



Causation and fact granularity

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Abstract

According to the modal theory of facts and states of affairs, two facts or states of affairs are identical iff they are necessarily equivalent. One important argument against the modal theory is the causal argument of John Perry, which can also be applied with equal strength to a number of more moderate-grain theories of facts and states of affairs. I argue that, at least in its original form, the causal argument is unsound. I also argue that, while the argument can be modified so that it avoids the problems of the original version of the argument, such modifications are at best only successful if they appeal to additional considerations involving either grounding or aboutness. Moreover, I argue that incorporating such considerations into the causal argument allows it to refute its targeted theories only if such considerations by themselves refute these theories. If this is correct, then the causal argument is at best superfluous and we should focus on these other considerations when evaluating these theories. The broader lesson from this is arguably that, in order to best evaluate these theories of facts and states of affairs, we shouldn't focus on arguments involving causation, but we should instead focus on arguments that involve other notions, such as grounding and aboutness.

Keywords Causation · Facts · States of affairs · Aboutness · Conditionals · John Perry

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1 Introduction

Say that a state of affairs is a way things either are or fail to be, and say that a fact is a way things are, or, in other words, a state of affairs that obtains.¹ According to the modal theory of facts and states of affairs, for any state of affairs s_1 and s_2 : $s_1 = s_2$ iff s_1 is necessarily equivalent to s_2 (that is, iff, necessarily, s_1 obtains iff s_2 obtains).² Since facts are obtaining states of affairs, this theory entails that, for any facts f_1 and f_2 : $f_1 = f_2$ iff f_1 is necessarily equivalent to f_2 .

There are a number of arguments that have been given against the modal theory that appeal to causation, arguably the most powerful of which is that of Perry (1989).³ Perry's causal argument (henceforth simply called the causal argument) can also be used to argue against a number of more moderate-grain theories of facts and states of affairs, according to which facts and states of affairs are individuated in a less coarse-grain fashion than on the modal theory.⁴ In this paper I argue that, at least in its original form, the causal argument is unsound. I also argue that, while the argument can be modified so that it avoids the problems of the original version of the argument, such modifications are, at best, only successful if they appeal to additional considerations involving either grounding or aboutness. Moreover, I argue that incorporating such considerations into the causal argument allows it to refute its targeted theories only if such considerations by themselves refute these theories. If this is correct, then the causal argument is at best superfluous and we should focus on these other considerations, which appeal to grounding and aboutness, when evaluating the theories targeted by the causal argument. The broader lesson from this is arguably that, in order to best evaluate these theories of the individuation conditions of facts and states of affairs, we shouldn't focus on arguments involving causation, but we should instead focus on arguments that appeal to other notions, such as grounding and aboutness.

In Sect. 2, I will describe the causal argument against the modal theory and describe how it applies equally well to certain other more moderate-grain theories of facts and states of affairs. In Sect. 3, I will argue that the causal argument is unsound, before then, in Sect. 4, considering modified versions of the argument.

¹ On this usage, states of affairs can fail to obtain. This usage therefore differs, for example, from that of Armstrong (1997). I am neutral here on the question of whether propositions are states of affairs, where propositions are understood to be the possible objects of propositional attitudes, such as belief and desire.

² Proponents of the modal theory include Stalnaker (1984), Lewis (1986b) and Jackson (1998).

³ A recent example of a proponent of Perry's causal argument is Hawke (2018), who regards compatibility with the kind of argument it exhibits as being one of the criteria of adequacy for theories of aboutness. Other arguments against the modal theory that appeal to causation have been given by Achinstein (1974) and Sober (1982). Both these causal arguments are directed in the first place against the modal theory of properties, according to which, for any properties p and q , $p = q$ iff p and q are necessarily coextensive. However, if the modal theory of properties fails, then the modal theory of states of affairs also plausibly fails, in part because states of affairs can be regarded as 0-place properties. Sober (1982) gives what I take to be a convincing response to the argument of Achinstein (1974). For responses to Sober's argument, see Armstrong (1997, pp. 145–146), Jackson (1998, pp. 125–128) and Marshall (MSa).

⁴ This has in effect been observed by Hawke (2018), who has employed Perry's causal argument as an argument against certain theories of aboutness, including the proposal Perry (1989) himself makes.

2 The causal argument

The causal argument against the modal theory can be stated as follows: Suppose that Caesar went into Tully's bedroom while he was asleep and screamed, thereby waking him up. Suppose Tully then got out of bed and was angry at Caesar due to the fact that, had Caesar not screamed, he would have slept for another hour. In this case, Caesar screaming brought it about that Tully woke up. However, by screaming, Caesar did not bring it about that Tully woke up and 3 exists. Hence, the fact that Caesar screamed caused the fact that Tully woke up, but didn't cause the fact that Tully woke up and 3 exists.⁵ Hence, the fact that Tully woke up is not identical to the fact that Tully woke up and 3 exists.⁶ However, assuming that 3 necessarily exists, the modal theory entails that these facts are identical. This because, if 3 necessarily exists, then the fact that Tully woke up is necessarily equivalent to the fact that Tully woke up and 3 exists. Hence, the modal theory fails.

This argument can be stated in a way that does not rely on the necessary existence of numbers, such as the number 3. For example, we can replace '3 exists' with a logical truth like 'Trump fell out of bed or Trump did not fall out of bed' to get the conclusion that the fact that Tully woke up is not identical to the fact that Tully woke up and (Trump fell out of bed or Trump did not fall out of bed), which, since these facts are necessarily equivalent, also conflicts with the modal theory.⁷

As noted in Sect. 1, the causal argument can also be applied to other more moderate grain theories of facts and states of affairs. I will illustrate this by describing how it applies to two such theories, the objectual aboutness theory and the fundamental constituency theory.⁸

States of affairs can plausibly be about, or concern, how certain things are. For example, the state of affairs of Tully waking up is about, or concerns, how Tully is. The state of affairs of Caesar being 1 metre away from Tully, on the other hand, is about, or concerns, how Caesar is related to Tully, and hence is both about how Caesar is and about how Tully is.⁹ (If one prefers to say that states of affairs *concern* how

⁵ I am assuming that facts can cause facts. [See, for example, Mellor (1987).] This claim is compatible with it also being the case that events can cause events. The claim that facts can cause facts is plausibly a consequence of the truth of certain natural to use ordinary language sentences. For example, suppose 'Suzy throwing the rock is a cause of the window breaking' is true. Then it follows from this truth, together with (A) and (B), that there is a fact that causes a fact.

