Causality, Contiguity, and Construction

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Abstract: The paper discusses the regularity account of causation but finds it insufficient as a complete account of our notion of causality. The attractiveness of the regularity account is its attempt to understand causation in terms of empirically accessible features of the world. However, this account does not match our intuition that singular causality is prior in normal epistemic situations and that there is more to causation than mere succession. Apart from succession and regularity, the concept of causality also contains a modal feature which allows us to engage in counterfactual discourses about singular causal events and to claim that a particular cause is both sufficient and necessary for its effect in the circumstances. However, we may directly observe singular causes, but the modal element is not something we can possibly observe. Rather, this element is something we add to our perception of succession. Thus, the paper suggests that the modal feature of causality is a mental construction which was originally formed by our knowledge of certain structural features of similar events in other situations. It stems not from what we actually observe but from what we have observed or may observe under different but relevant circumstances. So the concept of causation has partly an empirical content and partly a constructed one.

Keywords: causation, the regularity account, causal modality.

The concept of causality is commonly regarded as essential for understanding the difference between accidental and non-accidental happenings and the relation between the actual and the possible. Not only do we use causal notions whenever we try to grasp why something new and unexpected happened, but our sensory experience of the most familiar things is conceptualized in terms of these notions. Apparently we see causes everywhere and all the time. Still, doubts

about the reality of causes as something different from regularities are sometimes raised. David Hume is, rightly or wrongly, taken to claim that causation contains no necessity *in re*. Every idea of a causal modality stems from the mind's projection of necessity into it: only necessities *in dicto* exist. A born-again empiricist like Bas van Fraassen holds that

> from an empiricist point of view, there are besides relations among actual matters of fact, only relations among words and ideas.
>
> (van Fraassen 1989, 213)

Modal and causal locutions, however, are not among those expressions that are concerned with the actual state of affairs, since they seem to be about relations among possibilities. Instead he thinks that

> a graphic, if somewhat inaccurate way to put this would be: causal and modal discourse describes features of our models, not features of the world. (van Fraassen 1989, 214)

In contrast to this hard-core empiricism, I shall argue that causal claims may refer to *real* relations because causes are both actual and observable features of the world. However, although modal features are part of our causal understanding, I don't believe that a causal claim entails that modal entities like possibilities and necessities have their own *real* existence.

The question I want to address in this paper is therefore what the concept of causation includes which does not have its origin in concrete phenomena. I shall propose that all modal features of the causal relation are constructed from concrete contexts. These contexts include other contexts than the actual one in which similar events to the actual ones do not succeed each other.

1 The concept

Attempts to find causal mechanisms are already prevailing in our normal way of thinking as causal comprehension provides us with a well-ordered and structured understanding of the world. Expressing our recognition of causal connections is what the causal discourse is all about. The causal language is used for communication of what we see as non-accidental relations in both science and everyday life. Fun-

damentally, there is no difference between causal claims made in science and in ordinary life. In science they are merely made on the basis of greater theoretical insights and are justified by more sophisticated means of experimentation than in ordinary life.

Intuitively, we possess causal knowledge because we experience the world as basically causal in nature. We observe causes: in the same manner as we see things and events as having certain properties, we also see these things and events as causally connected and as partaking in physical processes. Furthermore, we could not act in a world where we did not know – or had quite reliable expectations about – how things would behave. Our knowledge of causes helps us to form actions whose results we wish to bring about or to prevent things we don't want from happening. Knowing causal processes is also a precondition for doing experiments and for successfully making and operating technical devices like machines and instruments. Thus, as a matter of fact, most causal beliefs represent genuine knowledge about the world. An obvious question is therefore how we obtain causal knowledge, and what we get to learn about causation by obtaining it; another is what we mean by expressing causal understanding; and finally there is the question of what constitutes causation as it is in the world itself. These three aspects of the causation are more or less distinct.

The first one bears on the methodology of science, how individual causal claims can be justified; the second is concerned with the nature of causal beliefs and the meaning of causal claims expressing those beliefs; and the third one deals with the ontological foundation of causal connections. I hold that in physics, for example, causation has a non-modal, or non-counterfactual, basis in the conservation of positive energy and its transmission in time and space (Faye 1989, 1994).

