What Killed your Plant? Profligate Omissions and Weak Centering

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This paper is on the problem of profligate omissions. The problem is that counterfactual definitions of causation identify as a cause anything that could have prevented an effect but that did not actually occur, which is a highly counterintuitive result. Many solutions of this problem appeal to normative, epistemic, pragmatic, or metaphysical considerations. These existing solutions are in some sense substantive. In contrast, this paper concentrates on the semantics of counterfactuals. I propose to replace Strong Centering with Weak Centering. This allows that the actual world is not the only world that is closest to the actual world. As a result, some counterfactuals that would otherwise have been true, turn out to be false. When these counterfactuals concern causation, fewer causal claims are true. In addition to describing steps towards solving the problem of profligate omissions, the proposal captures an abstraction that is shared by many of the existing solutions: depending on how the distance ordering underlying the Weak Centering condition is constructed and interpreted, some of these existing solutions can be recovered.

1 Introduction

Many people think that omissions can be causes.[1] Suppose Peter promises to water your plant, but he does not water it, and the plant dries up and dies. Peter's omission, i.e. his not watering the plant, causes the plant's death. The following definition of causation is consistent with this idea that omissions can be causes.

> Weak Dependence.
> *c* is a cause of *e* if and only if
> 1. had *c* not occurred, then *e* would not have occurred.

[1] I follow the literature on the problem of profligate omissions in assuming, at least for the sake of argument, that omissions can be causes. I do not thereby endorse the claim that omissions can be causes (cf. Woodward 2006, 20–23).

Peter's omission *c,* his not watering the plant, is a cause of the plant's death *e*. Had Peter watered the plant, then the plant would not have died.[2]

Unfortunately, Weak Dependence over-generates, that is, it identifies too many causes. The Queen of England did not water your plant either. Had she watered the plant, then the plant would not have died. Thus, her omission counts likewise as a cause of the plant's death.[3] In fact, the omission of *anything* that could have prevented the plant's death counts as a cause—a highly counterintuitive result. This is the problem of profligate omissions (Hart and Honoré 1959, 35–36; Lewis 2000, 196; Thomson 2003, 98–102; Menzies 2004; McGrath 2005; Woodward 2006; Bernstein 2014a, 2–3; Henne, Pinillos, and Brigard 2017).

The problem of profligate omissions complements the problem of overdetermination (Lewis 1987; Schaffer 2003). In contrast to the problem of overdetermination, which attacks Weak Dependence as a *necessary* condition, the problem of profligate omissions attacks Weak Dependence as a *sufficient* condition for causation. In cases of overdetermination Weak Dependence produces *too few* causes, whereas in cases of profligate omissions it produces *too many*.

Several solutions have been put forward to address the problem of profligate omissions. Some of those incorporate normative elements, such as the solutions suggested by Thomson (2003, 100), McGrath (2005), Henne et al. (2017), and relatedly Hitchcock and Knobe (2010).[4] Other solutions rely on epistemic considerations to distinguish between omissions that are salient and omissions that are not salient, as does the solution put forward by Bennett (1988, 133). Again others rely on pragmatic considerations about what causal claims are appropriate to assert in a context, as Lewis (2000, 196) proposes. Some solutions operate on the level of semantics and make the truth of causal claims dependent on a contextually given causal model, as Menzies (2004) suggests. Finally, some solutions proceed by formulating additional requirements that are imposed on the causal relation, such as the requirement that cause and effect must be proportional (Dowe 2010),

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[2] Throughout the paper I assume that the respective *c* and *e* are distinct and actually occur. Following Pearl (2000) and Woodward (2003), I interpret causal claims as claims about relationships between variables. That omissions occur should hence be understood as a claim about binary variables, denoting the occurrence of an event, having the value of 0.

[3] Some distinguish between absences and omissions such that the Queen not watering the plant is an absence but Peter not watering it is an omission. This distinction does not bear on the problem of profligate omissions (or absences) and I ignore it for present purposes.

[4] Importantly, the class of normative considerations here includes prescriptive as well as statistical norms.

or that the counterfactual between actual occurrences must be insensitive to changes in circumstances (Woodward 2006; Menzies 2010; 2011).[5] The motivating question for this paper is this: Is there something that these existing substantive solutions, at least some of them, have in common, at least to some extent? In this paper, I show how amending the well-known semantics for conditionals due to Lewis (1973a) yields a formal abstraction from which some of the existing solutions can be recovered. The paper argues, in line with existing proposals, that omissions can be causes without all omissions thereby being causes.

Many existing solutions are substantive in the sense that they pertain to the analysis or ontology of the causal relation. This paper, in contrast, puts forward a technical proposal in the sense that it targets the semantics that is used to evaluate causal counterfactuals. As far as possible, the proposal refrains from making claims about the nature of causation.

Specifically, the proposal is to use the Weak Centering condition of Lewis' (1973a) semantics for conditionals instead of the Strong Centering condition (the proposal hence reverts to Lewis' (1973b) original definition of counterfactual dependence). Weak Centering allows that the actual world is not the only world that is closest to the actual world. With this move, some counterfactuals that were true before are now not true anymore: Counterfactuals with true antecedents and true consequents are true only if both antecedent and consequent are true in all worlds that are closest to the actual world. Because some purportedly causal counterfactuals are of this kind—for example, "if the Queen were not to water the plant, it would die"—they now may turn out to be false. As a result, some widely held intuitions about paradigmatic cases of causation by omission can be accommodated without over-generating causes. Moreover, depending on how the distance ordering over possible worlds is interpreted—for example as representing epistemic salience, pragmatic context, or deviation from normative facts—different existing solutions to the problem of profligate omissions can be recovered. In this way, the proposal generalizes or abstracts existing solutions.

The aim of this paper is twofold. First, and foremost, the aim is to apply this amended version of Lewis' semantics—following work of Menzies (2004; 2011) and List and Menzies (2009)—to the problem of profligate omissions. Second, the aim is to thereby motivate the development of a framework for evaluating causal claims using a widely popular semantics.

The plan of the paper is as follows. Section 2 describes the amended formal setup using Lewis' semantics. Sections 3 to 6 present the proposal and discuss counterexamples. Section 7 offers

[5] This taxonomy is not exclusive. The insensitivity condition of Woodward (2006) as well as the proportionality condition of Bontly (2005), or Shapiro and Sober (2012) may be interpreted as working on the level of pragmatics.

reasons in support of the Weak Centering assumption. Section 8 illustrates the proposal as an abstraction of existing solutions. Section 9 concludes.