A. 'Suzy throwing the rock' and 'The window being broken' either refer to, or express, states of affairs.
B. If ϕ and ψ refer to, or express, facts, then: $\lceil \phi \text{ is a cause of } \psi \rceil$ is true iff the fact referred to, or expressed by, ϕ is a cause of the fact referred to, or expressed by, ψ .

(This footnote has benefited from discussion with Peter Hawke.)

⁶ I am assuming that the fact that $\phi =$ the fact that ψ iff, necessarily, the fact that $\phi =$ the fact that ψ .

⁷ See Perry (1989, p. 9) and Hawke (2018, p. 6). For simplicity, I will assume for the rest of the paper that 3 necessarily exists.

⁸ For more examples of the theories the causal argument applies to, see footnote 13.

⁹ We can distinguish between partial aboutness and complete aboutness, where s being *partially* about x does not preclude it from also being about y (where y shares no parts with x), while s being *completely* about x does preclude this. For example, while the state of affairs of Trump being self-identical is intuitively completely about how Trump is, the state of affairs of Pelosi being 1 metre away from Trump is intuitively only partially about how Trump is, since this state of affairs is intuitively also about how Pelosi is.

things are, rather than being *about* how they are, then one can replace ‘about’ with the relevant use of ‘concern’ in the following.) The objectual aboutness theory of facts and states of affairs endorses (OA).¹⁰

OA. For any states of affairs s_1 and s_2 : $s_1 = s_2$ iff:

- (i) s_1 is necessarily equivalent to s_2 , and
- (ii) for any x , s_1 is about how x is iff s_2 is about how x is.

Given certain intuitively plausible claims regarding aboutness, (OA) differs from the modal theory by individuating states of affairs less coarsely than the modal theory. To illustrate this, let us assume (as is intuitively plausible) that the fact that Trump is self-identical is about how Trump is (and not about how Biden is), while the fact that Biden is self-identical is about how Biden is (and not about how Trump is). Then, given this assumption, (OA) entails that these facts (and these states of affairs) are not identical, since they differ in what objects they are about. In contrast, since these facts are necessarily equivalent to each other, the modal theory holds that these facts are identical.¹¹ Given the above assumption regarding which states of affairs are about which things, an assumption I will take the objectual aboutness theory to endorse, (OA) therefore individuates facts and states of affairs in a less coarse-grain fashion than the modal theory.¹²

The casual argument as applied to the objectual aboutness theory can be stated as follows: Let us, as before, suppose that Caesar screamed and thereby woke Tully up. Then Caesar brought it about that Tully woke up. However, by screaming, he did not bring it about that Tully woke up and Tully = Tully. Hence, Caesar screaming caused the fact that Tully woke up, but it did not cause the fact that Tully woke up and Tully = Tully. Hence these facts aren’t identical to each other. These facts, however, are necessarily equivalent to each other and are both about how Tully is. Moreover, there is no y such that one of these facts is about how y is while the other fact is not about how y is. Hence, according to the objectual aboutness theory, these two facts are identical to each other. Hence the objectual aboutness theory, like the modal theory, fails.¹³

¹⁰ The notion of aboutness employed in (OA) is partial aboutness. (See footnote 9.) This is a simplified version of what I take to be the best version of the objectual aboutness theory. (For what I take to be the best version, see Marshall (MSc). For an account of objectual aboutness, see Marshall (MSb, MSd).) These theories agree when we restrict them to apply to only non-quantificational states of affairs, where a non-quantificational state of affairs can be understood as a state of affairs that can be expressed by a fundamental sentence that contains no quantifier expressions. (See below for the notion of a fundamental sentence.) See Goodman (2019, p. 631) for a theory that is at least in the vicinity of (OA). For simplicity, I am assuming necessitism, which is the thesis that, necessarily, for any x , necessarily, for some y , $x = y$. (See Williamson (2013).)

¹¹ I am assuming that, for any x and y : $x = y$ iff, necessarily, $x = y$. A different example can be chosen if this is rejected.

¹² Theories of objectual aboutness that are compatible with the modal theory and that reject this assumption can be obtained, for example, from Fine (1977, Sect. VII), Lewis (1988a, b) and Stalnaker (2011). Given such a theory of objectual aboutness, the objectual aboutness theory of facts and states of affairs is not more fine-grained than the modal theory.

¹³ Objectual aboutness is a subspecies of aboutness. In general, sentences and states of affairs (and propositions) plausibly stand in aboutness relations to

I will now describe how the causal argument also applies to the fundamental constituency theory. Say that an attribute is a property, relation, operator or quantifier, and let us assume that there is a distinction between fundamental attributes and non-fundamental attributes.¹⁴ Say that a fundamental language is a language whose vocabulary consists of (at most) brackets, variables, names, predicates, operator expressions and quantifier expressions, where each predicate, operator expression and quantifier expression in the language expresses a fundamental attribute. Finally, say that a fundamental sentence is a sentence in a fundamental language. The fundamental constituency theory of facts and states of affairs endorses the version of logical atomism given by (LA).

LA. For any state of affairs s , there is a fundamental sentence that expresses s .

The fundamental constituency theory also endorses (FC).

