MODELS OF INTENTIONAL EXPLANATION

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The controversy about intentional explanation of action concerns how these explanations work. What kind of model allows us to capture the dependency or relevance relation between the explanans, i.e. the beliefs and desires of the agent, and the explanandum, i.e. the action? In this paper, I argue that the causal mechanical model can do the job. Causal mechanical intentional explanations consist in a reference to the mechanisms of practical reasoning of the agent that motivated the agent to act, i.e. to a causally relevant set of beliefs and desires. Moreover, the causal mechanical model can provide in efficient and unproblematic applications, unlike action explanations using ceteris paribus laws or counterfactuals. The drawback of the latter models of explanation is their modal requirement: the explanans must mention or imply sufficient and/or necessary conditions for the explanandum. Such a requirement is too strong when it comes to intentional explanation of action.

I. Introduction

Most people know what intentional explanations of actions are about: these explanations refer to the relevant beliefs and desires of an agent. The puzzling thing concerning intentional explanation, however, is that it is not clear how such explanations should be modelled. How do these explanations work? What method should we use in order to capture the dependency or relevance relation between the explanans, i.e. the beliefs and desires of the agent, and the explanandum, i.e. the action? Should such explanations state ceteris paribus laws? Or can counterfactuals do the job? In this paper, I want to focus on these questions. In Section II, I argue that actions can be explained by means of causal mechanical intentional explanations. Such explanations consist in a reference to the mechanisms of practical reasoning of the agent that motivated the agent to act. In Section III, I argue that the causal mechanical model (henceforward CM model) is a better candidate for intentional explanations than the deductive-nomological model, i.e. explanations using ceteris paribus laws (cp laws in short), and the counterfactual model, i.e. explanations in terms of counterfactual sentences. The disadvantage of the latter models or methods of explanation is that they require that the explanans mentions sufficient and/or necessary conditions for the explanandum. Such a modal requirement is too strong when it comes to intentional explanations of actions. The CM model does not pose such a requirement since it does not involve conditional statements.

Before I begin, I want to make three preliminary remarks. First, CM explanations of action are normally taken to be explanations that imply a reduction of intentional states to neurophysiologic processes or brain states. This is why the CM model has a negative connotation for those who take folk psychology seriously. Not all CM explanations
are reductive explanations, however. As a matter of fact, Wesley Salmon—the founding father of the CM approach—already noted that CM explanations come in two types (1998, 324): etiological and constitutive CM explanations. Etiological explanations tell the causal story leading up to the occurrence of a phenomenon, while constitutive explanations provide a causal analysis of the phenomenon itself, referring to the underlying causal mechanisms that constitute the phenomenon. When it comes to actions, most philosophers only take the constitutive or reductive explanations into account. In this paper I want to focus on etiological CM explanations of actions. Such explanations refer to causal factors, i.e. beliefs and desires, that are to be situated on a similar level of description.

My second remark concerns explanatory pluralism of actions. I think we can and must distinguish between three different kinds of explanatory pluralism. An explanatory pluralism can mean that we should consider different theories or research programmes that investigate the origination of actions, e.g. social psychology, rational choice theory, behaviourism, evolutionary psychology. Another kind of explanatory pluralism concerns sorts of explanation. Sorts of explanation are different approaches or different conceptual constructions by which we can obtain specific information about an action. These sorts of explanation can be applied to different theories of explanation but are distinct from them. Examples of such sorts are, for example, intentional explanations, i.e. explanations that refer to beliefs and desires of an agent; dispositional explanations of actions, i.e. explanations that refer to the relation between the behavioural tendencies of an agent and the triggering situations of such a disposition (see e.g. Vanderbeeken and Weber 2002); functional explanations of actions, i.e. explanations that refer to the function of an action. For instance, sometimes a type of action has proven to be successful in the past and this can stimulate the agent to perform a similar action. A third kind of explanatory pluralism concerns the model or the method of an explanation e.g. the deductive-nomological (DN) model, the counterfactual (CF) model and the CM model. These models are instruments or tools that possibly can be used to shape a sort of explanation, like intentional explanations. Models of explanation enable us to capture the dependency or relevance relation between the explanans and the explanandum. It is the latter sort of explanatory pluralism I want to focus on in this paper.