Many ideas on which this current paper draws already exist at different places in the literature, but they have not yet been put to work together and brought to bear on the topic of causation by omission.[6] One central idea can be found in List and Menzies (2009), who propose a definition of causation that relies on Weak Centering. But their paper only addresses the exclusion problem for mental causation. In pursuit of my first aim, I examine how their framework addresses the problem of omissions. This is not a straight-forward application but requires careful discussion. Another insight central for this current paper can be found in the earlier work of Menzies (2004). But Menzies' concern was a different one: He wanted to show that the causal relation is not absolute. Moreover, Menzies (2004) in fact rejected any kind of centering assumption entertained by Lewis (1973a) and he contended that his proposal does not offer a solution to the problem of profligate omissions.[7] Hence, Menzies' approach does not cohere with the second aim of this current paper. Instead, my paper goes beyond this published work by aiming to show that the framework of evaluating causal claims presented by List and Menzies (2009) is surprisingly ecumenical when it is applied to causation by omission. However, this ecumenism may come at the price of substantive commitments and insights. Due to its noncommittal stance on ontological question of causation, the proposal in this paper may not constitute a full solution to the problem of profligate omissions, let alone an analysis of causation.[8]

Despite being largely technical in form, the proposal makes one substantive commitment on the ontology of causation: The proposal denies that causation is a natural (i.e. extensional,

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[6] In the final stages of preparing this paper for publication in this journal, I came across another paper by Peter Menzies (2011), in which he suggests a proposal that is largely identical to the one proposed here and applies it, among other things, to the problem of profligate omissions.

[7] Menzies (2004, 175) writes that "the absence of any factor that could be regarded as an interferer [such as the presence of nerve gas] can, in the right circumstances, act as a difference-maker for my writing at my computer". In other words, Menzies proposal would mandate that the absence of nerve gas in your room is a cause of you reading this paper.

[8] The proposal is incomplete in that it leaves open substantive assumptions about the distance ordering of the semantics. The task of interpreting the distance ordering—together with any formal characterization of the notion of "distance"—is notoriously difficult and I do not undertake any such attempt here.

contingent, mind-independent, non-evaluative) relation between events.[9] But this denies nothing of great importance. The idea that causation *is* a natural relation between events is largely a philosophers' platitude that is not "part of the folk conception of causation" (Menzies 2010, 342). To make matters worse, this philosopher's platitude creates several theoretical problems (Menzies 2010). By denying this platitude, the proposal not only avoids these problems but accommodates empirical evidence which suggests that causal facts are grounded in moral facts (Hitchcock and Knobe 2010; Menzies 2011; Henne, Pinillos, and Brigard 2017). The proposal is hence compatible with distance orderings that incorporate moral or evaluative considerations. This substantive commitment has hence significant benefits for few, if any, theoretical costs.

2 Setup

A counterfactual, such as "if it were the case that ____, then it would be the case that ____", for the purposes here, is a connective between two propositions, *A* and *B* (Lewis 1973a, 27–31). Propositions *A* and *B* are represented as sets of possibilities, that is, set of possible worlds. An *A*-world is a world in which *A* is the case; that is, it is a member of the set that represents *A*.

The truth of a counterfactual conditional is assessed relative to one particular possible world ω, for example, the actual world. Whether a conditional is true in the actual world depends on whether its antecedent *A* and its consequent *B* are true in worlds that are close to the actual world. Crucially, the notion of closeness here must be understood as an technical notion that encodes much of what is important in determining the truth of such conditionals and that can be given multiple substantive interpretations (cf. Williamson 2009, 9), and *not* as overall similarity. Centered on the actual world is a system of spheres that includes all possible worlds. The spheres are nested within each other and there is an innermost sphere that includes all worlds that are as close to the actual world as the actual world is to itself.[10]

A conditional of the form "if it were the case that *A*, then it would be the case that *B*" is true in a world ω if and only if either (i.) *A* is not possible—that is, there is no *A*-world in the set of all

[9] Another option: Instead of denying that causation is a natural relation between events, one could argue that there is a difference between causation and causal explanation, concede that this paper concerns only the latter, and hence maintain that causation *proper* is a natural relation between events.

[10] Strictly speaking, the assumption is that there is such a system for *any* possibility. But to ease the exposition I will mostly just talk of the actual world.

possible worlds—or (ii) *all A*-worlds in the smallest sphere that includes *A*-worlds are also *B*-worlds. These are the truth conditions for counterfactuals.

The central assumption here concerns the innermost sphere of possible worlds. In its standard version, the semantics assumes that this innermost sphere is a singleton, that is, it comprises exactly one world. This assumption is called *Strong Centering*. Strong Centering is supported by an interpretation I reject, namely, that of interpreting "closeness" or "distance" as overall similarity.[11] Instead, I assume *Weak Centering*, that is, that the innermost sphere of possibilities contains other worlds in addition to the actual world.[12]

For an initial motivation of Weak Centering—I return to this issue in more detail in Section 7—consider how Hart and Honoré (1959, 35–37), following a long tradition, suggest that in assessing the question of which omissions are causes, we tend to contrast what in fact occurs with what *normally* or reliably happens in similar situations. The idea is, firstly, that there is an appropriate way to assess likelihood or normality.[13] In the case of watering your plant, the intuitive judgment is that it is normal that Peter waters your plant but that it is *not normal* that the Queen waters your plant. More fundamentally, the idea is, secondly, that the situation, or the system, is described in a coarse-grained fashion: either something is normal, or it is not. *Weak centering is one way to incorporate this idea at the level of semantics*.[14] To avoid the vocabulary of "normal", call the set of worlds that is the innermost sphere of worlds, including the actual world, "proximal possibilities". Call "remote possibilities" all other worlds that are outside this innermost sphere. The proposal that I put forward rests on this dichotomy between proximal and distant possibilities and it requires that there exists such an innermost sphere of possibilities.

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[11] The motivation is thus: No world is more similar to the actual world than the actual world is similar to itself. This motivation does not carry over when the ordering is one of closeness instead of similarity.

[12] To be precise, this is but an interpretation of the Weak Centering assumption. The assumption itself says that for all worlds ω, ω is at least as close to itself as every other world.

[13] A more rigorous account of normality is provided by Menzies (2004, 160–69), who defines normality relative to a causal model. See also Menzies (2011, 196–201) for a motivation based in psychological evidence.

[14] Clearly, although Weak Centering is one way, it is not the only way.

3 Intuitive Presentation

The problem of profligate omissions shows that a supposedly sufficient condition for causation over-generates. Instead of Weak Dependence, consider the following necessary and sufficient conditions for causation. (Although I state the necessary condition here, it is not central to my argument.)

> Strong Dependence.
> *c* is a cause of *e* if and only if
> 1. had *c* not occurred, then *e* would not have occurred, and
> 2. had *c* occurred, then *e* would have occurred.

