

Category Mistakes in M&E*

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1 Causation

A widely accepted account of causation (Lewis, 1973) asserts:

- (1) If F and E both occur but F would not have occurred unless E had occurred, then E causes F .

This obviously implies

- (2) One's birth causes one's death.

an extremely odd result. But is it a counter-example? Lewis (2000) suggests that the oddness of (2) is due not to obvious falsity but to being "too obvious to be worth mentioning" (p. 196, referring to Grice, 1989). But many quite obvious propositions do not share the oddness of (2). Consider, for example:

- (3) One's birth precedes one's death.

This is not at all odd in the way that (2) is. So is (2) a counter-example to (1)?

It would seem that a defender of (1) must, either

- (A) offer some more plausible explanation of the seeming falsity of (2) that is compatible with its truth, or

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(B) admit that the term *cause* is not used here in its ordinary sense.

While I am unaware of any plausible version of strategy (A), strategy (B) is common. It is often said that metaphysics like science can quite properly modify ordinary terminology, so that to test a theory of causation against the ordinary use of the verb *cause* is as silly as testing physics against the ordinary use of the words *force*, *mass*, and *energy*.

A familiar worry is that scientific theories admit of empirical testing, whereas, if metaphysical theories are not testable against our ordinary use of the terms with which these theories are stated, it is unclear how else they are to be tested. In particular, if a theory of causation is not to be tested against ordinary judgments about what causes what, it is unclear that the theory can be tested and so unclear what the purpose of the theory is.

Defenders of (B) sometimes respond that the theory can be and is regularly tested against the intuitions of those who have grasped the relevant technical sense of *cause*. But is there a single relevant sense of *cause*? Those who introduce and discuss theories of causation do not always seem to have the same intuitions about their technical notion. The current methodological situation with respect to theories of causation resembles the situation in 19th Century introspectionist psychology, when results of introspection depended on the theoretical commitments of the introspector. This unhappy methodological aspects of introspectionist psychology was the main reason for the turn toward behaviorism in the early 20th century; theories of causation defended in a similar way run the risk of being mere castles in the air.

Serious philosophical theories have to be more than ways of talking about nothing. So there is good reason for defenders of (1) to explore strategy (A) and try to find some other explanation of the oddness of (2) than its alleged obviousness. I am not going to say anything more about the oddness of (2); I mention it only in order to motivate the idea that one way to make metaphysical and other philosophical theories testable is to make them answerable to ordinary language. This may not be the only way to make such theories testable and of course there is often a need in philosophy for technical terminology. But it is important to avoid just building castles in the air.

1.1 Transitivity

Now consider the claim that there is a causal relation and it is transitive.

(4) If E causes F and F causes G , then E causes G .

Vendler (1968a,b) objects that in relevant cases, the subject of *cause* specifies a fact and the object of *cause* specifies an event, where facts and events are of different categories, so that the sorts of things that cause simply cannot be the sorts of things that are caused. If this objection is right, there can never be a case in which E causes F and F causes G , so it does not make sense to suppose that the causal relation is transitive (or else the relation is vacuously transitive, since the antecedent of (4) can never be true).

An immediate issue is that there are clear instances of (4) that seem to make sense (whether or not they are true), so that Vendler's claim cannot in general be correct as stated. For example,

- (5) The explosion on the roof caused the fire in the building.
- (6) The fire in the building caused the windows to melt.
- (7) The explosion on the roof caused the windows to melt.

It seems intelligible to ask whether (5) and (6) jointly imply (7). I have asked people what they think and some say that the implication does not hold and others say it does hold. I haven't found anyone unfamiliar with Vendler's argument who says there is no way for both (5) and (6) to be true of the same case.

1.2 Direct and Indirect Causing

One way to motivate a negative answer to the question whether the implication holds in this case is to consider what happens if we replace (7) with

- (8) The explosion on the roof melted the windows.

Many people feel that (5) and (6) do not imply (8) and then some of them feel less likely to think (5) and (6) imply (7).

The causation in causatives has to be pretty direct. To take another example, suppose

- (9) Alice shoots at Bob, causing him to shoot back. His shot hits her and kills her.

Given that assumption, consider the following descriptions.