My third remark concerns causality. When I want to defend the idea of CM intentional explanations of action, this implies that I accept that intentional explanations can be causal explanations. Whether or not intentional explanations can be genuine causal explanations has been and still is a controversial topic that concerns problems about the possibility of mental causation. The most important problem is no doubt the well-known overdetermination problem between levels of causation (cf. Kim 1993), which brought up discussions about the causal role or causal efficacy of mental states (e.g. Menzies 2001; Pietroski 2000). We can avoid these discussions here, however, without taking a so-called free lunch. I give two arguments. First, there is a difference between the causation of an action and the causal explanation of an action. A causal explanation requires the mentioning of causal factors that are relevant for the action. It does not require that these factors cause the action in a direct causal chain. For instance, we can say that a belief is causally relevant for an action without being explicit whether a belief is causally efficacious itself or that it inherits its causal relevance from the brainstates (i.e. causal factors on a lower level
of description) on which it supervenes. In the latter case, the causal explanation relies on physical causation only. A second argument: the model of causal explanations I will defend is compatible with the so-called agent-causation theory. Agent-causation, unlike event-causation, can be understood as a safe conception of causation: it does not invoke causal chains between mental states and actions of an agent. It only presupposes causal relations between agents as a whole, having beliefs and desires, and actions of agents. This does not mean, of course, that in order to apply the CM model to intentional explanation, one need to be a convinced agent-causationist. It only means that this method of causal explanation is compatible with the agent-causation view and hence that it does not necessarily invoke event-causation concerning mental events, a view agent-causationists are not willing to accept.

II. CM Intentional Explanations

The CM Model

Before I discuss CM intentional explanations, I will first discuss the CM model in general. According to this method, explanations point out how the explanandum fits in the causal network of the world. Such explanations use singular sentences of the form ‘E because C’ that refer to relevant causal factors in terms of causal mechanisms, i.e. causal processes or causal interactions, without using constructions that imply laws or counterfactuals. Instead of relying on conditional sentences like laws or counterfactuals, the CM model uses Reichenbach’s mark-criterion by which causal mechanisms can be defined. By means of these mechanisms one can capture dependency relations between the explanans and the explanandum. Put differently, CM explanations put the ‘cause’ back into the ‘because’ by referring to the causal processes or causal interactions that produced or made happen the explanandum. Salmon has redefined the concepts ‘causal interaction’ and ‘casual process’ several times. In his 1998 book, we find the most recent definition:

A causal process is a process that can transmit a mark;

- A mark is an alteration to a characteristic that occurs in a single local intersection;
- A mark is transmitted over an interval when it appears at each space-time point of that interval, in the absence of causal interactions;
- A process is something that displays consistency of characteristics.

A causal interaction is an intersection in which both processes are marked (altered) and the mark in each process is transmitted beyond the locus of the intersection. (Salmon 1998)

Two important things need to be said about the CM model. First, note that Salmon finally recognized that the CM method faces an irrelevance problem (cf. critics in Hitchcock 1995). Talking of causal interactions and causal processes alone only shows us that a factor was a part of the causal history of the explanandum-event, not that it is causally relevant and thus explanatorily relevant for the explanandum. For instance, a piece of chalk of the billiard cue transmitted throughout the collision of two billiard balls is a causal process, but this causal process is nevertheless explanatory irrelevant for the explanation of the momentum of one of the balls. So, in order to obtain explanatory relevance we
need an additional criterion. Here, we can use the making-a-difference criterion (e.g. Woodward 2000, 2004). Salmon, however, suggests using a related but different criterion, namely the statistical relevance-criterion.\(^1\) This means that the CM model can be boiled down to the following two criteria:

B causes/explains A iff,

(i) (causal requirement) The explanans mentions causal interactions or causal processes;

(ii) (relevance requirement) \(P(A/B) > P(A/\neg B)\).

Second, several criticisms, for example Sober (1987), Kitcher (1989) and Dowe (1992), have pointed out that Salmon is too liberal in defining causal processes and causal interactions in terms of ‘characteristics’. In this way, the CM model fails on two counts: it excludes many causal processes and it fails to exclude many pseudo processes. Yet, the first objection only imposes a restriction not an error. So, in order to save the CM model, only a solution for the second shortcoming is required. Here, it is important to note that the respective counter-examples include relational properties. An easy way out, then, is to define causal mechanisms in terms of non-relational properties instead of the notion ‘characteristics’. This solution, although restricting, enables us to maintain the CM model without restricting it to a theory of conserved quantities (cf. Dowe 1992). Such a theory excludes most if not all application of the CM model in the social sciences.

