# Overdetermination and Causal Closure: A Defense of the Causal Argument for Physicalism

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## 1. Introduction

Among the arguments that have been proposed for physicalism, the "causal argument" developed in work by David Lewis (1966), David Papineau (2001), Jaegwon Kim (1998, 2005), and Daniel Stoljar (2011) is widely taken to be the most compelling. This is an empirical argument that aims to show how advances since the Scientific Revolution make physicalism a reasonable metaphysical position to hold. Recently, Justin Tiehen (2015) has raised an interesting objection to this argument that takes the form of a dilemma. Tiehen's ultimate conclusion is that at best, the causal argument is circular and so its premises cannot provide support for its conclusion, physicalism. The aim of the present paper is to respond to Tiehen's objection in order to provide a defense of the causal argument. Although there are several rather straightforward responses a physicalist can give to Tiehen's dilemma, consideration of this argument is worthwhile for clarifying the status of and motivation for the argument's key premise: the causal closure of the physical domain.

## 2. The Causal Argument for Physicalism

The canonical form of the causal argument was presented in Papineau's 2001 paper "The Rise of Physicalism," as an argument for reductive physicalism. As Papineau himself notes (2001, p. 11) and Tiehen agrees (2015, p. 2407), this argument can be rather straightforwardly modified so that its conclusion is a physicalism that is neutral on the question of reductionism vs. anti-reductionism. In this paper, I follow Tiehen in considering a version of the argument whose

conclusion is reductive physicalism, to avoid complications that don't bear on the present disagreement.

I will depart from Papineau's formulation (at least initially) in just one respect. Papineau's formulation of the causal argument starts from a non-epiphenomenalism premise about mental events, that mental events all have physical effects. It works from there to the conclusion that all mental events are identical to physical events. Since I am interested in physicalism as a comprehensive metaphysical position, not just a solution to the mind-body problem, I will instead start from a non-epiphenomenalism principle about events that are "putatively nonphysical," be they mental, biological, or what have you.

We may then state the causal argument as follows:

(Non-Epiphenomenalism) All putatively nonphysical events have physical effects.

(Causal Closure) Every physical event that has a cause at t has a physical cause at t.

(No Overdetermination) Putatively nonphysical events do not overdetermine their effects.

Therefore,

(Physicalism) All putatively nonphysical events are identical to physical events.

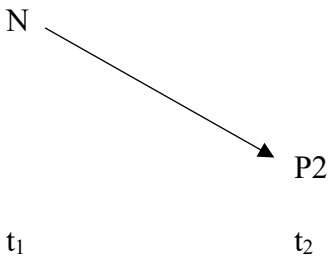
The key premise in this argument, the premise that required progress in the sciences of physics, chemistry, biology, and neuroscience in order to receive justification, is the second. This is what Papineau refers to as 'Causal Completeness' and Kim refers to as 'Causal Closure.' We will just call it 'CC' for short. The status of this principle will constitute the main subject of this paper.

Following Kim (1998) and Stoljar (2011), it is important to be clear how we are thinking about events in this argument. We want to make sure the conclusion is not just that every putatively nonphysical event has some true physical description, as Davidson (1970) tried to establish with his earlier causal argument for physicalism, but also that every putatively

nonphysical event-type or property is physical. The easiest way to do this is to be explicit that the events referred to in this argument are conceived in the Kimean way (Kim 1976) as property exemplifications. This means that we will take events to be nothing more than objects instantiating properties at times. For any events x and y to be identical, x and y must involve numerically the same objects instantiating numerically the same properties at the same time.

Assuming CC is established scientifically, and epiphenomenalism is off the table, the argument then proceeds intuitively as follows.[1] (The diagrams that follow are inspired by Kim (2005).) Consider a putatively nonphysical event N occurring at time $t_1$, and one of N's effects, a physical event P2 that occurs at time $t_2$.

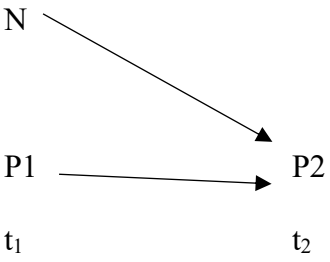
*Figure 1*




By CC, since P2 is a physical event, it must have a physical cause at $t_1$ as well. Call this cause P1.