Strong Dependence is how Lewis (1973b, 563) defines causal dependence (but not causation). Yet, Strong Dependence has not been explored in full in the literature on profligate omissions, especially not within the context of Lewis' semantics.[15] One reason for this is that on Lewis' popular analysis, Strong Dependence is equivalent to Weak Dependence. This is because Lewis assumes Strong Centering, which in turn implies that the set of proximal possibilities consists only of the actual world, which in turn makes the second condition of Strong Dependence "automatically true because its antecedent and its consequent are true" (Lewis 1973b, 563). This second condition is a *factual conditional*, since *c* and *e* both occur in the actual world. Strictly speaking, the causal relation is hence not defined in terms of *counter*factuals.

Because the second conditional is factual, terminological conventions should be adjusted accordingly. In conditionals, the past perfect "had *c* occurred" implies that *c* did *not* occur. But because *c did* occur, the statement must be expressed using the past tense instead. This use of the past tense follows Lewis' (1973a, 2) initial reading of conditionals and is also the terminological convention of Woodward (2006)—although specifically for insensitive causation. I likewise write from here on "if Peter were to" instead of "if Peter had". This terminological convention moreover aligns with how the semantics operates under Weak Centering. Interpretationally, Weak Centering invites reasoning about a situation in a way that takes into account more than what *actually* occurs. The terminological convention of "were" reflects this idea. Finally, this rather procrustean use of

[15] It has been investigated elsewhere, however. Menzies (2004) uses a kind of counterfactual dependence but rejects Lewis' semantics of counterfactuals. Beebee (2004, 298–300) argues against a proposal similar to the present one, yet without situating it rigorously in Lewis' semantics—I return to her objection later. Menzies (2011, 193–95) argues for Weak Centering in Lewis' semantics to discuss the problem of profligate omissions, yet among several other problems (I came across this chapter only in the last stages of revising this paper).

"were", when it is used for counterfactuals, shall also remind us that the proposal here does not aim to account for the use of counterfactuals in natural language. Rather, the aim of this paper is to adapt a formal framework to evaluate causal claims.

One risk of such a procrustean use is that this change in locution to "were" might influence intuitive judgements about the truth of counterfactuals. But the argument here does not rely on such intuitive judgments. Instead, the argument relies on assumptions of what is possible, the existence of certain proximal possibilities (see Section 4), and the Weak Centering assumption of the semantics.

Let me postpone a discussion of the motivation of Weak Centering until Section 7 and let us see instead what Strong Dependence has to say to the problem of profligate omissions. Consider the following four statements.

(1) If Peter were to water the plant, it would live.
(2) If Peter were not to water the plant, it would die.

If statements 1 and 2 are true, then according to Strong Dependence Peter's omission, his not watering the plant, is a cause of the plant's death. Similarly, the Queen's omission of not watering the plant is a cause of the plant's death if the following two statements are true.

(3) If the Queen were to water the plant, it would live.
(4) If the Queen were not to water the plant, it would die.

Peter's omission is a cause of the plant's death, but the Queen's omission is not, if statements 1 to 3 are true but *statement 4 is false*. I will first present the intuitions that are invoked to evaluate the truth values of these statements and, in a second step, develop these intuitions into three general assumptions (formal conditions to be imposed on the distance ordering).

Consider statement 1 first. This statement is an instance of the first condition of Strong Dependence. As before, it appears to be true. If Peter were to water the plant, it would live. This is because in all relevant possibilities the plant dies only because it is not watered. So, if someone came along and watered it, it would live. Consider now statement 2. This statement appears to be true as well. In all relevant possibilities that we consider (more on that in a minute), there is no one other than Peter to water the plant. It might be a remote possibility that someone else waters the plant, but this is not a proximal possibility. So, unless Peter waters the plant, it dies. So far, Strong Dependence agrees nicely with the idea that omissions can be causes insofar as it implies that Peter's omission is a cause of the plant's death.

Consider now statement 3. This statement appears true for the same reason statement 1 is true. Assuming that the plant would live if *someone* watered it, the plant would live if the Queen watered it. Now consider statement 4. This statement needs to be false in order to obtain the result that the

Queen's omission is *not* a cause of the plant's death. Now consider this: Although Peter in fact does not water the plant, Peter might show up and water the plant even if the Queen does not. It is not the case that the plant would die if the Queen were not to water it because Peter might show up as promised and water the plant.[16]

When thinking in this way, we set aside what actually happened and evaluate statement 4 by considering not only the actual world but also other possibilities, and in some of those other possibilities Peter shows up and waters the plant (cf. Williamson 2007, 134–55; Bernstein 2014a, 9). When considering a broader range of relevant possibilities, it seems true that the plant might live despite the Queen not watering it. This is the way in which the second condition is false and the reason for why the Queen's omission is not a cause of the plant's death.

Strong Dependence hence allows that omissions are causes without over-generating. The proposal hence *can*—but need not necessarily—accommodate the intuition that Peter's omission *is* but the Queen's omission is *not* a cause of the plant's death. Strong Dependence then appears to be a more plausible sufficient condition for causation.

It is important to note: The topic here is omissions not failures. I do not consider statements involving the expression of whose "failure" it is that the plant was not watered. Causal and counterfactual intuitions might differ when the statements are given using the normatively or evaluatively tinged expression of "failure".

4 Formal Development

This intuitive treatment can be stated more rigorously in the form of assumptions. The assumptions represent, within the setup above, the formal structure that existing solutions share. Technically, these assumptions impose restrictions on the distance ordering over possible worlds. Stating the proposal in this form will not only help see the proposal clearly but it also allows to structure possible objections systematically. The rejection of the first two assumptions—both individually and together—leads to a distinct respective family of counterexamples.[17] Recall that "*A* is

[16] I do not take this as a basic assumption, nor do I rely on intuitive judgments that statement 4 is false. In fact, I acknowledge that this reasoning could also be turned against Peter (if statement 2 is denied). I consider this possibility as the objection of "more than one possible preventer" in Section 6.2.

[17] Strictly speaking, these assumptions are not necessary to solve the problem of profligate omissions. What matters is not proximal possibility to the actual world of either worlds in which Peter or the Queen waters the plant. Instead, what matters to solve the problem of omissions is the

proximally possible" means that there is an *A*-world within the innermost sphere of possibilities, that is, an *A*-world that is as close to the actual world as the actual world is to itself.

Assumption I. It is proximally possible that Peter waters the plant.
Assumption II. It is not proximally possible that the Queen waters the plant.
Assumption III. If Peter were to water the plant, it would live.

Whether Assumptions I and II are true depends on how coarse-grained the distance relation over possible worlds is. The ordering needs to be coarse-grained enough to make Assumption I true but not so coarse-grained to make Assumption II false. As mentioned before, specifying systematically how the distance ordering is generated is not a task to be undertaken here. This could be a problem, as Beebee (2004, 299) worries, if there just is "no sensible way of specifying" the relevant interpretation of the distance ordering. But whether a distance ordering can be specified is a much broader issue that needs to be left aside for present purposes.[18]

Assumption III, finally, makes a very straightforward stipulation. It assumes that statement 1 is true. Using Assumptions I to III in Lewis' semantics for counterfactuals with Weak Centering, statement 4 is false.

