

Causation as Metaphor—a Catachresis

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Abstract

The thesis of this paper is that causation, when described and treated as a metaphor, increases in explanatory power, while diminishing the problems associated with standard analysis of it. I first present a description of the uses of metaphor in scientific and literary language. This is drawn primarily from Max Black's interaction view of metaphor, as well as the view forwarded by Donald Davidson in his *What Metaphors Mean*. I then outline some of the standard analyses in the field of causation, followed by some of the standard replies to those analyses. Finally, I show how describing causation in terms of a metaphor will bypass many of these objections, while maintaining or increasing its explanatory power.

[**Keywords:** Causation; Metaphor; Explanation]

Introduction to the Problem

The thesis of this paper is that causation, when described and treated as a metaphor, increases in explanatory power, while diminishing the problems associated with standard analysis of it. I will first present a description of the uses of metaphor in scientific and literary language. This will be drawn primarily from Max Black's interaction view of metaphor, as well as the view forwarded by Donald Davidson in his *What Metaphors Mean* (Davidson). I'll then outline some of the standard analyses in the field of causation, followed by some of the standard replies to those analyses. Finally, I'll show how describing causation in terms of a metaphor will bypass many of these objections, while maintaining or increasing its explanatory power.

So how does a metaphor operate? Let's take the following explanatory metaphor from the cognitive sciences: *The mind is a file cabinet in which memories are stored*. The author of this metaphor wants us to think of the mind as having certain things in common with a file cabinet – i.e., it is organized, compartmentalized, and efficient. One thinks of memories as file folders – you might flip through them until you put your hands on the appropriate one. Max Black describes this as the substitution view of metaphor (Black 31). Under the substitution view, the metaphorical expression can be translated somewhat literally.

Everyone knows how a file cabinet works. We know that you open the drawers, look through the file folders (which are organized according to one system or another). And we can easily apply this knowledge to the mind, memories, etc.

While an exact analysis of metaphor is unnecessary for our purposes here, I'll discuss the analysis of at least two prominent theorists. This will make explicit the distinction between Black's view that metaphor is related to meaning, while Davidson views the metaphor as belonging in the domain of use.

It would be a worthwhile accomplishment to reconcile these two views, but it will be enough to show that my thesis is tenable, regardless of where one finds one's self in the debate on the metaphor.

Before I begin, though, it's worth noting that the explanatory use of metaphor is not a new concept here. Philosophers and scientists have often used metaphor for its descriptive power – possibly more often than they'd like.ⁱ At least one philosopher has even gone so far as to forward the thesis that the hypothetico-deductive model, perhaps our most sacred causally explanatory model, should be supplemented by a metaphoric redescription of the domain of the explanandum (Hesse). The next section on the initial description of the metaphor devotes brief attention to both.

Analysis of Metaphor

Black's Interaction View

Consider the following metaphor: *the speaker plowed through the questions*. Following Black, let *focus* refer to the term doing the metaphorical work, or the term being used metaphorically. And let *frame* refer to the rest of the sentence (Black 27-28). In this case, "plowed" is the focus, with the rest of the sentence framing the metaphor.ⁱⁱ

Black first argues that to call a phrase a metaphor is to say something about its meaning. To justify this, he gives the following argument. If I were to translate a metaphor, word for word, into another language, the resulting sentence would be the same metaphor. And if the resulting sentence is the same metaphor, then to call a sentence a metaphor is to say something about its meaning. The sentence has the same meaning in both translations, and in both cases it maintains the metaphor. This tells us something, but how do we go about analyzing the metaphor? Black offers some possibilities.

We may think that when one says that the speaker plowed through the questions, what we are really saying is something about how he dutifully handled the examiners, didn't waste any time with examples, and cut the session short before it could get out of control. That is to say, whatever one means by the focus could simply be replaced with the literal meaning, thereby reducing the metaphor to its literal meaning. On this view, one may paraphrase any metaphorical statement with its literal counterpart. Black calls this the substitution view (Black 30-34).

We might well ask, then, why doesn't the speaker just give the literal version rather than burdening the listener with the duty of further translating the metaphor into its literal meaning? To offer one obvious answer – brevity. Why complicate matters with a long explanation, when a more brief metaphor will do? But another answer is that there

may be no good literal translation.

