# Omissions, Causation, and Modality

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Dissertation submitted in partial fulfillment of the
requirements for the degree of Doctor of Philosophy
in the Department of Philosophy
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# ABSTRACT

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# Abstract

In *The Neverending Story* (1984), "the nothing" was spreading throughout Fantasia. This is terrifying not just because of the nature of the west-German fantasy film but also because nothing—non-being—was represented as something that existed. Nothing can't be—or so it seems. In this dissertation, I ask: what do ordinary statements about omissions and absences mean if they are not about things that exist? And then I ask: how can an answer to this question help us understand omissive causation? I present various normative accounts of omissive language and omissive causal models. I end by considering some reasons to doubt such models.

*in memory of my mother, Shari [Henne]*

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# Chapter 1

# Introduction

Consider an important warning sign:

"WARNING FUMES MAY BE PRESENT"

The sign may seem quite scary at first. But consider an even more worrying sign:

"WARNING FUMES MAY NOT BE PRESENT"

It might seem odd to have this second warning sign; maybe it would be more efficient to say:

"WARNING FUMES PRESENT"

But this third sign does not seem to be equivalent to the second. The third warns us of the presence of fumes. That is, in most contexts, such a warning would tell us about the potential abnormal state in which there are dangerous fumes in the air nearby. The second sign, however, tells us a bit more than this; that is, it seems to tell us not only about the possible omission of fumes but also to alert us the scary fact that fumes are typical in this particular context and normally present in the breathable air nearby.

Of course, these first two warning signs are vastly different; including a negation in a statement will radically change its meaning. But there is something else different about these two statements that seems to get at a difference in the meaning of statements about absences and omissions, relative to those about actions and events. The first sign warns us about the possibility of an unusual event—the presence of fumes. Notably, we can't reduce the meaning of the first sign to one that describes a potential negative event (i.e., the second sign). But the second sign, which is about an

omission (or the potential omission of fumes), seems—in part—reducible to the third sign. If we reduce the meaning in such a way, however, we lose an essential part of the meaning of the sign—the part describing some relevant omissions or absence, which seems to have some normative component (i.e. it is normal, typical, or common for fumes to be present). Hence, the difference we observe between the first two signs—the first warning of a positive event and the second warning of an omission—seems not just to be a difference in what is and what is not but also a difference in what is normal.

The immediate, intuitive reaction to the difference in these statements tells us that there is something normative about the nature of omissive language and our cognition about omission, absences, and the like. I will defend such a view herein. First, I will suggest that an essential part of the meaning of omissive statements is normative. To see this, consider the context where you read the first sign when you are in some dangerous area, and there are fumes present and you escape without harm. There is an omission here: you did not breath in toxic fumes. And there is an intuitive causal relation: not breathing in fumes caused you to escape unharmed. But consider now that there is no sign in that area because fumes are not likely, and then you escape without harm. There is an absence here: you don't breath in toxic fumes. But there is no intuitive causal relation: that is, it seems wrong to say that not breathing in fumes caused you to escape unharmed. It even seem wrong to state "There is an omission of fumes in this area"; in such contexts, it seems appropriate to talk only about absences. The difference between these two cases is a normative difference. This difference, as I will defend in Chapter 2, is an essential part of the meaning of omissive statements and omissive causal language.

In Chapter 3, I try to doubt this view and the complete generalization of my previous findings (Henne, Pinillos, & De Brigard 2017). In this chapter, I suggest that

what affects omissive causal statements in not norms in themselves. Rather, norms affect the perceived relevance of counterfactual alternatives, and a more complete understanding of the modal structure of causal relations can affect omissive causal statements. I provide some empirical evidence for this view. To see this, consider the same example from the previous paragraph. Maybe what explains this difference in meaning is not the norms themselves but a difference in the perceived relevance of the alternatives. In the first case where the omission is abnormal, the counterfactual alternative—where you actually breath in some toxic fumes and die—is relevant. In the second case where the omission is normal, however, the counterfactual alternative seems like an irrelevant possibility. What I discuss in this chapter is that if we consider the relevant counterfactual alternatives in such situations, this may push around our causal judgments in a predictable way and mitigate the effect of norms.

In Chapter 4, I take on the omission effect: i.e. why people tend to think that actions cause events but also that omissions (matched for outcome) do only to a lesser extent. I rely on my previous findings and an existing model of causal judgment to explain this difference in causal judgments. In short, I argue that the difference in causal judgments for actions and omissions results from a difference in the perceived normality of the counterfactual alternatives. After I spell out this model and how it captures the omission effect, I show how it could help us understand similar effects in moral psychology.

In my Conclusion, I doubt my results in Chapter 4—and many other results in this dissertation. A recent model of causal judgments makes novel predictions confirmed in empirical studies. The model I use in Chapter 4 cannot account for these findings, while this new model can. Hence, I lay out some predictions of this model for omissions. I then outline some recent novel results that I found for omissive causal reasoning that are predicted only by this new model. I also note that this model

may account for my results in Chapter 3. And I end by suggesting what I take to be the most important questions for future work on omissive causal modeling.

# Chapter 2

# Nothin' from Nothin'

While it may seem vacuous, philosophers fuss a lot about omissions.[1] Consider:

(1) The corporation's failures caused the worker's death.

(2) There's been a lack of rain.

(3) There was a notable omission of two names in the acknowledgements.

(4) There were two glaring omissions in the chairwoman's speech.

On some semantic views, omissive statements like 1-4 have an ontological commitment; specifically, the omission terms entail possibilities (Bernstein 2014; 2016), entities (Tiehen 2014), fictions (Lewis 2000: 196; Murray 2018), or nothing at all (Clarke 2014). Contrary to some these views (for an overview, see Bernstein 2015), I will argue that the omissive terms in statements like (1)-(4) entail to nothing at all. On the view I present here, I preserve the ordinary meaning of omissive statements and allow for a counterfactual conditional analysis of causation for omissive causal statements—if we so please. This view also has theoretical benefits that some alternative theories lack; that is, it resolves some of the metaphysical problems engendered by the other views of omissions and the semantics of omissive language.

Notably, while this discussion affects related questions of omissive selectivity (McGrath 2005) and the ontology of omissions (Bernstein 2014), I focus on the semantic

[1] Title refers to Preston (1974)

question: that is, what do omissive statements—and omissive causal statements—denote? I, like many (e.g., Quine 1948), take semantics to guide ontology—at least in a limited way; so, this discussion will inform the ontological question about what omissions are.[2]

In section 2, I will introduce the paraphrase view of omissive statements. In section 3, I will show that the paraphrase view has many theoretical benefits over the competing views of omissive causal language. Supporting this more parsimonious view of omissions, I conclude in section 4 that omissions are just what they seem to be—nothing at all.

## 2.1 The Paraphrase View

Consider an ordinary omissive statement:

(3) There was a notable omission of two names in the acknowledgements.

To make sense of this statement, we must assume a few things about a context in which this statement is true. First, assume that someone expressed this statement in order to convey information about the acknowledgements section of a recently published paper where the author is acknowledging every member of the lab, which has eleven members, yet she only listed nine names. Second, assume that the sentence that expresses (3) is spoken earnestly in a context in which the speaker knows that there are eleven lab members. Lastly, assume that the speaker intends for her statement to describe something about the section of the acknowledgments about only

[2]But see Ritchie (2016) for a discussion of the limits of this approach.

the lab so that 'names' refers to the names of assumed lab members and not some other set of names.

Even with this specified context with an ordinary English statement, there may seem to be something odd entailed by 3: it denotes an omission. Specifically, given that the statement true, it may commit us to something to which we do not want to be committed. The omissive term—here, simply 'omission'—might denote something rather than nothing.[3] We can readily show this odd commitment with an ordinary regimentation of (3). If we begin regimenting 3, we get:

(3.1) It is true that there are at least two things such that they are a lab member and they are an omission.

When we further regiment this sentence into predicate logic, we find that 3.1 means:

(3.2) $(\exists x \exists y \exists z ...)((O(x) \wedge M(x)) \wedge (O(y) \wedge M(y)) \wedge (O(z) \wedge M(z)) \wedge (x \neq y \wedge x \neq z \wedge y \neq z ...))$

The predicate 'O' means 'an omission' and the predicate 'M' identifies it as a member of the lab.[4] Under this regimentation and the usual inference rules of predicate logic, 3.2 commits us to some entity such that it is an omission. For, given the conjunction

[3]Some may wonder if I beg the question here. I state that it is odd that omission terms may commit us to something rather than to nothing and that this commitment might be wrong. In other words, our omission terms *prima facie* ought to denote nothing. So, one might charge that I beg the question by assuming my conclusion. But I do not assume this conclusion. If we must explain omissive language by denotations to fictions or to possibilities or to something of the like, then I will accept that view. Nonetheless, because of its initial oddness to say that omissions are entities, I simply want to doubt that commitment in order to explore more parsimonious views of omissive language.

[4]This formulation is truncated only for the sake of space. Other ellipses will have the same function in forthcoming equations.

in 3.2, we can derive:

(3.3) $(\exists x)(Ox)$.

In other words, there exists at least one thing that is an omission. Unless the entailment of 3.3 is explained away in terms of pragmatics or as some mistake in the regimentation, this analysis commits us to omissions as entities—or to some kind of fictional machinery or entity.

I expect that any sort of ontological naturalist—that is, one who accepts only natural entities in her ontology—would claim 3.3 is false; there are not omissions in the natural world to satisfy the predicate 'O'. Moreover, we do not want to posit fictions, or fictitious entities, where we do not have reason to do so. If we regiment in this way, then this result is a problem for omissive statements, like (1)-(4).

But there may be alternative ways to parse (3). So, at this point, we could also try regimenting (3) simply as a negative existential:

(3.4) It is not the case that there are two names in the acknowledgments.

(3.4), however, is false because there are, as specified by the context, nine lab members mentioned in the acknowledgments section of the article. So far, these two direct paraphrases of (3) fail. They result in unwanted ontological commitment, or they result in false statements.

Hence, I think that it is time to specify the meaning of the statement in order to develop a more appropriate paraphrase of (3). This new paraphrase, I will argue, will resolve several issues with omissive statements, but it will require that we have to add something to our understanding of omissive language and omissive statements.

Here, I will offer my new paraphrase view. Holding fixed the assumptions about the context, (3) entails:

(3.5) There are nine names in the acknowledgements.

Assuming that there are eleven lab members and that there is an omission of two lab members' names, then it is true that there are nine lab members mentioned in the acknowledgments.[5] Not only is this statement true, but it also commits us only to positive events—no bizarre, fictional, or non-existent entities. This is apparent if we regiment our statement to be:

(3.6) $(\exists x \exists y \exists z ...)((M(x)) \wedge (M(y)) \wedge (M(z)) \wedge (x \neq y \wedge x \neq z \wedge y \neq (z...))$

The predicate 'M' means 'member of the lab'. So far, we are not committed to anything odd. But (3.6) does not convey the full meaning of (3). In this context, 3 also expresses the expectation of there being eleven lab members mentioned. Acknowledging this additional information expressed by (3), we could then think that (3) entails the negative existential:

(3.7) It is not the case that there are eleven names in the acknowledgements.

[5]It may also be suggested that (3) entails the statement 'There are eight names in the acknowledgements'—given that (3) implies that there are at least two omissions. I take this to be an issue of conversational implicature. That is, the speaker of (3) conversationally implies that there are exactly two notable omissions. This implicature can be cancelled. For instance, if the lab member, Matt, is also omitted, but everyone omits his name in the acknowledgments of their papers, then one could cancel the implication of there being exactly two omissions. For now, I will hold the context fixed so that there are exactly two omissions. I will return to this issue.

(3.7), however, does not convey the additional meaning of (3) that we need. There could be, for instance, ten names of lab members in the acknowledgments. In this case, (3.6) and (3.7) are true, yet the precise meaning of (3) is lacking. To see this, consider the meaning of (3) again. (3) is true because there are two names missing from the acknowledgments. So, (3.7) does not tell us enough information to specify that there are exactly nine names of lab members in the acknowledgments. Furthermore, and importantly, (3.7) could be false while (3) is true. For instance, it could be the case that all of the two past lab members' names are in the acknowledgments. Here, (3) is true because the two members that are expected to be in the acknowledgments are not, and (3.7) is false because there are maybe eleven lab members' names in the acknowledgments. Moreover, (3.7)—even in conjunction with (3.5)—does not convey how many lab members are actually in the acknowledgments section, while (3) does (in context). (3.7) is consistent with there being three names in the section, and (3) is not. Also, if we assume that the conjunction of (3.5) and (3.7) convey the full meaning of (3), we also have conveyed insufficient meaning of the original statement. Only by inference can we claim that 3 is true given the truth of (3.5) and (3.7). This inference tells us that we have not captured the full meaning of (3). In sum, the entailment from (3) to (3.5) seems to accurately convey an essential part of the statement meaning. Something, however, is still missing from this paraphrase.

Consistent with some metaphysical projects on omissions (McGrath 2005) and some experimental work (Henne, Pinillos, & De Brigard 2017), we may think that the (3) also expresses normative content as in:

(3.8) There should be two more names in the acknowledgments.

Consider now that (3) entails the conjunction of (3.5) and (3.8): that is, there are

nine names in the acknowledgments (from the set of lab members) and there should be two more. Does this convey the full meaning of (3): i.e., the number of names of lab members in the acknowledgments and the expected number of names? It does seem so. There is no ambiguity here in the number of names in the acknowledgments or not in the acknowledgements as we had with the previous attempts. And I will argue that this paraphrase not only captures the full meaning of 3 but also avoids problems of alternative views and paraphrases.

Given this reading of (3), it seems that omissive statements entail two things: the positive event(s) and the expectation(s). For my purposes, let us say that the omissive statements convey positive events ($_E$) and a normative expectation ($_N$). To ensure that this translation conveys the appropriate meaning of the omissive statement, consider another common omissive statement:

(4) There were two glaring omissions in the chairwoman's speech.

On the paraphrase view I offer here, 4 means the conjunction of two statements:

($4_E$) The chairwoman gave a speech containing statements$_{K-N}$ .

($4_N$) The chairwoman should have mentioned two additional statements$_{x,y}$ in her speech.

As with (3) and (3.5), (4) cannot be expressed only in terms of positive events. Moreover, ($4_N$) cannot be eliminated without changing the meaning of 4. In turn, this paraphrase view ought to be accepted thus far—although we have to see what other problems the view may engender.

There are some immediate objections to this view. Most notably, some may think

that that the normative conjunct—like $(4_N)$—is pragmatic—that 1 only conversationally implies something like $(4_N)$ (Varzi 2006). Specifically, when someone utters (4) they may conversationally imply $(4_N)$ in order to adhere to the cooperative principle. The normative implication of omissive statements then is not semantic. But we can test this argument. Consider a cancelation test of (3):

(3.9) There's an omission of two names in the acknowledgements, but it is not the case that there should be two more.

(3.9) yields a contradiction.[6] So, it does not seem to be a case of conversational pragmatics but rather a semantic entailment. Nonetheless, some may argue that $(3_N)$ is still pragmatic by conventional implicature or otherwise. If so, this argument must be given against the semantic account outlined here. I see no need to consider at this point an implicature view of the normative content.

Such a view as the one I have outlined here has a number of immediate theoretical benefits. First, it is consistent with some metaphysical views of omissions. McGrath (2005), for instance, argues that omissions have a normative component. This semantic view accounts for the normative component of the metaphysics of omissions. Moreover, this view is consistent with recent experimental work on the selection of particular omissions in causation by omission (e.g., Henne et al 2017). If the normative component of omissions accounts for the selection of some omissions over others,

[6](3.9) is not immediately a contradiction; that is, it's not immediately in the form $(P \wedge \neg P)$. But consider a version of the classic example of the cancelation test: his hand writing is great, but I don't mean to suggest he is a poor philosopher. Our linguistic competence allows us to cancel this false implicature in some particular contexts. Consider now: Paul is a bachelor, but his is married. Our linguistic competence does not allow us to cancel this implication. The test in (3.9) is more like this bachelor case. Consider the meaning of 'it is not the case that there should be two more names in the acknowledgments'. If this is true, then it seems that there is—necessarily—not an omission of two names (if the context is fixed). If our ordinary linguistic competence identifies these contradictions, then we ought to accept that (3.9) fails the test.

it is theoretically beneficial to have this benefit expressed in the semantics of omissive language. But there are other theoretical benefits to this theory that need to be discussed in detail.

## 2.2 Theoretical Benefits

Now that I have presented the paraphrase view of omissive statements, I can compare it to alternative views. In this section, I will show that, juxtaposed to its competing views, it avoids four problems that other views encounter. In particular, the view avoids a lush ontological commitment, allows for a counterfactual dependence account of causation, distinguishes clearly between omissions and absences, and obviates what's been called the identification problem.

### 2.2.1 Lush Ontological Commitment

Some views of omissions—particularly those that posit omissions as possibilities or as fictions—engender a lush ontological view. That is, they posit the existence of more entities than may be necessary to explain the meaning of omissive statements. The paraphrase view avoids a verdant ontological landscape by maintaining an arid desert of omissions; that is, it posits the existence of fewer entities by explaining away omissions on the level of semantics.

In her recent work, Bernstein developed an alternative account of the semantics of omissive statements (Bernstein 2014; 2016). She writes about the metaphysics of omissions, but she shows how the semantics of omissive statements results from her metaphysical account. On her metaphysical view, omissions are tripartite entities,

consisting of an actual event, a possible event, and a counterpart relationship between them. So, omissive statements denote some event in the actual world, wherein the omission of $C$ occurs, the set of possible worlds where $C$ occurs, and the counterpart relation between these events holds.

Apply this view to (2). Recall:

(2) There's been a lack of rain.

On Bernstein's view, the rain in some specified location, time, and context failed to occur in the actual world—suppose that it failed to occur in Durham this week and that it should have rained. Furthermore, in a nearby possible world, the event occurred: suppose it rained a day or two this week, just as expected. Moreover, a counterpart relation holds between the event in the actual world and that in the possible world—that is, between the omission of the rain occurring and the rain actually occurring. Consistent with her metaphysical view, Bernstein gives us the semantics to understand omissive statements like (2). Formally:

(2.1) $\exists e(Ie@ \wedge \exists w \exists e'((Ww) \wedge (Ie'w) \wedge (Ce'e) \wedge (Re')))$

(2.1)[7] reads 'There is some actual event that could have been rain.' (2.1) is the semantic reading of 2 that specifies the metaphysics of omissions, as Bernstein develops them.

This theory yields many benefits. Notably, it fits well with our natural language, our ordinary omissive causal language, and our selection of particular causes and omissive causes. For instance, it explains why the statement 'My failure to water my

[7]Rx: x is 'rain occurred'; Wx: x is a world; Ixy: x is in world y; @x: x is actual; and Cxy: x is a counterpart of y (Bernstein 2014).

plant caused it to die' is true and why the statement 'President Trumps's failure to water my plant caused its death' is odd; the world in which Donald Trump waters your plant—or does anything for you—is a very distant world. Moreover, Bernstein's theory—better than alternative egalitarian theories—distinguishes between omissions and absences. On her view, negative existentials refer to absences, the events that occur only in very distant possible worlds. Omissive statements like 2 denote omissions, where the counterpart relation holds between the possible event in the actual world and the event in some nearby possible world. Absence statements—for instance, 'Donald Trump is absent from the White House'—are understood as negative existentials: $\neg\exists x(\mathrm{Dx} \wedge \mathrm{Wx})$. The benefits of this view are plentiful.