Statement 4 stated that if the Queen were not to water the plant, the plant would die. This statement meets neither of the two truth conditions for counterfactuals. First, the statement is not vacuously true, as it does not meet the first of the truth conditions for counterfactuals. There are worlds in which the Queen does *not* water the plant (by Assumption II). Therefore, the first of the truth conditions for counterfactuals is not met. Moreover, also the second condition of the truth conditions is not met. There are worlds where the Queen does not water the plant and yet the plant does *not* die. The worlds are those in the smallest sphere that permits the antecedent of the counterfactual in statement 4 to be true. This is the sphere of proximal possibility. All worlds in the sphere of proximal possibility are worlds in which the Queen does not water your plant (by Assumption II). But there are worlds where the plant lives because it is a proximal possibility that Peter waters your plant (by Assumption I). And if Peter does water the plant, then the plant will live (by Assumption III). Hence, there are worlds in the sphere of proximal possibility in which

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relative proximity of the closest worlds in which Peter waters the plant and worlds in which the Queen waters the plant to each other. I still make these assumptions in this way because they allow an exposition of the framework that is easier to follow and provide a novel taxonomy of objections (see below).

[18] Furthermore, for one detailed account of how to specify the distance ordering see Menzies (2004).

the Queen does *not* water the plant but the plant lives. Therefore, statement 4 is false. Figure 1 illustrates the situation.

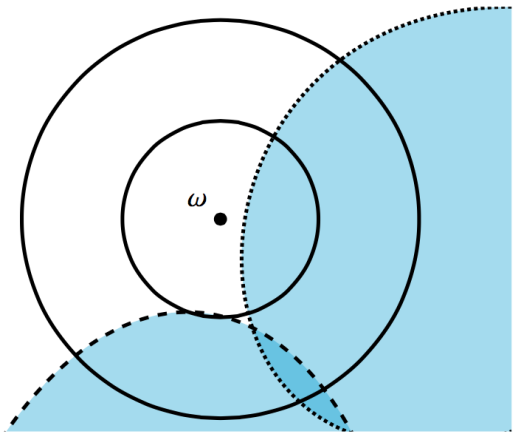

Figure 1: Nearby possible worlds around the actual world ω.

In Figure 1, the dot shows the actual world ω in the space of possible worlds. The inner circle is the sphere of proximal possibility. The shaded region covers worlds in which the plant lives, while the white region covers worlds in which the plant dies. To the right of the finely dotted line are worlds in which your plant is watered by Peter. Below the coarsely dashed line are worlds in which your plant is watered by the Queen.

Note that in the situation depicted in Figure 1, statements 1 to 3 are true and only statement 4 is false. In all worlds in which Peter waters the plant, the plant lives (statement 1 is true). Moreover, in all worlds in which the Queen waters the plant, the plant lives (statement 3 is true). In all proximally possible worlds (the inner circle) in which Peter does not water the plant, the plant dies (statement 2 is true).[19] Nevertheless, there are also proximally possible worlds in which the Queen does not water the plant, but the plant still lives (statement 4 is false). These are worlds in the shaded area in the inner circle to the right of and above the coarsely dotted line.

Strengthening dependence and weakening centering, together with some assumptions about the distance ordering, vindicates the idea that Peter's omission, i.e. his not watering your plant, *is* a cause of the plant's death, but the Queen's omission is *not*.

[19] Consider here the intersection of the inner circle and the area left of the finely dotted line.

5 Extensions to Other Cases

It can easily be seen that this proposal extends beyond the case of the Queen's omission. You might want to consider, for example, whether the Prince's omission of not watering the plant is a cause of the plant's death. Recall that when we started with Weak Dependence, anything that would prevent an effect counts as its cause. But when we adopt the proposal above, we get a result parallel to that of the Queen for the Prince.

To see how the proposal generalizes, suppose Jones' omission of not closing the fire doors is a cause of the raging fire that destroyed the building.[20] The intuitively compelling judgment might be that Jones' omission of not closing the fire doors is a cause of the building's destruction but that the Queen's omission of not closing the fire doors is not. We can amend the three assumptions above to fit the new case by substituting the descriptions of the new causal relata for the old ones as follows. First, it is proximally possible that Jones closes the fire doors. Second, it is not proximally possible that the Queen closes the fire doors. Third, if Jones were to close the fire doors, the building would not be destroyed.

Now with the three assumptions adapted to the new case, we can make the same argument as above. Jones' omission is a cause of the building's destruction, but the Queen's omission is not. Even if neither the Queen nor Jones actually close the fire doors, Jones might close them, and the fire would not destroy the building. For further cases, we can resolve the problem of profligate omissions in the same way whenever the three assumptions hold. But what about those cases when these assumptions about the distance ordering do not hold? What if there are no or even several proximal possibilities?

Or suppose you are currently reading at your desk. One worry of profligate omission might be that the absence of nerve gas is a cause of you reading at your desk. After all, if there were nerve gas present in your room, you would not be reading at your desk.[21] But the absence of nerve gas is *not* a cause of you reading at your desk if it is a proximal possibility that you might not be reading at your desk. If this *is* a proximal possibility then it is not the case that if nerve gas were absent, then you would be reading at your desk. Instead, it is a proximal possibility that there is no nerve gas in your room, and you also are not reading at your desk. It follows then that the absence of nerve gas does not stand in the strong dependence relation to you reading at your desk and it is, hence, not a cause of you reading at your desk.

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[20] This case is from Beebee (2004).

[21] This case is from Menzies (2004).

There might be some disagreement over whether intuitively the absence of nerve gas should be a cause of you reading at your desk. If the absence of nerve gas were to count as a cause, it seems that omissions would profligate again as causes. The condition of causation would still seem to over-generate.