So, perhaps the substitution view does not have it right. Maybe there's a bit more to it than simple substitution. Maybe by metaphor, Black considers, we mean something closer to either simile or analogy. The mind, then, is like a file cabinet in that We then replace the "...” with the relevant properties that liken a mind to a cabinet where one keeps files. Thus, by analogy, we reduce the metaphorical phrase to its simile counterpart. Black names this the *comparison view*.

It's easy to see how, under the comparison view, by reducing a metaphor to a simile or an analogy, it can quickly lose all its explanatory power. Everything is like everything in an infinite number of ways. Some analogies are better than others, but there seem to be no false analogies. In no cases can we say, "no, a truck is not like a bird," or, "no, a tree is not like an envelope." There are always analogues – those relevant properties that two objects share. The comparison view, as an analysis for metaphor, leaves the metaphor with a vacuous explanatory power.

Black then argues for what he calls the *interaction view*. The interaction view is free from the main defect of the substitution and comparisons views, while offering important insights into the uses and limits of metaphor. With the introduction of the interaction view comes the introduction of a new metaphor which will aid in its analysis: "the poor are the trash of the inner cities."

What exactly is being said about the poor? The substitution view says that there is something being said – but what? The comparison view only draws our attention of some vague similarities between the poor and trash. Black argues that our thoughts and concepts of both terms 'poor' and 'trash' interact to form a new meaning that is a consequence of the interaction. The focus comes to have a new meaning, which is neither identical with its literal meaning, nor any literal substitute. This frame imposes a meaning that emerges from the interaction.

You might think of this as a filter (to use a metaphor to describe metaphors). For example, you have to describe the Battle of Waterloo using only the language of chess. You would speak of Lord Wellington putting Napoleon's army in check, etc. The interaction between the focus and the frame select certain aspects of the battle to emphasize or diminish. It brings forward aspects that might not have been seen otherwise.

Davidson's Theory of Use

One philosopher, at least, diverges from Max Black's interaction view of metaphor. Donald Davidson describes a distinction between the meaning of words and their use. While Black argues that metaphors depend on the meaning of the word, Davidson contends that the metaphor belongs strictly in the domain of use.

Unlike Black, Davidson argues that it is not the case that metaphor has a non-literal meaning, in addition to its literal meaning. Everything that a metaphor conveys, it

does with the literal meaning of the words. So that when Herman Melville writes that “Christ was a chronometer,” we require no additional translation besides what we find in the literal meaning of the words (Davidson 336). His argument for this idea follows.

Consider the metaphor, “the spirit of God moved upon the face of the water.”ⁱⁱⁱ If the term ‘face’ is to apply correctly not only to people, but also to water, then water really does have a face. If we are to think of words in metaphors as applying to what they properly apply to, then there is no difference between a metaphor and a new term in the language. That is, if the word in the metaphor applies appropriately to the thing, and it has some additional meaning, then there must be some additional meaning of the original term. And if there is some additional meaning of the word, then it is difficult to see how metaphor is distinct from merely a new term in the language.

But it’s not the case that the metaphor provides for the introduction of a new term in the language. So it must not be the case that the metaphor includes some distinct extended meaning of the words.

The exact analysis of metaphor is not important for the following section. Though Hesse assumes the interaction view of metaphor, much, if not all, of the important consequences will fall out of a view such as Davidson’s as well. Finally, I will make my account of causation general enough so that it may be subsumed under any account of metaphor.

The Explanatory Metaphor

Hesse’s metaphorical supplement

As I’ve mentioned, I don’t believe that the idea of harnessing the explanatory power of metaphor in scientific explanation is unique to me. Mary Hesse argues that the deductive model of scientific explanation should be modified and supplemented by a view of theoretical explanation as metaphoric redescription of the domain of the explanandum. I’ll base the remainder of my argument on her model (Hesse 119-24).

Following Hesse, let *primary system* be the primary referent of the descriptive statement, and *secondary system* be the secondary referent. So, to recall the metaphor from above, the poor are the primary system, and trash is the secondary system.

The hypothetico-deductive method as a model for scientific explanation is flawed. The bridge laws linking the theoretical and the observational languages cannot be derived from the explanans alone. But this is where the strength of metaphor as explanation comes in. In metaphor, there are no correspondence rules or bridge laws because there is only one language – the observation language. By introducing metaphor, there is no problem of connecting the explanans and the explanandum. The only problem left, then, is to provide and understand an analysis of metaphors, as it applies to explanation.