The CM Model Applied to Intentional Explanations

How can the CM model be applied to intentional explanations? For instance, what kind of causal interactions can we refer to when it comes to intentional explanations of action, i.e. when it comes to beliefs and desires? I believe the answer is simple: none. It would be strange, I believe, if we started talking about causal interactions between beliefs and desires. Therefore, CM intentional explanations need to be conceived of in a different way. One important step is to recognize that intentional explanations, unlike some physical explanations, do not refer to preceding causal interactions of any kind. They refer to causal factors, i.e. beliefs and desires, that are responsible for the manifestation of an action. Beliefs and desires, being causal factors, can be understood as parts of causal processes, i.e. as descriptions of (parts of) causal processes. This means that CM intentional explanations of action will have to do without a reference to causal interactions: they should and can refer to causal processes instead. A next important step is to recognize that the action itself, our explanandum, is a causal interaction. An action, at least most actions, can be conceived as a causal interaction between an agent and his or her environment. Here we have two intersecting causal processes: the agent having a set of beliefs and desires, on the one hand, and the environment, on the other (see Figure 1).

So, if the explanandum itself is a causal interaction, we cannot explain the explanandum by referring to another causal interaction, but we can explain the explanandum by referring to causal processes that are involved (altered) in this causal interaction, i.e. by referring to the causal processes that make a difference for this causal interaction.

Note that the application of the CM method to intentional explanations requires a broader notion of causal processes than is usually taken for granted. Most philosophers,
e.g. Dowe (1992) and Woodward (2004), take a causal process to be a process that involves
the propagation of a momentum or energy. But, as we have mentioned in Section II ('The
CM Model'), a causal process defined in terms of non-relational properties can be some-
thing different as well, e.g. the transmission of information or the goal directedness of a
system. Note that Salmon himself defends a more general or broader notion (1998, 71):
‘a causal process is capable of transmitting energy, information or a causal influence
from one part of space-time to another’. Unless we are willing to accept a broader
notion of causal processes, we will not be able to apply the CM model to more complex
subject-matters than the so-called billiard ball examples.

Note also that in this application of the CM model, the mental states are not causal
processes but part of such a process. They are the mark that is transmitted and that will be
modified throughout the causal interaction, i.e. the action. In CM intentional explanations,
the mark-criterion is used to capture the motivating mental states: the agent having a set
of beliefs and desires is a causal process, and the relevant beliefs and desires are the marks or
the characteristics of such a process. This requires some clarification. To give an example:
imagine that I have the desire for coffee, and I have the belief that I can get a good
coffee in the pub outside the university building. Based on this desire and belief, I can
form the intention to go to this pub and if everything goes well, I will go and get coffee
in the pub. Here, two scenarios are possible. (i) If there is no coffee available in this pub,
e.g. because it is Monday and the pub is closed, then I will no longer have the same
belief. I will no longer believe I can go for a coffee to this pub at the very moment. (ii) If
it turns out that I can get a cup of coffee in the pub, then, after drinking my coffee, I will
no longer have the same desire for coffee anymore. In both cases I will no longer have
the same beliefs and desires: the original characteristics of the causal processes are modi-

One possible objection against this example is that we can think of some general
beliefs and desires that will not be modified throughout the causal interaction, and that
still are relevant for an intentional explanation of the action. For instance, we can say
that the agent has a desire to live a peaceful or happy life, and it can be argued for that
we can use this general desire instead of the particular desire for coffee. If we accept
that such general desires can be referred to in intentional explanations, we can construct
counter-examples that do not fit the CM model. I believe we can turn this objection into
a benefit, however. If we allow general descriptions of beliefs and desires, we will end
up with general and vague intentional explanations. The CM method, on the other hand,
enables us to single out or to point down particular mental states that are relevant for an intentional explanation. The fact that some mental states under some description will be modified after the causal interaction ensures us that these mental states are causal factors that are involved in the causal interaction, i.e. the action. Intentional explanations that refer to these more specific or particular mental states will be more explicit or precise. Another objection might be that not all mental states that will be modified throughout the causal interaction are relevant for intentional explanations. For instance, when I go to the pub, it can be that I notice that they serve a new Belgium beer there. This means that my visit to this pub brings about a change in my beliefs about the availability of the brands of Belgium beer. This example shows that other possible beliefs and desires can change throughout the causal interaction. This objection does not hold, however. As I mentioned in Section II ('The CM Model'), Salmon finally recognized that a CM explanation requires two requirements, a causal one and a statistical one. The second requirement is meant to exclude such cases of explanatory irrelevance: the availability of Belgium beer does not change my intention to go to this pub if I want a cup of coffee.