The approach, however, gives a lush ontological view where it may not be required. On her view, positive events occur in the actual world, and the omitted events occur in the nearby possible worlds. So, the view not only commits us to omissive language that denotes a positive events—or set of events—but also to possible events and to counterparts. Given that many philosophers think we should shave off the entities that do not exist with Occam's Razor, or favor a less parsimonious theory where we have one, then when presented with Bernstein's elegant view, we ought also to consider competing views—especially if they posit fewer entities. If we have a more parsimonious approach, we might be right to accept it.

In turn, this lush ontological commitment is one reason to accept the paraphrase view over Bernstein's account.[8] On the paraphrase view, omissive statements denote only the existence of positive events—not additional possibilities or counterparts. The paraphrase view's more desiccated ontological landscape is a good theoretical reasons

[8]I will, however, argue in favor of a Bernstein-like modal account in the next chapter on omissive causal reasoning. While I depart from her account at the level of semantics, I do think that people ultimately reason modally. And this is essential to views of actual causation and causal modeling. However, I want to depart from her semantic account that could commit us to a lush ontological view.

to favor it over Bernstein's view. On some readings, however, the view requires the existence of norms as in ($4_N$). This ontological commitment, nonetheless, if it is a problem, is a problem for much of normative theory. Furthermore, norms themselves, like omissions may be paraphrased away—although this discussion is fitting for another article. Given that this potential difficulty is wide-ranging and unresolved, I will bite the bullet here and accept that there is an ontological commitment to the existence of norms. Despite this acceptance, the paraphrase view, unlike Bernstein's view yields a commitment to fewer entities, which is an important theoretical benefit for the theory.

### 2.2.2 The Ontological Commitment Problem

The most significant difficulty for theories of omissions, as I mentioned in the introduction, is that some of them commit to the existence of omissions being entities, fictions, or otherwise. I call this the ontological commitment problem of omissions. The paraphrase view avoids any commitment to the existence of omissions as entities by paraphrasing away such a commitment.

One way philosophers have explored the ontological commitment of omissive language is through their work on the semantics of omissive causation. A common first pass at analyzing omissive causation is to apply Lewis' original counterfactual-conditional analysis of causal statements (Lewis 1973). Recall:

Counterfactual Dependence: $(\neg O(c) \mathbin{\square\!\!\rightarrow} \neg O(e))$ iff

e causally depends on c.

On this an analysis, c and e are distinct actual events, and the counterfactual statement reads: 'If it were not the case that c occurred, then it would not be the case

that e occurred'. More precisely, all of the nearest worlds where c does not occur are worlds in which e does not occur; put another way, the nearest worlds to the actual world where c does not occur are worlds where e does not occur. On this analysis, $(\neg O(c) \mathbin{\Box\!\!\rightarrow} \neg O(e))$ is sufficient to state that c causes e. To be clear, what has been discussed here is not Lewis' final definition of causation—only his definition of causal dependence, which is all I need to discuss this problem for omissions. On his view, to state that the nearest possible worlds in which the cat is not curious are the worlds in which the cat does not die is sufficient to claim "The cat being curious caused the cat's death." The view works similarly for omissions. Recall 1:

(1) The corporation's failures caused the worker's death.

Given the counterfactual conditionals analysis, (1) means, "If the corporation's failures had not occurred, then it would not be the case that the worker died." In terms of this analysis, we can analyze this statement in two ways (See discussion Lewis 1987: 191-2). Consistent with positive-event causation:

(1.1) $(\mathrm{O}(\neg o) \mathbin{\Box\!\!\rightarrow} \neg O(d))$.

(1.1) says that had the omitted events—failures—actually occurred, the worker's death would have not occurred. Or the nearest worlds in which the corporation acts accordingly, the worker does not die. Another way to interpret (1) is:

(1.2) $(\neg O(o) \mathbin{\Box\!\!\rightarrow} \neg O(d))$.

(1.2) says, "if the corporation's failures had not occurred, then the worker would not have died." (1.1) identifies the omission in 1 with a positive property—something like

the corporation acting appropriately. This reading of 1 yields a number of difficulties that I cannot comment on here (see Bernstein 2014: 4). Either conditional (1.1) or (1.2), however, entails something odd. Given that the conditional (assuming it is not a counterpossible) is true—non-vacuously true—there are worlds close to the base world—or in the case of (1.2), the actual world—where another statement that must be true:

(1.3) There are corporate failures.

Given the truth of (1), (1.3) must be true at the nearest o-worlds that are d-worlds because—given the truth of the of the conditional (1.1) or (1.2)—it must be the case that there are corporate failures where the worker dies. When we regiment this sentence in the Quinean way, we find that (1.3) means:

(1.4) It is true that there are corporate failures.

When we further regiment (1.4), we get:

(1.5) $\exists x(Ox \wedge Cx)$.

The predicate 'O' means 'a failure' and the predicate 'C' identifies them as being corporate.[9] Simply, there is something that the corporation didn't do. Under this analysis, (1.5) commits us to something that is an omission, or a failure—just like in (3.3). For, given the conjunction, we can derive:

(1.6) $\exists x(Ox)$

[9](1.5) is truncated. Because (1) describes multiple failures, a similar statement can be made for other variables. I shorten (1.5) for simplicity.

Again, there is an omission in that there is some failure, lacking, inaction, or non-doing.[10] Unless the entailment of (1.6) is explained away in terms of pragmatics or as some mistake in the regimentation, this analysis commits us to omissions as entities—or to fictions.

Now, we are to the point we were at in section 1. And, again, I expect that any sort of ontological naturalist would claim (1.6) is false; there are not omissions or failures or lacks in the natural world to satisfy 'O'. And, again, we do not want to posit fictions, or fictitious entities, where we may not have to do so. We could also try regimenting (1.5) again as a negative existential:

(1.7) It is not the case that the corporation acted.

But (1.7) is false because there are probably at least a few corporate acts that were appropriate and did not contribute to the worker's death—although it may be an insufficient amount of relevant actions that cause her death.

Given this analysis, if we accept Lewis' original view, we are committed to possible entities that are omissions, which is a result that conflicts with our commitment to naturalism. This is the ontological commitment problem for omissive causation. I do not deny that there may be ways around this problem. But I name this problem as one that must be adequately avoided in developing an account of omissive causal language. Given that there are no immediately obvious ways around this problem, we can look to other theories that explain this kind of causal language and avoid the problem.

The paraphrase view avoids this ontological commitment problem. Consider how

[10]I do not commit myself to omissions or failures all being non-entities. Some omissions like refraining and other sorts of intentional omissions and inactions are actually acts.

the view handles statement (1). Given the outline above, (1) entails:

$(1_E)$ $\quad (O(a) \mathbin{\square\!\!\rightarrow} O(l))$.

In ordinary language, "If it were the case that the corporation acted, then it would be the case that the worker lived." This preventing relationship—what McGrath (2005: 142) calls a would-be preventer—is the semantic expression of the events denoted by (1). To deny $(1_E)$ is to deny the counterfactual conditional analysis of causal statements. The second and more controversial entailment is:

$(1_N)$ The corporation should have had acted.

$(1_N)$ is the semantics for the normative entailment that accounts for the expectation of a positive event in the context.[11] Notably, the paraphrase view avoids the ontological commitment problem. Some philosophical views, like some people, are good at avoiding commitment, which yields a number of inconvenient problems, and the paraphrase view is one of those problem-averse theories.

### 2.2.3 The Wiggle Problem

The next problem that the paraphrase view resolves concerns causation by omission. A second pass at an analysis of omissive causation can use Lewis' later causation-as-

[11] I defend this entailment in section 1, but some philosophers may question whether all omissive causation—or all causation for that matter—is pervasively normative (Bernstein 2017; see also Chapter 3). This view might not be incongruent with the empirical work on causation and omissive causation as I will discuss in the next chapter (Hitchcock  Knobe 2009; Henne et al 2017).

influence view (Lewis 2000). Recall his view:

Counterfactual Influence: C causes E iff C is the ancestral counterfactual influence to E.

To understand this view, we need a few definitions. First, C counterfactually influences E iff there is a substantial range of $C_1, C_2, ..., C_N$ of not-too-distant alterations of C and there is a range of $E_1, E_2, ..., E_N$ of alterations of E such that if $C_1$ occurred, $E_1$ would have occurred and so on. By this definition, if one strikes the match, the flame occurs, and if one strikes the match in a slightly different way, the the flame occurs slightly differently.[12] Second, C is the counterfactual ancestral of E if C influences a chain of events $D_1, D_2, ..., D_N$ and that chain of events influences E. This requirement blocks off non-transitive causal relations between C and E.

Now, consider (1) again. On the counterfactual-influence view, we get:

(1**) $(\neg C_1 \,\Box\!\!\rightarrow E_1) \wedge (\neg C_2 \,\Box\!\!\rightarrow E_2) \wedge ... \wedge (\neg C_N \,\Box\!\!\rightarrow E_N)$, where any $C_K$ or $E_K$ are not-too-distant alterations of C or E.

In the case of a positive event, if you wiggle C you wiggle (get an not-too-distant alteration of) E. So, if the 4 ball causes the 6 ball to move, then hitting the 4 ball slightly different will cause the 6 ball to move slightly differently. For (1), our omissive causation case, the same rules apply. Hence, a slight alteration of $\neg C$ is some very similar occurrence of $\neg C_K$ . On this account, if we accept (1), then we accept two statements. First, if there are more corporate failures of the relevant type, then the worker dies slightly differently. Moreover, if we accept that there are fewer corporate failures, then the worker's death may be slightly less severe—maybe she was just

[12]This view relies on the assumption that the nearest non-C world is not a not-C world but a slightly different C world in which C occurs slightly differently (Lewis 2000: 190).

injured.

Accepting that this is a plausible view of omissive causation and causation in general, there are again three ways to interpret the omissions in this causal relation: as fictions, as entities, or as nothing at all. Each, however, either produces the ontological commitment problem or is incoherent.

Consider the omissions in (1**) as entities. That is, consider that the omissions identified in (1**) are actual distinct events. This interpretation, however, creates the ontological commitment problem that I discussed in the previous section. I hold that the same arguments against this view hold in this case. Similarly, consider the omissions in (1**) as fictions, as Lewis preferred (Lewis 2000: 196). This position is only plausible if we have reason to deny ontological parsimony, for we should not posit fictions unless we have reason to do so. While the causation-as-influence view is coherent on these interpretations, it gives us an undesirable ontological result.

Consider lastly that omissions are nothing at all. On this reading, what is wiggled is the omission, or the not-doing: the corporate failures, the lack of rain, the omission of the statements, and so on. The problem here is that there is no wiggle room because of the the differences in something not happening do not affect the result: nothing still occurs. Unlike positive events, omissions do not have slight alterations that make a difference to the result. Call this the Wiggle Problem. Consider (1) as an example of this problem. But suppose that we make the corporate failures slightly different such that there is just 1 more omission. Does the worker still die? Yes. So, there is no difference to the result: there is no wiggle. Or suppose that the exact same omissions occurred but that the CEO simply forgot instead of maliciously failing to act. The worker still dies, and there is no wiggle. And the wiggle problem is a difficult problem to wiggle out of.

One might counter this problem by saying that there is some difference. Specif-

ically, the worker's death might happen a little differently; for instance, her death might have happened a bit differently (although it is an unnoticeable difference). So, there is a difference; there is a wiggle.

There are two replies to this objection. First, the wiggle may be the result of a positive event, not an omission. That is, the addition of a single corporate act makes a difference, and the number of acts is what creates the wiggling. The omissions here make a no difference no matter what happens. Second, not all omissions have such a quality. Consider the corporations failure to act on policy X. Had policy X not been implemented because the CEO was drunk or because he was evil, it does not matter; these distinct omissions make no difference to the result.

Given the problem of ontological commitment and the wiggle problem, the causation as influence reading of omissive causation has a dilemma. The view only makes sense if omission are entities or fictions (Lewis' desired strategy), but this is not a view a naturalist would want to hold without other options. If, however, the view accepts that nothing is nothing (omissions are just omissions), then the wiggle problem occurs. Again, the paraphrase view can resolve this dilemma. Just as in section 3.2, the omissive statement denotes a positive event—here a series of positive prevention relations. This commitment to positive events obviates the wiggle problem. Moreover, the normative commitment maintains the commitment to omissions being nothing, while maintaining the ordinary meaning of the statement. This view, in other words, avoids the commitments beyond those of the naturalist. For explication, consider, again, (1). On the paraphrase view and this Lewisian view of causation, the statement entails the conjunction of:

$(1_{E^*})$ $(O(a_1) \boxed{\rightarrow} O(l_1)) \wedge (O(a_2) \boxed{\rightarrow} O(l_2)) \wedge ... \wedge (O(a_K) \boxed{\rightarrow} O(l_K))$,
where any $O(a)$ or $O(l)$ are not-too-distant alterations of $a$ or $l$.

and

($1_N$) The corporation should have had acted.

Again, we see the paraphrase view of omissive statements avoids denoting unwanted entities while allowing for a counterfactual conditional analysis of causation.

### 2.2.4 The Identification Problem

In the omissions literature, there is no failure to highlight an important problem about negative acts. Some philosophers have suggested that negative acts, a kind of omission, are descriptions of positive acts in terms of what they are not (Vermazen 1985). On this view, a description like 'The failure to make a joke at the party' is a negative description of the positive act like 'the twisting of the button on one's shirt'. The identificationist strategy is to identify omissive statements with positive events or states of affair (for discussion, see Murray 2018). Then some identificationists aim to exclude the omissions, for they do no work beyond the work of the positive events or actions (see Sartorio 2009: 516-18). There, nonetheless, is a growing consensus that this strategy fails (See Murray 2018; Clarke 2014, chapter 1; Sartorio 2009: 518).

While this might seem to be only a difficulty for theories of omissive acts, it has an analogous position for metaphysical view of omissions. The metaphysical identificationist holds that omissions are negative descriptions of positive events or states of affairs (Payton 2018).[13] The description "There is a lack of water" refers to the state of affairs, for instance, where the pipes are dry. Omissive statements, on such a view, are negative descriptions that are identical to a positive state of

[13]Notably, this view is distinct from the view of negative states of affairs addressed in Thomson (2003).

affairs. Like the problem for negative act, this metaphysical identificationist view has a number of unresolvable issues that I will not redescribe here (see Murray 2018; Clarke 2014; Sartorio 2009: 517).

The problem for the overall project in this chapter is that some philosophers may argue that the paraphrase view is simply an identificationist account, which will easily fail. The paraphrase view, I argue, is not an identificationist account; it does not identify negative descriptions with positive events. Rather, it says that the meaning of an omissive statement denotes positive events and a norm violation. Consider a case: 'Sam failed to bring enough beer'. Here, Sam forgot to get beer for everyone. An identificationist might identify this omissive description with 'Sam bought gum'. But that description does not seem to be identical to the omissive statement because Sam also bought whiskey, and there is no reason to preference one state of affairs as the appropriate description (see Clarke 2014). On the paraphrase view, the statement denotes the positive events that Sam brought some beer and the normative claim that he should have brought more beer for everyone. The positive event here—that Sam brought some beer—is the relevant positive event identified for the truth of the statement. It, however, is not identified with the truth of the omissive statement for the normative claim is necessary. The paraphrase view is not an identificationist strategy—although it denotes, in part, positive events. In turn, this successful avoidance of reducing to an identificationist account is another theoretical benefit for the paraphrase account of omissive statements.

### 2.2.5 Absences and Omissions

Another theoretical benefit for the paraphrase view is that it cleanly distinguishes between omissions and absences, a problem that many views of omissions have (Clarke

2014). On Bernstein's (2014) view, for instance, she distinguishes between omissions and absences by stating that absences are the very distant possibilities expressed in negative existentials. Consider an ordinary omissive statement: 'There is a lack of rain in Durham this Spring'. On her view, there is insufficient rain that occurred in Durham this Spring, but there are nearby possible worlds in which enough rain occurred, and a counterpart relation holds between the omission and the possibility of rain. Consider now an absence: 'There is no rain in the desert'. This absence statement can be read as a negative existential: $\neg\exists x(\mathrm{Rx} \wedge \mathrm{Dx})$, where 'R' is the property 'being rain' and 'D' is the property of 'being in the desert'. This distinction is principled and accords with many of our intuitions.

Nonetheless, this distinction—along with many distinctions for modal theories—yields a vague distinction, for there is no hard cutoff between omissions and absences. For one, it might seem like Bernstein's view arbitrarily distinguishes between omissions and absences by claiming that only absences are negative existentials. Reasonably, however, we might, for instance, call 'There is no rain here', where we might expect rain but it is a very distant metaphysical possibility that there is rain, an omission. In other words, Bernstein's view, while it fits many of our ordinary statements well, has exceptions; that is, we have some negative existentials that are omissions.

Another problem for the view is that the modal distance may not account for the distinction between absences and omissions. Consider a case where a worker is legally required to ensure that there is nothing blocking a particular part of a machine in a factory. No worker in the factory, however, checks for blockage at this part of the machine, and there has never been such a problem. Furthermore, it is a very distant world where anything blocks this part of the machine. The law in this case was simply an arbitrary rule added to a number of ordinances about factory safety. One day, nonetheless, a worker fails to check the machine, and the blockage harms another

worker slightly. On Bernstein's view, the worker's failure is an absence: it is not the case that the worker checked for blockage. Nonetheless, it seems right to claim that the worker's careless omission—his failure—caused another worker's harm. Here, it is not modal distance that accounts for the distinction—rather it is the normative violation (arbitrary as it is). Another way of putting this charge is that there is distance from the actual world that we can point to at which the possibilities are absences as opposed to omissions. Of course, one could leave this distinction vague, for much of ordinary language is as such. But if the paraphrase view accounts for this distinction accurately, then it would have an additional theoretical benefit. The paraphrase view, in turn, has the benefit of cleanly distinguishing between the two: omissions violate norms, and absences do not.

## 2.3 Conclusion

I have outlined a semantic account of omissive causal language that avoids the problem of ontological commitment problem and the wiggle problem. The view notable commits us to nothing; omissions are omissions—nothing is nothing. Some may argue that the view, however, commits us to norms, which would be a detriment to the view. Nonetheless, norms are posited pervasively in language. So, this issue will have to be defended elsewhere. While this view has many issues, it is a viable alternative to some recent accounts.

# Chapter 3

# Denorming Omissive Causation

Suppose your brother promises to water your plant while you are out of town, but he fails to do so. It would be appropriate to say the following: "My brother's failure to water my plant caused it to die." On a dependence account of causation—where counterfactual dependence is sufficient for causation—this statement is true if the following is true: if my brother had watered my plant, it would not have died. But, in this situation, it is also true that if Donald Trump had watered the plant, the plant would not have died. And there is an infinite number of omissions like these for which had their counterpart action occurred they would have prevented the plant from dying. I do not want to claim, however, that Donald Trump's failure to water the plant, for instance, caused the plant to die. Dependence accounts allow for these omissions to count as causes, but they should not. This is called the problem of profligate causes (Menzies 2004; McGrath 2005; Bernstein 2014; 2015).