A very attractive consequence of this fact is already built into the interaction view

of metaphor That the explanation may modify the explanandum is built into the relation between metaphors and the primary system. Metaphors, and therefore their deductive consequents, already have the primary system as their referents. Because of this, the literal descriptions could be discarded as inadequate. Even if the literal description is false, the metaphor can still tie together the primary system and the explanandum.

Because of this, metaphor plays a very pliable role in explanation. Since in the interaction view metaphors rely on the shifting of the literal meaning of the terms, their dynamic nature allows for the scientific theories to change without changing the metaphor.

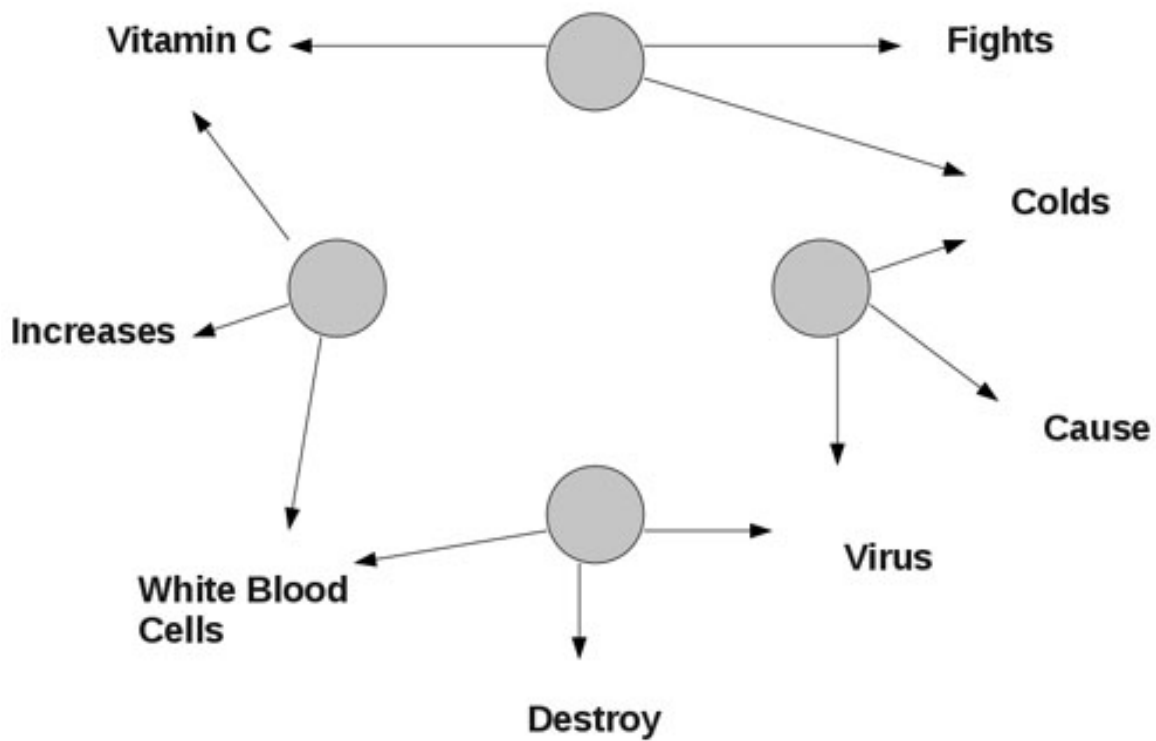


Figure 1

By way of example, in cognitive psychology, there is a simple chart which describes memory storage. According to the network model, knowledge is represented as a network of inter-related proposition (see Figure 1).

On this view knowledge is stored in the nodes, and memories and relations of ideas are represented in the networks between these nodes. The nodes in Figure 1 would radiate out in every direction far enough to include all the related propositions in a network drawing all the facts and knowledge into one model.

These nodes will be the focus of my metaphor. These nodes have great

explanatory power. You may think of them as theoretical entities, such as propositions, depending on your position on the cognitive sciences. You could further think of them as synapses or neurons. It might be the case that the smartest minds in the field think that the node is a theoretical entity. Science might someday come to show that, in fact, the nodes are a previously undiscovered physical structure. Regardless of what the science comes to show, the metaphoric description will remain explanatory. As the science changes, so changes the domain of the explanandum. But as was previously shown, the metaphor has the primary system as its referent. The metaphor allows the node to play the role of some yet-to-be determined detail, while allowing the discussion to continue (Gagne et al. 79).