FC. For any state of affairs s_1 and s_2 : $s_1 = s_2$ iff

- (i) s_1 is necessarily equivalent to s_2 ,
- (ii) for any x , s_1 is about how x is iff s_2 is about how x is, and
- (iii) for any fundamental attribute π , (there is a fundamental sentence expressing s_1 that contains a simple expression expressing π) iff (every fundamental sentence expressing s_2 contains a simple expression expressing π).

Finally, the fundamental constituency theory also endorses the assumptions regarding which states of affairs are about which things described above that are endorsed by the objectual aboutness theory (namely, that the fact that Trump is self-identical is about Trump and not Biden, whereas the opposite is true of the fact that Biden is self-identical).¹⁵

To illustrate the difference between the fundamental constituency theory on the one hand, and the modal theory and objectual aboutness theory on the other hand, suppose

Footnote 13 continued

subject matters. Some, but not all, subject matters are objectual subject matters, where examples of objectual subject matters are *how is Trump*, *how are Trump and Pelosi* and *how are emeralds*. Examples of subject matters that aren't objectual subject matters are *how is Trump colour-wise* and *how is Trump shape-wise*. The objectual aboutness theory in effect holds that two states of affairs are identical iff they are necessarily equivalent to each other and are about the same objectual subject matters. A potentially more fine-grained theory of states of affairs is the general aboutness theory that holds instead that two states of affairs are identical iff: they are necessarily equivalent to each other and they are about the same subject matters (including subject matters that aren't objectual). Hawke (2018, Sect. 4.3.2) in effect shows that Perry's causal argument applies to the general aboutness theory given Yablo's (2014) theory of aboutness. It might also be possible to apply a version of the causal argument similar to the version applied to the fundamental constituency theory below to the general aboutness theory given the theories of aboutness of Hawke (2018) and Fine (2016). This will arguably be the case if those theories are extended to account for quantification by holding that $\lceil \exists x \phi(x) \rceil$ expresses the same state of affairs as $\lceil \phi(a_1) \vee \phi(a_2) \vee \dots \rceil$, where a_1, a_2, \dots are names for all the things. [See Fine (MS, Sect. 7).]

¹⁴ A fundamental attribute can be taken to be a perfectly natural attribute in the sense of Lewis (1986b) and Sider (2011).

¹⁵ A theory of the individuation conditions of facts and states of affairs that is roughly in the vicinity of the fundamental constituency theory is that of Plate (2016, 2018). Plate's theory differs from the fundamental constituency theory, for example, by replacing necessary equivalence with a stronger equivalence relation (with different versions of Plate's theory employing different such relations).

that being unit negatively charged is a fundamental property, identity is a fundamental relation, and conjunction is a fundamental operator. Say that a state of affairs s “contains” a fundamental constituent π iff *some* fundamental sentence that expresses s contains a simple expression that expresses π (which, given the fundamental constituency theory, is the case iff *every* fundamental sentence that expresses s contains a simple expression that expresses π). Then, according to the fundamental constituency theory, the state of affairs expressed by the fundamental sentence (1) is not identical to the state of affairs expressed by the fundamental sentence (2), since the latter has identity and conjunction as fundamental constituents, while the former doesn’t.

1. Trump is unit negatively charged.
2. Trump is unit negatively charged and Trump = Trump.

In contrast, since (1) and (2) are necessarily equivalent, the modal theory entails that the states of affairs expressed by (1) and (2) are identical. Provided, as is intuitively plausible, the states of affairs expressed by (1) and (2) are about the same things, the objectual aboutness theory also entails that these states of affairs are identical to each other.

The causal argument applied to the fundamental constituency theory can be stated as follows: Suppose Clay is a 1 m^3 cubical piece of clay. Let us continue to assume that identity and conjunction are fundamental attributes, and let us also assume that the property of being a 1 m^3 sphere can be metaphysically analysed in terms of identity and conjunction (and other fundamental attributes) along the lines of ‘Necessarily, for any x , for it to be the case that x is a 1 m^3 sphere is for it to be the case that x has parts $x_1, x_2\dots$ that are not identical to each other such that...and...’.¹⁶ Then, the state of affairs expressed by (3) can be expressed by a fundamental sentence containing (amongst other expressions) simple expressions expressing identity and conjunction.¹⁷

3. Clay is a 1 m^3 sphere.

It follows that the state of affairs expressed by (3) and (4) contain the same fundamental constituents, which include identity and conjunction.

4. Clay is a 1 m^3 sphere and Clay = Clay.

Since the states of affairs expressed by (3) and (4) are also necessarily equivalent to each other and are about the same things, it follows from the fundamental constituency theory that they are identical to each other. Suppose next that Caesar used his hands to reshape Clay so that the piece of clay changed from being cubical to being spherical.

¹⁶ If the second of these assumptions is rejected, then we can replace this property with a property expressed by a predicate of the form ‘has parts $x_1, x_2\dots$ that are not identical to each other such that...and...’, where the ellipses are filled in so to specify a certain causally alterable distance arrangement of $x_1, x_2\dots$. Given necessitism (assumed in footnote 10), a metaphysical analysis of the property of being F may be taken to be a true sentence of the form ‘Necessarily, for any x , for it to be the case that x is F is for it to be the case that $\phi(x)$ ’, where, on the intended reading, such a sentence is true iff (assuming that there are such properties) the property of being F = the property of being such that $\phi(x)$. For example, ‘Necessarily, for any x , for it to be the case that x is a vixen is for it to be the case that (x is female and x is a fox)’ is a metaphysical analysis (given it is true), and so (given it is true) the property of being a vixen is the property of being such that one is female and one is a fox.

¹⁷ I am assuming that, if ϕ expresses a state of affairs and ‘For it to be the case that ϕ is for it to be the case that ψ ’ is true, then ϕ expresses the same state of affairs as ψ .