- (10) ? Alice causes her own death.
- (11) ?? Alice kills herself.
- (12) * Alice shoots herself.

Some people might think that (9) implies (10). It is much less plausible that (9) implies (11) and completely implausible that it implies (12).

This suggests distinguishing direct or immediate causation from indirect causation, and instead of saying that (9) implies (10), say that it implies:

- (13) Alice indirectly causes her own death.

Applying the suggestion about direct and indirect causation to the earlier example, we might say the following.

- (14) The explosion on the roof directly caused the fire in the building.
- (15) The fire in the building directly caused the windows to melt.
- (16) The explosion on the roof indirectly caused the windows to melt.

And then the relevant transitivity principle might be expressed as follows:

- (17) If E either directly or indirectly causes F and F either directly or indirectly causes G , then E either directly or indirectly causes G .

Perhaps even such conclusions as the following are acceptable:

- (18) One's birth either directly or indirectly causes one's death.

More generally, causal theorists sometimes defend principles of causation by rephrasing them as principles using some other notion than simple causation. In this case, the relevant notion is *directly or indirectly cause*. Other substitutions might replace statements using the verb *cause* with statements using *is a cause of*, *(causally) leads to*, or *is (causally) responsible for*. Or, statements of the form E causes F are replaced by statements using constructions like F is an effect of E , F is a result of E , or F is a consequence of E . Vendler (1967b) argues that these various constructions are quite different in their implications about sorts of things E and F can be.

We might worry that changing from *cause* to one of these other notions is to change the subject and is sometimes to begin to introduce the sort of technical vocabulary that makes it difficult to test theories of causation and threatens the castles in the air problem, but I do not want to pursue such worries at this point. A more pressing question is whether Vendler is right about the subjects and objects of *cause*. If he is, the same point presumably applies to *cause either directly or indirectly*.

The question is whether something can both cause something and also be caused by something. It may seem obvious that this is possible, since for example (5) and (6) can both be true. But Vendler sees an equivocation. He says that *the fire in the building* refers to a different thing in (5) than in (6): in (5) it refers to an event and in (6) it refers to the fact that there was a fire or perhaps some further fact about the fire:

1.3 Subject Position

The subject of *cause* can be almost anything (McGrath 2001).

- (19) Joe's carelessness caused the windows to melt.

- (20) Joe caused the windows to melt
- (21) The fact that the fire in the building was so intense caused the windows to melt.
- (22) That the fire in the building was so intense caused the windows to melt.¹

A number of writers have suggested that there is a basic subject category for the very *cause* such that, in any (true) sentence of the form “*E* causes *F*,” either *E* designates something of that basic category or *E* has an intimate relation to something of the basic category that causes *F*. Theorists making this suggestion divide as to whether the basic category is that of facts or events.²

- (23) Jack caused the dog’s death.
- (24) Some fact about Jack, perhaps some fact about what Jack did or didn’t do, caused the dog’s death.
- (25) Some event involving Jack, perhaps something Jack did, caused the dog’s death.

A standard argument for thinking that facts rather than events are the basic category of causes is that omissions can be causes although they are not events.³

- (26) Jack’s failure to feed the dog caused its death.
- (27) Jack’s not feeding the dog caused its death.
- (28) That Jack did not feed the dog caused its death.

1.4 Object or Complement Position

Vendler argues that, although a basic subject noun phrase (*NP*) of the verb *cause* refers to a fact, a basic object *NP* refers to an event. Furthermore, the verb *cause* cannot have as its “complement” (the material following the verb) either a *that* clause or an explicit reference to a fact.

- (29) * That there was an explosion in the basement caused (the fact) that the fire in the building was intense.

Similarly, a sentence nominalization, which might be used to refer to a fact, can serve as an apparent subject of *cause* but not as its complement.

¹As indicated below, the “that” clause in this sentence is probably not in subject position.

²Sometimes the basic category is identified with *states of affairs*. For present purposes, I assume that facts are among the states of affairs, being in particular the states of affairs that obtain. Since states of affairs presumably have to obtain in order to be causes, there seems to be no difference between taking states of affairs to be basic causes and taking facts to be basic causes.