Without taking an official stance on the matter of what causal judgment is correct, this case of the nerve gas is worthwhile to examine for two reasons. First, it illustrates how the present proposal extends to cases in which the actual situation is described by an action instead of an omission (you read at your desk—an action—in contrast to Peter *not* watering the plant or Jones *not* closing the fire doors, which are omissions). Second, the case highlights an instance in which the present proposal treats a case differently from Menzies (2004). On Menzies' view, proximal possibilities are homogenous in the sense that relevant factors of a given situation are identical. The reason for this is that Menzies (2004, 160–66) takes proximal possibilities to be given by a model that evolves in lawful and deterministic ways such that the relevant factors have respectively identical values.[22] In contrast to Menzies (2004), my proposal above allows that the worlds in the sphere of proximal possibility differ in significant respects and count all as proximal possibilities nonetheless. *Some* are worlds in which Peter waters the plant, some are worlds in which he does not. Some are worlds in which you read at your desk, some are not. In this way, the present proposal is more resistant to profligate omissions than the proposal as stated by Menzies (2004).[23]

6 Counterexamples

Three kinds of counterexamples loom. In counterexamples of the first kind, the sphere of proximal possibility is empty of preventers. Imagine that Peter's watering the plant would be, just like the Queen's, only a remote possibility. There is no event that is proximally possible and that, if it were to occur, would prevent the effect. In the second kind of counterexample, there is more than one proximally possible preventer. Suppose that in addition to Peter, it is also proximally possible that your friend Anne waters your plant. Finally, in the third kind of counterexample, the possibilities are inverted. Suppose the Queen's (or Anne's) watering the plant is a proximal possibility and

[22] Instead of "proximal possibilities" Menzies (2004, 160) calls this the "field of normal conditions". But the ideas are largely analogous; except for the fact that I assume that this sphere of possibilities includes the actual world whereas Menzies (2004, 162) explicitly rejects this idea.

[23] In the later paper with List (2009), the proximal possibilities contain worlds that different in relevant respects. This is the proposal that I use here.

Peter's watering the plant is only a remote possibility. I discuss each of these counterexamples in turn.

6.1 No Proximal Preventer

Suppose that Peter promised to water your plant even though Peter has a terrible allergy and cannot go anywhere near your plant. In this case it is not proximally possible that Peter waters your plant and the problem of profligate omissions returns. Technically, both conditions of Strong Dependence are met for all possible preventers. For any possible preventer, it is true by definition that if this preventer actually occurred, then the plant's death would *not* occur (first condition). It is also true, given that there is no proximally possible preventer, that if this preventer were not to occur, the plant would die (second condition). In other words, this counterexample attacks Assumption I. It argues that Peter's watering the plant is only a remote possibility and that the plant dries up in all proximally possible worlds.

This counterexample implicitly mandates a certain level of grain to the distance ordering. Recall that Assumption I is true when the distance ordering is sufficiently coarse-grained, that is, when the sphere of proximal possibility is large enough. The problem of profligate omissions does not arise when we can distinguish between proximal and remote possibilities such that there are some proximal possibilities that would prevent a given effect. So, one could respond to the objection by saying that the objection gets the distinction between proximal and remote possibilities wrong. It is a proximal possibility that Peter waters the plant, contrary to what the objection supposes. But on what basis can it be said that the distinction between proximal and remote possibilities is drawn in the wrong place? What would be the right way to distinguish between proximal and remote possibilities?

A more robust understanding of proximal and remote possibilities is needed. So far, proximal and remote possibilities were distinguished in a purely formal way. Proximal possibilities are those possibilities in the innermost sphere of distance from the actual world. Now the distance ordering needs to be interpreted to be able to argue, with this interpretation in hand, that the objection gets the distinction between proximal and remote possibilities wrong.

As a first step, choose your preferred interpretation of what the distance ordering represents. One plausible candidate would be Menzies' (2004) account of the normal evolution of a causal

model.[24] Another candidate would be to encode Woodward's (2006) account of sensitivity in the distance ordering. In this paper, in order to obtain an abstraction, I remain officially uncommitted as to which the overall right interpretation is. Let us say, fitting the proposal of Bennett (1988, 133) into the formal framework, we interpret the distance ordering as encoding epistemic salience. The fact that Peter is allergic to your plant is irrelevant to whether Peter's watering the plant is proximally possible. Because Peter promised to water your plant and because of the way the situation is presented, Peter's watering the plant is epistemically salient, and the Queen's omission is not. Therefore, on the interpretation of proximal possibilities as epistemically salient possibilities and unlike what the objection suggests, Peter's watering the plant is a proximal possibility, but the Queen's watering is not.

Alternatively, recovering the solution of McGrath (2005), interpret the distance ordering as encoding what agents ought to do. Proximal possibilities are those actions that ought to be done. Hence, because Peter promised to do so, Peter's watering the plant is a proximal possibility, but the Queen's is not.

The proposal here can furthermore accommodate distance orderings that lead to different causal judgments; such as the ordering described by Lewis (1979).[25] On such an ordering, since Peter cannot water the plant because of his allergy, someone else's omission might be a cause of the plant's death instead—even if this other person, unlike Peter, did not promise to water the plant. This is the case of "inverted possibilities" that I return to shortly (Section 6.3). For now, it shall suffice to say: The present proposal is not wedded to salvaging the intuition that Peter's omission is cause of the plant's death. Instead, the aim is to stop the over-generation of causal claims — that is, the aim is to address the problem of profligate omissions. Whether the resulting theory of causation is intuitively plausible is another matter; a matter that depends crucially on the underlying distance ordering over possible worlds.

This illustrates a general way in which counterexamples of this first kind can be addressed. First, interpret the distance ordering. Second, argue with this interpretation against one of the objection's central premises. In sum, the response to this first objection is to defeat it with your

[24] Although not quite, as we have just seen. To allow that the sphere of proximal possibility includes worlds that differ in relevant respects, Menzies' (2004) account of the normal evolution of a causal model would have to be amended.

[25] I refer to Lewis (1979) only for illustration. I do not suggest that this is a candidate for the correct distance ordering.

favorite interpretation of the distance ordering.[26] In more general terms: On the picture sketched here, the problem of profligate omissions can be addressed by the right description of the causal system. The description needs to be grained in such a way that there is exactly one proximal preventer.

6.2 More than one Proximal Preventer

In the second kind of counterexample, there exist two or more proximally possible preventers. Suppose that your neighbor Anne cares greatly about plants. Unlike Peter, she has not promised to water your plant, but it is proximally possible that she waters it anyway. In this case, there are two possible preventers in Anne and Peter. This counterexample attacks Assumption II above which requires that the alternative preventer is not proximally possible.

In this case, Anne greatly cares about plants and neither Anne's omission nor Peter's omission is a cause of the plant's death. Each of their preventions does not meet the second condition of Strong Dependence. It is *not* the case that if the respective omission were to occur, the plant would die. If Peter were not to water the plant, Anne might water it. Likewise, if Anne were not to water the plant, Peter might water it. Both respective preventions are proximally possible and stand in the way of either being a cause of the plant's death. The counterexample hence purports to show that there are *too few* causes.

This objection parallels cases of redundant causation (cf. Lewis 1987; Schaffer 2003).[27] The definition of causation gives us no cause where there should be some. In other words, the problem of profligate omissions is a problem *over*-generation and hence pertains to the sufficient condition of the definition of causation. The problem of redundant causation, in contrast, is one of *under*-generation. This problem pertains to the necessary condition of the definition. In this paper, I defend the sufficient condition for causation. The problem of redundant causation has been addressed elsewhere.