Then Caesar brought it about that Clay is a 1 m^3 sphere, and hence Caesar caused the fact expressed by (3). Now, by using his hands to reshape Clay, Caesar did not bring it about that Clay is a 1 m^3 sphere and $\text{Clay} = \text{Clay}$. Hence Caesar did not cause the fact expressed by (4). Hence, contrary to the fundamental constituency theory, the fact expressed by (3) is not identical to the fact expressed by (4). The fundamental constituency theory, like the modal theory and the objectual aboutness theory, therefore fails.

3 Against the causal argument

The causal argument has at least some initial plausibility. In this section, however, I will argue that, despite this initial plausibility, the argument is unsound. While I will focus on the version of the causal argument that targets the modal theory, the following discussion with suitable modifications also shows that the versions of the argument that target other theories of facts and states of affairs are also unsound.

Let $\ulcorner \langle \phi \rangle \urcorner$ symbolise \ulcorner the state of affairs of it being that $\phi \urcorner$. (Since facts are obtaining states of affairs, if ϕ is true, then $\langle \phi \rangle$ is a fact and we can at least informally pronounce $\ulcorner \langle \phi \rangle \urcorner$ as \ulcorner the fact that $\phi \urcorner$.) The causal argument as applied to the modal theory holds that, in the case described in Sect. 2, (5) is true and (6) is false.

5. Caesar screaming brought it about that Tully woke up.
6. Caesar screaming brought it about that Tully woke up and 3 exists.

According to the argument, since (5) is true and (6) is false, $\langle \text{Caesar screamed} \rangle$ causes $\langle \text{Tully woke up} \rangle$ but does not cause $\langle \text{Tully woke up and 3 exists} \rangle$, and hence, contrary to the modal theory, $\langle \text{Tully woke up} \rangle$ is distinct from $\langle \text{Tully woke up and 3 exists} \rangle$.¹⁸

One problem with this argument is that (6) plausibly has both a conjunctive reading and a non-conjunctive reading, just like (7) does.

7. Jane wants to go swimming and go hiking.

(7) has a non-conjunctive reading on which the proposition desired is the proposition that Jane goes swimming and hiking. (7) also has a conjunctive reading on which it is equivalent to (8).

8. Jane wants to go swimming and Jane wants to go hiking.

That (7) has such a conjunctive reading can be justified by noting that (9) has a reading on which it can be true.

9. Jane wants to go swimming and go hiking, but doesn't want to do both, since it would be too tiring.

On this true reading, (9) entails that: Jane wants to go swimming and Jane wants to go hiking, but it is not the case that Jane wants to (go swimming and go hiking).

Just as (7) has both a non-conjunctive reading and a conjunctive reading, (6) plausibly has a non-conjunctive reading on which it is equivalent to (6n) and a conjunctive reading on which it is equivalent to (6c).

¹⁸ x is distinct from y iff x is not identical to y .

- 6n. Caesar screaming brought it about that (Tully woke up and 3 exists).
 6c. (Caesar screaming brought it about that Tully woke up) and (Caesar screaming brought it about that 3 exists).

It is surely the case, especially if we assume that 3 necessarily exists, that Caesar screaming does not bring it about that 3 exists. Hence (6c) is false. Hence, it could be that the most salient reading of (6) when employed in the causal argument is its conjunctive reading, and the reason why (6) seems false when the causal argument is initially presented is due to (6) being false on its conjunctive reading, rather than it being false on its non-conjunctive reading. However, if (6) is only false on its conjunctive reading, then it doesn't follow from (5) being true that ⟨Tully woke up⟩ is distinct from ⟨Tully woke up and 3 exists⟩, and hence it doesn't follow that the modal theory is false. Hence, unless we have good reason to think that (6) is false on its non-conjunctive reading, rather than being false merely on its conjunctive reading, we don't have good reason to think that the argument is sound.

A second problem with the causal argument concerns a further respect in which (6) has multiple readings. Causes may either be *partial* causes or *complete* causes. Intuitively, fact p is a merely partial cause of fact q iff p together with some other facts brings q about; whereas, p is a complete cause of q iff p brings about q by itself, without any help from other facts. Caesar screaming is a merely partial cause of Tully waking up, since Caesar screaming works together with other facts, such as facts about the presence of oxygen and facts about Tully's ears, to bring it about that Tully woke up. As a result, for the causal argument to be sound, (5) and (6) need to have their meanings (5p) and (6pn).

- 5p. Caesar screaming partially brought it about that Tully woke up.
 6pn. Caesar screaming partially brought it about that (Tully woke up and 3 exists).

The second problem with the causal argument is that, even for those who hold that ⟨Tully woke up⟩ is distinct from ⟨Tully woke up and 3 exists⟩, there are strong reasons to think that (6pn) is true, rather than false as is required by the causal argument. First, given one thinks that causation is transitive, a plausible principle connecting causation with metaphysical grounding is (T).¹⁹

T. If p partially causes q , and q partially grounds r , then p partially causes r .

Given the assumption that ⟨Tully woke up⟩ is distinct from ⟨Tully woke up and 3 exists⟩, (10) is plausibly true, since, given this assumption, it is plausible that ⟨Tully woke up⟩ and ⟨3 exists⟩ collectively completely ground ⟨Tully wakes up and 3 exists⟩.

10. ⟨Tully woke up⟩ partially grounds ⟨Tully woke up and 3 exists⟩.

Given (10), however, it follows from (5p) and (T) that (6pn) is also true. Hence, since the soundness of the causal argument requires (5p) to be true and (6pn) to be false, it follows from (10) and (T) that the argument is unsound.

Second, even if one rejects the transitivity of causation (and rejects (T)), there is a strong argument in favour of (6pn) being true. Over the last 20 years, a number of

¹⁹ (T) has been defended by Lange (2013).

philosophers have rejected the transitivity of causation due, in effect, to its incompatibility with the dependence thesis (Dep).²⁰

Dep. Suppose it is the case that, had p failed to obtain, then q would have failed to obtain. Then, p partially causes q .