Another brief example will drive this point home. Why do evolutionary biologists insist on maintaining the metaphor of design? Is it really useful to think of organisms as artifacts, as if they were designed? Is it really appropriate to treat evolutionary biology in this way, or ought we rather to stick with questions of taxonomy? Wouldn't it be more rigorous to eliminate all teleological talk from biology? At least one philosopher argues that to eliminate the metaphor of design from talk in science would see evolutionary biology grind to a halt, if in fact it could ever get started. Ruse argues that the metaphor is an "essential part of thought – including scientific thought – and that they are a prime force in forcing people to think in new and imaginative and fertile ways." The metaphor is such a valuable heuristic, for example, that the force and simplicity with which it forces scientists to ask 'why' is unparalleled (Ruse 270-71).

We are now in a position to apply the explanatory power of the metaphor to the problem of causation in metaphysics and science. Before the final section, I present what I take to be the problem with standard analyses of a very important issue in the philosophy of sciences, as well as in metaphysical discussion – the problem of causation.

Causation

Humean Causation

Hume identified four constituents of causation: constant conjunction, spatiotemporal contiguity; temporal priority; and necessary connection (Kim 217).

The Humean conception of causation states that

c causes e if c is spatiotemporally before e, and whenever you have an event like c you have an event like e (Hume §4 & §7).

The problem with this is obvious: the problem with epiphenomena. It might be the case that c and e satisfy the requirements listed above, but both are the result of a third event, f, which is in fact the cause of c and e. An agent cuts his arm, first he bleeds, then he gets an infection. Infection always follows the bleeding, but in fact, both were the result of some third event, i.e., the cut. One can imagine many, many more examples of this type.

Necessary and/or Sufficient Conditions

Next consider an analysis of causation in terms of necessary and/or sufficient reasons.

1. c causes e iff c and e are actual, and c is sufficient for e, or
2. c causes e iff c and e are actual, and c is necessary for e (Sosa et al. 5-8).

One might, obviously, combine the two to entertain a view of necessary and sufficient conditions, but the discussion should answer that view as well. I'll first answer (1).

(1) says that c is a cause of e iff there is an actual condition d such that c necessitates e on d only if there is a law l such that e is entailed by (c & d & l) but not entailed by either (c & d) or (d & l). But this will allow too many things to be the cause of e. Let X satisfy the following minimal independence conditions: (i) X & [d & (X c)] does not entail e; (ii) [d & (X c)] & l does not entail e. But then X causes e, since no restriction was placed on X except that it satisfy those minimal independence conditions. This is because if X, c, and d are actual, then X c is actual, and [d & (X c)] is actual. But then X necessitates e. So this entails that if a fire causes some smoke, then Antarctica's being too cold also causes the smoke.

(2) says that c is a cause of e iff there is an actual condition d such that e necessitates c on condition d. The logic will work the same. This view entails that if e has a cause, then any event that satisfies those minimal independence conditions will also count as a cause (Sosa et al. 6-7).

Mackie's INUS condition

The necessary and/or sufficient conditions analysis might be made to work if one can modify the requirements to exclude those minimally independent conditions from counting as causes. Mackie proposes one such strategy with his INUS conditions. If C is a cause of E at t, then:

C is an Insufficient but Necessary part of a condition which is itself Unnecessary but Sufficient for E (at t) (Mackie 245).

Since in this case C is a unique cause of E, rather than a general cause, as in the previous case, the previous objection does not work against Mackie. He further introduces the concept of causal field to contain the instances and conditions that are relevant to the case, excluding all others.

This view, like the others, suffers from what appear to be inescapable objections. First, as Kim notes, the INUS condition commits Mackie to an unorthodox, and likely unacceptable ontology. Further, in many cases, Mackie's view cannot differ between cause and effect, without modifying the view to include temporal restrains, thereby begging the question against those who argue that backward causation is possible (Lewis), (Lewis, (Dowe)). Finally, The INUS condition cannot account for probabilistic

laws, since in those cases there is no part that is a sufficient condition. If causation works as quantum physicists think that it does, any complete analysis must account for probabilistic causation.