There are two general solutions to this problem that have recently been proposed. The first I will call the modal view. Although the modal view can come in many forms, one popular account comes from Bernstein's work on the metaphysics of omissions and the semantics of omissive statements (Bernstein 2014; 2016). On her view, omissions are tripartite entities, consisting of an actual event, a possible event, and a counterpart relationship between them. So, omissive statements denote some event in the actual world, wherein the omission of $C$ occurs, the set of possible worlds where $C$ occurs, and the counterpart relation between these events holds. On Bernstein's semantic account, the watering of the plant in some specified location, time, and

context failed to occur in the actual world—for instance, my plant went unwatered in Durham this weekend while I was away, and my brother should have watered it. Furthermore, in a nearby possible world, my brother watered the plant as he promised. Lastly for her view, a counterpart relation holds between some event in the actual world and the occurrence of the omitted event in the possible world—that is, between, for instance, the event where my brother also goes away on some trip (and does not water the plants) and the possibility that my brother waters the plant.

Bernstein's semantic account avoids the problem of profligate causes by distinguishing omissive causes from non-causes. That is, it explains why the statement "My brother's failure to water my plant caused it to die" is true and why the statement "President Trump's failure to water my plant caused its death" is false; the world in which Donald Trump waters my plant—or does anything for me—is a very distant world, but the possible world in which my brother waters the plant is a very nearby possible world. Thus, because the possible world in which my brother waters my plant is comparatively closer to the actual world than the possible world in which Donald Trump waters my plant, it is more relevant to consider the counterfactual "If my brother had watered my plant, then it would not have died" than it is to consider the counterfactual If Donald Trump had watered my plant, then it would not have died. Omissive causes, on her account, are selected out of other possible omissions that would have prevented the result because the counterfactual is more relevant than the alternatives. While her view does not contain a sharp cutoff between omissive causes, absences, and omissive causal conditions, it does offer a solution to the problem of profligate causes (Bernstein 2014: 13). Regardless of the particular features of her account, I will refer to the modal view as a general class of views that solves the problem of profligate causes with modal machinery.

An alternative solution to the problem, which I will call the norm view, holds

that norms help select an omissive cause out of all the counterfactually dependent omissions (McGrath 2006; Henne et al. 2017). This view is largely the product of empirical research on causal reasoning showing that norms help people select a particular cause out of many causal conditions (Knobe & Fraser 2008; Hitchcock & Knobe 2009; Kominsky, Phillips, Gerstenberg, Lagnado, & Knobe 2015; Samland, Josephs, Waldmann, & Rakoczy 2016; Icard, Kominsky, & Knobe 2017). Recent work has applied this view to omissive causal reasoning (Clarke, Shepherd, Stigall, Waller, & Zarpentine 2015; Willemsen 2016; Henne et al. 2017), showing that norms affect causal judgments such that abnormal omissions are more likely to be judged as causes relative to normal events and omissions. In one experiment, for example, Henne and colleagues showed participants vignettes in which a fictional character, Kate, failed to put oil in a machine called the K4 MAGNUM (Henne et al. 2017: Experiment 4). They varied prescriptive norms in a between-subjects design such that Kate's omission was either normal (she was not supposed to put oil in the machine) or abnormal (she was supposed to put oil in the machine). In the vignette, participants read the following statement about the omission: "While he noted Janet's inaction, Stephen also noticed that Kate not putting oil into the machine allowed the K4 MAGNUM to break down". Participants were then asked to fill in the blanks of some words from a few sentences. The first was always the statement above with the verb "allowed" missing. Participants who considered the abnormal vignettes, relative to those who considered the normal vignettes, were more likely to falsely recall "caused" than "allowed". This finding provides evidence for a cognitive workaround for the problem of profligate causes.

While the normative view has some support, many metaphysicians attack these results as metaphysically, semantically, or conceptually irrelevant. Consider Lewis:

> We sometimes single out one among all the causes of some event and call it "the" cause, as if there were no others. Or we single out a few of the "causes," calling the rest mere "causal factors" or "causal conditions." Or we speak of the "decisive" or "real" or "principle" cause. We may select the abnormal or extraordinary causes, or those under human control, or those we deem good or bad, or just those we want to talk about. I have nothing to say about these two principles of invidious discrimination. I am concerned with the prior question of what it is to be one of the causes (unselectively speaking). (Lewis 1974: 558- 559).

In this passage, Lewis argues the definite description of a cause does not imply its uniqueness as a metaphysical cause. While people frequently implement certain cognitive heuristics and biases that affect causal selection identified in definite descriptions, these heuristics and biases do not inform the metaphysics of causation. In the case at hand, while norms affect omissive causal judgments, they may be irrelevant to the true causal semantics or what an omissive cause is in the world.[1] Bernstein emphasizes a related point:

[1]Here, I use "bias" as it used by some opponents (philosophers and cognitive scientists) of the normative views. We, however, do not claim that the effects of norms of causal judgment is a pervasive cognitive bias. Some researchers do claim that people are motivated to make particular causal judgments when they want to attribute blame to an agent (e.g., Alicke, Rose, & Bloom 2011). Because participants, for instance, want to blame Kate, they judge that her failure is the cause of the machine breaking down. On this view, participants' judgments of blame distort their causal judgment. There is, however, growing evidence that the effect of norms is not a motivational bias but a basic component of causal cognition (Knobe 2010; Icard et al 2017).

> Such are the limitations of a normative concept of causation: it falls short when these norms are not in operation. Studies establishing the relationship between causation and normative concerns may be relevant to the metaphysics of causation, but they cannot limn the mind-independent causal structure of the world minus norms. And it is worth noting that a large portion of the metaphysics of causation, across many different projects, does not concern norms at all. What metaphysicians are looking for is, e.g., an answer to the question: "In virtue of what at the bottom level of reality is the rain a cause of the plant's death while the Queen of England is not?" Reinforcing an intuitive link between causation and moral responsibility does not make progress on this strictly metaphysical question. (2017: 89-90).

Bernstein claims that not all causal selection is normative. Furthermore, she argues that even if norms tell us something about causal judgment or the metaphysics of causation, these views do not help us understand the core of the causal concept, which is a counterfactual relation like those proposed by Lewis and Bernstein (Bernstein 2017: 89). What matters for many metaphysicians is that when philosophers are considering cases of causation, they are considering the appropriate causal concepts. On such views, in order to really understand causation, we have to understand something more about the counterfactuals and their relationship to the events and omissions in the actual world. Hence, while norms affect some causal judgments, if people considered appropriate, relevant possibilities, their judgments would be consistent with modal views. Accordingly, there are two viable solutions to the problem of profligate causes in judgments of omissive causation. On the normative view, norms pervasively affect omissive causal judgments, regardless of which or how many possibilities are considered. On the modal view, diligent consideration of alterna-

tive possibilities and the dependency relationships determine the appropriate causal judgments, regardless of norms. Given this contrast, I can develop two hypotheses:

> Hypothesis 1: Norms affect omissive causal judgments such that an abnormal omission is more likely to be selected as a cause than a normal omission. Regardless of the possibilities considered by a reasoner, the abnormality of the omission affects the omissive causal judgments.
>
> Hypothesis 2: While norms affect omissive causal judgments in some experiments, if reasoners consider a set of contingencies compossible with the omission and consistent with omissive causing, then the consideration of these possibilities will predict causal judgments, and norms will have no effect.

Using a novel experimental paradigm, I test these competing hypotheses in three experiments. I find some evidence consistent with hypothesis 1; when reasoners consider a single possibility, they show the norm-inflation effect discussed above. But I also find consistent evidence for hypothesis 2; when reasoners are forced to consider a set of counterfactual alternatives, the norm-inflation effect disappears and the set of possibilities determines their causal judgments. I interpret these results as lending support for the modal view and as encouraging a revision to the claimed pervasiveness of the norm view (Hitchcock & Knobe 2009; Henne et al. 2017).

## 3.1 Testing the Hypotheses

A limitation of most studies on causal reasoning is that they tend to argue for the mediation of counterfactual thoughts only in an indirect way, as the process of counterfactual generation during causal judgments is rarely directly assessed (Henne et al.

2017; cf, Phillips et al 2015: Study 2). But without a way to directly probe the participants' process of counterfactual generation during causal judgments, it becomes difficult to test the non-normative modal view. Thankfully, a recent proposal, consistent with some modal accounts, overcomes this limitation. Based upon mental-model theories of relational reasoning (Johnson-Laird 1983; 2006), Khemlani and colleagues provided empirical evidence showing that reasoners represent possibilities that are consistent with commissive causation (Khemlani, Barbey, & Johnson-Laird 2014; Johnson-Laird & Khemlani 2017), omissive causation (Bello & Khemlani 2015; Bello, Wasylyshyn, Briggs, & Khemlani 2017), and their related semantic terms. Their proposal relies on three main principles from the mental-models theory (Johnson-Laird 1983; 2006):

1. Mental models represent sets of possibilities: reasoners use percepts or assertions to build one or more discrete possibilities of what is observed or imagined.

2. Mental models are iconic: a model's structure is isomorphic to the structure of what it represents, much the same way that a diagram is isomorphic to what it depicts.

3. Mental models are parsimonious: by default, reasoners tend to build a single model of a situation for a given relation. The model tends to represent only what is possible rather than what is impossible. Reasoners who deliberate can construct a fully explicit model (i.e., a model that represents instances of all schematic possibilities consistent with the relation), but doing so demands considerable cognitive resources.

These principles can be applied to relational concepts to predict how people will reason about them.

Recently, the mental-model theory has been applied to omissive causation. Specifically, Bello & Khemlani (2015) developed a model-based theory of omissive causation, allowing, and prevention. The theory distinguishes partial models from fully explicit models of omissive causation. A partial model represents a privileged, default possibility to which an omissive causal relation refers, whereas fully explicit models represent all possibilities consistent with an omissive causal relation. These possibilities can be explicitly modeled, as shown in Table 1. For ease of explanation, I refer to the fully explicit model of omissive causation as the cause model and to the fully explicit model of allowing as the allow model.

The model-based theory of omissive causation has garnered recent empirical support (Khemlani et al *under review*; Bello et al 2017; cf. Lombrozo 2010: 326). In one experiment, Bello and colleagues had participants read 16 vignettes like the following (Bello et al 2017: Experiment 1): Suppose the following statements are true:

1. A particular car engine requires maintenance.

2. The lack of a particular part will [cause / enable] the engine to fail.

And then participants were instructed to select each contingency that was possible given the scenario. The following four contingencies were presented, in random order:

resume= ,,

The car has the part and the engine fails. (A and B)

The car has the part and the engine doesn't fail. (A and ∼B)

The car doesn't have the part and the engine fails. (∼A and B)

The car doesn't have the part and the engine doesn't fail. (∼A and ∼B)

Critically, when participants saw omissive statements with "cause" rather than "enable", they were less likely to select the ∼A and B contingency, while the other contingencies were selected at nearly the same rate. This finding suggests that reasoners privilege possibilities consistent with the model-based view as opposed to other possibilities. Specifically, because people select contingencies in the way they do when they are presented with the terms "cause" and "enable", it is clear that people are reasoning by considering distinct possibilities—exactly those predicted by the model-based theory. This work also suggests that reasoners discriminate omissive causation and allowing relations via the presence or absence of certain possibilities that are part of the core meaning of each concept, respectively.

The model-based theory of omissive causation also gives a modal solution to the problem of profligate causes. The theory holds that a particular set of considered contingencies distinguishes omissive causes from other non-causal omissive relations like allowing.[2] In turn, a strongly causal omission is that in which in the contingency ∼A B occurs and the contingency A ∼B is possible. For instance, where my brother fails to water my plant and where had he watered it, it would not have died, my brother's failure to water my plant is an omissive cause. When reasoners consider these possibilities, they will select the omission to be a cause. Moreover, where these contingencies are not possible or where other contingencies are judged to be impossible, the omission will not be selected as a cause.

There are clear distinctions between the model-based and the norm-based theories. Recent work explores the relationship between the model-based and the norm-based

[2]It is important to note that on some counterfactual dependence accounts, there is no distinction between enabling (or allowing) and causing (Lewis 1974; for discussion, see Sartorio 2010). While some metaphysicians distinguish enablers and causes (Lombard 1990; Thomson 2003), others argue that while there may be a semantic difference, there is no metaphysical difference between the relations (See Mackie 1992; Sartorio 2010; cf. Lombard 1992). I am committed to a cognitive and semantic difference between enablers and causes as I have defined them in Figure 3.1, but I remain agnostic about the metaphysical distinction.

theories (Henne, Bello, Khemlani, & De Brigard *under review*). The findings suggest that fully explicit mental models of omissive allowing—i.e., what I call allow models, as they represent all possibilities consistent with the term 'allow'—and not norms predict the difference between omissive causing and allowing judgments. Specifically, the model-based theory, not the norm-based theory, predicts judgements of omissive allowing, while norms have little effect on omissive causing and allowing judgments when people are forced to reason about the fully explicit models (Henne et al *under review*). It remains unclear, however, exactly how and when norms affect causal reasoning. Because there is substantial evidence that abnormal omissions are more likely to be selected as causes (Clarke et al. 2015; Willemsen 2016; Henne et al. 2017) and given that there is substantial evidence supporting the model-based view (Khemlani et al 2018; Bello et al 2017), it remains an open question how precisely the two views interact.

To test the model-based theory of omissive causation, I presented reasoners with between one and three images representing possibilities consistent with the partial model, the allow model, or the cause model (Figure 3.1). Each stimulus consisted of either one, two, or three images. Each individual image represented a possibility. Each stimulus was chosen to be either consistent with only the partial model, the allowing relation (i.e., allow model), or the causing relation (i.e., cause model). The models are consistent with the theory from Khemlani and colleagues (Bello & Khemlani 2015; Bello et al. 2017; Khemlani et al. *under review*). The partial model is consistent with a single possibility that makes omissive causing and allowing true. If the model-based theory is correct, then when they consider possibilities consistent with the allow model, reasoners should judge that ∼A allows B rather than ∼A causes B. Moreover, when they consider possibilities consistent with the cause model, reasoners should judge that ∼A causes B rather than ∼A allows B. By contrast, where

they are presented with the partial model, reasoners' responses should be equivalent for judgments of "causes" and "allows" because they are unable to directly consider and reason about possibilities consistent with the distinct models. To test the norm effect on omissive causal selection, I modified the normative status of the omission (∼A) in each stimulus set such that the omission was either prescriptively normal (supposed to happen) or abnormal (not supposed to happen).

Using this methodology, I conducted three experiments, and my results show that while norms affect omissive causal selection in partial models (the representation of the individual possibility asserted (∼A B)), they do not affect cause or allow judgments when models are made fully explicit—that is, when people represent all of the possibilities consistent with omissive causing or omissive allowing. Experiment 1 shows this difference for reasoning about omissive allowing. Because omissive causation and allowing are logically consistent, omissive causing still shows a norm effect. Experiment 2a presents reasoners with an impossibility that distinguishes causation and allowing, and it shows that norms do not affect judgments in the fully explicit models of omissive causation or allowing; the models alone predict causing and allowing judgments. Experiment 2b conceptually replicates the results from 2a in a social context. The findings ultimately support hypothesis 2 and a revision of the generalizability of hypothesis 1. This results ultimately accommodate work supporting the norm view in a general modal account.

| Model | Relation | The possibilities that yield distinct relations. | | | |
|---|---|---|---|---|---|
| | All Possibilities | ~A B | ~A ~B | A ~B | A B |
| Cause Model | ~A **causes** B | ~A B | X | A ~B | - |
| Allow Model | ~A **allows** B | ~A B | ~A ~B | A ~B | - |
| Partial Model | ~A **causes or allows** B | ~A B | - | - | - |

**Figure 3.1**: The core meanings of causal relations and allowing conditions in terms of the conjunctions of the temporally ordered possibilities to which they refer. 'X's means that the conjunction is impossible given the truth of the relation, and '-' means that the inclusion of the possibility would make the term weaker. This table represents fully explicit models for cause and allow; partial models are ~A B for omissions.

## 3.2 Experiment 1

### 3.2.1 Methods

#### Participants

902 individuals voluntarily participated in this study through Amazon's Mechanical Turk for monetary compensation. Participant recruitment was restricted to individuals in the United States with a prior approval rating above 85%. 50 participants failed an attention check or reported that they took the survey multiple times, so they were excluded from my analyses. As such, data were analyzed from 852 participants ($M_{age} = 36.90$, $SD = 11.40$, age range = [19-74], 51% female). All participants reported being fluent English speakers. All experiments presented in this paper were approved by the Duke University Campus Institutional Review Board.

#### Procedure

Participants were randomly assigned to one of six possible conditions in a 2 (Norms: normal or abnormal) x 3 (Model: partial model, cause model, or allow model) between-subjects design. All participants—regardless of the condition to which they were randomly assigned—were acquainted with an image of a machine with a blue wire, a battery, a speaker, a safety (that could be turned ON or OFF), and another unspecified component (Figure 3.2). They were told that the machine could produce sound through the speaker. After these general instructions, participants were presented with images of 1-3 different ways in which the machine could be (depending on the condition), and they were instructed to describe those situations using drop-down menus. They could choose from the following options to describe each of the three situations: (1) "The blue wire touches the battery, and the speaker plays music," (2)

"The blue wire touches the battery, and the speaker does not play music," (3) "The blue wire does not touch the battery, and the speaker plays music," and (4) "The blue wire does not touch the battery, and the speaker does not play music." The purpose of this part of the task was to ensure that participants were attending to the machines and responding to the relevant parts. resume= ,,

Normal Conditions. In the normal condition, the machine's safety is ON, so the blue wire is not supposed to touch the battery. That is, it is normal for the blue wire to not touch the battery.

Abnormal Conditions. In the abnormal condition, the machine's safety is OFF, so the blue wire is supposed to touch the battery. That is, the blue wire not touching the battery is abnormal.

Partial-Model Conditions. In the partial-model conditions, participants only saw situation one (∼A B), which was identical to that in the first situation in the causal and allowing conditions.

Causal Conditions. In the causal-model conditions, participants saw images of two situations: (1) the blue wire does not touch the battery, and the speaker plays music (∼A B), and (2) the blue wire touches the battery, and the speaker does not play music (A ∼B).

Allowing Conditions. In the allowing-model conditions, participants saw images of three situations: (1) and (2), both of which were identical to those in the causal conditions, along with another situation in which the blue wire does not touch the battery, and the speaker does not play music (∼A ∼B).

Attention Checks. I included a direct attention check asking participants if they paid attention during the task and another question to exclude participants who

attempted to take the survey multiple times (Appendix A). Participants who reported having taken the survey and participants who reported not having paid attention during the study were excluded.

After observing the three images and identifying what they saw, participants were explicitly reminded of the norm manipulation. Participants read: "For all situations, the safety is…", and selected "on" or "off". Then they read: "So, the blue wire is…", and they selected "supposed to touch the battery" or "not supposed to touch the battery." They were then asked to think back to their observations and to fill in the verb in the following sentence: "The blue wire not touching the battery _____ the speaker to play music". Participants could choose between the verb "causes" or "allows".