Philosophers who reject the transitivity of causation (due to their commitment to (Dep)) should also reject (T) on similar grounds. This doesn't help the causal argument, however, since it also follows from (Dep) that (6pn) is true. This is because, in the case of Caesar waking Tully described in Sect. 2, had Caesar not screamed, Tully would not have woken up (when he did). Hence (11) is true.

11. Had Caesar not screamed, it would not have been that (Tully woke up and 3 existed).

It then follows from (Dep) and (11) that (6pn) is true, which is contrary to what is required for the causal argument to be sound. Hence, whether or not causation is transitive, it is plausible that (6pn) is true and the causal argument is unsound.

It might be thought that we can avoid this second problem with the causal argument by changing some of the details of the case of Caesar waking Tully and embracing the view of causation on which (Dep) holds, causation is not transitive and (T) fails. For example, we might rewrite the case so that Cleopatra is in Tully's bedroom when Caesar screamed, and that, had Caesar not screamed, Cleopatra would have screamed (at the same time Caesar actually screamed) and would have woken up Tully instead. In this modified case, it is no longer true that, had Caesar not screamed, Tully would not have woken up. As a result, in the modified case, (11) would also not be true, and so (Dep) wouldn't be able to be used to show that (6pn) is true in the modified case.

Unfortunately, this attempt to rescue the causal argument fails, since, if (6pn) is true in the original case where there is no Cleopatra, then the presence of Cleopatra in the modified case shouldn't prevent (6pn) also being true in the modified case. This is because, in the modified case, Cleopatra doesn't actually do anything to Tully, although she would have done something if Caesar hadn't screamed. In the modified case, Cleopatra is like a backup assassin who would have killed the assassination target if the primary assassin had failed to kill them, but doesn't kill the target since the primary assassin kills them. In such a case, the presence of the backup does not prevent the primary assassin causing the death of the target. Similarly, if Caesar screaming partially brought it about that (Tully woke up and 3 exists) in the original case, then Caesar screaming should also do this in the modified case, since the presence of the backup of Cleopatra should not prevent such causation occurring.

There is also a further problem with the causal argument when it is modified by adding Cleopatra, which is closely related to the first problem with the argument discussed above. As argued above, (6pn) is true in the original case where there is no Cleopatra. Since it is natural for us to (at least initially) judge (6) to be false when we

²⁰ For this incompatibility, see Hall (2000, 2004). Proponents of (Dep) typically place certain restrictions on the principle, such as requiring that the counterfactual is to be read in a suitable non-backtracking sense [see Lewis (1973)], that the facts (or events, when (Dep) is applied to events) that stand in the causation relation are sufficiently "distinct" (so that, for example, we don't have the consequence that each fact causes itself) [see Kim (1973) and Lewis (1986a)], and that they are non-disjunctive [see Lewis (1986a)].

encounter the causal argument, this makes it plausible that the most salient reading of (6) in the argument, and the reading we naturally adopt when we are confronted with the argument, is its conjunctive reading on which it is false but on which the causal argument is invalid. Since modifying the argument by adding Cleopatra shouldn't change what reading of (6) we adopt, we have further reason to reject the causal argument related to the first problem with it described above. In particular, we have a strong reason to think that the reason why (6) seems false in both the original case and in the modified case is that (6) is read with its conjunctive reading on which it is false but on which the argument is invalid.

The above problems show that the causal argument against the modal theory is unsound with respect to both the original and the modified case of Caesar screaming. As noted above, similar considerations show that the causal argument is also unsound when applied against other theories of facts and states of affairs, such as the objectual aboutness theory and the fundamental constituency theory.

4 The modified causal argument

I have just argued that the causal argument is unsound. It might be thought, however, that the argument can be modified so that it avoids the problems described in the last section. In particular, it might be thought that the argument can be made successful by: i) making it transparent that the argument employs the notion of complete causation rather than partial causation, ii) avoiding unwanted conjunctive readings of its premises and intermediate conclusions, and iii) suitably changing the description of the case of causation, so that we have an instance of complete causation of some fact p without complete causation of the conjunction of p with some other fact q , where p is necessarily equivalent to this conjunction. An attempt to give such an argument is the following: Suppose Ellie is an electron that is stationary and on which no forces are acting. Suppose Merlin is a wizard who then casts a “repelling” spell on Ellie that exerts a force on Ellie that causes it to move. Since the only force exerted on Ellie is due to Merlin's spell, (12) is true.

12. ⟨Merlin casts a repelling spell on Ellie⟩ completely causes ⟨Ellie moves⟩.

In contrast, (13) is false.

13. ⟨Merlin casts a repelling spell on Ellie⟩ completely causes ⟨Ellie moves and 3 exists⟩.

Since (12) is true, while (13) is false, it follows that ⟨Ellie moves⟩ is not identical to the necessarily equivalent fact ⟨Ellie moves and 3 exists⟩, from which it follows that the modal theory is false.

Call this argument against the modal theory the modified causal argument. A problem with this argument as it currently stands is that it is not immediately obvious why we should think that (13) is false. Just as it was shown in Sect. 3 that Caesar's screaming is a partial cause of the fact that Tully woke up and 3 exists, it can be shown that Merlin's spell is a partial cause of the fact that Ellie moved and 3 exists. Given Merlin's spell at least *partially* caused the fact that Ellie moved and 3 exists, however,

it is not immediately obvious why we should think that it doesn't *completely* cause this fact.

