shown that the Humean conception of the relationship between levels of causality has the consequence that singular causality can be given a probabilistic analysis if generic causality can. Therefore the position according to which generic causality, but not singular causality, can be given a probabilistic analysis is not compatible with the Humean conception.

In the full version of the paper, I show that this position is not compatible either with what I take is the other basic conception of the relationship between levels of causality: the conception according to which generic causal claims are generalizations over singular causal claims. If this is indeed the case, one is left with two (arguably non-exclusive) options:

[3] More detailed arguments can be found in the full version of the paper.

- giving up the appealing position according to which generic causality, but not singular causality, can be given a probabilistic analysis; or
- developing a sophisticated theory of the relationship between levels of causality.

Quite some authors (most notably Cartwright, Eells, or Hitchcock) have already endorsed one of these options and it seems to me that a good deal of their motivation for doing so has to do with the claims I make in the paper. Correlatively, it may be considered that my conclusions are not very great news. However, it is my contention that no proper argument had been given in favor of the claims that I support, and my ambition is precisely to have made up for that gap.

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