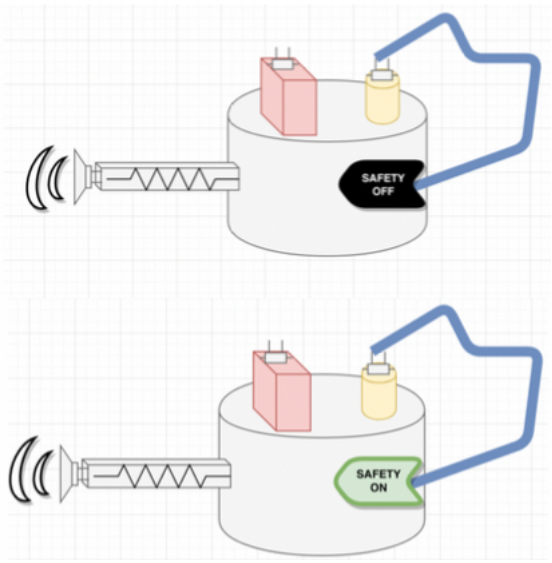


**Figure 3.2**: The stimuli used in Experiment 2. Participants in the abnormal condition saw the machine with the black safety i.e., in the off position (top diagram), and those in the normal condition saw the machine with the green safety, i.e., in the on position (bottom diagram).

### 3.2.2 Results

Full results from Experiment 1 are depicted in Figure 2. The $\alpha$ level for all statistical tests was set at .05. resume= ,,

Norms. Consistent with hypothesis 1 and the work by Henne et al. (2017), my first prediction was that abnormal omissions rather than normal omissions would be more likely to be selected as causes. For the partial-model conditions, participants were more likely to select "causes" than "allows" in the abnormal partial-model condition relative to the normal partial model condition, $\chi^2(1, N = 284) = 4.36$, $p = .03$, Cramer's V = .12. For the causal model conditions as well, participants were more likely to select "causes" than "allows" in the abnormal causing condition relative to the normal causing condition, $\chi^2(1, N = 281) = 6.07$, $p = .01$, Cramer's V = .14. For the allow model conditions, however, I found no evidence that participants in the abnormal condition, relative to the normal condition, were more likely to select "causes" than "allows", $\chi^2(1, N = 287) = .53$, $p = .46$, Cramer's V = .04.

Models. My second prediction, in line with hypothesis 2, was that the consideration of the possibilities consistent with fully explicit models of omissive causing and allowing should be reflected in judgments about each concept, receptively. For the normal conditions, participants were more likely to select "allows" than "causes" in the allow model relative to the partial model, $\chi^2(1, N = 288) = 4.10$, $p = 0.04$, Cramer's V = .11. Furthermore, for the abnormal conditions, participants were more likely to select "allows" than "causes" in the allow model relative to the partial model, $\chi^2(1, N = 283) = 11.26$, $p < .0001$, Cramer's V = .19.

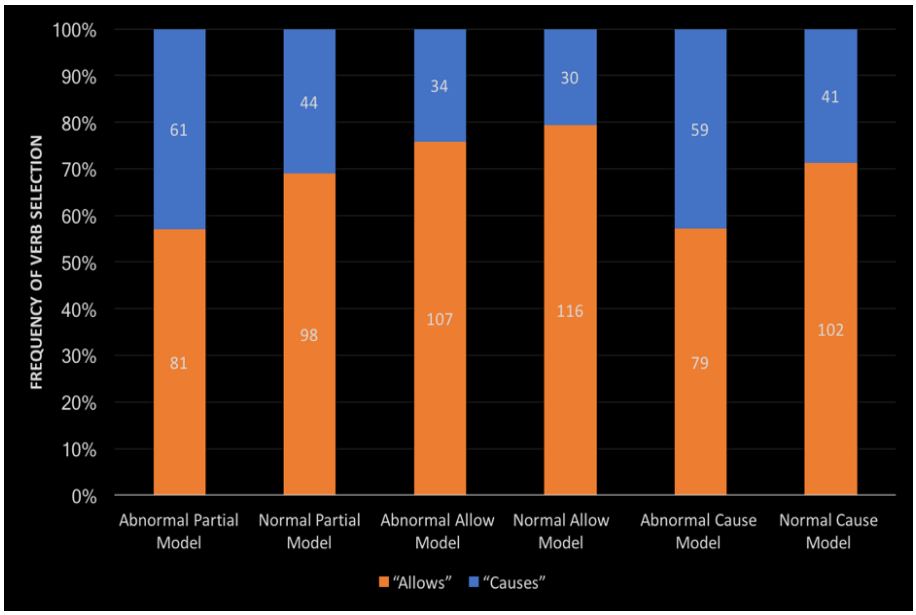


**Figure 3.3**: This figure shows the frequency of verb selection for each condition in Experiment 1. The numbers depicted on each bar represent the number of participants assigned to that condition who selected "allows" or "causes."

### 3.2.3 Discussion

As predicted by the model-based theory of omissive causation, reasoners in the allow-model conditions relative to the partial-model conditions selected "allows" more frequently than "causes". As predicted by the norm-based view, norms affect causal judgments when reasoners consider only the single possibility in the partial-model conditions (∼A B). However, when reasoners have access to fully explicit representations of the allowing model, norms do not significantly drive judgments toward selecting "causes" rather than "allows". This finding is inconsistent with hypothesis 1 as a general claim about causal reasoning, because the hypothesis predicts that abnormal omissions relative to normal omissions, regardless of the possibilities considered, should make participants more likely to select "causes" rather than "allows".

The norm effect, however, still occurs for the causal-model conditions such that

abnormal omissions are more likely to be selected as causes. As such, the findings support a more constrained version of hypothesis 1: the norm effect may occur when reasoners are presented with a partial model or with a causal model. Nonetheless, someone could argue that this result occurs because the omissive causal and allowing model are not distinguished enough, given that the causal model in this experiment is ambiguous (Figure 3.1). The possibilities considered by participants in the allow-model conditions and those considered in the cause-model conditions are logically consistent. It may, then, be ambiguous to reasoners whether the cause-model represents allowing or causing because reasoners are not actually considering the fully explicit cause model; instead, they are only considering a partial cause model (∼A B, A ∼B). The possibility that distinguishes these relations is ∼A ∼B, where the blue wire does not touch the battery and the speaker does not play music; this contingency is possible in the allow model, but it is impossible in the cause model. In turn, I needed people to explicitly consider an impossibility of (∼A ∼B) in the fully explicit causal-model condition that distinguishes omissive causing and allowing. The model-based theory predicts that if reasoners represent the possibility that distinguishes omissive cause and allow, then their judgments should accord with the model-based theory of omissive causation. Experiment 2a and 2b aim to distinguish these concepts for reasoners by making certain impossibilities salient.

## 3.3 Experiment 2a

### 3.3.1 Methods

#### Participants

653 individuals voluntarily participated in this study through Amazon's Mechanical Turk for monetary compensation. Participant recruitment was restricted to individuals in the United States with a prior approval rating above 85% who did not participate in Experiment 1. 96 participants failed attention checks or reported that they took the survey multiple times, thus they were excluded from the analyses. As such, data were analyzed from 557 participants ($M_{age} = 35.70$, $SD = 11.60$, age range = [18-98], 49% females). All participants reported being fluent English speakers.

#### Procedure

Participants were randomly assigned to a single cell of a 2 (Norms: normal or abnormal) x 2 (Model: causal model or allow model) between-subjects design. Participants were presented with the same stimuli as in Experiment 1, and the dependent variable in Experiment 2 was the same as that in Experiment 1. Just as in Experiment 1, participants were acquainted with images of a machine with a blue wire, a battery, a speaker, a safety, and another unspecified connection (See Figure 3.2). In order to distinguish the models, participants were given additional information about the machine they observed. This information forced participants to represent possibilities and impossibilities consistent with the distinct models. In this way, Experiment 2a diverges from Experiment 1. resume= ,,

> Normal and Abnormal Conditions. These were described in exactly the same way as in Experiment 1. Furthermore, if participants failed to correctly describe

the norm manipulation, I immediately provided corrective feedback before they were able to continue further in the experiment.

Causal Model. In the causal model conditions, participants were told the following: "For this machine, it is physically impossible for both the blue wire not to touch the battery and music not to play from the speaker at the same time. If the blue wire does not touch the battery, music plays from the speaker." This possibility distinguished the causing and allowing models.

Allowing Model. To keep the conditions consistent, participants in the allowing model were told, "For this machine, it is physically impossible for both the blue wire to touch the battery and music to play from the speaker at the same time. If the blue wire touches the battery, music does not play from the speaker." While this impossibility distinguishes weak and strong meanings of "allow" (Bello & Khemlani 2015), it was only included to keep conditions consistent. During the task, participants were reminded of the impossibility in order to ensure that they understood it.

Attention Checks. I included the same attention checks as in Experiment 1. To ensure that participants were attending to this task, I added nine additional questions to the instructions where participants described the components and orientations of the machines in drop-down menus; their performance on this task was part of the inclusion criteria (Appendix A). Participants who failed to answer all of these questions correctly were excluded from the statistical analysis. Because these attention checks result in a large number of exclusions, I also analyzed the data with only the same exclusions as those reported in Experiment 1. Results were identical regardless of the strictness of the exclusion criteria.

### 3.3.2 Results

Results of Experiment 2a are included in Figure 3. The $\alpha$ level for all statistical tests was set at .05.

resume= ,,

Norms. Consistent with hypothesis 1 and Henne et al. (2017), my first prediction was that abnormal omissions rather than normal omissions would be more likely to be selected as causes. Critically, for the allow model conditions, I found no evidence that the participants in the abnormal condition, relative to the normal condition, were more likely to select "causes" than "allows", $\chi^2$ (1, N = 279) = 1.91, $p$ = .16, Cramer's V = .08. Also, for the causal models, I found no evidence that the participants in the abnormal condition, relative to the normal condition, were more likely to select "causes" than "allows", $\chi^2$ (1, N = 278) = .08, $p$ = .77, Cramer's V = .01.

Models. My second prediction, consistent with hypothesis 2 and the model-based theory, was that the consideration of possibilities consistent with the models should predict cause and allow judgments consistent with the models. Critically, for the normal conditions, participants were more likely to select "allows" than "causes" in the allow model relative to the causal model, $\chi^2$(1, N = 280) = 15.73, $p < 0.0001$, Cramer's V = .23. Also, for the abnormal conditions, participants were more likely to select "allows" than "causes" in the allow model relative to the causal model, $\chi^2$(1, N = 277) = 8.46, $p$ = 0.003, Cramer's V = .17.

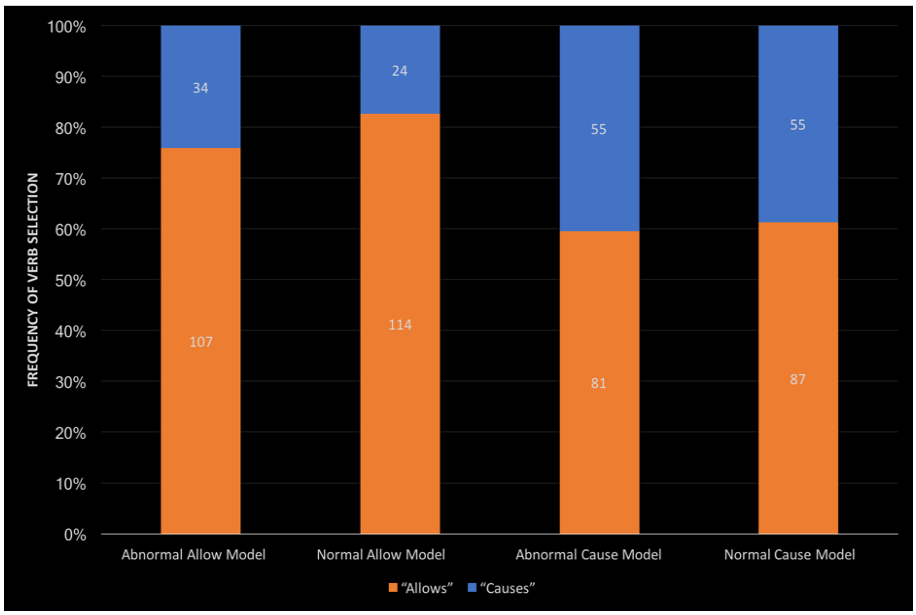


**Figure 3.4**: This figure shows the frequency of verb selection for each condition in Experiment 2a

### 3.3.3 Discussion

For both the cause and allow models, I found no evidence that reasoners are more likely to select an abnormal omission relative to a normal one. While I found this norm effect for partial models and causal models in Experiment 1, when reasoners considered possibilities and impossibilities that distinguish omissive causing and allowing, this effect disappears. This finding is inconsistent with a general interpretation of hypothesis 1 because the hypothesis predicts that abnormal omissions relative to normal omissions, regardless of the possibilities considered, should make participants more likely to select "causes" rather than "allows."

For both normal and abnormal conditions, consideration of possibilities and impossibilities consistent with the models predict omissive causing and allowing judgments; that is, people are more likely to select the verb "causes" than the verb "allows" when they consider possibilities and impossibilities consistent with the models.

This finding supports hypothesis 2.

## 3.4 Experiment 2b

The primary purpose of Experiment 2b is to show that the results obtained in Experiment 2a were not merely the product of the stimuli used (i.e., the machines). To this end, I conceptually replicate those findings with a different stimulus set. I also included a "Don't Know" option for the verb selection component of the task. This addition was used to ensure that participants are not merely guessing which verb is appropriate. It also ensures that I am capturing the phenomenon of interest.

### 3.4.1 Methods

#### Participants

654 individuals voluntarily participated in this study through Amazon's Mechanical Turk for monetary compensation. Participant recruitment was restricted to individuals in the United States with a prior approval rating above 85%. 121 participants failed an attention check or reported that they took the survey multiple times; thus, they were excluded from the analyses. As such, data were analyzed from 533 participants ($M_{age}$ = 35.50, $SD$ = 10.60, age range = [19-70], 45% females).

#### Procedure

The procedure in Experiment 2b is similar to that in Experiment 2a, but there is a key difference: I used a social situation to test my predictions in Experiment 2b. Participants were introduced to a soccer video game, where Ned, who was playing as the goal keeper, and Jack, who was playing as the kicker, were practicing for a video

game competition. The study was a 2 (Norms: normal or abnormal) x 2 (Model: allow or cause) between-subjects design. resume= ,,

| Relation | The possibilities that yield distinct relations. | | | |
|---|---|---|---|---|
| All Possibilities | ~A B | ~A ~B | A ~B | A B |
| ~A **causes** B | ~A B | X | A ~B | - |
| Ned not lunging causes Jack to score. |  | IMPOSSIBLE |  | - |
| ~A **allows** B | ~A B | ~A ~B | A ~B | - |
| Ned not lunging allows Jack to score. |  |  |  | IMPOSSIBLE |

**Figure 3.5**: This table shows the possibilities and impossibilities that make the omissive causal and allowing statements true

Abnormal Conditions. In the abnormal conditions, participants were told the following: "In the match that you are about to see, Ned is practicing his goal keeping. So, Ned is supposed to lunge for the shots that Jack's character takes." In this case, failing to lunge for the shots is abnormal.

Normal Conditions. In the normal conditions, participants were told, "In the match that you are about to see, Jack is practicing his goal scoring. So, Ned is not supposed to lunge for the shots that Jack's character takes." In this case, failing to lunge for the shots is normal.

Causal Model. Participants who were presented with situations consistent with the causal model (Figure 3.5) saw that (1) Ned does not lunge for the ball,

and Jack scores and (2) Ned lunges for the ball, and Jack does not score. The order of presentation was fixed. To distinguish the models, participants who were presented with the causal model were also told the following: "Also, for this match, Jack got a SUPER SCORE power up. This power up makes it impossible that Ned does not lunge and Jack does not score. In other words, for the entire match, if Ned does not lunge, Jack scores."

Allow Model. Participants who saw situations consistent with the allow model (Figure 3.5) saw situations (1), (2), and (3) Ned does not lunge for the ball and Jack does not score. To keep the conditions consistent, participants in the allow model were also told the following: "Also, for this match, Ned got a SUPER BLOCK power up. This power up makes it impossible that Ned lunges and Jack scores. In other words, for the entire match, if Ned lunges, Jack won't score." Participants were asked several questions about the set up to ensure that they understood the instructions.

Attention Checks. Participants in Experiment 2b saw the same attention check as participants in Experiment 1. Because the attention checks in the instructions of Experiment 2 made little difference to the analysis, I used only one additional attention check (Appendix A). Before participants started the experiment, they were asked to observe and describe from a drop-down menu the one situation not used in the experimental conditions: Ned lunges for the ball and Jack scores. Just as in Experiment 1 and 2a, participants who reported having taken a similar survey and participants who reported not having paid attention during the study were excluded.

Dependent Variable. After considering the three situations, participants read the following: "Now, think about the situations you just observed. Using the

drop-down menu below, please fill in the blank and complete the sentence so that it best describes the relation between Ned's inaction and Jack's scoring. If you do not know, select 'don't know.'" Participants could choose one of the following three options on the screen: "causes," "allows," or "Don't Know." Participants also rated their confidence that the verb they chose is the right one on a scale from 1 (not at all confident) to 7 (very confident).

### 3.4.2 Results

A summary of results in Experiment 2b is included in Figure 4. The $\alpha$ level for all statistical tests was set at .05.

resume= ,,

*Norms.* Consistent with hypothesis 1 and findings from Henne et al. (2017), my first prediction was that abnormal omissions relative to normal omissions would be more likely to be selected as causes. Critically, for the allow model, only 4% (n = 12) of participants responded "Don't Know," suggesting that the majority of participants do not just select "causes" or "allows" indiscriminately. Furthermore, participants reported high confidence in their selections of "causes" or "allows" in the allow model ($M_{confidence}$ = 5.89, SD = 1.27). After excluding the 12 participants who responded "Don't Know", I found no evidence that the participants in the abnormal condition, relative to the normal condition, were more likely to select "causes" than "allows", $\chi^2(1, N = 254) = 1.53$, $p = .21$, Cramer's V = .07. Moreover, for the causal model, only 1% (n = 3) of participants responded "Don't Know", again suggesting that participants do not just select "causes" or "allows" indiscriminately. Furthermore, participants reported high confidence in their selections of "causes" or "allows" in

the causal model ($M_{confidence}$ = 5.68, SD = 1.22). But again, after excluding the 3 participants who responded "Don't Know," I found no evidence that the participants in the abnormal condition, relative to the normal condition, were more likely to select "causes" than "allows," $\chi^2(1, N = 264) = .24$, p = .61, Cramer's V = .03.

*Models.* My second prediction, consistent with hypothesis 2 and the model-based view, was that consideration of possibilities consistent with the models should predict cause and allow judgments consistent with the models. First, for the normal model, only 2% (n = 8) of participants responded "Don't Know," suggesting that the majority of participants do not just select "causes" or "allows" indiscriminately. Furthermore, participants reported high confidence in their selections of "causes" or "allows" in the normal model ($M_{confidence}$ = 5.70, SD = 1.31). After excluding the 8 participants who responded "Don't Know," participants were more likely to select "causes" rather than "allows" in the normal causal model relative to the normal allow model, $\chi^2(1, N = 269) = 26.29$, $p < .0001$, Cramer's V = .31. Second, for the abnormal model, only 2% (n = 7) of participants responded "Don't Know," suggesting that the majority of participants do not just select "causes" or "allows" indiscriminately. Furthermore, participants reported high confidence in their selections of "causes" or "allows" in the abnormal model ($M_{confidence}$ = 5.88, SD = 1.18). After excluding the 7 participants who responded "Don't Know," participants were more likely to select "causes" rather than "allows" in the abnormal causal model relative to the abnormal allow model, $\chi^2(1, N = 249) = 39.64$, $p < .0001$, Cramer's V = .39.