III. Evaluating Models

Introduction

I realize that I use Salmon's theory in a quite unorthodox manner: I don't use it to explain a causal process by referring to a causal interaction but the other way around. But I believe that such an application is valid: we can apply the CM model to intentional explanations and I believe it opens opportunities. This brings me to the second part of this paper: why is the CM method a better candidate for intentional explanations than the DN method or the CF method? As mentioned in the introduction, I prefer an explanatory pluralism when it comes to models of explanations. I know that each of these models can be related with, or embedded in a certain metaphysical world-view, e.g. a Humean world ruled by laws, a semantic of possible worlds or a process-ontology, but I do not want to take up such a connection. I regard the DN model, the CF model and the CM model as methods that enable us to capture the relation of dependency or relevance between an explanans and the explanandum, not as three models that invoke different metaphysical world-views. I prefer a practical approach: these models of causal explanation are instruments or tools and the adequacy of a model depends on its applicability. Moreover, I do not want to argue for or against one or another model in general. My claim is that, when it comes to intentional explanations of action, the CM method is a better candidate than the other models because it allows for simple and straightforward applications. Let me give you my arguments.

The DN Model

The classical DN model. First, I will discuss the classical DN model, as defended in Hempel and Oppenheim (1965). According to this model, explanations are arguments.
The explanandum is deduced or derived from a set of premises, containing at least one empirical law.

Explanans: \[ C_1, C_2, \ldots, C_n: \text{antecedents or initial conditions} \]

\[ L_1, L_2, \ldots, L_n: \text{Universal Laws} \]

Explanandum: E

The characteristics of the classical DN model are: (i) nomological necessity, i.e. the explanans is a sufficient condition for the explanandum; (ii) generality, i.e. due to the universal law (the universal quantifier) DN explanations explain types of events, not just particular events. The classical DN model faces several problems, e.g. the asymmetry problem, the irrelevance problem, the determinism requirement (see e.g. Salmon 1998, sec. 6). I will ignore these problems here. Based on both characteristics alone, we can say that the DN model is a bad instrument for intentional explanations because there is no such thing as a strict psychological law (e.g. Davidson 1980). Moreover, in the case of intentional explanations we are interested in singular explanations, not general explanations. We want to know the reasons behind one particular action. We don’t want to know the possible sets of mental states that are a sufficient condition for a type of action. Conclusion: even if we could use the classic DN method, it is too laborious for our purposes.

The all-things-being-equal model. An alternative version of the nomic method defended by e.g. Pietroski and Rey (1995) and Pietroski (2000) are nomic explanations that use \( cp \) laws. I will call this the all-things-being-equal model, or the \( cp \) law model for short. A \( cp \) law can be formulated as follows: \( cp[(\forall x)(Bx) \Rightarrow \exists y(Ay)] \). Since laws are supposed to be exceptionless, such regularity can only be a genuine law if there is at least one case in which the regularity holds, i.e. the explanans must be a possible sufficient condition for the explanandum. Put differently, the \( cp \) generalization is a genuine law and hence is explanatory if and only if it has a completer. It is important to note that it need not be the case that someone who uses \( cp \) laws in an explanation must actually be able to describe the completer in a non-trivial way. Instead, it is enough to know that the completer exist, that we have good reason to think it exists. There is a whole discussion going on about whether or not the completer account is valid (see e.g. Schiffer 1991). I will ignore this discussion here. Instead I take it for granted that DN explanations using \( cp \) laws can do the job in some cases.

Nevertheless, I don’t think that the \( cp \) law model can be properly applied to intentional explanations that refer to a set of beliefs and desires of an agent alone. I have two reasons: the \( cp \) law model requires (a) that the explanans mentions a possible sufficient condition, i.e. that it mentions a set of positive causal factors that can bring about the explanandum when obstructing factors are absent; (b) that we have good reasons to believe that the respective \( cp \) law has a completer. I have serious misgivings with both requirements. First of all, a set of beliefs and desires can never be a sufficient condition for an action due to what I like to call the problem of causal closure of actions. The origination of an action is a very complex process that involves a whole variety of causal factors, and a set of beliefs and desires is only one of them. Other positive causal factors are...
required in order to have a possible sufficient condition. Second, since the origination of an action is such a complex process, it remains unsure if we actually can spell out a completer. So why should we just accept that the respective \( cp \) law has a completer?