³If I understand her correctly, Thomson, 2003, seems to allow two sorts of basic causes, events and also certain states of affairs (including omissions) that involve something’s being at fault for what has been caused. In what follows, I simply assume that Vendler is right about the basic subject of *cause*.

- (30) The fire’s burning intensely caused the windows to melt.
 (31) * That there was an explosion in the basement caused the fire’s burning intensely.
 (32) That there was an explosion in the basement caused the fire’s intense burning.

The word *burning* in (30) and (31) is a verb, which therefore has to be modified by the adverb *intensely* rather than the adjective *intense*. In (32) *burning* is a noun, which therefore has to be modified by the adjective *intense* rather than the adverb *intensely*. In the deviant (31) the complement is a sentence nominalization, whereas in (32) the complement is a noun phrase with a nominalized verb. Vendler argues that noun phrases with nominalized verbs refer to states or events rather than facts.

On the other hand, *cause* can take an infinitival clause as complement, as in (30), and such clauses can describe omissions.

- (33) Jack’s forgetfulness caused him not to feed the dog.

If such clauses refer, they seem to refer to the same sort of thing *that* clauses refer to (if they refer) and Vendler is wrong in the asymmetry he sees between the subject and object of *cause*.

One issue is whether such complement clauses refer. A related issue is whether they are appropriately classified as noun phrases. They are certainly not noun phrases in the straightforward sense of having a noun as their head. However, it has sometimes been suggested that sentential complements can be appropriately categorized with noun phrases. We take up these issues below.

1.5 “Transitivity”

Supposing with Vendler that the basic subject of *cause* refers to a fact and that its object refers to an event, where these are different categories of entities, what should be said about the principle of the transitivity of causation, either (4) or (17)? Can such a principle be intelligibly formulated that has a chance of being non-vacuously true?

As noted earlier, a causal statement whose subject designates something *X* other than a fact might be interpreted as a causal statement whose subject is “some fact about *X*” Perhaps we can accept the intelligibility of each of these principles if we understand them as follows, where *E*, *F*, and *G* are variables that range over facts.

- (34) If *E* causes *F* and some fact about *F* causes *G*, then *E* causes *G*.
 (35) If *E* either directly or indirectly causes *F* and some fact about *F* either directly or indirectly causes *G*, then *E* either directly or indirectly causes *G*.

This is not exactly the transitivity of the relation expressed by the verb *cause*, but perhaps it is close enough for the purposes of the theory of causation.

Alternative, we might state principles using causal statements with infinitival complements (Bennett, 1988):

- (36) If E causes it to be the case that F , and F causes it to be the case that G , then E causes it to be the case that G .

There is a worry here about quantification into this sort of infinitival sentential complement, a worry that we will be discussing below.

For the time being, then, let me end my discussion of the transitivity of the causal relation and turn to the important but not always recognized difference between facts and propositions.

2 Facts and Propositions

Sometimes philosophers simply identify facts with true propositions (Williamson, 2000). Such an identification is clearly wrong, since replacing *the fact that* with *the true proposition that* can change the truth value of a statement.

- (37) The fact that fires are hot makes it true that fires are hot.
(38) *The true proposition that fires are hot makes it true that fires are hot.
(39) The fact that there was an explosion in the basement caused the fire to burn intensely.
(40) *The true proposition that there was an explosion in the basement caused the fire to burn intensely.

Similarly, even when a proposition happens to be true, there is a big difference between remembering the proposition and remembering the fact.

2.1 Implications of Knowledge

Since facts and propositions are different, there is a potential worry about the following widely held principle.

- (41) If x knows p , then x believes p and p is true.

The worry is that no single sort of thing can be known, believed, and true. Only facts can be known but they cannot be true or believed. It is propositions, not facts, that are true or believed. Someone might know a proposition in the sense of being familiar with that proposition. But one can know a proposition in that sense without the proposition being true.

- (42) Jack knows the proposition that there is a greatest prime number, but he is rightly skeptical about its truth.

While (41) seems plausible considered by itself, it seems less plausible when we specify whether the variables quantify over propositions or facts.

- (43) * For any proposition p , if x knows p , then x believes p and p is true.
(44) * For any fact p , if x knows p , then x believes p and p is true.

(43) fails because, as illustrated in (42), one can know a proposition without believing it. (44) fails because facts are not the sorts of things one believes and are not the sorts of things that can be true.