In sum, this second kind of counterexample raises a problem for a definition of causation as Strong Dependence that is orthogonal to the problem of profligate omissions. The counterexample raises the problem of redundant causation and overdetermination. But, for the purposes here, I have not committed to Strong Dependence as a definition of causation. The problem of profligate

[26] I showed how some interpretations defeat the objection in this way. I do not claim that each interpretation of the distance ordering can defeat this kind of counterexample in this way.

[27] Although the present case of more than one proximal preventer differs from overdetermination cases insofar as neither Anne nor Peter actually waters the plant.

omissions arises when Weak Dependence is taken to be sufficient for causation. The proposed amendment is to add a second conjunct (2.) to this sufficient condition, (one direction of Strong Dependence). But that the conjunction of the two clauses of Strong Dependence are together sufficient for causation does not mean that each is necessary. In virtue of being a counterexample of under-generation, this second kind of counterexample is a problem attacking Strong Dependence as a necessary condition—parallel to that of redundant causation—and hence distinct from the one that is my concern here.[28]

6.3 Inverted Possibilities

In the third kind of counterexample the possibilities are inverted. This counterexample results from denying both Assumption I and Assumption II. For illustration, consider again your neighbor Anne instead of the Queen. Suppose that even though Peter promised to water your plant, Peter is severely allergic to your plant and it is therefore not proximally possible that Peter waters it. Instead, it is a proximal possibility that your neighbor Anne waters the plant. She has spare keys to your house and an aptitude for horticulture. But, alas, she does not water the plant and it dries up and dies. According to the proposal above, Anne's omission of not watering the plant *is* a cause of the plant's death but Peter's omission is not.

The objection is that these judgments conflict with intuitions. Intuitively, Peter's omission counts as a cause of the plant's death (because he promised to water it) but Anne's omission does not. In other words, the objection is that normative facts matter. Judgments about causation in cases of promises should take the fact that a promise has been given into account: That Peter promised to water the plant is relevant for, or even explains, why it was *his* omission that caused the plant's death.

I recognize the strength of this objection. Judgments about causation are sensitive to normative facts. My response comes in three steps.

First, it should be noted that the objection seems to accept that the problem of profligate omissions has been solved. Whereas before causes over-generated, there is now exactly one cause: Anne's omission to not water your plant caused your plant's death. The objection hence does not

[28] I included the necessary component of Strong Dependence only to show that the Queen and other omissions do *not* cause the death of the plant. But, strictly speaking, this assumption need not be made, and it need not be show that the Queen is *not* a cause. It would have been enough to show that the proposed amendment to the sufficient condition of causation is such that the problem of profligate omissions does not arise anymore.

raise the problem of profligate omissions again. The objection is instead that the solution to the problem of profligate omissions has been bought at the price of consistency with intuitive judgments about causation.

Second, the objection errs in assuming that the proposal above rules out that causation depends on normative facts. Instead, as discussed in Section 6.1, the proposal can recover the solution of McGrath (2005), for example, by interpreting the underlying distance ordering as encoding what agents ought to do. The proposal here therefore need not conflict with intuitive judgments. Whether the proposal does conflict, depends on the distance ordering—a topic that was deliberately left open here.

Third, the conflict with intuitive judgments might be acceptable. One could argue—contrary to what the objection contends but in line with a form of causal naturalism—that judgments about causation should *not* be sensitive to moral facts. One would then respond to the objection that the judgments of the proposal above are exactly right because causation ought to guide intervention. Causation encodes information about what would have to be done in order to change a given effect. If you want your plant to live, your best bet is to get Anne to water it. Never mind that Peter promised to do it. On this metatheoretical assumption—that one role of causation is to guide intervention—the present proposal, paired with a non-normative distance ordering, picks out the proximal preventer correctly, even if it may go against intuitions or common-sense judgments.

Be that as it may, the key upshot is that this third objection seems to agree that the proposal described above achieves its aim. When we assume Weak Centering, accept a distinction between proximal and distant possibilities, and find an appropriate granularity in the description of the causal system, then the problem of profligate omissions can be solved. This is what many existing solutions to the problem seem to have in common. Some of these solutions may conflict with intuitions. Answering this objection can be left to them.

7 Motivation for Weak Centering

I now return to the question of how to interpret and motivate Weak Centering. Weak Centering seems to imply something quite implausible especially when the distance ordering is substantively interpreted as encoding similarity (cf. Bennett 1974; Walters 2016). Under Weak Centering, the possible world in which Peter does water the plant is taken to be just as distant from the actual world in which Peter does not water the plant as the actual world is distant from itself. Lewis (1973a, 29), interpreting the distance ordering as overall similarity, writes in defense of Weak Centering that "perhaps our discriminations of similarity are rather coarse, and some worlds

different from ω are enough like ω so that such small differences as there are fail to register".[29] But, as is well-known, interpreting the distance ordering as encoding overall similarity runs into serious problems and is therefore considered implausible: The differences between worlds where Peter does not and worlds where Peter does water the plant are not "small differences" and they can hardly "fail to register". Hence, Weak Centering conflicts with understanding "distance" as overall similarity.

The distance ordering thus must not be interpreted as a similarity ordering (cf. Williamson 2009, 9). Or as Stalnaker (1987, 127) puts it: "[T]he intuitive notion of overall similarity between possible worlds ... is not the one that is relevant to the interpretation of counterfactual conditionals". For the purposes here, there may be obvious and significant differences between two worlds, and yet they may be taken to be equally distant for the purposes of interpreting causal claims.[30] To not invite confusions between distance and similarity, I speak of a "distance ordering" or a "distance relation" over possible worlds. Of course, the question remains of how this distance between worlds should be interpreted if it is not interpreted as some sort of similarity. I return to this question once more in the next section. Let me first get the case in favor of Weak Centering into view.

The argument in favor of Weak Centering is a pragmatic or instrumental one: Weak Centering helps to give the right answer, namely, that—in the original case—the Queen's omission is *not* a cause of the plant's death. The argument that I support suggests that the semantics, by which we operationalize the definition of causation, should be adjusted in order to accommodate *some* intuitive judgments about causation (namely, that the Queen does not cause the plant's death). This instrumentalist approach contrasts with a revisionist approach mandating that intuitive judgments need to give way to implications of the theory: all possible preventers would count as causes of the plant's death. Whether or not normative facts should matter for causation, judgments about the Queen not being a cause (and similar judgments) should be taken seriously (cf. Henne, Pinillos, and Brigard 2017). In this sense, I follow the instrumentalist approach and adopt Weak Centering to accommodate that some—but only some—omissions can be causes.[31]

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[29] Notation in this quote is adapted.

[30] Using the expression "similarity" for what we called "distance", Walters (2016) writes that "similarity here is a technical notion". I prefer to use a neutral term instead of borrowing the term "similarity" and replacing its common meaning with a technical meaning.