In order to defend both claims, let us take a brief look at the process of the origination of an action. I will give a general outline of the requirements for the origination of an action (see e.g. also Mele and Moser 1998, sec. 6 or Searle 2002). The origination of an action consists of three steps: the deliberation process, the formation of an intention and the actual manifestation of an action. In each of these steps, one or more positive requirements are necessary. Note that each step also involves negative requirements, i.e. the absence of obstructing factors. It is these negative requirements that \( cp \) clauses are meant to exclude. Hence, a \( cp \) law does not need to mention these negative requirements but if we want to spell out the respective completer, we should be able to give a full list of all the possible negative requirements.

(i) **Deliberation** (process of practical reasoning):
- An agent has a set of beliefs and desires.
- Obstructing or overruling desires and beliefs are absent.
- The agent wants to choose between different opportunities, i.e. the set of beliefs and desires motivate the agent to form a decision. The agent must be rational; he or she must be willing to act according his or her beliefs and desires. (Note that an action always involves a choice. This is an intrinsic feature of an action versus mere behaviour.)
- The agent can choose between different opportunities, i.e. the agent must know some sort of rule, e.g. a decision rule, rule of thumb, that enables him or her to overcome the decision problem. The agent must also be able to apply the rule correctly.

(ii) **Formation of an intention** (the volitional part):
- The agent must be willing to act according to his or her decision, i.e. the agent should have no weakness of the will or *akrasia*.
- Internal obstructions must be absent, i.e. there may be no obstructing emotions, cognitive malfunctions (e.g. the agent may not forget about his or her decision), etc.
- The agent must be capable of trying to act upon its intention at time \( t \), i.e. he or she must be physically capable to act upon its intention at \( t \). (The agent must have control over his or her body.)

(iii) **Manifestation of the action** (the executive part):
- External obstructing factors must be absent, i.e. obstructing or distracting events or persons must be absent.
- The agent must be able to intentionally succeed in \( A \)-ing, i.e. it may not be just plain luck that he or she could succeeded in the realization of the action.

I do not want claim that this list is exhaustive, and indeed we can discuss about how we should formulate all these requirements and whether or not all the conditions I mentioned are required. One thing is clear, however: a set of beliefs and desires alone is not enough in order to get a possible sufficient condition for an action (cf. argument against (a)). Moreover, we cannot be certain or we cannot prove (yet?) that \( cp \) laws that refer to
a set of beliefs and desires have a completer and hence are genuine laws (cf. argument against (b)). This allows me to conclude that we can be sceptical about the cp law model when it comes to intentional explanations due to the problem of causal closure of actions.3

The CF Model

The contraposition model. A next method is the counterfactual method. Note that, due to the flaws of the DN approach, several philosophers consider CF explanations to be the only option for explaining actions. Their advantage: they don’t need universal laws and they are singular explanations. Here we find another argument against the (primacy of the) nomic model: the fact that counterfactuals can do the job shows that we do not need laws for intentional explanations. Nevertheless, the CF model faces some crucial problems as well.

I will first discuss the classical CF model, i.e. the contraposition model put forward by Lewis (1973). His CF theory of causality is based on a contraposition of two counterfactual statements, a positive and a negative one. By means of these conditions we can capture sufficient and necessary causes of a phenomenon. Summarized, the contraposition model goes like this:

C causes/explains E iff,

(iii) C and E are distinct events
(iv) C \rightarrow E (C is a sufficient condition)
(v) \neg C \rightarrow \neg E (C is a necessary condition).

The main characteristic of this model is that the explanans is not only a sufficient condition for the explanandum as in the case of DN explanations but a necessary and sufficient condition. Based on information about the explanans, we can always deduce information about the existence of the explanandum. This means that the contraposition model is even stronger and hence more problematic than the cp law model. We still face the problem of causal closure of actions (due to the sufficient condition) and we are confronted with a new problematic requirement (due to the necessary condition).