2.2 Propositional Attitudes

There is a related problem with philosophical discussions of so-called “propositional attitudes,” which are often treated as including not only beliefs but also desires, intentions, hopes, fears, sadness and happiness.

Treating all these attitudes as attitudes toward propositions allows the statement of certain putative principles.

- (45) If x intends p , x believes p .
(46) If x desires that S and x believes that if T then S , x will tend to desire that T .
(47) If x is sad that S , x is not happy that S .
(48) If x is sad that S , x knows that S .

But what does the variable p range over in (45)? Although x may believe various propositions, it doesn’t make any obvious sense to suppose that x intends various propositions.

And what sort of variables are S and T in (46), (47), and (48)? Is it really logically acceptable to quantify into *that*-clauses as is apparently done in these examples? Is this some sort of second-order quantification? Is it a version of substitutional quantification? (If so, the substitution class needs to be specified.) Should we think of these principles as axiom schema?

A further problem with (46) is that, although x may believe a certain conditional proposition, it does not make any obvious sense to suppose that x desires the proposition that is the consequent of that conditional proposition.

Similarly, with respect to (47) and (48), it is unclear what it could be for x to be sad a proposition in the way that x can believe a proposition (Graff, 2000).

2.3 Massaging the Predicate

One way to try to get around these problems is to change *desiring that P* to *desiring-true the proposition that P*, change *hoping that P* to *hoping-true the proposition that P*, change *being sad that P* to *being-sad-about-the-truth-of the proposition that P*, etc.

This allows the following reformulations of the preceding principles without any quantifying into *that*-clauses.

- (49) If x intends-true p , x believes p .
- (50) If x desires-true p and believes a conditional whose consequent is p and whose antecedent is q , then x will tend to desire-true q .
- (51) If x is sad-about-the-truth-of p , x is not happy-about-the-truth-of p .
- (52) If x is sad-about-the-truth-of p , x knows-true p .

The same idea can then be applied to handle the earlier problem about how to say that if you know it, it must be true, and you must believe it.

- (53) If x knows-true p then p is true and x believes p .

Although this handles many cases, it abandons the original claims about knowing, desiring, being happy, and being sad, in favor of much less ordinary claims about knowing-true, desiring-true, being happy-about-the-truth-of, and being-sad-about-the-truth-of.

2.4 Massaging the Complement

The suggestion just considered treats sentential complements as always referring to propositions and replaces certain predicates. A related idea (King, forthcoming; Parsons, 1993) is to replace certain sentential complements with references to things that are the values of certain partial functions of the relevant propositions. For example, the complement of *know* would refer to a fact that is determined by the proposition. Then the principle connecting knowledge with true belief would be this:

- (54) If x knows the fact corresponding to p , then p is true and x believes p .

Further tinkering could extend this to certain other cases. We might, for example, suppose that to be sad or happy that S is to be sad or happy about the fact that S .

- (55) If x is happy about the fact corresponding to p , x is not sad about the fact corresponding to p .

To extend this to other cases we might postulate unexpressed propositions and other material, e.g.,

(56) To fear that *S* is to fear the possibility corresponding to the proposition that *S*

(57) To hope that *S* is to hope for the possibility corresponding to the proposition that *S*.

This again seems to move some distance from ordinary language.

2.5 Modal Operators

At this point it is useful to consider similar issues concerning the statement of principles about what is possible or necessary. One standard approach via modal logic takes the basic principles to involve the sentential operators, *possibly* and *necessarily*. The idea is that there is no reference to the proposition that Betty is smart in a sentence such as:

(58) Possibly Betty is smart.

The words *Betty is smart* syntactically form a sentence, not a noun phrase. The adverb, *possibly* applies to that sentence to form another sentence.

A similar analysis is often provided for

(59) It is possible that Betty is smart.

In this analysis, the *that* clause is again not a noun phrase and does not refer to anything. It is instead a sentential complement of the predicate *possible*.

Notice that this construction does not take noun phrase complements.

(60) *It is possible the proposition that Betty is smart.

Rosenbaum (1967) takes the *that* clause in (59) to be “extraposed” from subject position, so that (60) is a variant of

(61) ?That Betty is smart is possible.