In contrast, however, the meaning of causation is saturated with modal notions. The problem here is not that we don't understand causal terms – in fact we do; for we are able to use causal terms correctly without any hesitation. As competent speakers of a language we don't need a definition of causality to know what it is, in the same way as we don't need one to understand what human beings, animals, flowers, books, and cars are: this is something we are taught while learning our first language. Our linguistic practice shows that

we are just as familiar with causation as we are with these other things. The interesting issue is indeed to get to understand what we understand, and why we understand it as we do: what structure of the world lies behind the formation of causal concepts? What, in other words, is it about the world that has forced us to operate with a concept whose content supersedes what can have empirical support? The focus of our discussion will be the explication of what we mean by the ascription of the causal nexus between events, and how we can justify the modal interpretation of causal statements.

Various proposals are in circulation of what should be considered as a more elaborated account of our causal statements. The most common attempts are suggestions to analyze causality in terms of regularities, counterfactuals, or probabilities. All these accounts have one thing in common; namely the idea that the notion of causality are reducible to another notion which is taken to be either more fundamental or better understood. In opposition to the reductionist accounts, I hold that causal claims cannot be fully defined in terms of any other concept. Indeed, the causal discourse is loaded with reference to regularities, counterfactuals, and probabilities, but these notions cannot by themselves replace the notion of causality.

Causality supports regularities, counterfactuals, and probabilities. Assume two individual events α and β are causally connected, then the phrase 'α causes β' apparently implies the following claims: (i) events of type B follow events of type A given the actual circumstances C, (ii) if α had not happened, then β would not have happened; and (iii) the probability of β is greater with α than without α. But at the same time causality gives rise to its own problems independently of any other related notion. Rather than any of these notions, individually or collectively, being able to explain causality, each of them may contribute to a philosophical elucidation of the concept. The virtue of a theory of causation would be that in combination with theories of these other notions it would explain all relevant facts about causation. What I propose is that although our understanding of causality is not completely analyzable in terms of regularity, counterfactuality, and probability, it is nevertheless so closely associated with them that it is impossible to grasp causality without taking its relation to these other notions into due consideration.

Thus, on the one hand, I agree with the non-reductionist conception that the truth conditions of singular causal statements are not completely translatable into the truth conditions of any other kind of statement. On the other hand, I subscribe to the anti-realist view that the truth conditions of singular causal statements in some ways have to be fettered to what is epistemically accessible. Every notion of causation which goes behind experience and which therefore cannot be articulated in observational terms does not have an objective correspondence. Only I suggest that our understanding of causal claims has to be explained in truth conditions whose fulfillment somehow in principle can be observed. My contention is that the causal reality does not reach beyond what can be made manifest, and it is through our experience that we acquire a grasp of the most general conditions under which a causal description of the world is possible.

2 Regularity

Causal thinking plays a major role in both science and everyday life as we incessantly acquire beliefs about events bringing about other events in our surroundings. Scientists believe, for instance, that acid rain causes the death of our forests, and that PCP gases break down the ozone layer over the Antarctic. They also believe that the sun stays warm through the fusion of hydrogen into helium, and that severe radioactive radiation produces cancer. In daily life we believe that the wind causes waves to build and tree branches to sway, and that exposure to water corrodes iron. But how can we be sure that these connections really exist, how do we prove that causal beliefs are not fictions but representations of the objective world? What makes us certain that the causal dependency between cause and effect is real and not, as claimed by Hume, merely a projection of our subjective imagination onto our sense experience?

Hume's account of causation treats it mainly as a regularity of similar events. As he says in his famous dictum:

> we may define a cause to be an object, followed by another, and where all the objects similar to the first are followed by objects similar to the second.
> (Hume 1748, sec. VII, part II, p. 76.)

Singular causes reduce to generic causes, and generic causes reduce to a regularity of concomitant events. The idea of causal power pursuant to which the cause brings about its effect seems to be part of our causal understanding. However, Hume thinks it is a subjective idea which we instinctively read into the phenomena. Perception does not support a notion of causal nexus to which the cause necessitates its effect as different from the notion of regularity where the effect merely follows the cause. What the latter does not capture is the psychological feeling of efficacy attending our perception but which has no counterpart in sense impressions.