[1] If one is not troubled by epiphenomenalism, then one will deny the first premise of the causal argument. Then if one wants to be a physicalist, one will have to find some other argument for physicalism. For now, I will follow Papineau and Tiehen in rejecting epiphenomenalism, while conceding that this paper doesn't present any argument against the view. But see footnote 3 for further discussion.

*Figure 2*




However, by the third premise of the argument, N cannot overdetermine P2. In other words, at $t_1$, there must only be one cause for the effect P2. Thus, N and P1 are not distinct causes. Rather N is identical to P1.[2]

*Figure 3*


Since there was nothing special about the putatively nonphysical cause N, the argument establishes the general conclusion, reductive physicalism: all putatively nonphysical events are identical to physical events.

3. Tiehen's Dilemma

[2] This is where we could easily modify the argument to have it lead us to physicalism of any sort, not just reductive physicalism. Following Bennett (2003), we could allow that if putatively nonphysical events are ontologically dependent on physical events, as the nonreductive physicalist thinks, then too, N and the physical event it is ontologically dependent on, do not overdetermine their effects, or do not overdetermine them in a way that the third premise means to rule out.

Tiehen's dilemma for the causal argument starts from the question: what is the metaphysical explanation of the argument's second premise, CC? Recall how we are understanding this principle:

(CC) Every physical event that has a cause at t, has a physical cause at t.

In answer to this question, Tiehen notes that any physicalist will accept the claim he calls 'P*.' This is a simple logical consequence of reductive physicalism. Tiehen states P* as:

(P*) Every event is physical.

Assuming that only events can be causes of events, P* logically implies CC. So, Tiehen argues, any physicalist should believe that P* metaphysically explains CC. But, Tiehen proposes, a physicalist who offers the causal argument will likely believe that CC has an additional metaphysical explanation.

Tiehen doesn't get too preoccupied with how exactly the physicalist should formulate this other metaphysical explanation for CC. In his paper, he formulates it as:

(LCC) It is a law that causal completeness obtains.

The key idea that, in my view, Tiehen is trying to get at with his rough statement LCC is the following. A physicalist who defends the causal argument is someone who likely thinks that there is something about the way the world is structured, nomically, that makes CC obtain. The physical laws imply that if a physical event does not happen spontaneously, but is caused in some way, then there is at least some physical explanation of how it comes to be. I'll say more about this in Section 4. But for now, I just ask the reader to interpret Tiehen's LCC in this way. It needn't be read in as literal a way as Tiehen's formulation may invite, as the claim that there is literally a law of physics, alongside the Schrödinger equation or Newton's laws: the causal closure of the physical domain. Instead, the idea behind LCC is just that there is something about

the physical and nomic structure of the world that makes CC obtain. Although it may be controversial *whether* LCC is true, it seem clear that defenders of the causal argument think something like LCC is true, and that *if* LCC is true, then it provides a metaphysical explanation of CC.

And now we can state Tiehen's dilemma. If we ask what is the metaphysical explanation for CC, the physicalist who endorses the causal argument has two options. On the one hand, they can say that both P* and LCC are metaphysical explanations of CC, that P* and LCC metaphysically overdetermine CC. But then, the problem is that they must reject the No Overdetermination premise of the causal argument, since, Tiehen argues, this premise is in tension with the acceptance of metaphysical overdetermination.

On the other hand, to remain consistent with the No Overdetermination premise, it seems that the physicalist must deny that there are two or more metaphysical explanations of CC. They cannot reject P*, since this would be to reject physicalism. And so this means they must reject LCC. But, Tiehen thinks defenders of the causal argument can't reject LCC, or at least they never do reject it. His evidence for this is that if we read (say) Kim (1998, 2005) and Papineau (2001, 2002) on the causal argument, we can see that they frequently endorse counterfacuals like:

> If there were physically irreducible mental properties or events, then they would be epiphenomena.

Kim certain endorsed counterfactuals like this. After all, Kim's view was that there actually exist some physically irreducible mental properties, qualia, and so, due to CC and the No

Overdetermination premises, they are epiphenomena.[3] Since physicalists think that in the (perhaps not so) distant worlds where there are such things as irreducible qualia and dualism is true, CC nonetheless obtains and so physical causes exclude irreducible mental events as having causal efficacy with respect to physical events. So, Tiehen thinks that Kim and Papineau view CC as modally stable, something with the status of a law. Thus, advocates of the causal argument endorse LCC.