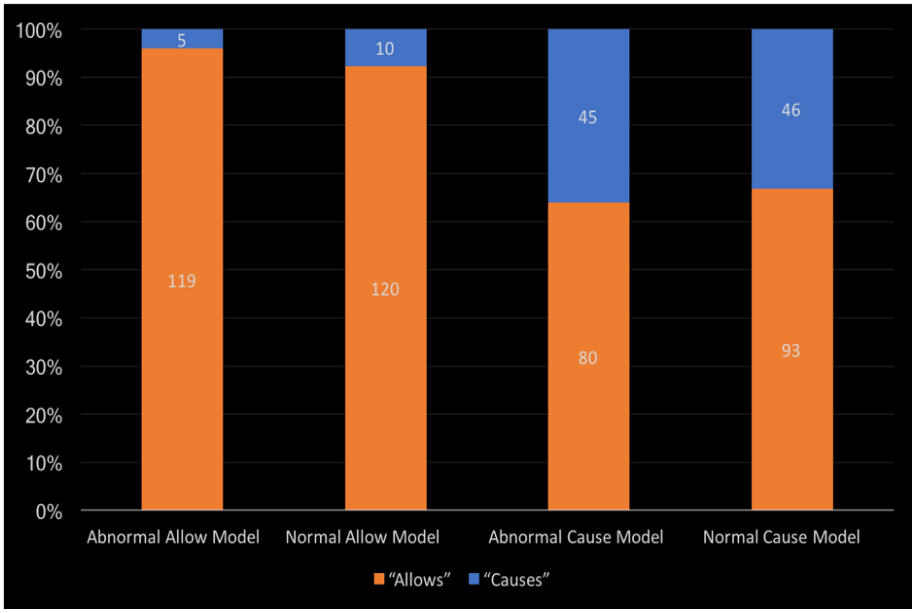


**Figure 3.6**: This figure shows the frequency of verb selection for each condition in Experiment 2b.

### 3.4.3 Discussion

In Experiment 2b, I find strong evidence against the generality of hypothesis 1. I do not find that norms affect omissive causal judgment such that abnormal omissions, relative to normal ones, are more likely to be selected as a cause. While the original hypothesis makes a general claim about omissions regardless of considered possibilities, this hypothesis seems only true for partial models, or a single possibility, as I find in Experiment 1. I do find considerable evidence for hypothesis 2, however; people tend to describe causing and allowing relations in exactly the way predicted by the model-based theory.

## 3.5 General Discussion

The purpose of the three experiments reported herein was to test whether the consideration of alternative possibilities or norms helps people to select omissions as causes relative to non-causal omissions. Consistent with hypothesis 1—that norms generally affect omissive causal judgment—Experiment 1 shows that for partial models, or the consideration of a single possibility, norms affect judgments; specifically, abnormal omissions are more likely to be selected as causes than normal omissions. Notably, this finding is consistent with work showing that norms affect omissive causal selection, and it conceptually replicates these prior findings (Henne et al. 2017; Willemsen 2016; Clarke et al. 2015) with novel visual stimuli. For the allow-model conditions in Experiment 1, however, participants did not show a norm effect; in both the abnormal and normal allow-model conditions, participants selected "allows" and "causes" at the same rate. While hypothesis 1 is a general hypothesis that is supposed to hold regardless of the possibilities considered, Experiment 1 provides some evidence against this more general reading. Experiments 2a and 2b provide further evidence against this more general reading. Experiments 2a and 2b show that for fully explicit cause and allow models—that is, when people consider alternative possibilities consistent with omissive causing or allowing—the norm effect disappears. These results are inconsistent with hypothesis 1 as it was formulated, but they do support a more restricted interpretation of it.[3] In particular, these findings provide evidence against the unrestricted claim that normative judgments universally help people to select omissions as causes (McGrath 2005; Henne et al. 2017). Norms only help people to

[3]Other work has suggested a restriction of something like hypothesis 1 for event causation because causal learning can be non-normative (Danks, Rose, & Machery 2014). My work makes a similar yet novel point about omissive causation. More importantly, the results show a de-norming of omissive causation for causal reasoning.

select omissions as causes when people consider a limited set of possibilities.

Notably, these results provide consistent and strong evidence for hypothesis 2; the consideration of particular possibilities predicts judgments that are consistent with the meaning of omissive causing and allowing on the model-based view. And Experiment 1, 2a, and 2b all provide clear evidence for model-based theory. I take these results to support a more nuanced interpretation of the norm-inflation effect and its relationship to model accounts. Specifically, it seems that with limited access to possibilities, norms effect people's causal judgments by restricting the perceived range of possibilities (Phillips et al 2015). Future work will have to determine the extent to which this is true.

### 3.5.1 Revisiting the Problem of Profligate Causes

A famous proposal by McGrath (2006) is that abnormality helps people to select potential preventers (omissions) out of the set of omissions that would prevent the result from occurring (see also Thomson, 2003). On this account, the way that omissive causes are distinguished from non-causal omissions is by their normative status. For instance, my brother's failure to water my plant caused its death because he was expected to water it but did not; in contrast, while my cousin's failure to water my plant did not cause its death because he was not expected to water it and did not. Some recent philosophers have adopted this view and provided empirical support for it (Henne et al 2017).

An alternative proposal by Bernstein (2014; 2016) is that comparative similarity and the nearness of possible world's helps select an omission as a cause, relative to non-causal omissions. While her view is ultimately a metaphysical account, I have focused on her semantic theory and the cognitive predictions that follow from

it. On her view, the nearness, or relevance, of the possible event relative to more distance possible events helps select omissions as causes. For instance, Donald Trump watering my plant is a distant possibility, while my brother watering my plant is a nearby possibility, so my brother's failure is selected as a cause of the plant's death.

While this work does not speak to the specifics of particular norm-based or modal accounts, the three experiments have empirically evaluated the validity of these two general views about omissive causation. I manipulated prescriptive normative status of the relevant omissions in a similar way to recent empirical work (Henne et al. 2017; Willemsen 2016; Clarke et al. 2014). I manipulated the possibilities consistent with the modal view using a model-based theory that has previously been supported with empirical evidence (Bello & Khemlani 2015; Bello et al. 2017). I find consistent evidence in favor of a modal view about omissions, omissive causation, and its solution to the problem of profligate causes.

Nonetheless, it is clear that norms affect causal judgments in situations where people consider a single possibility. When reasoners consider a limited set of possibilities (the actual situation), norms effect omissive causal judgments such that more abnormal omissions are selected as a cause while normal omissions are not. What may be happening in these cases is that normative judgments are inducing people to automatically, implicitly disregard some possibilities. This interpretation is consistent with work in cognitive psychology showing that normative judgments affect the perception of possibilities (Phillips et al. 2015; Phillips & Knobe *forthcoming*; Phillips & Cushman 2017; Shtulman & Phillips 2017). On this view, it may be the case that the prescriptive norms drive participants toward selecting abnormal omissions as causes because possibilities consistent with omissive allowing are perceived to be impossible. The manipulation of the consideration of possibilities consistent with particular models may then be overriding this tendency for people to automatically,

implicitly disregard other possibilities by forcing them to explicitly consider those very possibilities. Future work will further explore the validity of this explanation, but it is clear that norms serve as a cognitive workaround for the problem of profligate causes given a limited set of possibilities.

Given these results supporting hypothesis 2 along with this explanation whereby perceived norms limit the consideration of particular possibilities, the modal semantics seems to adequately resolve the problem of profligate causes. While I remain agnostic on the metaphysical accounts of these views, it is clear that the semantic account is supported by the experimental work reported here; the consideration of a particular set of relevant possibilities helps select an omission as a cause.

### 3.5.2 Future Work

A possible objection to these findings is that the norm manipulation is not effective—that is, the norm is not salient to participants. I find this objection unlikely to be true because Experiment 1 shows a norm-inflation effect for partial models and cause models. Moreover, it is exactly these kinds of manipulations that have been used to elicit the norm-inflation effects in other studies (e.g., Henne et al. 2017; Willemsen 2016; Hitchcock & Knobe 2009), and I did everything I could to make these norms salient to participants in the studies. Future work ought to implement a variety of additional diverse norm manipulations to allow for even broader generalizations. Researchers, moreover, ought to explore not only prescriptive norms as I do here but also descriptive norms (Sytsma, Livengood, & Rose 2012) and norms of proper functioning (Phillips & Kominsky 2016).

Another central area of future work is to examine whether these distinct types of norms are constraining the representation of default possibilities considered. That

is, researchers need to determine whether participants who view abnormal omissions are actually screening off these possibilities. To study this explanation, researchers can ask about the likelihood of contingencies after participants make an omissive causal judgment for normal and abnormal omissions. If norms focus attention toward considering or not considering particular contingencies, then the contingencies judged to be possible and impossible will differ between normal and abnormal omission cases for partial models. In particular, participants in abnormal partial model conditions, relative to those in normal partial model conditions, will judge contingencies to be possible or impossible more similar to the cause model than the allow model. Future work must explore this possibility.

There is a lot of future work for philosophers and psychologists to do on omissive causal reasoning. Researchers, for instance, need to explore the extent to which events and omissions in causal scenarios respond differently to the models discussed here. Given that researchers have consistently found differences between event and omissive causation (e.g., Cushman & Young 2011), it is essential to test the model-based theory on different kinds of causal judgments and to determine how this difference comes about. Regardless of the directions of this future work, I have offered an explanation for the problem of profligate causes that accommodates both the norm view accepted by some philosophers and the modal account offered by others.

# Chapter 4

# What Explains the Omission Effect?

Suppose Karen walks by her neighbor's car and notices that the headlights were left on and that the window is open. While she could easily reach in and turn off the headlights, she doesn't. Later, the car battery dies. Now, consider a slightly different case where her neighbor's headlights were off, but Karen reaches in the open window and turns on the headlights. Again, the car battery dies. Karen seems more responsible for her neighbor's car battery dying when she actively turns on the lights than when she just doesn't turn them off. In line with these judgments, some philosophers argue that people are more morally responsible for doing harm than they are for allowing it to occur, *ceteris paribus* (e.g., Kamm 2007). This difference is important not only to ethicists but also to legal scholars (Moore 2009) and to cognitive scientists (Cushman & Young 2011).

It's common for philosophers, psychologists, and legal scholars to trace this moral difference to a difference in causal judgments (e.g., Moore, 2009).[1] If causal judgments affect our moral judgments, then the difference in moral judgments between acts and omissions may be—at least in part—grounded in a difference between the non-moral causal difference between acts and omissions. But what explains this causal difference? Production theorists—roughly, those who describe causation as a production

[1]Herein, I discuss "causal judgment" rather than "actual causation". Actual causation is sometimes called "token causation" or "singular causation" and some philosophers and cognitive scientists speak directly of causal judgment. I'm generally referring the relation that we judge to hold when we say that one event caused another event to occur. I'm keeping this work consistent with those who work on actual causation (e.g., Halpern and Hitchcock, 2014). But I'll discuss "causal judgment" throughout.

or as a physical transfer of energy or force (see Hall 2004; Bernstein 2015)—have an easy answer. In short, they reject omissions as causes because omissions do not physically generate anything. Dependence theorists—roughly, those who think that some kind of counterfactual dependence is central to (and perhaps necessary or sufficient for) causation (Lewis 1973)—lack an easy explanation for this intuitive difference. Herein, I argue that dependence theorists can account for the difference in actual causation by working out the details of counterfactual relevance and the context-sensitive ordering of counterfactual alternatives. This view may provide the basis for a (partial) explanation for the moral difference between acts and omissions.

## 4.1 The Omission Effect for Causal Judgment

There is an intuitive difference between the extent to which acts and omissions cause events. Consider a few ordinary cases. A company's CEO is said to have caused its success because she actively changed certain policies—not because she didn't change successful policies that were already in place. A band is said to have caused the success of their new album because they changed their lineup—not because they kept their original lineup the same. Your favorite song played because you turned on the radio—not because you didn't turn it off. It seems right to say that Karen turning on the headlights caused the battery to die, but it seems less right to say that Karen's failure to turn off the lights caused the battery to die. Empirical work bolsters these judgments; people are more likely to agree that acts are causes than omissions (Cushman & Young 2011; Walsh & Sloman 2011; Henne, Niemi, Pinillos, Knobe, & De Brigard *under review*). I will refer to this difference as the omission effect for causal judgment: people are less likely to judge an omission, relative to a

similar act, as a cause when matched for outcome (ceteris paribus).[2]

To obviate any potential issues resulting from under-description, it is useful to consider a more detailed case. Consider two versions of the case that I will refer to as IMPLOSION:

ACT

> Tom works for a demolition company, and today he is demolishing a building. The building will implode automatically at 5:00 PM if knob A is switched on. The knob can be switched either on or off. Today, knob A is off. At noon, Tom checks to see if knob A is on, and he sees that it's off. So, he changes the position of knob A to the on position. The building implodes automatically at 5:00 PM.

OMISSION

> Tom works for a demolition company, and today he is demolishing a building. The building will implode automatically at 5:00 PM if knob A is switched on. The knob can be switched either on or off. Today, knob A is on. At noon, Tom checks to see if knob A is on, and he sees that it's on. So, he does not change the position of knob A at all. The building implodes automatically at 5:00 PM.

[2]Here, my goal is not simply a descriptive project about actual causation. My goal is to contribute to the burgeoning, flexible formal framework for representing actual causation in line with Halpern and Hitchcock (2014), Woodward (2006), and others. The term 'actual causation' refers to judgments of the form '$C$ causes $E$', where $C$ and $E$ are distinct token events.

In the act case, the relevant causal statement is:[3]

(1) The building imploded because Tom changed the position of knob A.

In omission case, the relevant causal statement is:

(2) The building imploded because Tom did not change the position of knob A.

While 1 seems obviously true, the truth of 2 is less clear. Though each statement picks out an actual cause of the implosion, 2 seems less intuitive than 1. It's true that if either Tom's action or his inaction hadn't occurred in each case, then the outcome wouldn't have occurred. Intuitively, however, 1 is more accurate than 2.[4] For production theorists there is an obvious explanation for this difference in causal judgment: omissions aren't causes, acts are. Let's explore this is more detail. Process theories describe causation as a physical transfer of energy or force along a causal pathway (Salmon 1984; 1994; Dowe 2000; 2004). On such accounts, causation is a continuous process along a "world line" (Salmon 1994; 1997; 1998; Dowe 1992; 1995; 2004), and this process transmits a conserved quantity like energy along the pathway (Salmon 1994; Dowe 2004). Causation, in short, is a physical, generative process. These views seem intuitive; there is an obvious physical, generative process that occurs when Tom changes the position of knob A, current flows through the

[3]I don't assume that all English sentences with 'because' refer to a causal relation. I simply use 'because' as a more natural reading of these causal relations. That is, if someone were to ask why the building imploded, the typical response would be in this form. Differences in causal and explanatory judgments have been observed (Livengood & Machery, 2007).

[4]I don't mean to imply that statement 1 rightly expresses an actual cause of the result while statement 2 doesn't; that is, I do not intend to express binary between agreement and disagreement with the causal statements. Instead, I'm pointing out a level of agreement that differs between 1 and 2, which is consistent with the empirical literature and requires explanation.

machinery and wiring, and then the building implodes. And the explanation for the omission effect is simple. Omissions do not transfer energy to their respective results—acts do. The intuitive difference in actual causation and the experimental results simply reflect this difference.

But what—if anything—accounts for this difference if we are some kind of dependence theorist? In what follows, I will offer a new explanation for this difference in causal judgment that relies on dependence theories of actual causation and their machinery. It is often assumed that dependence views of actual causation are egalitarian about event type—that is, they do not treat acts differently from omissions. Such egalitarianism implies that the omission effect rests on people making a mistake of some kind and that any difference in actual moral or legal responsibility for acts versus omissions cannot depend on a causal difference. I will, however, explore counterfactual account that is not egalitarian and allows for the omission effect. This model based on Halpern and Hitchcock (2015) not only handles the judgments that discuss in their work but also the omission effect.

## 4.2 The New Explanation

To see how dependence theories seem to have trouble with the omission effect, we can use a typical counterfactual analysis of causal statements that employs a necessity conditional and a sufficiency conditional. While this account comes out of Lewis (1973), it has been refined by Pearl (2000) and Woodward (2006) and applied to many other problems in theories of causation (e.g., List and Menzies, 2009). On this view, roughly, if the occurrence of e counterfactually depends on the occurrence of c, then the occurrence of c causes the occurrence of e. Moreover, if the occurrence of e

counterfactually depends on the occurrence of c, then the following two counterfactual conditionals are true.

(3) $(\mathrm{O(c)} \mathrel{\square\!\!\rightarrow} O(e))$

(3) $(\sim\mathrm{O(c)} \mathrel{\square\!\!\rightarrow} \sim\mathrm{O(e)})$

I will refer to 3 as the sufficiency conditional and 4 as the necessity conditional. On this account, read 3 as: If c had occurred, then e would have occurred. Read 4 as: If c had not occurred, then e would not have occurred.[5] Consider an example: Suzy throws a baseball at a window and the window shatters. Suppose we accept 5:

(5) Suzy throwing the baseball caused the window to shatter.

Assuming a counterfactual dependence theory of causation, then we should accept that if Suzy hadn't thrown the baseball, then the window wouldn't have shattered. And for counterfactual dependence to hold, we need both the sufficiency and necessity conditionals to hold. Suzy's action was sufficient for the window's shattering:

(5.1) If Suzy had thrown the baseball, the window would've shattered.

5.1 is true in the actual world. Suzy's action is also necessary:

(5.2) If Suzy hadn't thrown the baseball, the window wouldn't have shattered.

[5]In line with Lewis (1973) and Woodward (2006), 3 is true so long as both c and e occur in the actual world. Moreover, I do not assume possible-world accounts of counterfactual conditionals. The debates between different semantic theories of counterfactual conditionals does not have bearing on what I say here. I use possible-world talk occasionally for explication.

Given the truth of 5.1 and 5.2, the occurrence of the window breaking counterfactually depends on the occurrence of Suzy throwing the baseball. This truth grounds the truth of the causal statement, 5.

Now that I have explained the view, we can apply it to the contrasting cases in IMPLOSION and the causal statements, 1 and 2, that demonstrate the omission effect. First consider 1, the act case. The ordinary English counterfactuals associated with 1 are:

(1.1) If Tom had changed the position of knob A, the implosion would've occurred.

(1.2) If Tom hadn't changed the position of knob A, the implosion wouldn't have occurred.

1.1 is true, as is 1.2. So, 1 is true. Now, consider statement 2, the omission case. The ordinary English counterfactuals associated with 2 are:[6]

(2.1) If Tom had not changed the position of knob A, the implosion would've occurred.

(2.2) If Tom had changed the position of knob A, the implosion wouldn't have occurred.