Following a Humean analysis, the traditional empiricist theory of causation is based on two independent conceptions: (1) to understand singular causal sentences means to realize that they can be derived from a general law; (2) the statement of a general law is merely a statement about regularity of the generic events in question. On the one hand, one may read '*X* causes *Y*' as stating a relationship between types, saying something like '*X* is that kind of event that causes *Y* to occur', '*X* produces *Y* in the proper circumstances', or '*X* is able to bring about *Y*'. On the other hand, one can also read the sentence as expressing a relationship between tokens: 'On this particular occasion an instance of *X* caused the instantiation of *Y*'. Thus, empiricists hold that the second reading is a derivation from the first. Moreover, they usually regard the causal relationship between generic events as entirely constituted by their constant succession.

Sometimes we are able to observe that an event is caused by another, sometimes not. Indeed a person can be wrong about his perceptual judgment of causes as he can be wrong with respect to other kinds of perceptual judgment such as predication of properties and identification of things. The perception of causes is not different from perceiving or observing things or events. Through our senses we simply acquire a linguistic belief that the term 'cause' applies to a state of affair in our sensory field. Thus, seeing what is going on does not depend on any insight in similar cases. A child needs to be burned only once to realize that the hot stove causes the burning pain. Quite often we see two particular instances of certain event types succeeding one another for the first time, however still grasping them individually as causally connected. The idea of regularity between them as

generic events is no part of the causal belief one acquires by merely seeing them as singular instances of a causal connection. Rather, such a conception is inductively derived from the reiteration of individual but genetically similar cases under certain recognizable circumstances. As a result we may eventually arrive at a general statement about causally connected events. In fact a causal law can be tested only against particular instances of this law; therefore, singular causal connections cannot get their meaning from the law that they are supposed to support. Another problem is that in many cases a particular cause becomes only an instance of a regularity or uniformity because an unlimited number of exceptions, or *ceteris paribus* clauses, are included in the formulation of a generalization. There are, for instance, many children who get a stomach ache from drinking milk, though millions of children drink milk every day without getting pains in their stomach. Thus, we cannot simply infer straight away to a regularity by saying that all children drinking milk get stomach ache on the basis of a number of individual causal observations. It has been discovered that some children are not able to decompose the lactose in milk with the result that drinking milk causes a stomach ache. One could therefore formulate a more complex form of generalization, according to which drinking milk causes no pain except for those cases where the absence of the capacity to digest lactose are followed by a stomach ache. But we can only arrive at these complex and complete regularities after further investigations and after having recognized the individual exceptions. Consequently, we don't need to know whether there exist such regularities to be able to see individual causes.

Apart from these shortcomings in the regularity view, the notion of singular causes does not entail the idea of a complex regularity for another reason. For individual causes associate with the idea of positive as well as negative alternatives to what actually happened. Different causes usually bring about different effects but in a given situation an effect requires that its cause occurred. Whether this particular cause occurred or not makes an important difference in what became the effect: that particular cause was simply necessary for this particular event in the circumstances. As a consequence we want to talk hypothetically about individual events. The effect would be absent if the

cause had been absent; that is, the absent cause would be sufficient for the absence of the effect.

Another regularity theory of causation is J.L. Mackie's discussion of INUS conditions (Mackie 1972, 62 f). An INUS condition is an *i*nsufficient but non-redundant part of an unnecessary but *s*ufficient condition. Mackie attributes this kind of analysis to J.S. Mill. The latter pointed out two things: (i) an effect of a certain kind (*E*) is usually not preceded by merely one particular kind of events (*C*) but by a combination of several factors (*C* = *X*, *Y*, *Z*), that is, different types of events, states or situations which together cause the effect; (ii) an effect can be preceded by more than one combination of factors. Several different sets of factors can generate the same effect. For instance, a fire may be caused by a short circuit, a bolt of lightning, or an arsonist. Thus, an INUS condition is an insufficient but non-redundant factor *X* that in conjunction with other similarly insufficient and non-redundant factors *Y* and *Z* form a sufficient cause *C* of *E*. Moreover, such a conjunction of INUS conditions may contain negative conditions, factors whose negation are conjuncts in a minimal sufficient condition.