The cp contraposition model. A possible solution is proposed by Haugeland (1983). Baker (1995) follows this solution. John Haugeland suggests taking up cp clauses inside the counterfactuals. In this way, we can loosen the strong dependency relation of both the negative and positive condition. In sum:

C causes/explains E iff,

(vi) C and E are distinct events
(vii) C (cp) \rightarrow E (C is a possible sufficient condition)
(viii) \neg C (cp) \rightarrow \neg E (C is a possible necessary condition)

It is clear, however, that this solution won’t do: using cp clauses will not solve the problem of causal closure of actions since the cp contraposition model still implies that a set of beliefs and desires is a possible sufficient condition for an action. As mentioned before, a set of beliefs and desires alone, cannot be a sufficient condition.
The negative condition model. A better solution is the so-called negative condition model defended by e.g. Schiffer (1991) and Ruben (1994). They propose to use only the negative condition of the contraposition model. This counterfactual is meant to capture a necessary condition for the explanandum. In sum:

\[ C \text{ causes/explains } E \text{ iff,} \]

\[ \neg C \Rightarrow \neg E \text{ (C is a necessary condition)} \]

This is an interesting option because a set of beliefs and desires indeed is, I believe, a necessary condition for an intentional action. Yet, it has been argued, e.g. by Platts (1980), Sen (1982), Schick (1984) and Searle (2001), that actions can be motivated by so-called ‘desire-independent reasons’ alone, for instance normative beliefs. Such beliefs already presuppose or imply a motivational or volitional component, so we do not need to mention an additional desire in intentional explanations. This shows that, in some cases, the negative condition model only needs to mention a (normative) belief rather than a set of beliefs and desires. In other words: if the idea of ‘desire-independent reasons’ is correct, mentioning a belief and desire is not obligatory in order to obtain a necessary condition for an action.

The negative condition model also faces another and more important problem, namely the classical problem of overdetermination and pre-emption. I will call this problem the redundant requirement of absence of actions. If we use a model of explanations that requires that a set of beliefs and desires is a necessary condition for an action, we will end up with a very restricted model since such a model presupposes the absence of the effect. This requirement is hard to fulfil in the case of actions: agents can have several reasons to act upon and they often act for no reason at all. For instance, if I take up my example of going for coffee in the pub again, the negative condition model requires that, if I do not have a desire for coffee or if I do not believe I can get in the pub, then it should not be the case that I show up in this pub after all. This means that two types of cases should be absent. (i) The first type of case concerns some kind of deviancy; it should not be the case that I’m just walking around and enter the pub on my way, for no reason whatsoever; neither should it be the case that, while I’m looking for the university building, I walk into this pub by mistake. Such cases do happen, and in these cases I’m still manifesting actions. (ii) Another type of case concerns overdetermination of reasons; it may be the case that, although I have no need for coffee, I still want to go to the pub because I need to use the toilet, I want a beer, I want to meet someone, I want to go and see if I left my coat there, I want to eat something, etc.

Both types of cases are fatal because they falsify the logic of counterfactuals: the negative condition model requires that we refer to reasons that are a necessary condition for the action. This problem is hard to overcome since it will be difficult to make sure that an agent does not have other reasons that can motivate the respective action anyway. Only if we know all the possible reasons of an agent and we can be sure that the agent will not manifest the respective action for no reason at all, can we use the negative condition model. But even if this is the case, this makes the negative condition model quite complex and therefore not interesting for applications.
Note that some philosophers, like Schiffer (1991), Ruben (1994) and also Baker (1995), try to minimize the problem of pre-emption and overdetermination by stating that such cases are rare. But this is definitely not true when it comes to reasons and actions. In the case of actions, it happens all the time that agents have more than one reason to act upon, or that they will still do things for no real reason at all. I do not exclude that, eventually, a solution to this problem can be found. Nevertheless, I doubt that such a solution will still make the negative condition model attractive for applications. In Ruben (1994), for instance, we find a very sophisticated solution. But as Ruben admits, this solution can only overcome some cases of overdetermination, and what is more important, it brings in new problems, e.g. it wrongly makes the pre-empting factors explanatory as well. This is something we obviously want to avoid.

The CM model. The above discussion of the nomic and the CF model and their problems gives us good reasons to say that the CM method is a better candidate than these models because it provides in singular explanations, and it does not require that beliefs and desires are neither necessary or sufficient nor necessary and sufficient for an action. The fact that the DN model and the CF model try to capture sufficient or necessary conditions makes them problematic and if possible, laborious and very complex. CM intentional explanations, on the other hand, just refer to positive causal factors of the explanandum in terms of causal processes or causal interactions. They show how the explanandum fits in the causal network of the world, by means of the mark-criterion and a relevance requirement. This is, I believe, all we need in the case of intentional explanations.