That it is not obvious that (13) is false, and that a reason needs to be given for thinking that (13) is false, can be made vivid by considering the following argument that (13) is instead true. Let 'Merlin's spell' abbreviate '(Merlin casts a repelling spell on Ellie)'. Since there are no causes of (Ellie moves and 3 exists) other than Merlin's spell that are contemporaneous with Merlin's spell, there are no other facts such that Merlin's spell, together with these other facts, collectively brings it about that (Ellie moves and 3 exists). If this is correct, however, then it follows from (14) that Merlin's spell is not a merely partial cause of (Ellie moves and 3 exists).

14. If f is a merely partial cause of g , then there are one or more facts that are each distinct from f , are *causes* of g , and are such that f together with these facts collectively bring about g .

Since Merlin's spell is a partial cause of (Ellie moves and 3 exists), but is not a merely partial cause of this fact, it follows that Merlin's spell is a complete cause of this fact, and hence it follows that (13) is true.

A plausible response to this argument that (13) is true is that what is true of mere partial causation is not (14), but is instead (15), where (15) is obtained from (14) by replacing 'causes' with 'determinants', and where the determinants of g include both the causes of g and the metaphysical grounds of g .

15. If f is a merely partial cause of g , then there are one or more facts that are each distinct from f , are *determinants* of g , and are such that f together with these facts collectively bring about g .

Given it is (15) that holds, rather than (14), the above argument for Merlin's spell completely causing the fact (Ellie moves and 3 exists) fails, since, while Merlin's spell partially causes this fact, and there are no causes of this fact such that Merlin's spell working with these causes collectively bring about this fact, there might be some determinants of this fact that do this instead.

While the above argument for (13) being true fails, we still need a positive reason to think that (13) is false for the modified causal argument to be successful. I will now argue that, while we might be able to expand the modified causal argument so that it provides the needed justification, this can only be done by appealing to non-causal considerations that help the modified causal argument refute the modal theory only if these considerations work by themselves to refute this theory. If this is correct, then, adding such considerations to the modified causal argument at best renders the argument superfluous and we are better served by focusing on these other considerations when evaluating the modal theory, rather than on the causal argument.

One strategy for showing that (13) is false is motivated by the above response to the argument that (13) is true. In particular, the above response suggests that, in order to show that Merlin's spell merely partially causes fact (Ellie moves and 3 exists), we should find some non-causal determinants of this fact—in particular, some metaphysical grounds of this fact—such that, these determinants work with Merlin's spell to

bring about $\langle \text{Ellie moves and } 3 \text{ exists} \rangle$. A natural way of attempting to implement this strategy is to appeal to the popular grounding principle (Conj).²¹

Conj. If p and q are facts, then p and q (collectively) completely ground the conjunction of p and q .

(16) follows from (Conj) and the facthood of $\langle \text{Ellie moves} \rangle$ and $\langle 3 \text{ exists} \rangle$.

16. $\langle \text{Ellie moves} \rangle$ and $\langle 3 \text{ exists} \rangle$ collectively completely ground $\langle \text{Ellie moves and } 3 \text{ exists} \rangle$.

It follows from (16) that $\langle 3 \text{ exists} \rangle$ is a (partial) ground of $\langle \text{Ellie moves and } 3 \text{ exists} \rangle$, and hence is a determinant of it. One might then argue that this determinant works with Merlin's spell to bring about $\langle \text{Ellie moves and } 3 \text{ exists} \rangle$, and thereby conclude that, due to (15), Merlin's spell doesn't completely cause $\langle \text{Ellie moves and } 3 \text{ exists} \rangle$.

In more detail, in addition to (Conj), a proponent of the modified causal argument might appeal to (17), (18) and the transitivity principle concerning determination (TD).

17. If distinct facts f_1 and f_2 collectively completely determine g , and f_1 does not completely determine f_2 , then f_1 does not completely determine g .

18. f completely causes g iff: i) f partially causes g , and ii) f completely determines g .

TD. If (f completely determines g) and (g and h collectively completely determine i), then (f and h collectively completely determine i).

A proponent of the modified causal argument might then attempt to justify the claim that Merlin's spell does not completely cause $\langle \text{Ellie moves and } 3 \text{ exists} \rangle$ as follows: Since Merlin's spell completely determines $\langle \text{Ellie moves} \rangle$ (since it completely causes it), (19) follows from (TD) and (16) (where (16) is deduced from (Conj) as above).

19. Merlin's spell and $\langle 3 \text{ exists} \rangle$ completely determine $\langle \text{Ellie moves and } 3 \text{ exists} \rangle$.

Since Merlin's spell has no effect on 3 existing, it follows from (17) and (19) that Merlin's spell does not completely determine $\langle \text{Ellie moves and } 3 \text{ exists} \rangle$. It then follows from this and (18) that Merlin's spell does not completely cause $\langle \text{Ellie moves and } 3 \text{ exists} \rangle$.

One problem with the above argument for Merlin's spell not being a complete cause of $\langle \text{Ellie moves and } 3 \text{ exists} \rangle$ is that, while many instances of (Conj) are highly plausible, other instances, such as (20), are much less compelling.

20. If $\langle \text{Ellie moves} \rangle$ is a fact, then $\langle \text{Ellie moves} \rangle$ completely grounds $\langle \text{Ellie moves and } \text{Ellie moves} \rangle$.

(20) arguably fails to be compelling, in part because the claim that $\langle \text{Ellie moves} \rangle = \langle \text{Ellie moves and } \text{Ellie moves} \rangle$ has at least some prima facie plausibility, and, given this identity claim and the facthood of $\langle \text{Ellie moves} \rangle$, (20) conflicts with Non-circularity.

Non-circularity. No fact partially grounds itself.

²¹ If $\langle \phi \wedge \psi \rangle$ can be distinct from $\langle \psi \wedge \phi \rangle$, then (Conj) will need to be modified to allow for p and q having no unique conjunction. One way of doing this is to replace 'the conjunction' in (Conj) with 'every conjunction'.

As a result of this, a proponent of the modal theory might argue that (Conj) does not unrestrictedly hold and should be replaced with (Conj*²²).