In this view, the *that* clause in (61) is an *NP*; extraposition moves the *that* clause out of the *NP*, which then must be filled with the pronoun *it* in (59). Similarly, in this view,

(62) It is true that snow is white

is the result of extraposition from

(63) That snow is white is true.

However, it appears that the extraposition analysis is syntactically indefensible for sentences like (59) and (62).

Emonds (1972) observes that this sort of *that* clause tends to occur in apparent subject position only in the main (“root”) clause of a sentence and not in subordinate clauses. Even in the main clause it cannot easily occur after subject-aux inversion in questions or preposings like topicalization.

(64) If it is possible that Betty is smart, let us choose her.

(65) * If that Betty is smart is possible, let us choose her.

(66) Is it possible that Betty is smart?

(67) * Is that Betty is smart possible?

(68) ? That snow is white is true if snow is white.

(69) * Snow is white if that snow is white is true.

(70) It is true that snow is white if snow is white.

(71) Snow is white if it is true that snow is white.

(72) * If that snow is white is true, snow is white.

(73) *? If snow is white, that snow is white is true.

(74) ? If snow is white, then that snow is white is true.

In contrast, there is no problem with embedded causes of the form, *the proposition that S*.

(75) The proposition that snow is white is true if snow is white.

(76) Snow is white if the proposition that snow is white is true.

(77) If the proposition that snow is white is true, snow is white.

(78) If snow is white, the proposition that snow is white is true.

(79) If snow is white, then the proposition that snow is white is true.

Emonds concludes that the extraposed form in sentences like (59) and (62) is syntactically basic. A “root transformation” of “intraposition” moves a *that* clause complement in a main clause into apparent subject position.

Koster (1978) uses data from several languages to argue that Emonds’ intraposition is a form of topicalization and, in particular, that the intraposed *that* clause in sentences like (61) is not actually in subject position but in topic position.

2.6 Psychological Predicates as Operators

Just as there are modal logics of possibility and necessity, there are also treatments of belief, knowledge, truth, etc., in which psychological predicates are operators on sentences (e.g., Hintikka, 1962). The idea is that in sentences like

- (80) Albert is happy that Betty is smart.
- (81) Albert hopes that Betty is smart.

the *that*-clauses are not *NPs* and so do not designate propositions (or anything else). They are sentential complements of the adjective *happy* and the verb *hopes* and indeed neither *happy* nor *hopes* takes a noun phrase object in sentences of this sort (Graff, 2000).

Of course, *know* and *believe* do take noun phrase objects. We have not only

- (82) Albert believes that Betty is smart.
- (83) Albert knows that Betty is smart.

but also

- (84) Albert believes the proposition that Betty is smart.
- (85) Albert knows the proposition that Betty is smart.
- (86) Albert knows the fact that Betty is smart.

Graff suggests plausibly that in all these cases the *that* clause by itself does not refer to anything but is a sentential complement of the relevant verb or noun.

It might be objected that there are passive forms of (82) and (83).

- (87) ? That Betty is smart is believed by Albert
- (88) That Betty is smart is widely believed
- (89) ? That Betty is smart is known by Albert
- (90) That Betty is smart is widely known

If passive only applies to predicate *NPs* and (87)-(90) are passives, *that* clauses can be *NPs*.

But the contrary arguments of Emonds (1972) and Koster (1978) apply here also. Contrary to appearances, the preposing involved in sentences like (87)-(90) cannot be passivization, because such preposing tends to occur only in the main clause and when topicalization could occur, whereas passivization has no such limitation.

- (91) * Although that the house is empty may depress you, it pleases me.
- (92) Although the fact that the house is empty may depress you, it pleases me.
- (93) * Did that John showed up please you?
- (94) Did the fact that John showed up please you?
- (95) * What does that he will come prove?
- (96) What does the fact that he will come prove?
- (97) Such things, it doesn't prove.
- (98) That he reads so much doesn't prove such things.
- (99) * Such things, that he reads so much doesn't prove.
- (100) Such things, the fact that he reads so much doesn't prove.

Not to worry, however. If an operator approach is adopted, the principles mentioned about knowledge, belief, and truth, as well as various other psychological principles can be represented as axioms in a logic with operators corresponding to *know*, *believe*, *happy*, *sad*, *hope*, *fear*, etc.