I want to make two concluding remarks. First, it is true of course that more needs to be said about CM intentional explanations. In Section II, I restricted myself to mentioning the general idea. If we give the application of the CM model to intentional explanations a further thought, one important disadvantage is the following: we can only apply the CM model to intentional explanations of action if we conceive the respective action as a causal interaction. Some sorts of actions like tryings, being mental states that can cause a bodily movement (cf. Pietroski 2000) or so-called negative actions, i.e. actions that lack bodily output (cf. Mele 2003) will be difficult to conceive in terms of causal interactions. For instance, in the case of tryings as basic actions, i.e. mental events that do not cause any bodily movement, the action does not have any impact on the environment. In the case of negative actions, it is not clear how such actions work upon the environment. A hunger strike for instance, lacks any physical intervention with the environment (although it has a psychological impact on the environment: this is what hunger strikes are all about). In sum, some sorts of actions—if we are willing to take such cases to be genuine actions—will be difficult to fit in the CM framework. The CM model faces a restriction here.

Second, I do not claim that the CM model is the best model for intentional explanations. Other alternatives are possible. But if my criticisms against the DN model and the CF model are correct, an alternative should have the same advantages as the CM model. For instance, we could consider statistical variants of the DN model, i.e. nomic explanations that refer to statistical laws (cf. Hempel’s Inductive-Statistical Model). Here, however, we face the disadvantage that we have to have exact information about
probabilities. This is a overly strong requirement when it comes to intentional explanations: in order to explain a particular action we need to know about the impact of a set of beliefs and desires concerning a type of actions. Moreover, we can be sceptical about the fact that a set of beliefs and desires that probably can bring about an action will do the job in the case of the particular action to be explained. For instance, it can certainly be the case that I will be motivated to do action A when I have a belief B and a desire D, but that somebody else is not. It is not certain that the presence of a set of beliefs and desires has the same motivational impact on different people. This makes causal thinking much more sophisticated in the case of mental states than, for instance, in the case of colliding billiard balls. Concerning the latter, a positive causal factor in one case will be a positive causal factor in others as well. We should be aware of this difference in order to avoid what I would like to call the billiard ball syndrome.

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NOTES
1. ‘I would now say that (1) statistical relevance relations, in the absence of information about connecting causal processes, lack the explanatory import and that (2) connecting causal processes, in the absence of statistical relevance relations, also lack explanatory import’ (Salmon 1998, 476).
2. For a related broad conception, I refer to a paper of Collier (1999) called: causation is the transfer of information.
3. In a personal communication, Paul Pietroski replied to my criticism that he takes actions to be tryings, i.e. to be mental events that cause bodily movements. This means that the conditions in the third step of my list are not required under this conception. This weakens the problem of causal closure of actions. However, even if we take up this conception of actions, there are still other positive requirements that need to be fulfilled in order to have cp laws that have a completer.
4. ‘An occurrence of F in C causally explains an occurrence G in C iff: (i) if an F had not occurred in C, then a C would not have occurred in C; and (ii) given that an F did occur in C, an occurrence of G was inevitable’ (Baker 1995, 122).
5. ‘The F fully causally explains the G iff (a) the F caused the G, and (b) either (i) if there had been another token event c’ in place of the F, which failed to be an F, c’ would not have caused the G, or (ii) there is a non-redundant disjunction of properties V, of which F is an element, such that if c’ had not had any of the properties which are elements of V, c’ would not have caused the G, and (c) in the hierarchy (or hierarchies, in the disjunctive case) of properties, h, to which F (or the elements of V) belongs, F (or each element of V) is the most determinate property in h that still meets conditions (a) and (b)’ (Ruben 1994, 475).
6. We could also consider hybrid variants of the CF model, e.g. counterfactual explanations that involve causal terminology, e.g. the causal influence model (cf. Lewis 2001) or the interventionist model (cf. Woodward 2001, 2004). Yet, the causal influence model is extremely complex since it requires information about ‘alterations’ of the factors mentioned in the explanans and the explanandum. The interventionist model, on the other hand, is simple and elegant but it lacks transparency: it shows which causal factors are relevant for the explanandum but, unlike the CM model, it does not show how these causal factors fit into the causal nexus leading up to the phenomenon to be explained.

REFERENCES


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