What I've just run through is more or less the letter of Tiehen's argument on the second horn of his dilemma, but I think there is a deeper point here, one I have already mentioned above. This is that defenders of the causal argument like Kim and Papineau think there is something about the physical nomic structure of the world that makes CC obtain. This is especially clear in Papineau's explanation of how CC was established theoretically and empirically by advances in physics, chemistry, molecular biology, and neuroscience culminating in the mid-twentieth century. To put it crudely, the defender of the causal argument thinks it is physics that makes CC true. And so, they must think that LCC is a metaphysical explanation of CC.

As result, it seems, we can't reject either P* or LCC as metaphysical explanations of CC without undermining the force or soundness of the causal argument. If we want the causal argument to present an empirical case for physicalism, we have to accept that there are these two

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[3] This means Kim can't take the causal argument to have exactly the same form as Papineau and Stoljar. Indeed the version of the causal argument Kim presented in his work looked more like:

K1. Either putatively nonphysical events are causes of physical events or they are epiphenomena.

K2. Every physical event that has a cause at t has a complete physical cause at t.

K3. Putatively nonphysical events do not overdetermine their effects.

Therefore,

K4. Either putatively nonphysical events are identical to physical events or they are epiphenomena.

metaphysical explanations for CC, and so CC is overdetermined. But CC can't be overdetermined, or we must reject the third premise of the argument. Strictly speaking, Tiehen is not aiming to show that the causal argument for physicalism is unsound. Rather, the idea is that if it is to be convincing and present an argument from theoretical and empirical advancements in physical science to physicalism, then it must undermine itself by allowing metaphysical overdetermination. If the only support for CC comes from P* (a trivial consequence of reductive physicalism), then the argument is essentially circular and uninteresting.

There are many viable strategies for responding to Tiehen's dilemma. But before I state some of them, it will help to state Tiehen's argument more compactly:

T1. Either the defender of the causal argument thinks that both P* and LCC metaphysically explain CC, or they think that CC has at most one metaphysical explanation.

T2. If the defender of the causal argument thinks that both P* and LCC metaphysically explain CC, then they must reject the No Overdetermination premise of the causal argument, and so they must find the causal argument unsound.

T3. If the defender of the causal argument thinks there is at most one metaphysical explanation for CC, then, since CC isn't fundamental, they have two options: they can think that the only metaphysical explanation for CC is P* or they can think that the only metaphysical explanation for CC is something like LCC.[4]

[4] Tiehen says (2015, p. 2407), and I can see no reason to quibble with him here, that his objections to LCC carry over to any other explanation a physicalist would try to put in its place.

T4. If the defender of the causal argument thinks that the only metaphysical explanation for CC is LCC, then they must thereby reject P*. This would be to reject physicalism and so to concede that the causal argument is unsound.

T5. If the defender of the causal argument thinks that the only metaphysical explanation for CC is P*, then they must thereby reject LCC. Then they are conceding that the only ground for CC is physicalism itself, which makes the causal argument circular or unconvincing.

Therefore,

T6. The causal argument for physicalism must be viewed by its defenders as either unsound or unconvincing.

The most controversial premises of this argument are T2 and T4. As will be clear, my preferred strategy for responding to this argument is to reject T2, because this response best illuminates a confusion many have about the causal argument. However, I think there are good reasons to reject T4 as well. So, let's start by discussing that premise.

## 4. Against T4: P* Need Not be Viewed as a Metaphysical Explanation of CC

Tiehen takes for granted in his paper that that any reductive physicalist will endorse his P* and take it to provide a metaphysical explanation for CC (2015, p. 2406). Recall:

P*: Every event is physical.

CC: Every physical event that has a cause at t has a physical cause at t.

But while it is straightforward, assuming that only events can be causes of other events, that P* logically entails CC, it is not at all straightforward that P* provides a metaphysical explanation for CC. When we say that some fact provides a metaphysical explanation for another, we are

thereby taking the former to explain in virtue of what the latter fact obtains (Rosen 2010, see also Skiles and Trogdon 2021). The obtaining of the former fact is makes the latter fact obtain. Metaphysical explanation is thus something more than mere logical entailment.

What is an example of a case in which some fact F1 logically implies some other fact F2 and yet we should not say that F1 metaphysically explains F2? To me, it is plausible that facts of the form $A \supset B$ logically imply but do not metaphysically explain facts of the form $\neg A \vee B$. And this is because first, facts of the form $\neg A \vee B$ metaphysically explain facts of the form $A \supset B$ and second, metaphysical explanation is asymmetric. In general, where there are logical equivalences, if we were forced to say every instance of logical entailment is one of metaphysical explanation, we would be forced to reject the asymmetry of metaphysical explanation.