Like 1, the act case, the sufficiency and necessity conditionals are true for statement 2, the omissions case. 2.1 is true, and had Tom changed the position of knob A, the implosion wouldn't have occurred, so 2.2 is true. Both causal statements—both 1

[6]This statement, 2.1, is a bit difficult to parse, but it just states the sufficiency relationship between the omission and the result: Tom not changing the position of the omission is sufficient for the implosion.

and 2—accord with the counterfactual theory of causation. But so far there is no explanation of the omission effect for causal judgment; both 1 and 2 count equally as causes under these definitions. And if we accept other dependence theories, we similarly find that omissions and actions equally count as causes. So far, this seems like a problem for dependence theories of actual causation.

There is, however, an additional component to many counterfactual theories that may be useful to explaining this difference in causal judgment: relevance. Suppose Walter lights a match, and a fire starts. On counterfactual accounts, when people reason about whether the lighting of the match caused the fire, they do so by considering counterfactual alternatives (for instance, where Walter doesn't light a match) and asking whether the outcome (the fire) would still occur. Since the fire would not occur in that counterfactual alternative where Walter didn't light the match, Walter lighting the match caused the fire. But, of course, many other counterfactual alternatives could've made a difference to the outcome. For instance, if there hadn't been oxygen in the atmosphere, then the first wouldn't have occurred. But we don't want to claim that the presence of oxygen caused the outcome. To explain this difference, many philosophers appeal to relevance (e.g., Hitchcock & Knobe 2009; Hitchcock & Halpern 2014). The basic idea is that when evaluating causal claims, some counterfactual alternatives are more relevant than others, and this difference in relevance explains the difference in our causal judgments.

Philosophers and cognitive scientists have suggested that a number of factors affect the relevance of counterfactual alternatives, but one of the most common factors is norms (Kahneman & Tversky, 1981; Kahneman & Miller, 1986; McGrath, 2005; Hitchcock & Knobe, 2009). Consider again the example of Walter's fire. The presence of oxygen in the atmosphere is normal; it would be abnormal (infrequent) for there not to be oxygen in Earth's atmosphere, so this counterfactual alternative is more

likely to be considered irrelevant. Walter lighting the match, by contrast, is less normal because it happens less frequently—even if it is, all things considered, likely to happen. As a consequence, the counterfactual alternative where Walter does not light the match will be seen as more relevant than the counterfactual alternative in which the oxygen is absent.

Consistent with this literature, I use the term scarenormto encompass both normal frequencies and normative prescriptions (Hitchcock & Knobe 2009; Henne et al 2017; Bear & Knobe 2017). Suppose Aaron runs a red light and crashes into Devin who is going through a green light. If either Aaron or Devin hadn't gone through the intersection, the crash wouldn't have occurred. Aaron violated a prescriptive norm. Here, it is a relevant alternative where Aaron, just as he was expected, stops at the red light. Devin, on the other hand, conformed to the norm, and she acted just as expected. Hence, the counterfactual alternative where Devin stops at the light is irrelevant. Cognitive scientists consistently find that both statistical and prescriptive norms affect causal judgment (Hitchcock & Knobe 2009; Icard et al 2017; Kominsky, Phillips, Gerstenberg, Lagnado, & Knobe 2015; Henne et al, 2017). And some have recently found that the impact of norms on causal judgment is mediated by perceptions of counterfactual relevance (Phillips et al, 2015: Study 2). In sum, norms are taken to affect the relevance of perceived counterfactual alternatives, and this difference in relevance affects judgments of causation.

Some philosophers have built these notions of normality and relevance into more technical definitions of actual causation (Hitchcock & Halpern 2013; 2014; Halpern 2016). On these views, there is a normality ordering of witnesses. Roughly, a 'witness' is a counterfactual alternative in which the value of a potential causal factor and the outcome variable (i.e. the result) both change in value. Return to the fire example above. In this case we have a number of witnesses: resume= ,,

(W = 0, O = 0, F = 0)

(W = 1, O = 0, F = 0)

(W = 0, O = 1, F = 0)[7]

In the example, the alternative where Walter does not light a match, there is no oxygen in the atmosphere, and the fire doesn't occur (W = 0, O = 0, F = 0); the alternative where Walter lights a match, where there is no oxygen in the atmosphere, and the fire doesn't occur (W = 1, O = 0, F = 0); and the alternative where Walter doesn't light a match, there is oxygen in the atmosphere, and the fire doesn't occur (W = 0, O = 1, F = 0) are all witnesses to the actual situation. A normality ordering ranks these witnesses in terms of how normal they are relative to the actual world, omitting any witnesses that are less normal than the actual circumstances.[8] The highest ranked witnesses are the most normal in the particular context. This gives us a normality ordering of: resume= ,,

(W = 0, O = 1, F = 0) $\succ$ (W = 1, O = 0, F = 1)[9]

Given this ordering, (W = 0, O = 1, F = 0) is a witness to W = 1 being the actual cause of the fire.

This model shows how norms affect counterfactual relevance, thus the actual cause of some event. But it may be helpful to take stock here. Once we have a normality ranking of witnesses, the most normal (highest ranked) witness is the relevant

[7]Here, W represents 'Walter lights the match', O represents 'oxygen is present in the atmosphere', and F represents 'the fire occurs'. The value of 1 is given if that condition is present, and 0 is given otherwise. Moreover, in such conjunctive causal structures like this one, the structural equation for the actual cause is simply F = min(W, O); each factor is individually necessary for F, and they are jointly sufficient.

[8]Witnesses in the normality ranking at are least as normal as the actual circumstances; those that are more abnormal are irrelevant (for instance, (W = 1, O = 0, F = 0)).

[9]Note that the witnesses where there is no oxygen present are less normal than the actual world. Because of this, they are irrelevant to the normality ranking.

counterfactual alternative. If the actual situation is the highest ranked witness, then counterfactual alternatives are irrelevant, and people would not judge the events that the variables represent as the actual cause of the outcome. If the actual situation, however, is not the highest ranked witness, then the highest ranked witness is a relevant counterfactual alternative, and people will judge the events that the variables represent as the actual cause of the outcome.

While it may not at this point be clear how this view can help us understand the omission effect, a novel view can be developed out of this work on causal modeling (Pearl, 2000; Halpern  Pearl, 2005; Halpern & Hitchcock, 2014). Some philosophers who use these models suggest that their view accounts for causation by omission by treating omissions just like acts (Halpern & Hitchcock, 2013; 2014). With some additions to the models, these modeling accounts, I argue, also have an explanation for the difference in actual causation between acts and omissions. Consider again that these rankings determine the most normal counterfactual alternative. Often, the value of the variables in this most normal witness is referred to as a "default state," which is the defeasible, assumed state of a given factor, or potential actual cause (Halpern & Hitchcock, 2014). For example, the most normal witness in the original fire example is where Walter does not light a match and oxygen is present in the atmosphere (W = 0, O = 1, F = 0). In this example, Walter not lighting a match is a default state. It's assumed that Walter is (by default) not lighting a match—lighting one is a deviation from normal events—and this assumption is defeasible because this assumption can be revised in different contexts (for instance, one where Walter is told to light the match).

There are two points of clarification about default states. One is that default states are not necessarily omissions or absences (Hitchcock 2007: 506); rather, default states are the initial states in which something remains. That is, a default state is

a state in which something continues in that state or remains in a state rather than changing states. Consider the continued presence of oxygen, for instance, which is a positive state, rather than an omission, that is also a default state.

The other point of clarification is that the default state can change with context and the salience of a norm. Consider the default state of a fan. In a cool climate, the default state of a fan is the fan being off. But suppose that the fan is in a warm climate and is always on. The default state of the fan in this context is such that it continues to be on. Turning the fan off, in this context, would deviate from the default state. Suppose further that the fan is in the warm climate, and someone put a sign on the fan that says, "Keep fan off." When this prescriptive norm is the most salient, the default state of the fan is off—although it is statistically normal for the fan to be on.

Now, that we have these clarifications, we can return to the omission effect. On my account, inactions—that is, non-doings, omissions, failures, and so on—where an agent does not change but remains the same, are typically default states. Acts, where the agent changes something, are typically deviant states. These states affect the selection of the relevant witness because the default state is the highest-ranking witness. On this kind of understanding, norms and event type—i.e., acts and omissions—both help identify default states. Hence, this view is consistent with the flexible, formal framework from (Halpern & Hitchcock 2013; 2014). Future work will have to determine to what extent norms affect default states and how default states affect actual causation. But what I suggest here, and what I will argue throughout, is that an event type produces the omission effect for actual causation because typically omissions are default states and acts are deviant states.[10]

[10]Here, I do not claim that all omissions or what philosophers and psychologists have sometimes referred to as omissions entail a default state. Instead, I suggest that the cases used to see and understand omissions and produce the omission effect in cognitive science and in philosophy result

To see this explanation at work, consider the act case of IMPLOSION.[11] As I mentioned above, the turning of knob A is necessary and sufficient for the implosion. To check whether turning the knob is an actual cause we consider the counterfactual alternatives. So, we consider our only witness (K = 0, I = 0), where Tom does not turn knob A and the implosion does not occur. Now, this witness is more normal than the actual world: resume= ,,

$$(\mathrm{K} = 0, \mathrm{I} = 0) \succ (\mathrm{K} = 1, \mathrm{I} = 1)$$

This counterfactual alternative here is relevant, so we have a witness to our actual cause. Importantly, the default state is where knob A is not on. This the relevant witness for the actual cause. The act (K = 1) is a deviant state. The omission case is different. While (K = 1, I = 0) is a witness in the omission case, this witness is less normal than the actual world, thus not be the relevant witness for the actual omissive cause. This counterfactual alternative here is irrelevant. Critically, knob A is already turned on, so this is the default state. Changing the position of the knob, however, deviates from this default state. This explains the difference in relevance. And this difference in relevance between the act and omission cases yields the difference in actual causation.

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from a selection of default states and the normality ordering of counterfactuals. Some non-doings or omissions do not select default states. For instance, refraining is often seen as an omission, as in "Alex refrained from eating the marshmallow." But in refraining cases, the default state is that act that isn't performed (for instance, Alex eating the marshmallow)

[11] We can represent the structural equation of the actual cause: I = min(K). Here, K represents Tom changing the position of the knob, and I represents the occurrence of the implosion. The background conditions could be added into the equation as another variable, but this equation can remain simple for my purposes.

## 4.3 Applying the Explanation

The ultimate goal of this explanation is to ground the moral difference between acts and omissions at least partly in actual causal differences. Below, I apply my explanation to a moral case. If the explanation is at least in part correct, then for an act-omission difference there should be a causal difference as well.

Consider two contrasting cases that are commonly used in the literature (Spranca, Minsk, & Baron, 1991; Willemsen & Reuter, 2016):

PEPPER ACT

> John and Ivan are the finalists of a tennis tournament. The day before the final they have dinner together. John remembers that Ivan is allergic to Cayenne pepper and that eating Cayenne pepper gives him a severe stomachache. He also remembers that the house dressing contains Cayenne pepper. He thinks to himself: "If Ivan eats the house dressing he will probably get a stomachache. Then I'll have a chance to win." At the restaurant, Ivan orders first. Before Ivan makes his choice, John recommends the house dressing to Ivan. When the waiter asks Ivan whether he prefers the house dressing or the Italian dressing, Ivan orders the house dressing. Ivan has no idea it contains Cayenne pepper. Ivan gets a severe stomachache that keeps him up all night. John wins the match.

PEPPER OMISSION

> John and Ivan are the finalists of a tennis tournament. The day before the final they have dinner together. John remembers that Ivan is allergic to Cayenne pepper and that eating Cayenne pepper gives him a severe stomachache. He also remembers that the house dressing contains Cayenne pepper. He thinks to himself: "If Ivan eats the house dressing he will probably get a stomachache. Then I'll have a chance to win." At the restaurant, Ivan orders first. When the waiter asks Ivan whether he prefers the house dressing or the Italian dressing, Ivan orders the house dressing. Ivan has no idea it contains Cayenne pepper. John says nothing and realizes that had he told Ivan about the Cayenne pepper, he would have ordered the Italian dressing. Ivan gets a severe stomachache that keeps him up all night. John wins the match.

For contrasting cases like these, researchers find that people judge John's action, relative to his omission, as more morally wrong and that John is more responsible in the act case (Spranca, Minsk, & Baron, 1991; Cushman & Young, 2011).[12] And intuitively it does seem that John actively recommending the house dressing is more morally wrong than saying nothing when Ivan orders it. What may account for part of this difference in moral wrongness is a difference in actual causation.

To evaluate the potential difference in causal judgments between the act and omission case, we must first lay out the conditionals required for the truth of the causal statements. In PEPPER ACT, the relevant causal statement is:

(6) John recommending the house dressing caused Ivan to get sick.

[12] A much smaller effect occurs for non-moral causal judgments that affect these moral judgments (Cushman & Young 2011; Henne et al enquoteunder review).

And the relevant counterfactuals are:

(6.1) If John had recommended the house dressing, Ivan would've gotten sick.

(6.2) If John had not recommended the house dressing, Ivan wouldn't have gotten sick.

In PEPPER OMISSION, the relevant causal statement is:

(7) John not warning Ivan about the house dressing caused Ivan to get sick.

And the relevant counterfactuals are:

(7.1) If John had not warned Ivan about the house dressing, Ivan would've gotten sick.

(7.2) If John had warned Ivan about the house dressing, Ivan wouldn't have gotten sick.

Given the discussion from section 2, the next step is to evaluate the relevance of 6.2 and 7.2. In PEPPER ACT, we can get a normality ranking of the witnesses:

resume= ,,

$(R = 0, S = 0) > (R = 1, S = 1)$[13]

The default state is that John does not recommend anything to Ivan. That is, it seems like the default for PEPPER ACT is where John simply doesn't recommend

[13]Here, R represents John recommending, and S represents Ivan getting sick.

the house dressing. And this state is more normal than the event in the actual world; that is, it seems more in accordance with moral norms that John doesn't try to make his competitor sick—it even seems more normal in terms of the frequency of recommending salad dressings. Moreover, the potential omission in this case—John not acting—is the default state. Hence, (R = 0, S = 0) is the relevant witness for the actual cause—John's act—in the scenario. Consider now PEPPER OMISSION. Consider, too, the witnesses of this omissive actual cause: (W = 0, S = 0).[14] John wants Ivan out of the competition, so it would be abnormal for him to go out of his way to prevent Ivan's mistake. The default, moreover, is for John to keep not warning Ivan, and to warn him would be to deviate from the default. In this case, the default is for John to say nothing and for him not change the course of events. Thus, the witness would be more abnormal than the actual scenario—hence, irrelevant—producing a difference in actual causation for the act and omission cases. And this difference, in part, accounts for the difference in moral judgments between the act and omission cases.

## 4.4 Is this the best Explanation?

There may be alternative ways to explain the omission effect for moral judgments. Moore (2009), for instance, argues that omissions cannot be causal, while actions can be, so—since causation is required for certain kinds of responsibility—people are less responsible for omissions. Some production theories of causation reject omissive causation generally, so these judgments—while psychologically interesting—are irrel-

[14]Here, W represents John warning, and S represents Ivan getting sick. The witnesses are different counterfactual events. But this difference does not affect the analysis that I give here. Even if the events are different and not directly comparable, my primary point about relevance still holds.

evant to causal theories. Theorists like Moore argue that this difference in acts and events being causes, while omissions are not, is what grounds the moral difference. So, the non-causal property of omissions elicits the moral difference for them.

We might look deeper to alternative explanations in line with production views that will ground the difference in moral judgments. Some process theorists argue that omissive causal judgments are conflations of a causal concepts and explanatory ones (Beebee 2004). On this view, when people make omissive causal judgments they are actually explaining a complex situation and using causal verbs—like "because"—as shorthand (Beebee 2004; see also Livengood & Machery 2007; but see Henne, Pinillos, and De Brigard, 2017). On this view, an omissive causal statement explains the omissive situation in ordinary language, while the actual causal relation is a complex story about the transfer of entities between an event and the result. This causal and explanatory difference between acts and omissions might ground the difference in moral judgments for doing and allowing.

There still might be alternative explanations. Another way production theorists explain omissive causal judgments is to embed them in cases of double prevention (See Paul & Hall 2013: 175; Hall 2004). Suppose Tom removes a jack from under his car. On this view, the statement "The lack of a jack caused the car to fall to the ground" can be expressed in terms of two preventers; the jack was preventing the car from falling to the ground, and Tom prevented the jack from preventing. While there are force relations and the removal forces, there is no commitment to omissive causation. Wolff and colleagues argue that omissive causation is embedded within double prevention, and they provide empirical evidence for this claim (Wolff, Barbey, & Hausknecht 2010). But while these accounts explain omissive causal statements, they do not provide a positive account of the omission effect, beyond simply rejecting omissions as causes. The explanation I offer here does.

Beyond the production view, it may be worth thinking through some alternative possible ways for the normality to explain the omission effect. A natural explanation arises about the relationship between omissions, normality, and counterfactual thinking: omissions, one might think, are simply more frequent—more normal in terms of statistical normality—than acts. On this account, it is more normal to fail to act than it is to act; for instance, it is more normal not to change the position of the knob than it is to change the position. This view has its roots in now classic work on counterfactual thinking (Kahneman and Miller 1986; see also, Roese 1997), and it has even been suggested as an explanation for the omission bias in legal decision making (Prentice & Koehler 2002). On this kind of account, the most normal witnesses would always include omissions.

But this completely deflationary explanation is unlikely to be true. At a purely psychological level, although the evidence is mixed (Roese 1997), researchers studying the omissions effect in decision making and regret find that normality at best only explains some of the omission bias (Baron & Ritov 2004; Reb & Connolly 2010).[15] Hence, it is unlikely that simply an effect of normality explains this difference in causal judgments. At a more philosophical level, moreover, this explanation would prohibit all causation by omission. If omissions are more normal universally, then there will never be a higher ranked witness with an alternative act to witness some omission as an actual cause.

[15]The omission effect for moral responsibility refers to people judgments of agents' moral responsibility for some outcome. The omissions bias, on the other hand, typically refers to a behavior: people are more willing to bring about bad outcomes by their omission rather than by their action. Recent empirical work has started to explore the relationship between people's judgments and their behavior (DeScioli, Christner, & Kurzban 2011).

## 4.5 Conclusion

Above, I give a dependence account for the omission effect for causal judgment. While some philosophers who accept a kind of dependence account have attempted to remain egalitarian about event type for causal judgments, I give a reason not to. Now, dependence theorists can explain the omission effect without thinking that it results from a mistake. Moreover, they now have a defense against the claim that their theory cannot make sense of the difference. This view also lays the foundation for explaining the responsibility differences that are apparent in moral theory and the law and for showing how these differences in judgments of responsibility affect our own behavior when we act or fail to act. While this view that relies heavily on Halpern and Hitchcock (2015) makes some novel predictions, I give some reason to doubt it in the next chapter.

# Chapter 5

# Conclusion

In the previous chapters, I have generally supported a normative view of omissions. In Chapter 2, I argued for a normative account of the semantics of omissive statements. This view, I argued, had some potential theoretical benefits to alternative accounts. In Chapter 3, I argued that the norm-inflation effect that I have previously found in empirical work can be accounted for in terms of a more robust understanding of the modal structure of the omissive causal scenario. Hence, modality (or modal cognition)—not not simply norms—affects causal judgments. In Chapter 4, I argue that a model of causal reasoning that incorporates norms may explain not only the effects of norms on causal judgments but also the omission effect for causal judgment. In this conclusion, I actually want to raise two doubts about the views that I present in this dissertation and outline an area of area of future work on omissive causal reasoning.