[31] The proposal above is not uniquely mandated by such an instrumentalist approach. Yet, given that the proposal is more abstract than existing solutions, it can be seen as a minimal move. Note also that the argument here does not necessarily rely on the instrumentalist approach. The proposal

It should be noted that in addition to the instrumentalist argument, also a coherentist argument for Weak Centering might be available. Williamson (2007) suggests Weak Centering for an account of modality. Menzies (2011, 194) defends Weak Centering because it avoids reducing the truth conditions of counterfactuals with true antecedents "to those of the corresponding material conditional", because it avoids validating the problematic inference rule of the Strengthening of the Antecedent for counterfactuals with true antecedents, and because it avoids several problems for Lewis' theory of causation. Finally, Stefánsson (2014) argues for Weak Centering to make Lewis' semantics consistent with the thesis of Humean Supervenience.

Unfortunately, assuming Weak Centering instead of Strong Centering has a price. Even if it works well in interpreting causal claims, Weak Centering might not be a good assumption for the semantics of counterfactuals more generally (cf. Walters 2016). The instrumentalist case for Weak Centering might be restricted to causal counterfactuals as a special case of counterfactuals more generally. Consequently, a gap opens in the landscape of theories between semantics for counterfactual conditionals generally and special-purpose semantics to operationalize definitions of causation.

Is this price for Weak Centering too high? The answer depends on your valuation of certain theoretical virtues. The price is too high if you assign a high value to theoretical unity. But the price will be outweighed by the benefits if you assign a high value to making counterfactual theories of causation work in line with the intuitive idea that some omissions can be causes. This part of the conflict over Weak Centering is situated in larger metatheoretical issues that are beyond the scope of this paper.

8 Related Proposals

The proposal here is similar in spirit to what Beebee (2004, 298–300) and McGrath (2005, 134–36) discuss as "proximal would-be prevention". Yet the proposal here also differs in some ways from theirs. The proposal here operationalizes the sufficient condition for causation using semantics for counterfactual conditionals. Neither McGrath nor Beebee aim at solving the problem of profligate omissions by improving on existing counterfactual theories of causation. They do not discuss Strong Dependence or a similar condition of two conditionals. Yet given the similarities, my proposal might be seen as a formalization of the notions of a "proximal would-be preventer" (McGrath) or "reasonably close" (Beebee).

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above can also leave the semantics unchanged and instead be interpreted as a theory of pragmatics providing assertibility conditions (cf. Lewis 2000; McGrath 2005, 145–46; Walters 2016).

Likewise, Strong Dependence can be seen as abstracting some extant solutions. Depending on how the formal framework is interpreted—in particular the distance ordering over possible worlds — some existing solutions can be recovered. For example, you could interpret the distance ordering in a way that makes proximal possibilities represent what is normal. You could understand "normal" either in an epistemic sense as what is likely, or you could understand it in a normative sense as what should be the case. Under these interpretations, we would get solutions similar in spirit to that of Bennett (1988, 133) and McGrath (2005), respectively.

The formal framework could also be employed as a solution to the problem of profligate omissions on the level of pragmatics. What counts as proximal possibilities may then depend on the context in which statements about causation are made (cf. Kratzer 1977). The distance ordering could be interpreted as encoding either what statements are appropriate to assert, or what statements are true in a context. In turn, we would get solutions similar to that of Lewis (2000, 196) and Menzies (2004), respectively.

Next to those epistemic and pragmatic solutions is another class of solutions to the problem of profligate omissions that rely on the idea that cause and effect need to be proportional (Yablo 1992; Dowe 2010). The proposal here entails proportionality about causation and hence belongs in this class. Yet in contrast to other proportionality solutions, Strong Dependence does not formulate a proportionality condition explicitly. Instead, proportionality is implicit as a by-product of Strong Dependence (cf. List and Menzies 2009, 480). In this sense, Strong Dependence is simpler relative to existing ideas.

To illustrate the importance of only validating but not requiring a proportionality condition, consider how Dowe (2010) uses an explicit proportionality condition to address the problem of profligate omissions. In his proposal Dowe follows Yablo (1992) in defining proportionality in terms of the distinction between determinate and determinable properties. But this leads to problems. First, the determinate-determinable distinction itself is problematic (Menzies 2008, 202; Bernstein 2014b). Second, employing the distinction in this way presupposes a particular account of supervenience between higher- and lower-level properties, and rules out other theoretical alternatives of this relation (List and Menzies 2009, 480). Third, the particular formulation of proportionality in Dowe (2010) might result in his proposal facing another problem of profligacy (Bernstein 2014b).

Nevertheless, even if the proposal above does not assume proportionality explicitly in the way Yablo (1992) does, it still entails a proportionality condition. And there are several significant problems for such proportionality theories of causation (Maslen 2009; Shapiro and Sober 2012; Weslake 2013; Franklin-Hall 2016; McDonnell 2016; 2018). The proposal presented here might still be susceptible to these.

9 Conclusion

The problem of profligate omissions is an over-generation problem. Anything counts as a cause that does not actually occur but that, if it were to occur, would prevent something that actually occurs. This strikes many as implausible. The problem of profligate omissions stands next to the problem of overdetermination (aka redundant causation). Whereas the problem of overdetermination attacks counterfactual dependence as a *necessary* condition for causation (an *under*-generation problem), the problem of profligate omissions attacks counterfactual dependence as a *sufficient* condition for causation (an *over*-generation problem).

Several solutions to address the problem of profligate omissions have been put forward. The proposal of this paper is to introduce a semantical amendment to Lewis (1973b). Or rather: The idea is to *revert* to a setup of the semantics as Lewis (1973b) originally introduced it. The proposal is to use Weak Centering and, accordingly, to define causation in terms of two conditionals instead of one. This proposal can address the problem of profligate omissions. Because of Weak Centering, the actual world may not be the only world that is closest to the actual world. The sphere of proximal possibilities grows. As a result, factual counterfactuals—such as "if the Queen were not to water the plant, it would die"—that would otherwise have been true, may turn out to be false. When these counterfactuals concern causation, fewer causal claims are true. The path to Weak Centering is prepared by understanding the distance ordering over possible worlds as a purely technical notion and not as encoding overall similarity between worlds.

The proposal is by no means a full solution to the problem of profligate omissions. The proposal gives neither an interpretation nor a systematic formal characterization of the distance ordering. This has two reasons. First, giving a substantive account of distance orderings over possible worlds is a notoriously difficult task that goes beyond the scope of this paper. Second, the aim of this paper is to provide an abstraction from various existing solutions. The formal framework that I suggest, and specifically the distance ordering, can be interpreted in different ways to recover existing solutions based on normality, epistemic salience, or pragmatic admissibility. The proposal identifies a formal structure or common insight that different existing solutions share, in the hope that this helps to generalize and situate the existing proposals.