What is called a cause will most often be the INUS condition that is most salient; the other INUS conditions are regarded as helping factors. That is so in everyday life, and that is so in science too. For instance, catalysts in chemical reactions may be regarded as the helping factors, while the salient factors are those that appear in the stoichiometric equation. But all INUS conditions can also be named INUS or partial causes. The full cause of *E* is then defined as the disjunction of all possible minimal sufficient conditions of *E* so that the full cause, in contrast to an INUS cause, becomes both necessary and sufficient for a certain type of effect.

The INUS condition account is a more sophisticated regularity theory of causation than Hume's old account. It opens up for the possibility of considering complex uniformities containing counteracting causes rather than simple uniformities. For this reason regularity statements may sustain counterfactuals in connection with singular causal judgments; however, such generalizations are not entailed by these judgments. One consequence is that positivists who consider the regularity theory as the proper response to every causal fact still have to face serious challenges. For they fail to offer, it seems, a satisfactory

explanation of the following two facts: first, the conception of singular causes come first, that of generic causes comes second. We immediately have perceptual access to individual cases of causation, but we have no such direct entrance to general cases. We cannot get to the idea of a regularity of the same kinds of events under given circumstances without first having observed contiguous instances of these events. Second, we generally believe that there is a further fact about causally connected events than mere succession. The causal connection is considered to be robust and not reducible to mere succession or a regular succession of similar events. Unless there is a causal nexus linking the cause and the effect, the order in which world has happened and is going to happen would be a matter of coincidence. Thus we feel confirmed in talking about a single cause as necessitating its effect as we apparently see that the effect must follow the cause in the given circumstances. In this context it seems also appropriate to talk about hypothetical alternatives: what would have happened in this particular case, if the cause had not obtained? That's the reason why we feel justified in saying that a singular causal statement entails counterfactuals.

In a way even Hume seems to admit that the causal connection is robust. For just after stating the above definition of causation he adds something that seems rather incompatible with the traditional regularity view of succession. It goes,

> Or in other words where, if the first object had not been, the second never had existed. (Hume 1748, sec. VII, part II, p. 76)

How could Hume believe that this phrase is another way of expressing the content of his definition? Elsewhere, Hume seems also to turn against the notion of causation as a bare concatenation of events. In the *Treatise* Hume raises the question,

> Shall we then rest contented with these two relations of contiguity and succession, as affording a complete idea of causation? By no means. An object may be contiguous and prior to another, without being considered as its cause. There is a NECESSARY CONNEXION to be taken into consideration; and that relation is of much greater importance, than any of the other two above-mentioned. (Hume 1740, 77)

Perhaps Hume was not a positivist but a skeptical realist as some recent scholars have suggested?

Simon Blackburn goes right to the bone, I think, when he argues against such an interpretation. Instead, he maintains that Hume wanted to distinguish between causation as a nexus holding between particular events and a straitjacket guaranteeing the continuation of the same pattern between these kinds of events again and again (Blackburn 1993, 94 – 107). Whatever is the causal nexus between two events on one occasion, the causal continuation of matter could in principle change, so that in other places or at other times the same connection between events of the same kinds might cease to exist (the problem of induction). The causal connection may be robust in the sense that the individual cause necessitates the individual effect, but this fact does not make it necessary that the events similar to the cause necessitate events similar to the effect. First and foremost, according to Blackburn, Hume debunks the idea that any inductive inference from one particular occasion to other similar occasions can be justified by appealing to straitjacketing powers or forces between those events. Because the ascertainment of the reign of such powers or forces is placed under exactly the same inductive limitations as the generalization itself. The knowledge of powers or forces cannot make certain that events would never fall out otherwise than what they have been observed to do until now. Hume also believes that we can have no comprehension of the general idea of a relation over and above particular examples. Hence he cannot endorse a concept of law in which there exists a natural necessity between universals.