Counterfactuals

David Lewis was the major proponent of the counterfactual analysis of causation. Causation on this account is the ancestral of counterfactual dependence. So C causes E iff E counterfactually depends on C, or there is a causal chain of counterfactual dependence linking C to E. Therefore, if C hadn't occurred, then E wouldn't have occurred either, given the transitivity of counterfactual dependence (Lewis).

The problem with this view is that it cannot account for what is known as the problem of Late preemption, or late cutting. We may refer to the standard cases in which Billy and Suzy both throw their rocks at the bottles. Since Suzy threw first, her rock strikes the bottle first, breaking it. Had her rock not shattered the bottle, Billy's would have been sufficient, but, thanks to Suzy's preempting throw, Billy's rock never impacts the bottle.

In this case, we do not have counterfactual dependence between Suzy's throw and the bottle breaking. Had she not thrown, Billy's rock would have broken the bottle. Nor do we have a causal chain of counterfactual dependence. Billy's rock only preempts Suzy's after the effect has already occurred.

Causation as Metaphor

In the discussion of Mary Hesse's article, I discussed what I take to be a very attractive consequence of the metaphoric redescription as explanation: as the science changes, the explanatory metaphor changes with it. Refer back to the example of knowledge and storage from cognitive psychology. In that case, the metaphorical node was used to stand in for the functional entity in the knowledge storage. Note the important consequence of this fact: the explanatory power of the story of knowledge storage is allowed to continue. Rather than hanging the cognitive analysis on the strict phenomenon, the node brings the explanatory power, and is set to change meaning as the science advances.

What I propose is a simple argument from analogy. I propose that causation stand in that same relationship. Just as evolutionary biology cannot advance without the metaphor of design, so can physics not advance without the metaphor of causation. This simple concept, whatever in fact it is, stands in place to do a lot of explanatory work. When we give certain concepts or phenomena explanatory or predictive roles in science, we presuppose certain things about the role of causation.

This metaphor will do its most important work in those cases in which our intuitions about causation break down. Consider the following macro event. A boy hits a baseball toward a window. The previous day, a large brick wall between the baseball field and the window was removed. The ball breaks the window. Do we count the

removal of the wall as a cause of the window breaking? It seems that we should, since it would not have broken had the wall not been removed. But it also seems that it should not. How does an absent wall cause anything?

Now extend this sort of talk to the micro level. Does the absence of an a free neutron influence the rotation of this electron? By treating causation as a metaphor we can assume certain fact about causal law, without pinning them down, and move on to further talk about other events, like the spin of microscopic phenomena.

Conclusion and Remarks

The thesis of this paper is that causation, when described and treated as a metaphor, increases in explanatory power, while diminishing the problems associated with standard analyses of it. I have argued for this by analogy. Just as in evolutionary biology the metaphor increases explanatory power, so does causation work as a metaphor. Just as in cognitive psychology, treating the phenomena of knowledge of a metaphorical node, one diminishes the problems associated with the question of how knowledge and memories are stored. The same holds true for causation.

One worry I have regarding this view is that one might forward the following objection: Doesn't treating causation as a metaphor as you do imply that no further work can or need be done in this area? That is to say, if you can get the same explanatory work out of causation as a metaphor, why bother with an analysis of it at all? I reply that treating causation in a certain way, and using causal language precisely is not the same as giving an analysis. That is, I reply by saying that just as it is important for cognitive scientists to determine just what is locus of knowledge storage in the mind, so is it important for philosophers and scientists to determine finally just what we mean by causation. My solution is only a temporary one. I only offer causation as a metaphor as an instrumental device which will allow causal talk to continue. When a final analysis of causation can finally be presented, I hope that my metaphor will become a dead metaphor – a Catachresis.

Notes

i For example, Ruse describes the metaphorical value of the image of the tree of life, with its branches, roots, and stems in (Ruse). And Dawkins famously makes great use of the metaphor of the so-called "selfish gene" in (Dawkins).

ii For simplicity, I'll use metaphor to refer either to the focus, or to the phrase as a whole, making the distinction only when necessary to avoid ambiguity.

iii Where the relevant metaphorical term here to note is 'face.' I'll disregard further metaphors in the passage.

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