Anyway, it is plausible that a defender of the causal argument will think that it is really something about physics that makes CC the case. Moreover, they might think that even if P* has some bearing on why CC obtains, it can't provide the explanation of why CC obtains, since CC is a fact about causal relations and P* doesn't say anything about causation.

What this means is that the defender of the causal argument can say that CC is not overdetermined because only LCC provides a metaphysical explanation of CC. But this does not require the physicalist to reject P*. It only requires them to reject the claim that P* is a metaphysical explanation for CC.

## 5. Against T2: Two Responses

But in my view, although Tiehen's T4 is controversial, it is T2 that is the weakest part of the argument. Recall:

T2. If the defender of the causal argument thinks that both P* and LCC metaphysically explain CC, then they must reject the No Overdetermination premise of the causal argument, and so they must find the causal argument unsound.

There are several reasons why a defender of the causal argument might reject this premise.

The most obvious strategy for responding to this argument is to say that the No Overdetermination premise in the causal argument states that there is no *causal* overdetermination. But someone can reject causal overdetermination without worrying at all about metaphysical overdetermination. Indeed, typically the reason that philosophers have worried about causal overdetermination comes from their commitment to a process theory of causation, a theory according to which causal relations depend on the transmission or exchange of conserved physical quantities. Bunzl (1979) is a classic paper that uses a process theory of causation to show why causal overdetermination is incoherent. Papineau (2001, especially pp. 13-26) traces the rise of physicalism and the causal case for it at least partially to the theoretical understanding of causal processes as involving the conservation of physical quantities.[5] Kim (2007) was also explicit that he was assuming mental causation required causation in this sense. In his (2005), he argued that causation requires the transmission of some kind of conserved quantity, asking how we could see mental events as overdeterminers given that we cannot point to any distinctive contribution they make to their effects.[6] But nobody similarly defends a process theory of metaphysical determination, according to which metaphysical determination

[5] Papineau argues that the crucial step was taken by Helmholtz, who "saw that, if we assume that all fundamental forces are conservative, then this guarantees that a certain quantity, the total energy, will be preserved in all natural processes whatsoever, including the organic processes that formed the focus of his interest" (Papineau 2001, p. 24).

[6] As I will explain in Section 6, this is not Kim's primary reason for arguing that mental causation does not involve overdetermination. However, it is a concern he raises while discussing the topic.

would require the transmission of conserved quantities. So, there is no clear reason why the considerations motivating the rejection of causal overdetermination would carry over to motivate the rejection of metaphysical overdetermination.

Moreover, it is hard to imagine how one could make sense of some of the simplest and most obvious cases of metaphysical explanation while rejecting overdetermination. For example, what could be more straightforward examples of metaphysical determination than cases in which facts about an individual instantiating some property metaphysically explain existentially quantified facts about there being someone with that property? And yet existentially quantified facts are frequently overdetermined. Justin's being a philosopher metaphysically explains the fact that someone is a philosopher. But Alyssa's being a philosopher also metaphysically explains that same fact.

So one might reject Tiehen's second premise by drawing a distinction between causal and metaphysical overdetermination, and insisting that while the causal argument involves a rejection of the former, it does not and should not involve a rejection of the latter.

But there is another strategy for responding to Tiehen's second premise open to those who agree with him that a physicalist view allowing metaphysical overdetermination would be "objectionable in *exactly the same way* that views that posit systematic causal overdetermination are objectionable" (Tiehen 2015, p. 2410). One might note that these concerns about overdetermination being objectionable appear only where we are faced with what look to be competing explanations. They may then argue that P* and LCC don't compete, because they are different kinds of explanations. They are explanations that target different "Why" questions.

Those working in the metaphysics of science will be familiar with this kind of response. Barry Loewer (2012) made a similar move in order to defend a Humean theory of laws against

concerns about explanatory circularity raised by David Armstrong (1983). Armstrong had argued that Humeans, those who view laws as regularities that supervene on their instances, face an explanatory circularity. It is part of the basic conception of laws, and a commitment Armstrong argues that the Humean too must accept, that laws explain their instances. But the Humean view entails that it is instances that explain the laws. Since explanation is an asymmetric relation, one can't have it both ways. So, Armstrong argued, we must reject Humeanism.