In my opinion Blackburn's interpretation seems plausible. But, whatever Hume's view actually was, I agree that we have knowledge of particular causal connections independently of any grasp of laws of nature. But I disagree that we can have knowledge of particular causal situations without having a general notion of causality. We cannot get to such a concept just by observing the regularity between individual concomitant events. Hume seems to admit that. But neither are the additional features we associate with causality such as 'necessitation' or 'causal power' a result of a mere psychological habit. It is constructed from experiences of regularities and variations under similar circumstances. The idea that causes are necessary for their effects in the circumstances and that causes together with other factors necessitate their effects, is not one we can get from observing two actual

events. We eventually start to take observed patterns among similar events to be criteria for what it means to have causal powers or causal efficacy.

3 Modality

The concept of causality is of our making. It is a notion based on construction. When we see something acting as a cause of something else, it is not because we see directly one concrete event necessitating a succeeding concrete event. This is something we believe, not from what we see, but from our use of the concept. We do see one event causing another by applying the concept of causality on what we are seeing. However, it is not every feature of the concept which corresponds to something we actually see. Some aspects may reflect something beyond our actual experience.

The construction is a cognitive process in which a new or a more complex concept is formed by considering concrete things and *adding* features that distinguish them from other concrete things. In this case the aim of constructing is to make a distinction between accidental regularities and non-accidental regularities. Indeed the addition of features should not be arbitrary. To avoid this we must look into what characterizes generically similar events. The starting point of the construction of causality is to account for situations in which two actual events succeed each other non-accidentally. But we cannot cognitively move from the actual situation to *possible* situations without the use of abstraction. Before we can add features, we must subtract features. The way of abstraction is carried out by removing those features of the two actual events, which tie them to the actual circumstances. As Nancy Cartwright's aptly describes abstraction with respect to causal laws,

> It is not a matter of *changing* any particular features or properties, but rather of *subtracting*, not only the concrete circumstances but even the material in which the cause is embedded and all that follows from that.
>
> (Cartwright 1989, 187)

However, getting to the concept of causation in the first hand I would prefer to say that we remove those features of the actual circumstances, which we recognize as being dependent on this particular con-

text, by contrasting it with knowledge of the circumstances in which similar events succeeded each other and in which they did not. If these similar events appeared in a regular and predictive way, we said that the two actual events caused each other, whereas if these similar events did not appear in a regular and predictive way, we said that the two events did not cause each other.

Concrete events as such exist in space and time, actual events exist here and now, thus similar events to the actual ones exist at other spaces and times than here and now. So if causal dependency is taken to be more than mere succession and contiguity of two actual events, we cannot directly observe in this particular case what the remaining features are. These modal features are not empirically accessible in an immediate way. This is so because they are added from what we know about similar events in corresponding situations. We make up those features in virtue of considering other relevant but different circumstances in which we could control similar events and intervene in their succession. The one of these similar events that is used to control the other is thought of as necessitating the other, and the one whose existence does not depend on the other's is claimed to be necessary for the other. Thus, these structural features as they were disclosed through control and manipulation with our environment long ago became the modal features of causation, because even though the non-accidental patterns were observed for similar events, they were generalized to hold also in any actual case of succession.

In this matter our concept of causality was originally formed. It is not based on a projection of a psychological habit, but based on construction from structural features of similar events in other concrete situations and then applied onto actual, contiguous events. It is the modal part of our concept that helps us to understand what it means that two adjacent events are causally connected. If we had not been able to come up with the complex idea that some contiguous events are connected because the existence of one is dependent on the existence of the other, we would not have been able to understand the difference between events that are contiguous by accident and events that are contiguous by causal necessity. The concept of causality is constructed to make a separation between contingent dependency and contingent independency.

Granting that the concept of causality contains modal elements, and granting that these do not represent anything ontological in the actual case of causation, but represent the systematic appearances of similar events in other empirically accessible situations, we need a way to talk about how actual events would appear if they were to replace the similar events in these alternative situations. Instead of talking about generically similar events in other situations, we want to talk about actual events in other situations than the actual. Hence we invented counterfactual constructions.

Causal claims about actual events imply counterfactuals and for that reason the regularity account of causation fails. First, the belief one acquires when seeing an event causing another event is not merely that these two events exist together or that they are somehow connected with one another. A central element of our causal belief is that one, the cause, is not only temporal but also *causally prior* to the other, its effect. Although cause and effect by definition are causally related, one of them is regarded as superior to the other. That is the cause. The effect comes about because of the cause, but not vice versa: the cause does not happen because of the effect.