Conj*. If p and q are facts that are both distinct from the conjunction of p and q , then p and q (collectively) ground the conjunction of p and q .

If (Conj) is replaced by (Conj*), however, then we can no longer give the above argument for Merlin's spell not completely causing (Ellie moves and 3 exists). This is because we cannot derive (16) from (Conj*) (and the facthood of (Ellie moves) and (3 exists)) unless we already know that (Ellie moves) is distinct from (Ellie moves and 3 exists), and hence we cannot derive (16) unless we already know that the modal theory is false.

16. (Ellie moves) and (3 exists) collectively completely ground (Ellie moves and 3 exists).

Since we cannot derive (16) without begging the question against the modal theory, we therefore also cannot justify the claim that (3 exists) partially grounds (and hence partially determines) (Ellie moves and 3 exists), which is crucial to the above argument that Merlin's spell doesn't completely cause (Ellie moves and 3 exists).

For our purposes (given the limited conclusions of this paper), the main problem with the above argument that Merlin's spell doesn't completely cause (Ellie moves and 3 exists) is that, even if the argument does establish this claim, adding this argument to the modified causal argument renders it superfluous relative to a simpler and less insecure argument against the modal theory, and hence renders the modified causal argument unworthy of attention. The reason for this is that, if we expand the modified causal argument so that it includes this argument, then the modified causal argument will include (Conj), and, given the uncontroversial thesis that at least some instances of Non-Circularity hold, (Conj) by itself entails that the modal theory is false. To see why this is the case, suppose f is a fact that does not ground itself. Then it follows from (Conj) that f is distinct from the conjunction of f with itself, which, since these facts are necessarily equivalent to each other, entails that the modal theory is false. As a result, if the modified causal argument is expanded so that it contains (Conj) as a premise, then it will fail to provide any more reason to reject the modal theory than the following simpler argument from grounding.

Grounding: Since there is a fact f that does not ground itself, and, by (Conj), any fact grounds the conjunction of itself with itself, f is distinct from the conjunction of f with itself. Since these facts are necessarily equivalent to each other, it follows that the modal theory is false.

Since such an expanded modified causal argument contains other premises in addition to (Conj) that might be questioned, as well as being superfluous the expanded argument is also more insecure than the above argument from grounding. As a result, given the existence of these two arguments, we should focus on the argument from grounding rather than the expanded modified causal argument in evaluating the modal theory.

I am aware of one other way a proponent of the modified causal argument might try to justify the claim that Merlin's spell does not completely cause (Ellie moves and

²² A proponent of the need for such a restriction is Correia (2010, 2016).

3 exists). This second way of attempting to justify this claim appeals to the principle (21).

21. If f completely causes g , and g is at least partially about how x is, then f causally effects how x is.

To motivate (21), suppose f at least partially causes g , g is partially about how x is, and f doesn't causally effect how x is. Then it might be thought that, since f is not responsible for how x is (as it is described by g), f works together with whatever is responsible for how x is (as it is described by g) to determine g , and hence by (17) and (18), f is a merely partial cause of g .²³

Given that (21) holds, a proponent of the modified causal argument can argue as follows: It is possible that, while Merlin's spell completely causes Ellie to move, it does not have any causal effect on how the number 3 is. Let us also assume that this possibility obtains. (23) follows from (21) and (22).

22. \langle Ellie moves and 3 exists \rangle is (partially) about how 3 is.
 23. If Merlin's spell completely causes \langle Ellie moves and 3 exists \rangle , then Merlin's spell causally effects how 3 is.

Since Merlin's spell does not causally effect how 3 is, it then follows from (23) that Merlin's spell does not completely cause \langle Ellie moves and 3 exists \rangle .

As it stands, this argument for Merlin's spell not completely causing \langle Ellie moves and 3 exists \rangle is not decisive, since a proponent of the modal theory might, for example, reject (22). For example, they might respond to this argument by arguing that facts and states of affairs aren't about how particular things are. Instead of facts and states of affairs having such aboutness features, they might argue that it is some other kind of entity that has such features, such as perhaps states of affairs under modes of presentation. Alternatively, they might accept that states of affairs and facts can be about (or concern) how particular things are, but argue that our intuitions regarding what they are about are unreliable and can be easily rejected. A proponent of the modal theory who adopts the latter strategy, for example, might claim that, despite our intuitions to the contrary, (22) and (24) have the same truth-value, and that the only reason (22) seems true, while (24) seems false, is that the sentence 'Ellie moves and 3 exists' contains the name '3', while the sentence 'Ellie moves' doesn't.

22. \langle Ellie moves and 3 exists \rangle is (partially) about how 3 is.

²³ (21) has to be restricted to avoid counterexamples provided by disjunctions of states of affairs. Suppose, for example, that Merlin's spell completely causes \langle Ellie moves \rangle , but Merlin's spell has no effect on whether Cleopatra moves. (A) then follows from (B) and (T*), where (T*) is a variant of (T) which was discussed in Sect. 3.

B. \langle Ellie moves \rangle completely grounds \langle Ellie moves or Cleopatra moves \rangle .

T*. If p completely causes q , and q completely grounds r , then p completely causes r .

A. Merlin's spell completely causes \langle Ellie moves or Cleopatra moves \rangle .

Since \langle Ellie moves or Cleopatra moves \rangle is (partially) about how Cleopatra is, but Merlin's spell doesn't causally effect how Cleopatra is, (A) conflicts with (21). The needed restriction to (21) might perhaps be made by requiring that g in (21) be a non-disjunctive state of affairs, where a non-disjunctive state of affairs is intuitively a state of affairs that makes for a respect of resemblance among the possible (and perhaps impossible) worlds at which it obtains. \langle Ellie moves or Cleopatra moves \rangle is plausibly a disjunctive state of affairs, whereas \langle Ellie is an electron \rangle is (at least as far as we know) a non-disjunctive state of affairs.