Loewer's response was that there are actually two kinds of explanation in play in Armstrong's argument. According to the Humean, instances explain laws in a metaphysical or constitutive sense. But the laws explain the instances in a scientific or nomic sense. So, the Humean view does not imply explanatory circularity, nor a rejection of the common view that explanation is asymmetric.

The defender of the causal argument can invoke a similar strategy in order to avoid Tiehen's concerns about metaphysical overdetermination. They can argue that P* and LCC do not overdetermine CC, because P* and LCC explain CC in different ways. Here, I think the most plausible thing to say would be that P* explains CC in a constitutive sense, while LCC explains CC in a nomic sense.[7] The two explanations do not compete because they are answers to different "Why?" questions.

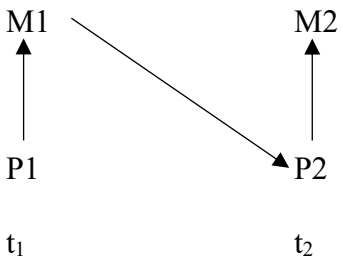
In my view, both of the previous responses to Tiehen's argument are promising and natural. However, there is an objection Tiehen would likely raise to both. This is that these responses are incompatible with claims that Kim himself made while presenting the causal

[7] Of course, this strategy is not compatible with the response I considered to Tiehen's dilemma in Section 4. To be consistent, the defender of the causal argument will have to choose among these responses.

argument in both his 1998 and 2005 books. Tiehen discusses these passages of Kim's in his 2015 paper, and so it is worth responding to them.

What the passages show is Kim arguing that there cannot be two explanations for a mental event M2: one a causal explanation in terms of an earlier mental event M1 and the other a metaphysical/constitutive explanation in terms of an event that is M2's supervenience base P2.

*Figure 4*




Kim is explicit that he believes these two putative determiners of M2 compete. He argues that we should instead say that M1 causes M2 only by causing P2. (Of course, Kim later goes on to argue using the causal argument that M1 can only cause P2 if it is identical to its own supervenience base P1.)

What this means is that Kim himself would not have accepted either of the responses to Tiehen I have presented in this section. Kim would not accept the first response because he is clearly concerned with overdetermination involving metaphysical explanation, not just causal explanation. He would not accept the second response because he thought that constitutive and causal/nomic explanations do compete.

This said, I have long been puzzled by these passages of Kim's. They are not required in order to accept the causal argument that is the primary focus of this paper. And it is unclear why

Kim thought that metaphysical and causal explanations compete in this way. Moreover, the usual motivations for concern about causal overdetermination do not straightforwardly carry over to the metaphysical case. So, I do think a defender of the causal argument can reject the second premise of Tiehen's argument T2 in either of the above ways I have considered. However, there is also a third way of responding to T2 that I think better gets to the heart of the issue. And it does not require we reject anything Kim argued in his work.

## 6. The Motivation Behind the No Overdetermination Premise of the Causal Argument

I think if we are going to best respond to Tiehen's claim that the causal argument defender can't see P* and LCC as overdetermining CC, we need to understand what motivated the No Overdetermination premise of the causal argument in the first place.

Too often, Kim is misrepresented as having argued for a general ban on causal overdetermination or a ban on causal overdetermination being "systematic" or "widespread," as would be the case if every case of mental causation was a case of causal overdetermination. Others, to be sure, have raised such worries. I have already mentioned Bunzl (1979). But even in 1998, Kim went to great lengths to emphasize that he wasn't concerned with causal overdetermination being systematic or widespread. Instead, his concern was that if we allowed that nonphysical events overdetermine physical effects (*ever* overdetermine then), then this would entail a violation of causal closure.

To see this, let's set aside physicalism for a moment and consider a standard, textbook case of causal overdetermination. Billy and Suzy are throwing rocks at a window. Each of their throws individually has enough momentum on its own to be capable of breaking the window. And suppose that at a given time, Billy and Suzy both throw their rocks, and the window breaks.

So, if Billy had just thrown his rock, the window would have broken. If Suzy had just thrown her rock, the window would have broken. But as it happens, both of their rocks strike the window at the same time and as a result, the window-breaking seems overdetermined.