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References

Beebee, Helen. 2004. "Causing and Nothingness." In *Causation and Counterfactuals*, edited by John Collins, Edward Jonathan Hall, and Laurie Ann Paul, 291–308. Cambridge: The MIT Press.

Bennett, Jonathan Francis. 1974. "Counterfactuals and Possible Worlds." *Canadian Journal of Philosophy* 4 (2): 381–402. https://doi.org/10.1080/00455091.1974.10716947.

———. 1988. *Events and Their Names*. Hackett Publishing.

Bernstein, Sara. 2014a. "Omissions as Possibilities." *Philosophical Studies* 167 (1): 1–23. https://doi.org/10.1007/s11098-013-0229-0.

———. 2014b. "Two Problems for Proportionality about Omissions." *Dialectica* 68 (3): 429–41. https://doi.org/10.1111/1746-8361.12071.

Bontly, Thomas D. 2005. "Proportionality, Causation, and Exclusion." *Philosophia* 32 (1–4): 331–48. https://doi.org/10.1007/BF02641629.

Dowe, Phil. 2010. "Proportionality and Omissions." *Analysis* 70 (3): 446–51. https://doi.org/10.1093/analys/anq033.

Franklin-Hall, L. R. 2016. "High-Level Explanation and the Interventionist's 'Variables Problem.'" *The British Journal for the Philosophy of Science* 67 (2): 553–77. https://doi.org/10.1093/bjps/axu040.

Hart, H. L. A., and Tony Honoré. 1959. *Causation in the Law*. Oxford: Oxford University Press.

Henne, Paul, Ángel Pinillos, and Felipe De Brigard. 2017. "Cause by Omission and Norm: Not Watering Plants." *Australasian Journal of Philosophy* 95 (2): 270–83. https://doi.org/10.1080/00048402.2016.1182567.

Hitchcock, Christopher, and Joshua Knobe. 2010. "Cause and Norm." *The Journal of Philosophy* 106 (11): 587–612.

Kratzer, Angelika. 1977. "What 'must' and 'Can' Must and Can Mean." *Linguistics and Philosophy* 1 (3): 337–55.

Lewis, David. 1973a. *Counterfactuals*. Oxford: Wiley-Blackwell.

———. 1973b. "Causation." *The Journal of Philosophy* 70 (17): 556--567. https://doi.org/10.2307/2025310.

———. 1979. "Counterfactual Dependence and Time's Arrow." *Noûs* 13 (4): 455. https://doi.org/10.2307/2215339.

———. 1987. "Postscripts to 'Causation.'" In *Philosophical Papers: Volume II*, 172–213. Oxford: Oxford University Press.

———. 2000. "Causation as Influence." *The Journal of Philosophy* 97 (4): 182–97. https://doi.org/10.2307/2678389.

List, Christian, and Peter Menzies. 2009. "Non-Reductive Physicalism and the Limits of the Exclusion Principle." *The Journal of Philosophy* 106 (9): 475–502.

Maslen, Cei. 2009. "Proportionality and the Metaphysics of Causation." PhilSci Archive. http://philsci-archive.pitt.edu/4852/.

McDonnell, Neil. 2016. "Causal Exclusion and the Limits of Proportionality." *Philosophical Studies*, August, 1–16. https://doi.org/10.1007/s11098-016-0767-3.

———. 2018. "Transitivity and Proportionality in Causation." *Synthese* 195 (3): 1211–29. https://doi.org/10.1007/s11229-016-1263-1.

McGrath, Sarah. 2005. "Causation By Omission: A Dilemma." *Philosophical Studies* 123 (1–2): 125–48. https://doi.org/10.1007/s11098-004-5216-z.

Menzies, Peter. 2004. "Difference-Making in Context." In *Causation and Counterfactuals*, edited by John Collins, Edward Jonathan Hall, and Laurie Ann Paul, 139–80. Cambridge: The MIT Press.

———. 2008. "The Exclusion Problem, the Determination Relation, and Contrastive Causation." In *Being Reduced: New Essays on Reduction, Explanation, and Causation*, edited by Jakob Hohwy and Jesper Kallestrup, 196–217. Oxford: Oxford University Press.

———. 2010. “Platitudes and Counterexamples.” In *The Oxford Handbook of Causation*, edited by Helen Beebee, Christopher Hitchcock, and Peter Menzies. Vol. 1. Oxford: Oxford University Press. https://doi.org/10.1093/oxfordhb/9780199279739.003.0018.

———. 2011. “The Role of Counterfactual Dependence in Causal Judgements.” In *Understanding Counterfactuals, Understanding Causation: Issues in Philosophy and Psychology*, edited by Christoph Hoerl, Teresa McCormack, and Sarah R. Beck, 186–207. Oxford: Oxford University Press.

Pearl, Judea. 2000. *Causality: Models, Reasoning, and Inference*. New York: Cambridge University Press.

Schaffer, Jonathan. 2003. “Overdetermining Causes.” *Philosophical Studies* 114 (1–2): 23–45. https://doi.org/10.1023/A:1024457117218.

Shapiro, Larry, and Elliott Sober. 2012. “Against Proportionality.” *Analysis* 72 (1): 89–93. https://doi.org/10.1093/analys/anr135.

Stalnaker, Robert C. 1987. *Inquiry*. Cambridge: The MIT Press.

Stefánsson, H. Orri. 2014. “A Lewisian Trilemma.” *Ratio* 27 (3): 262–75. https://doi.org/10.1111/rati.12039.

Thomson, Judith Jarvis. 2003. “Causation: Omissions.” *Philosophy and Phenomenological Research* 66 (1): 81–103. https://doi.org/10.1111/j.1933-1592.2003.tb00244.x.

Walters, Lee. 2016. “Possible World Semantics and True-True Counterfactuals.” *Pacific Philosophical Quarterly* 97 (3): 322–46. https://doi.org/10.1111/papq.12067.

Weslake, Brad. 2013. “Proportionality, Contrast and Explanation.” *Australasian Journal of Philosophy* 91 (4): 785–97. https://doi.org/10.1080/00048402.2013.788045.

Williamson, Timothy. 2007. *The Philosophy of Philosophy*. Malden, MA: Blackwell Pub.

———. 2009. “Probability and Danger.” In *Amherst Lecture in Philosophy*, 1–35. http://www.amherstlecture.org/williamson2009/.

Woodward, James. 2003. *Making Things Happen: A Theory of Causal Explanation*. Oxford: Oxford University Press.

———. 2006. “Sensitive and Insensitive Causation.” *The Philosophical Review* 115 (1): 1–50.

Yablo, Stephen. 1992. “Mental Causation.” *The Philosophical Review* 101 (2): 245–80. https://doi.org/10.2307/2185535.