Another element is that the two events are connected because in actual circumstances the cause is *necessary* for its effect. For instance, thaw causes the snow to melt, and in those situations the thaw can be regarded as causally necessary for the disappearance of the snow, in spite of the fact that other events can transform snow into water too.

This feature of non-logical necessity is what is referred to by the use of counterfactuals. We express it by endorsing a sentence like 'Had it not been for the thaw (and all else had been the same), the snow would not have melted'. It is obvious that the relationship between two accidentally co-occurring events cannot be described as obeying this kind of non-logical necessity.

The third element commonly associated with the notion of causation is that causes are efficacious in the sense that they *necessitate* their effects. This is indeed another way of saying that causes are sufficient for their effects. Our notion of a cause is such that whenever we have a belief that a particular event is the cause of another, we also believe that the causing event produces its effect by making it necessary. If something is a cause, nothing can stop it from being a cause by not

letting its effect happen. For how can an individual event be a cause if it does not give rise to an effect? By definition a cause necessarily brings about an effect.

Now, the ascription of truth values to counterfactuals goes beyond any actual confirmation. Quite evidently, counterfactual claims cannot be ascribed the value true or false on the basis of the observation of a non-existing situation since the antecedent is supposed to be false. Understandably, this has troubled empiricists. But though we cannot directly confirm the truth value of a counterfactual statement by our experience of the actual situation, it does not mean that we are prevented from making any assessment of it. For the necessity involved can be explicated in terms of possible worlds. Here I shall, nevertheless, stand by the anti-realist view concerning possible worlds as a family of models of our modal discourse. These worlds are nothing but fictitious constructions by which we can explicate our talk about necessity and possibility. But because possible worlds are not real, it does not mean that counterfactuals cannot be true or false. For given a certain possible world-model of counterfactuals such talks of necessity and possibility can legitimately be ascribed truth values according to the instructions of the model, I submit, in so far as the hypothetical claim of the counterfactuals can be actualized. Hence, a counterfactual claim about particular things or events should be understood as an abstract statement about how the entities mentioned will behave in other situations in virtue of their actual properties. In other words, the truth-makers or ontological ground for realizable counterfactuals should always be found in some factual, or categorical, properties of the things or of the events in question.

The claim just mentioned is not without problems. For how can counterfactuals whose antecedent and consequent actually are false be true because of some factual properties unless we allow some reification of possibilities (and therefore possible worlds)? We say that counterfactuals are true just in case the hypothetical content is realizable but this is not the same as stating that it is realized. Consequently, there cannot be categorical facts of the matter which make them true or false. Although the conclusion seems straightforward, I don't think it is inevitable. The reason is that counterfactuals function very much like indexicals in the sense that they contain an implicit reference to

both a certain moment of time t and certain particulars x_1, x_2, …, x_n. When someone utters contrary to the fact that 'Had the weeds in my garden been sprayed with herbicides, then they would have died', he has a certain period of time and certain particular weeds in mind. It is with respect to these moments and these individuals that the facts of the matter expressed in the antecedent and the consequent are not realized. But nothing dictates that the actual grounds for the ascription of a truth value to this counterfactual should be confined to the intended interval or the intended particulars. Here we must distinguish between two views concerning the grounds, corresponding to strong and weak constructivism respectively. The first position holds that the grounds have to cite only those properties that are actualized at a certain time t equal the intended time, and satisfied by certain particulars equal to the intended particulars. As a result counterfactuals cannot literally be true or false. The second position holds that the grounds only have to refer to what is actualized at any time different from t, the implicit time in question, and satisfied by any particulars different from x_1, x_2, …, x_n, the implicit particulars in question, but particulars of the same sort. So this view claims that counterfactuals are true or false if their hypothetical content can somehow be actualized at any time other than t, and that it is in fact realized at a time t^*. The two kinds of counterfactuals which don't have a factual content – and therefore no proper truth value – are those counterfactuals whose hypothetical content is not realizable, since they contain an explicit reference to a certain time or particular, which is never realized for whatever reason. In either case, no fact exists which can make such counterfactuals either true or false.