24. $\langle \text{Ellie moves} \rangle$ is (partially) about how 3 is.

For our purposes, the main problem with the second argument for Merlin's spell not being a complete cause of $\langle \text{Ellie moves and 3 exists} \rangle$ is that, as with the first argument for this claim discussed above, expanding the modified causal argument so that it includes this argument renders the modified causal argument superfluous and unworthy of attention. To see why this is the case, first observe that the expanded argument requires the truth of (22), since, if (22) is false, then Merlin's spell not completely causing $\langle \text{Ellie moves and 3 exists} \rangle$ does not follow from (21) and Merlin's spell not causally effecting how 3 is. Next observe that the expanded argument also requires the falsehood of (24), since, if (24) is true, it follows from (21) and Merlin's spell not causally effecting how 3 is that, contrary to the assumptions of the modified causal argument, Merlin's spell does not completely cause Ellie to move. Hence the expanded modified causal argument requires both the truth of (22) and the falsity of (24). However, by Leibniz's law, the truth of (22) and the falsity of (24) entail by themselves that the modal theory is false. Hence, the expanded modified causal argument provides no more reason to reject the modal theory than the following simpler argument from objectual aboutness.

Objectual aboutness: Since $\langle \text{Ellie moves} \rangle$ is not about how 3 is, and $\langle \text{Ellie moves and 3 exists} \rangle$ is about how 3 is, $\langle \text{Ellie moves} \rangle$ is distinct from the necessarily equivalent $\langle \text{Ellie moves and 3 exists} \rangle$, from which it follows that the modal theory is false.

As well as being more complicated, the expanded causal argument is more insecure than the argument from objectual aboutness, since it contains further premises that might be rejected, such as (21). In order to best evaluate the modal theory, then, we should focus on the argument from objectual aboutness rather than this more complicated and less secure expanded modified causal argument.

As noted in Sect. 3, the versions of the causal argument that target other theories of facts and states of affairs face the same kinds of problems as the version that targets the modal theory. In response to these problems, just as in the case of the version targeting the modal theory, we can modify these versions so that they avoid unwanted conjunctive readings, employ the notion of complete causation, involve a plausible case of complete causation, and appeal to either grounding or aboutness considerations to justify the needed further claims regarding what completely causes what. However, just as in the case of the version targeting the modal theory, such modified versions of the causal argument are superfluous relative to simpler and less insecure arguments from grounding and aboutness that target the same theories of facts and states of affairs. I will finish this paper by illustrating this in the case of a modified version of the causal argument that targets the objectual aboutness theory and appeals to considerations of aboutness.

In place of premise (21), the modified causal argument that targets the objectual aboutness theory and appeals to aboutness has premise (25).²⁴

²⁴ As with (21), (25) needs to be restricted to avoid counterexamples involving disjunctions of states of affairs. (See footnote 23.) As with (21), one possible restriction is to require that g be non-disjunctive.

25. If f completely causes g , and g is at least partially about how x is F -wise, then f causally effects how x is F -wise.

The argument is the following: It is possible that Merlin casts a repelling spell on Ellie that completely causes Ellie to move but does not causally effect how Ellie is identity-wise. Suppose this possibility obtains. Since (Ellie moves and Ellie = Ellie) is partially about how Ellie is identity-wise, and Merlin's spell does not causally effect how Ellie is identity-wise, it follows from (25) that Merlin's spell does not completely cause (Ellie moves and Ellie = Ellie). Since Merlin's spell completely causes (Ellie moves), it follows that (Ellie moves) is distinct from (Ellie moves and Ellie = Ellie). Since (Ellie moves) and (Ellie moves and Ellie = Ellie) are necessarily equivalent to each other and are about the same things, it follows that the objectual aboutness theory is false.

In addition to relying on the premise (26), this modified causal argument against the objectual aboutness theory requires (27).

26. (Ellie moves and Ellie = Ellie) is about how Ellie is identity-wise.
 27. (Ellie moves) is not about how Ellie is identity-wise.

The argument requires (27) since, if (27) is false, then it will follow from (25) and Merlin's spell not causally effecting how Ellie is identity-wise that Merlin's spell does not completely cause (Ellie moves), which conflicts with the assumptions of the argument. Due to Leibniz's law, however, (26) and (27) by themselves entail that (Ellie moves) is distinct from (Ellie moves and Ellie = Ellie), and hence by themselves entail the falsehood of the objectual aboutness theory. The above modified causal argument is therefore only sound if the following simpler and less insecure argument from attributive aboutness is sound.

Attributive aboutness: Since (Ellie moves and Ellie = Ellie) is about how Ellie is identity-wise, and (Ellie moves) is not about how Ellie is identity-wise, it follows that (Ellie moves) is distinct from (Ellie moves and Ellie = Ellie). Since (Ellie moves) and (Ellie moves and Ellie = Ellie) are necessarily equivalent to each other and are about the same things, it follows that the objectual aboutness theory is false.

The modified causal argument against the objectual aboutness theory is therefore superfluous relative to this attributive aboutness argument, since it doesn't provide any further reason to reject the objectual aboutness theory than this simpler argument. The modified causal argument is also less secure than this argument from attributive aboutness, since it contains further premises that might be rejected, such as (25). Just as in the case of the other theories targeted by the causal argument, then, in evaluating the objectual aboutness theory, we should consider other simpler and less insecure arguments against the theory, such as the argument from attributive aboutness, rather than considering such a modified causal argument.²⁵

²⁵ While both the modal theory and the objectual aboutness theory are targeted by arguments that appeal to aboutness, one need not think that these arguments have the same strength. For example, one might think that the objectual aboutness argument is sound without thinking that the attributive aboutness argument is sound. One might also have different views regarding the relative strength of the arguments from grounding and the arguments from aboutness.

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