Consistently, research finds an impact of norms on causal judgment (Kahneman & Tversky 1982; Kahneman & Miller 1986; Knobe & Fraser 2008; Hitchcock & Knobe 2009; Icard et al 2017; Kominsky et al 2015; Henne et al 2017; see also, Hart & Honore 1985; McGrath 2005). But—as I note in the previous chapter—similar patterns of causal judgments show up for act-omission differences. To recall, the omission effect refers to a phenomenon whereby, across a range of scenarios, people judge that agents who perform an act played a greater role in causing the outcome than agents who did nothing at all (Cushman & Young 2011; Walsh & Sloman 2011; Willemsen & Reuter 2016). It may be that we can account for norms and act-omission distinctions in the

same model as I do in the previous chapter. Accounting for this similar in a model of causal reasoning will not only be a more parsimonious view but also tell us some essential about causal cognition and how to model it.

Below, however, I present two pieces of evidence to doubt this model. I will suggest that an alternative model may account for previous evidence, some new effects of omissive causal reasoning, and make some predictions no other models make. These doubts, I argue, are strong motivation for a new line of work in future research.

## 5.1 Explaining the Omission Effect with Counterfactual Theories

The explanation for the omission effect that I give in the previous chapter draws on views according to which causal cognition relies on counterfactual reasoning (Byrne 2011; Gerstenberg et al 2017; Lewis 1974; Mackie 1974). As I discuss in all of the previous chapters, this view holds that people's causal judgments depend on the consideration of counterfactual alternatives. As such, when people reason about whether some event caused an outcome, they do so by considering a counterfactual alternative and asking whether the outcome would still occur.

To see how counterfactual theories might explain the omission effect, recall that in any given causal scenario, there will be many different counterfactual alternatives in which the outcome would not have occurred. For instance, not lighting a match or there not being oxygen in the atmosphere are counterfactual alternatives in which the fire does not occur. In order to explain this phenomenon with a counterfactual theory, we need to assume that not all counterfactuals are treated equally (Bello, 2016;

Bernstein, 2014; Halpern & Hitchcock 2014; Kahneman & Miller, 1986; Phillips et al 2015). This notion might be spelled out in a number of different ways.

The approach that I focused on in the last chapter is deeply influence by Halpern & Hitchcock (2014). This model accounts for the relevant witnesses and shows how norms may function in an a model of actual causation, and it allows for omissive causation. Moreover, it allows for a graded account of causation so that we are not limited to discussing only 'the' cause. There are, however, alternative counterfactual approaches that make novel predictions that are not in line with this model.

One such approach would be to say that this distinction of counterfactual alternatives is a matter of how likely people are to simulate counterfactuals with that particular antecedent, where the probability of simulating a counterfactual can be impacted by a number of different factors (see, e.g., Byrne 2016; Icard et al. 2017; Kahneman & Miller 1986). Abstracting away from the details of these slightly different interpretations, I will use the notation

$$P(C = 0)$$

to describe the relevance of the counterfactuals in which event $C$ did not occur.

A number of different theories then use such an understand of relevance explain why an event might be regarded as more causal when people see the corresponding counterfactual as more relevant. I will rely on one account that I will call the *necessity/sufficiency* model (for further detail see Icard et al, 2017). On this model, the degree to which a given factor is regarded as the cause of an outcome is a weighted sum of the degree to which it is necessary for the outcome and the degree to which it is sufficient for the outcome, with the weighting being determined by the probability

of considering the counterfactual. If we represent the degree of necessity as

$$(P^{\nu}_{C=0}(E=0))$$

and the degree of sufficiency as

$$(P^{\sigma}_{C=1}(E=1))$$

the measure of causal strength becomes:

$$P(C=0)P^{\nu}_{C=0}(E=0) + P(C=1)P^{\sigma}_{C=1}(E=1)$$

At this point, it may be best to put this abstractly so that any reader could plug in any number of causal factors into the general model of causal strength (*CS)*:

$$CS(X,Y) := P(X=0)P^{\nu}_{X=0}(Y=0) + P(X=1)P^{\sigma}_{X=1}(Y=1)$$

This model captures a lot of what we want in a model of causal strength. Counterfactual theories like these provide a simple explanation for the fact that people think of different counterfactuals as relevant when they are making causal judgments. The core idea is that people tend to ask different questions depending on which counterfactual they consider. Thus, suppose a person is wondering whether factor $C$ caused an outcome. If she considers counterfactuals in which $C$ did not occur, she will tend to ask whether $C$ was necessary for the outcome. By contrast, if she considers counterfactuals in which $C$ did occur (and various other background conditions were altered), she will ask whether $C$ was sufficient for the outcome. The impact of counterfactual thinking on causal judgments about a specific factor therefore depends on

the degree to which this factor was necessary or sufficient. If the factor is necessary but not sufficient, it will be regarded as less causal when people are less inclined to consider counterfactuals in which it did not occur.

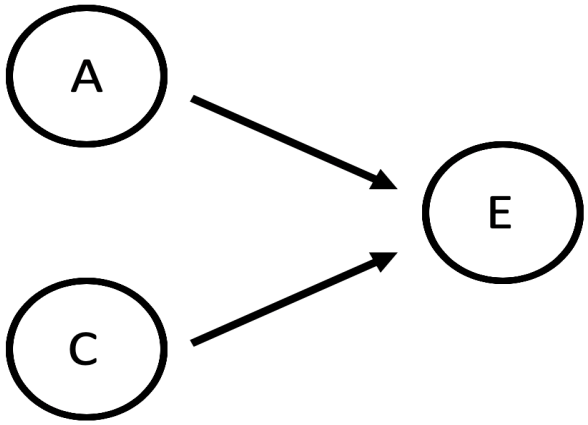



**Figure 5.1**: This figure shows a basic unshielded collider structure, where $C$, $A$, and $E$ are individual events that occur. In conjunctive scenarios (joint causation), the conjunction of $C$ and $A$ are jointly sufficient (but individually necessary) for $E$. In disjunctive scenarios (overdetermination), either $C$ or $A$ are individually sufficient (but not individually necessary) for $E$. In all cases discussed in this section $C{=}A{=}E{=}1$. Where I discuss the omission of $C$ or $A$, this model would simply represent $\sim C$ and $\sim A$.

Like the model in the previous chapter, this model can explain the omission effect. To see this, we have to make a few assumptions. First, people have a tendency to consider counterfactuals in which action is replaced by inaction, rather than vice versa (Byrne & McEleney 2000; Kahneman & Tversky 1982; see also Byrne 2016). Second, the omission effect will arise when we have conjunctive or joint causal structures or when we are considering only one singles causal factor (see below). With these assumptions, the model shows us that the omission effect arises because of a difference in the way people think about different kinds of counterfactuals. In omission effect examples like in the previous chapter or in ordinary conjunctive scenarios (Figure 5.1), the necessity/sufficiency model makes the right predictions.

To see this, first compare two distinct conjunctive cases: $C_1$, $A_1$ , $E_1$ and $C_2$, $A_2$, $E_2$, where

$$P(C_1) > P(C_2) \text{ and } P(A_1) = P(A_2)$$

This is the standard set up to see abnormal inflation effects in causal reasoning (Icard et al 2017). Given that the conditional probability of $C_1$ is greater when it is an abnormal and the conjunct's probability ($A_1 = A_2$) is fixed, then we have a greater necessity strength. That is, the causal strength of $C_2$ will be greater than $C_1$. But now suppose the difference between and the counterfactual of $C_1$ and $C_2$ is a difference in the act-omission distinction. In this kind of case, we would expect—given that people tend to consider counterfactuals in which action is replaced by inaction, rather than vice versa (Byrne & McEleney 2000; Kahneman & Tversky 1982; see also Byrne 2016)—the omission effect for causal judgment to fall out of this model. That is, we expect:

$$P(\sim C_1) > P(C_2) \text{ and } P(A_1) = P(A_2)$$

Here again *CS* predicts that the causal strength of $C$ to be greater than $\sim C$. Hence, we get the omission effect for causal judgment. So far this model makes equivalent predictions to the one I propose in the previous chapter.

Notably, the model predicts two additional effects. The first is causal supersession for action (Henne *In Preparation*). That is, if it's the case in our conjunctive model is such that

$$P(C_1) = P(C_2) \text{ and } P(\sim A_1) > P(A_2)$$

then we would expect it to be the case that

$$CS(C_1, E) > CS(C_2, E)$$

We see this in the results of the model:

$$CS(C, E) = P(C)P(A) - P(C) + 1$$

Because $P(A)$—or $P(\sim A)$ in the omission case—is monotonic with $CS$ in this result, then we expect causal supersession for action. In other words, if one causal factor—$A$—is an action, rather than an omission, then the causal strength of the alternative factor—$C$—decreases, and if one causal factor—$A$—is an omission, rather than an action, then the causal strength of the alternative factor—$C$—increases.

To see this result intuitively, consider the following cases:

ACTION

Laurie likes GC brand coffee. GC is doing a new promotion for their new coffee flavor where customers can receive a free sample. Customers will receive a free sample if both they have previously purchased coffee beans from GC and they are subscribed to the GC email list. Laurie has previously purchased coffee beans from GC, and she is not subscribed to the GC email list. When she hears about the promotion, Laurie checks to see if she is subscribed to the email list, and she sees that she is not. So, she changes her subscription status, and she subscribes to the email list. Because customers will receive a free sample if both they have previously purchased coffee beans from GC and they are subscribed to the GC email list, Laurie receives a free sample.

OMISSION

> Laurie likes GC brand coffee. GC is doing a new promotion for their new coffee flavor where customers can receive a free sample. Customers will receive a free sample if both they have previously purchased coffee beans from GC and they are subscribed to the GC email list. Laurie has previously purchased coffee beans from GC, and she is subscribed to the GC email list. When she hears about the promotion, Laurie checks to see if she is subscribed to the email list, and she sees that she is. So, she does not change her subscription status, and she remains subscribed to the email list. Because customers will receive a free sample if both they have previously purchased coffee beans from GC and they are subscribed to the GC email list, Laurie receives a free sample.

In the ACTION case, Laurie changes her status, and in the OMISSION case, Laurie does not change her status at all. In the OMISSION case, it seems that Laurie received a free sample because she previously had purchased coffee beans from GC. But this does not seem so in the ACTION case. This is the supersession effect for action-omission differences. In recent work, I use this case and two others to test this prediction (Henne *In Preparation*). I find exactly what the model predicts: there is suppression for action-omission differences in the conjunctive cases but not in the disjunctive ones (Figure 5.2). This new effect is predicted by the necessity/sufficiency model. It's not clear how the model I present in the previous chapter can handle this new result.

This necessity/sufficiency model makes one additional prediction that is not predicted by other models: the reverse omission effect—in overdetermination cases omissions should actually be judged to be more causal than actions. Using the same (slightly modified) vignettes, I investigated this effect (Henne, Niemi, Pinillos, De

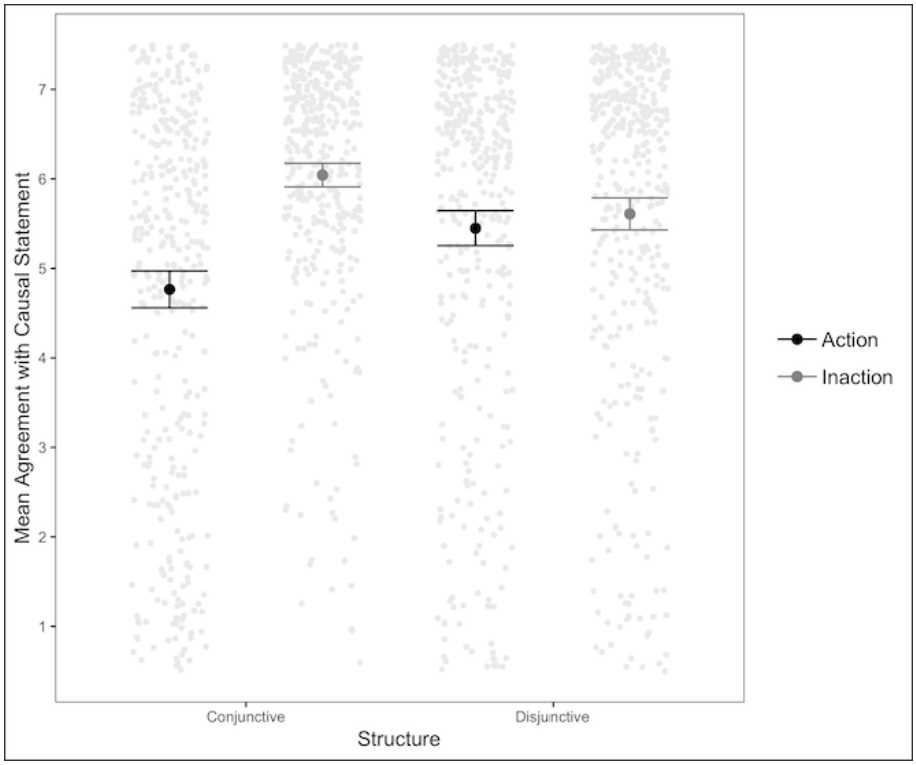



**Figure 5.2**: Mean agreement with the causal statement across three vignettes as a function of action-omission(inaction) differences and disjunctive-conjunctive differences (Henne *In Preparation*). Error bars represent 95% confidence intervals and light grey dots represent individual data points.

Brigard, & Knobe *Under Review*). And I find evidence for it (Figure 5.3). The core idea of this effect is that perhaps people focus more on necessity when evaluating actions and more on sufficiency when evaluating omissions. Since overdetermination cases involve a factor that is sufficient but not necessary, omissions would then be seen as more causal than actions in cases of overdetermination. In turn, I find this general pattern. In conjunctive cases, people attribute less causation to inaction, whereas in overdetermination cases, they actually attribute more causation to inaction. This result provides evidence for the hypothesis that the impact of the action-inaction distinction is driven by counterfactual reasoning.

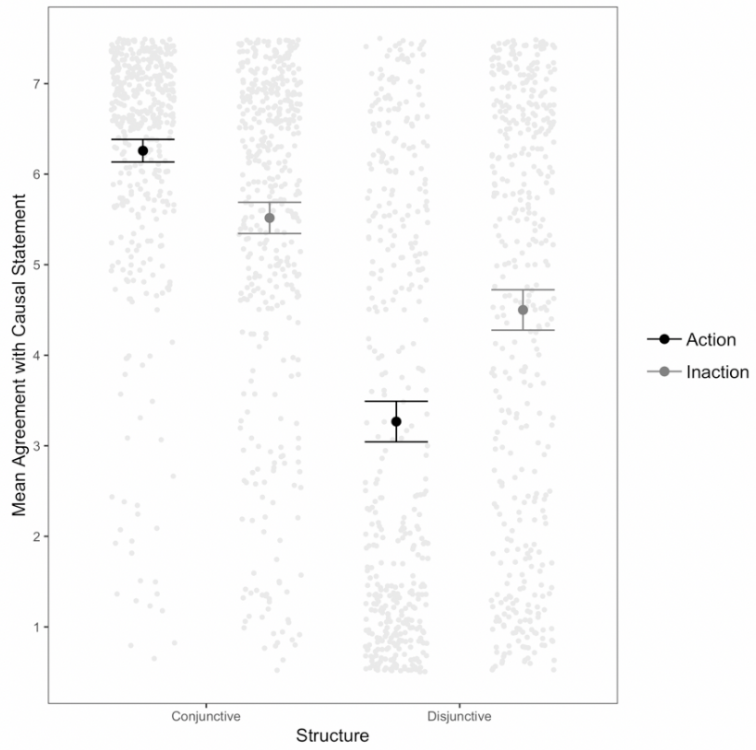



**Figure 5.3**: Mean agreement with the causal statement as a function of action-omission(inaction) differences and disjunctive-conjunctive differences (Henne et al *Under Review*). Error bars represent 95% confidence intervals and light grey dots represent individual data points.

In this section, I give some evidence to doubt the model I presented in the previous

chapter. Based on these new findings, I take this as strong motivation for further exploration of necessity/sufficiency model.

## 5.2 Concluding Remarks and Future Work

Given the new evidence for this new model, it should be further explored. Notably, the necessity/sufficiency model may also explain my findings in chapter 3; there is the potential that the denorming results that I found therein could also be explained by the model. Specifically, the forced consideration of the alternative possibilities in the experiment might have actually change the perceived likelihood of the counterfactual alternative—rather than simply considering the entire model for individual semantic terms. The extent to which this is true should be explored in future work. The view that I put forward does not seem to be incompatible with this new model—although it may have to be adjusted. Future work will have to explore this possibility as well. It also seems that this model makes unique predictions about insufficient contributing causes and transitivity in causal judgment. As always with omissive causal reasoning, there is never nothing to do.

Regardless of which model can best account for these newly found effects of causal reasoning, I am left with a major question. In all of what I've discussed herein, I have attempted to account—as many have—for this intuitive difference between certain counterfactuals. Some counterfactuals seem more normal. Some seem more appropriate—or they come to mind more easily. Some seem relevant or irrelevant—or more or less probable. But few philosophers and cognitive scientists can agree on this difference (i.e. what accounts for it). Is it the likelihood that we think about it? Is it the similarity between what we experience and what we can easily imagine? I'm not sure. But this I think is the biggest question for omissions and omissive causal

reasoning (and for causal reasoning more generally). I hope to work on this project in the coming years.