There are two ways of looking at this event that is the window breaking. We can look at it in a very fine-grained way and think of it as an event where the window breaks in a very specific way at that time. In this case, some might argue (Bunzl) that this is really a case of joint causation, not overdetermination. In order for the breaking event to happen in just the way it did, it was actually necessary for both Billy and Suzy to throw their rocks. Billy and Suzy's throws are just two components of the one larger total cause of the event. On the other hand, we could look at the window-breaking as a more coarse-grained event. It is just a window-breaking, it isn't essentially something that happened in just this specific way. So even if only Billy or only Suzy had thrown their rock, and the breaking happened slightly differently, still it would have been this same event that resulted. In this case, it seems this is a case of true overdetermination, because we have two distinct causes (at the same time) for the same event.

The claim that Kim wants to make is that in cases like this, whether we think of the window-breaking as one of joint causation or overdetermination, a complete explanation for why the window broke must appeal to both Billy and Suzy. If someone wants to know what happened and why it happened (whether "it" is understood in either a fine-grained or coarse-grained way), it will not do to appeal *either* to the fact that Billy threw his rock *or* that Suzy threw hers. An accurate account of what actually took place that led to the window's breaking must mention *both* Billy's *and* Suzy's throws. More generally, in cases of joint causation and causal overdetermination, complete and accurate causal explanations must include both causes.

So, if we are going to say that there is even one case in which physical and nonphysical events overdetermine later physical events, then we are saying that there is at least one case in which the complete explanation of why some physical event occurred does not appeal exclusively to physical events. To give a complete explanation for why that physical event occurs, one has to go outside the chain of physical events. And this is straightforwardly a violation of causal closure.

That is the justification for the No Overdetermination premise of the causal argument. It is not a blanket ban on metaphysical overdetermination, nor causal overdetermination, nor is it even a ban on widespread or systematic overdetermination. It is a ban on nonphysical events' overdetermining physical causes. That particular kind of overdetermination would violate causal closure (CC).

An upshot is that, properly understood, the No Overdetermination Premise is not an independent premise in the causal argument for physicalism. This is something that is misleading in canonical formulations of the argument, such as those presented by Papineau and Stoljar. If we want to illustrate the connections between the premises, the argument would better be formulated in something like the following way:

1. All putatively nonphysical events have physical effects.

2. Every physical event that has a cause at t has a complete physical causal explanation at t.

3. If there is a time t at which a physical effect has a cause that is not a physical cause, then this would imply the falsity of (2).

Therefore,

4. All putatively nonphysical events are identical to physical events.

Or, some might prefer a version of this argument with the contrapositive of (3):

1. All putatively nonphysical events have physical effects.

2. Every physical event that has a cause at t has a complete physical causal explanation at t.

3. If (2), then there is no time t at which a physical effect has a nonphysical cause.

Therefore,

4. All putatively nonphysical events are identical to physical events.

Viewing the argument this way, we can see that there is no inconsistency between the No Overdetermination premise of the causal argument and the claim that P* and LCC both metaphysically explain CC. CC isn't a physical event, and so causal closure of the physical domain doesn't say anything about whether it can have multiple explanations.

## 7. But Is the Causal Argument Compelling?

In summary, the defender of the causal argument can respond to Tiehen's dilemma in two main ways. They can reject P* as a metaphysical explanation of CC, while allowing that P* is true. Or they may reject Tiehen's claim that the No Overdetermination premise in the causal argument bears on whether P* and LCC may metaphysically overdetermine CC. To me, the latter response is more compelling and in the spirit of what defenders of the causal argument like Kim would say. But either response is satisfactory.

All of this said, there may still be concerns about the status of the causal argument. First, it would be nice to have a clearer account of how exactly the theoretical and empirical results of physical science support CC. Papineau (2001) provides an inductive argument here pointing (1) to the (theoretical) success of scientists in providing complete physical explanations for physical

events that were previously thought to have only nonphysical causal explanations and (2) a lack of empirical evidence for any nonphysical causal powers. Later work by Tiehen (2022) and previous work by me (2016) have discussed issues about the adequacy of the argument from physics to causal closure. There still remain some open questions. But this is a topic for another day.

Second, it would be nice to be clearer about the inference that takes us from causal closure to the No Overdetermination premise of the causal argument. I've given what I hope is an intuitive sketch of the argument above, but here too, I believe there is more to say. That causal closure of the physical domain prevents nonphysical events from overdetermining physical effects is central to the causal argument, certainly the way it was presented by Kim. And once we recognize that the premise is a consequence of causal closure, not a claim motivated by a general concern about metaphysical overdetermination, the defender of the causal argument has what they need to respond to Tiehen's dilemma. This link between the premises of the argument is where, in my view, criticism of the causal argument is better directed.

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