Or, perhaps equivalently, they are best expressed using second-order or substitutional quantification. Compare the following ordinary language variants of (41)-(44).

- (101) Anything one knows, one believes.
- (102) * Any proposition one knows, one believes.
- (103) * Any fact one knows, one believes.

(102) wrongly implies that anytime one knows what propositions another person has uttered, one believes them. (103) wrongly implies that one believes facts.

These problems with (102) and (103) arise because they involve first-order quantification over propositions or facts. The seeming intelligibility of (101) might arise from its making use of a different sort of quantification, perhaps similar to cases of quantifying the predicate as in

- (104) She is everything you would want in a colleague.

A possible worry is that it may be that we can only satisfactorily understand second-order quantification or substitutional quantification by translating their results into first-order terms. If so, we might interpret (104) in one of the following ways:

- (105) She has every quality you would want a colleague to have.
- (106) Every result of substituting a predicate for F in the following is true: "If you want want a colleague to be F , she is F ."

Such translations raise difficulties of their own. But they may be the best that we can do at the moment.

3 Books and Bottles

In thinking about certain philosophical topics, philosophers often end up saying things like the following.

- (107) If something causes something else which causes a third thing, then the first thing causes the third.
- (108) If you know it, you believe it and it is true.
- (109) Whatever is necessary is true.
- (110) Whatever is true is possible.
- (111) Something can be possible but not true.
- (112) Something can be possible but not necessary.

Is the moral of the our discussion so far that these ways of talking involve illegitimate category mistakes? Yes, and no. No, they are not illegitimate as informal talk. But yes, they involve illegitimate category mistakes if taken seriously as theoretical claims, since theory aspires to a degree of rigor that we do not insist on informally.

Chomsky (2000) discusses a similar issue concerning the interpretation of the semantic representation of words in a natural language, as compared with words used in scientific theory. He notes remarks like the following.

- (113) The book I just took out of the library has a red cover, took four years to write, weighs two pounds, and has been translated into several languages.
- (114) After I painted the door brown I had to walk back through it to leave the room.
- (115) After the bank lowered interest rates, it burned down and was rebuilt across the street.

Questions similar to those we have been discussing apply to these ordinary examples. The particular copy with the torn cover that was taken out of the library and that weighs two pounds isn't something that took four years to write and that copy hasn't been translated into several languages. The word *book* might be used to refer to a general sort of thing that has a number of distinct copies or it might be used to refer to one of the copies. Something particular was written that somehow determines the general thing that has the distinct copies. The words making up the general thing were translated into words in other languages. It isn't at all clear what the general book is, the "type" maybe, or "universal", as compared with the particular copies. And it isn't clear what sort of thing got written and what got translated. A number of different things are involved of different metaphysical categories. Yet (113) appears to identify these things as if they were the same thing.

Similarly in (115) the word *bank* appears to be used to invoke a related cluster of things, a financial institution, a particular physical building, and something like a particular physical building that can be however "rebuilt." The initial reference is to the financial institution, while the pronoun *it* seems to refer to the physical building. It is not just that the same word can be used to refer to these different things, since the trick won't work for financial institutions and river banks.

(116) * After the bank lowered interest rates, there was a flood and the river overflowed it.

In this case the pronoun *it* is not interpreted as referring back to *the bank*.

Properly understanding this way of talking about books and banks may shed light on the ordinary ways of talking with which this section began. Perhaps objections to such ways of talking are like objecting that the baby can't both finish the bottle and then break it. Should we conclude that there is nothing wrong with these ordinary ways of talking?

To repeat, I want to say: there is and there isn't. When we do philosophy, we often need to try to get clear on metaphysical issues and then we need to talk more precisely and carefully. Just as there is a distinction between ordinary language and the language of scientific theory, there is a distinction between ordinary language and the language of philosophical theory. When we are trying to provide a rigorous account, we cannot be satisfied with the sort of type-shifting that goes on in ordinary talk of books, banks, and bottles.

To be sure, we also need to avoid castles in air. So we need to make sure that our metaphysical and epistemological theories are grounded in some sort of evidence, perhaps ordinary language judgments.

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