In his penetrating study of counterfactuals in terms of possible worlds, David Lewis argued that a counterfactual is true if, and only if, every world where the antecedent as well as the consequent hold, is closer to the actual world than any world where only the antecedent holds (Lewis 1973, 16 – 18). However, philosophers have questioned Lewis' account because this specification of the truth conditions of counterfactuals suffers from the weakness that we have no precise way of defining which world is closer or similar to which. Apparently, we cannot even characterize the similarity relation in terms of facts about these worlds, say, which laws of nature belong to the closest

worlds, since Lewis is ready to sacrifice the laws of nature to save the asymmetry in the evaluation of counterfactuals. I believe, nevertheless, that it is possible to give coherent arrangement in which some of the accessible worlds are closer to the actual world than others (Faye 1989, 65 – 74). The cost is that we cannot preserve any asymmetry in the relation between the content of the antecedent and that of the consequent except what rests on a temporal succession.

Let us distinguish between the *actual* circumstances and what could be called the *causally relevant* circumstances. The actual circumstances are, for instance, those which are present whenever an event causes another, whereas the causally relevant circumstances are those which are present each time similar events co-occur (*i.e.* those conditions which are present in every possible world in which events of the same sorts as the actual ones co-occur). So the actual circumstances contain all causally relevant circumstances, but the converse is not the case: the causally relevant circumstances do not contain every actual circumstance. In addition to the causally relevant conditions, the actual circumstances consist of conditions that are causally irrelevant, those being events which do not repeatedly occur every time events similar to the actual events co-occur (Faye 1989, 160 – 163). Hence, any situation (world), consisting of circumstances that are taken to be quite similar to the actual circumstances, is closer to the actual situation than every situation that consists of the causally relevant circumstances, but not of every circumstance equal to the actual circumstances. Analogously, every situation consisting of the causally relevant circumstances is closer to the actual situation than anyone that does not contain all of them.

The causal statement we make about the individual events involved in a causal connection is warranted only because we always recognize similar events as instances of generic events in virtue of naming them with the same kind of terms. The separation of the world into particular events and things presupposes a distinction between tokens and types, as well as a knowledge allowing us to apply type names to individuals in the correct circumstances. In my opinion the ascription of a truth value to a counterfactual like 'If the gas had not been lit, the water would not have boiled' can be empirically justified by simple induction from the observation of similar

situations in which the circumstances are generically equivalent to the actual circumstances, except for events of the same sorts as the cause and the effect. We are observing such a situation whenever we see that a stove is working, a kettle filled with water placed on the stove, and oxygen present without seeing an event similar to the cause (lighting of the gas), and an event similar to the effect (boiling water). Similarly, I argue that in those precise circumstances, seeing no event of the same type as the effect amounts to seeing no event of the same type as the cause. Thus, on the basis of the same observations and simple induction we may also evaluate a statement like 'If the water did not boil, then the gas would not have been lit' as truthfully stated.

So we can conclude that experience yields support for a counterfactual symmetry, and not the asymmetry we suspect the causal nexus to have (Faye 1994, 143 – 147). This implies, if it is true, that counterfactuals cannot explicate the entire meaning of causal statements. Causal claims do not reduce to counterfactual claims, in spite of the fact that the latter can be used to describe features of the former. Since empirical observation assigns a truth value to both counterfactuals, we are unable to express in a counterfactual language of necessity and sufficiency which of the two singular events is *causally prior* to the other. The idea that these events are *causally connected* seems nonetheless adequately caught in that language.

4 Conclusion

I have argued that our concept of causality is a construction in the sense that modalities rest in the heart of this notion. I agree with those empiricists who believe that modal talks do not refer to anything in nature. As conceptual inventions necessity and possibility belong to epistemology and not ontology. However, most empiricists are presentists by allowing only the present situation to be belief generating and truth conveying. But if you are an empiricist of a more pragmatic sort, you don't have to restrict your knowledge claims to what you actually can observe, but what you have observed and what you will observe. For a pragmatist induction is not a problem. Rather modal concepts like 'necessity' and 'possibility' help us to understand what we actually observe in the light of what we have seen and what we

can expect to see. Therefore a notion like causality is a linguistic construction to speak about the actual observation with respect to past and future observations.

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