# Chapter 6

# Appendix A

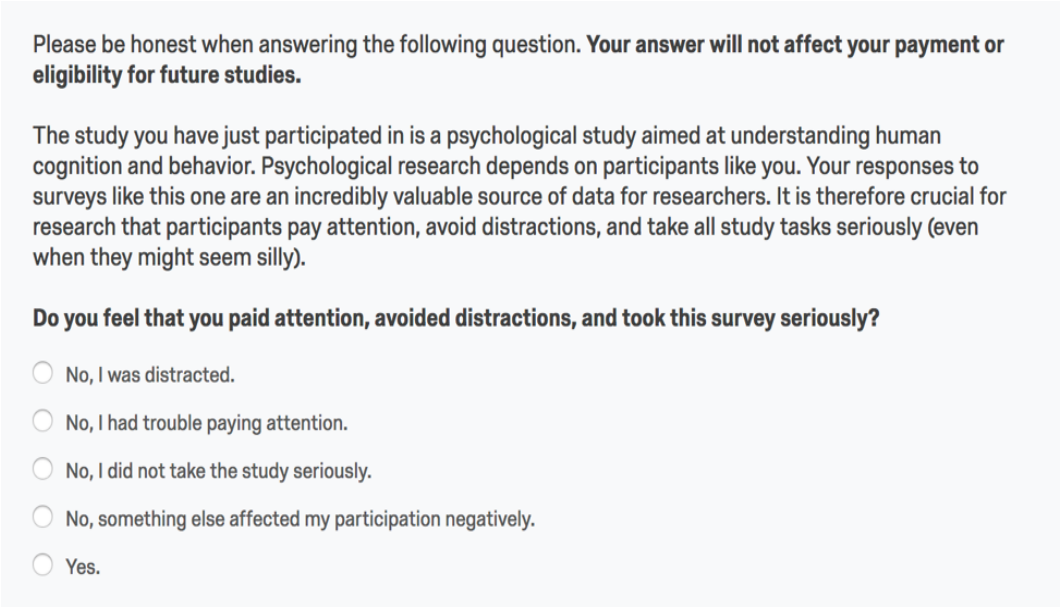



**Figure 6.1**: General Attention Check for Experiments 1, 2a, and 2b

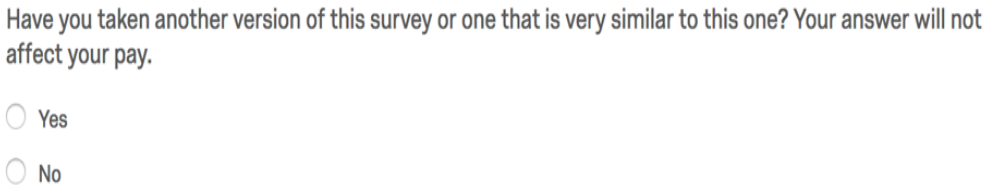



**Figure 6.2**: General Attention Check for Experiments 1, 2a, and 2b

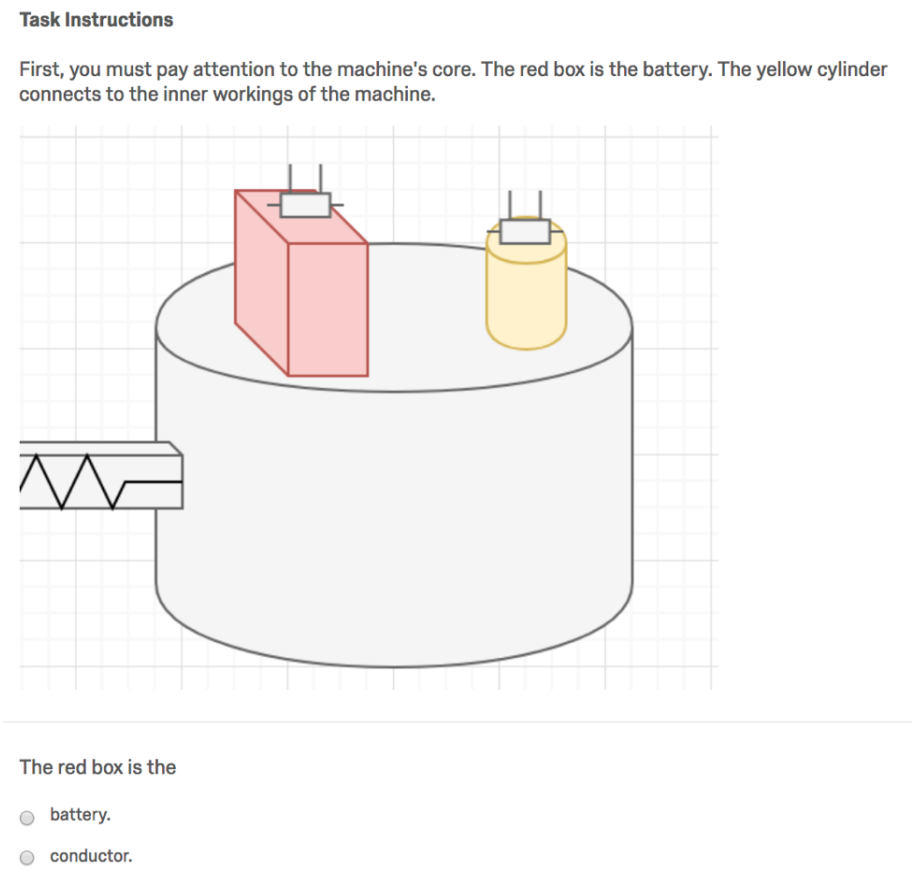



**Figure 6.3**: Additional Attention Check for Experiment 2a

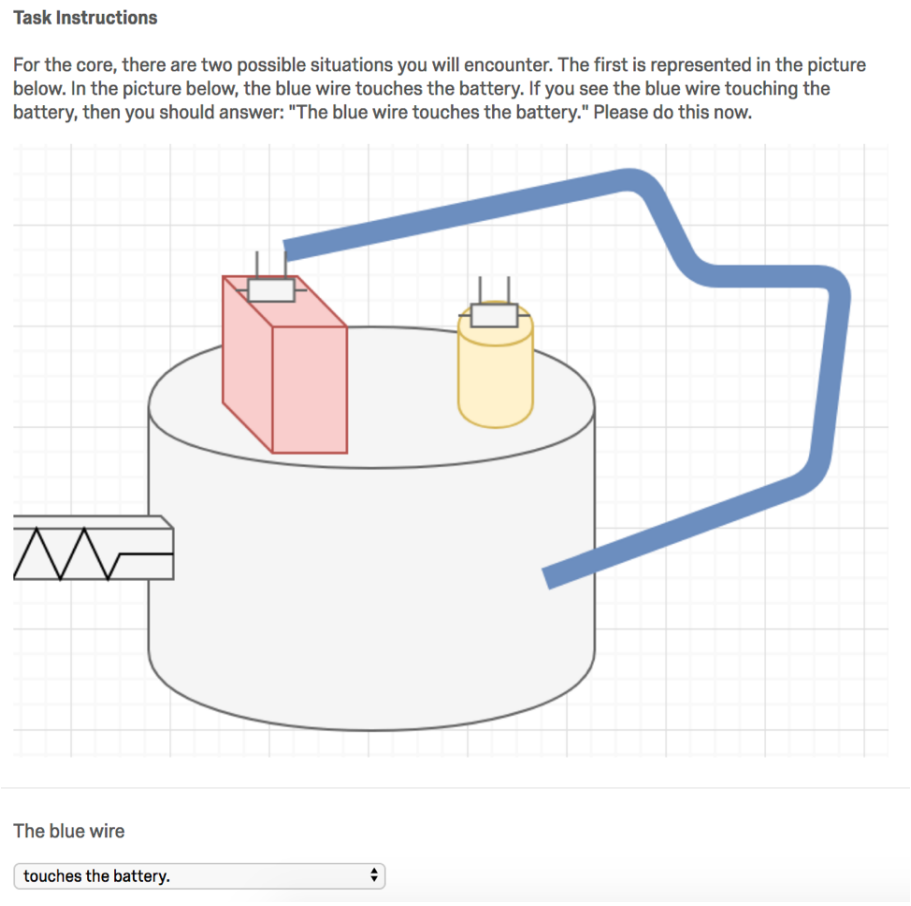



**Figure 6.4**: Additional Attention Check for Experiment 2a

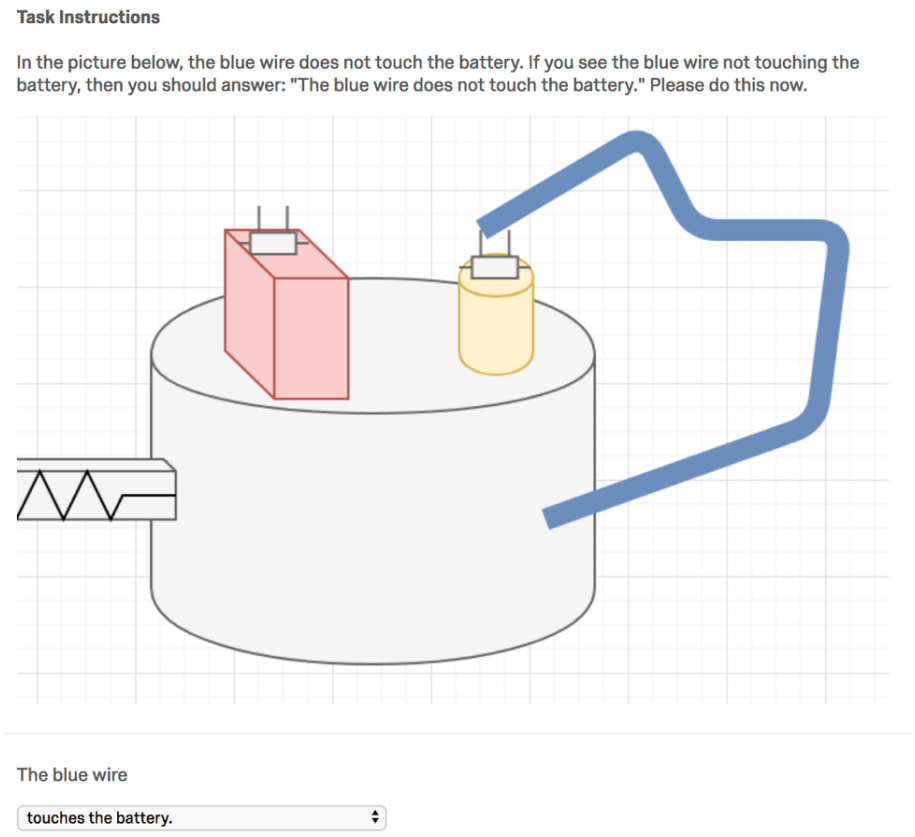



**Figure 6.5**: Additional Attention Check for Experiment 2a

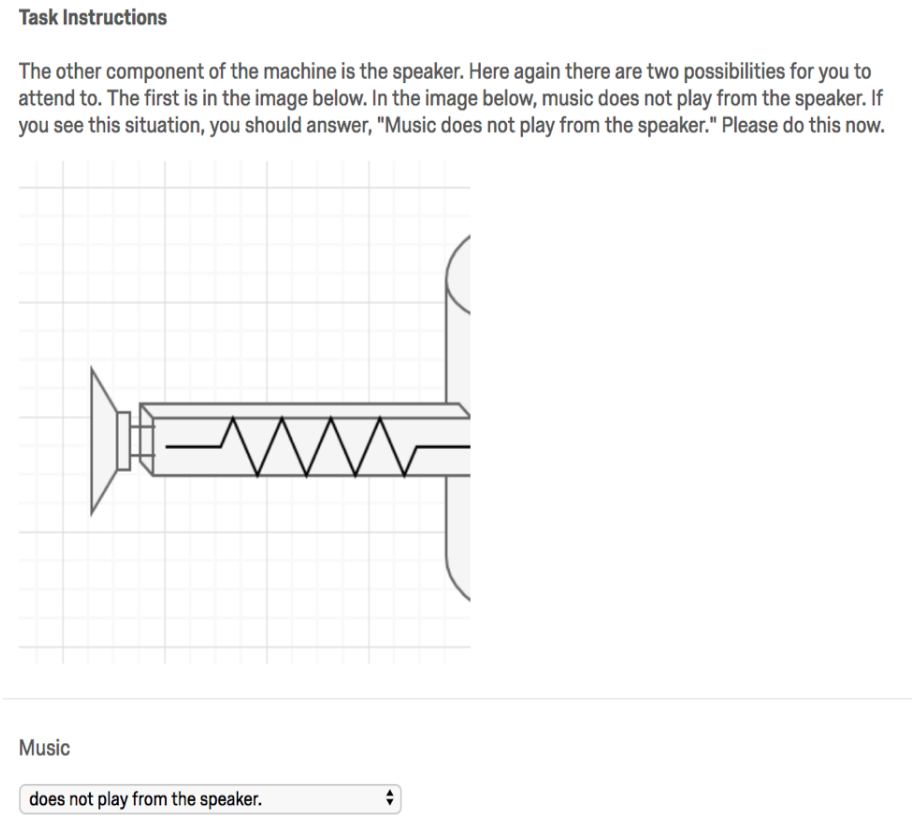



**Figure 6.6**: Additional Attention Check for Experiment 2a

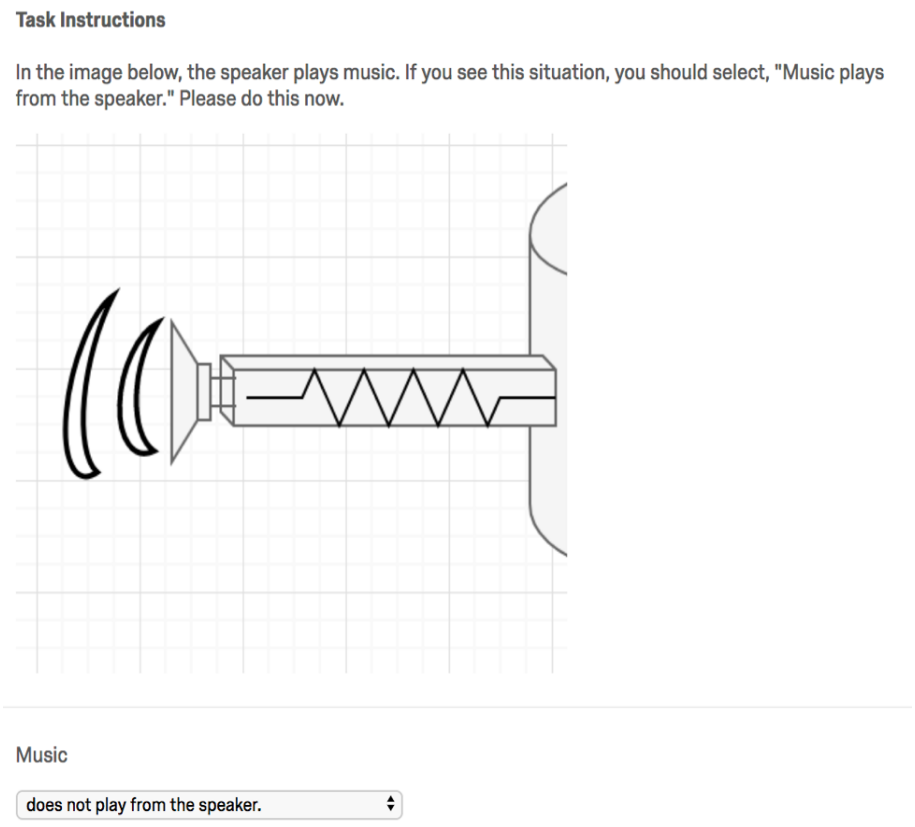



**Figure 6.7**: Additional Attention Check for Experiment 2a

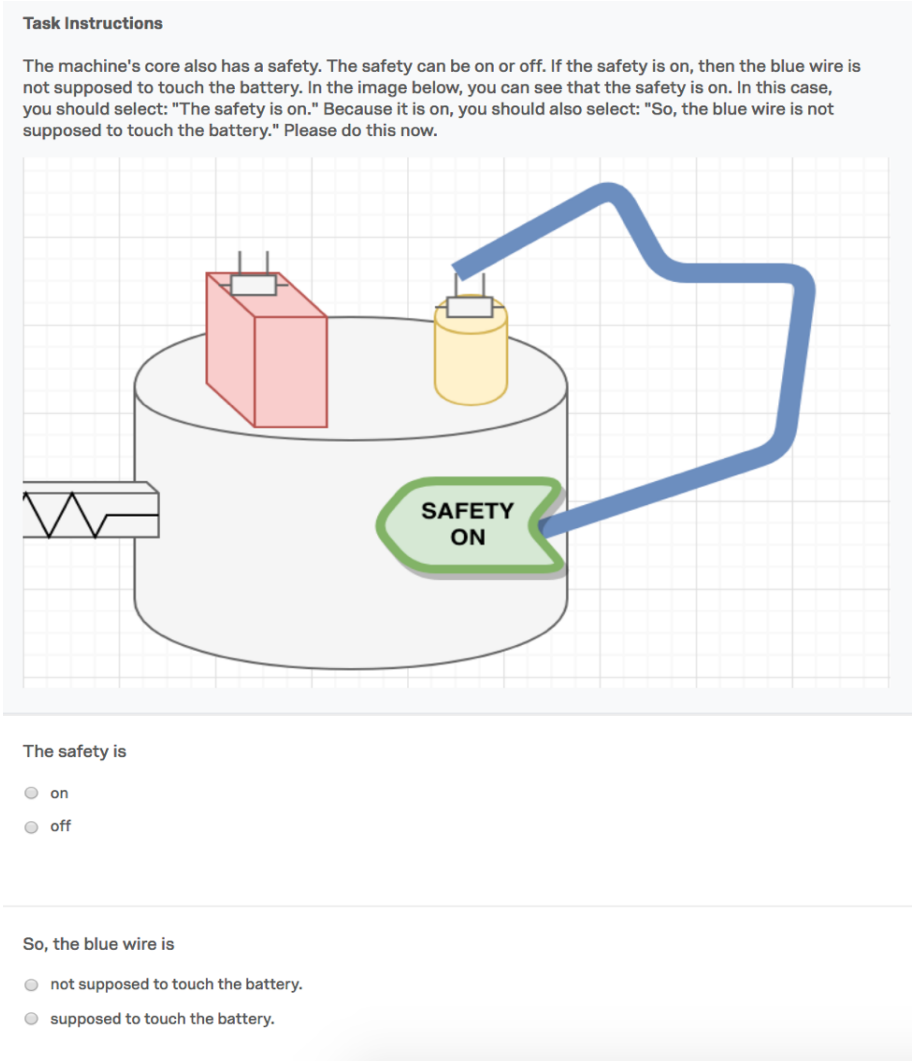
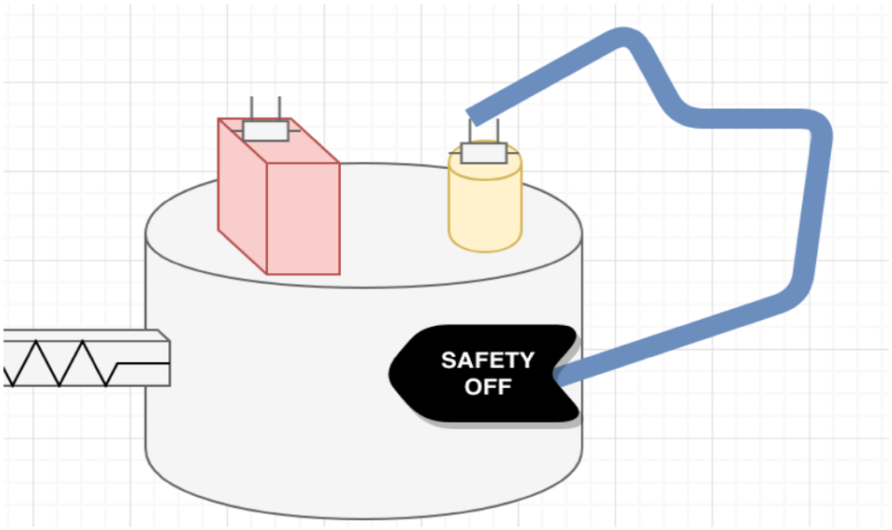



**Figure 6.8**: Additional Attention Check for Experiment 2a

**Task Instructions**

The safety can also be off. If the safety is off, then the blue wire is supposed to touch the battery. In the image below, you can see that the safety is off. In this case, you should select: "The safety is off." Because it is off, you should also select: "So, the blue wire is supposed to touch the battery." Please do this now.




The safety is

- on
- off

So, the blue wire is

- not supposed to touch the battery.
- supposed to touch the battery.

**Figure 6.9**: Additional Attention Check for Experiment 2a


**Figure 6.10**: Additional Attention Check for Experiment 2b

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# Biography

Paul Henne received his bachelor's degree in Philosophy and in English from Lake Forest College. He then earned a Masters degree in Philosophy from Arizona State University. After graduating from Duke University in the Spring of 2019, he will return to Lake Forest College as an Assistant Professor.