

## VIII—DEFENDING DUALISM

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In the contemporary mental causation debate, two dualist models of psychophysical causal relevance have been proposed which entail that although mental events are causally relevant in the physical domain, this is not in virtue of them causing any physical event. It is widely assumed that the principle of the causal completeness of the physical domain provides a general argument against interactive dualism. But, whether the completeness principle presents a problem for these alternative forms of interactive dualism is questionable. In this paper, focusing on the popular no-gap argument for the completeness principle, I explore one reason why.

In the contemporary mental causation debate, it is commonly assumed that interactive dualism must be false in virtue of the principle of the causal completeness of the physical domain. However, consideration of new dualist models of psychophysical causal relevance reveals that it is far from clear that the completeness principle can be appealed to to provide a general argument against interactive dualism. Standard dualist models of psychophysical causal relevance take the causal role of mental events in the physical domain to be that of initiating a single physical event or set of physical events in the chains of neurophysiological causation that terminate in bodily movement. However, a number of recent interactive dualist accounts have abandoned this model. According to these accounts, mental events are causally relevant in the physical domain, but not in virtue of causing any physical event. Whether the completeness principle presents a problem for them is questionable. In this paper, my focus is on the popular no-gap argument for the completeness principle and why it fails to generate a completeness principle of the strength required to overcome these alternative dualist models.<sup>1</sup>

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<sup>1</sup> For a discussion of these alternative dualist models in relation to attempts to establish the completeness principle via an appeal to the conservation laws, see Gibb (forthcoming a).

## I

Few of those in the contemporary mental causation debate would wish to deny the commonsense claim that mental entities can be causally relevant to physical entities. It is my desire to move my arm that is causally responsible for my arm's moving. It is my intention to open the door that is causally responsible for my getting up to open the door. The problem is recognized to be that of specifying a plausible relationship between mental and physical entities that is consistent with this causal interaction. Despite a lack of agreement in the contemporary mental causation debate about exactly how this problem should be addressed, the general consensus is that dualism—be it a substance dualism or an anti-physicalist property dualism—cannot provide the answer. This is primarily because the argument from causal overdetermination appears to offer a straightforward rejection of all forms of interactive dualism. The argument can be set out as follows:

- (1) *Relevance*: Mental events are causally relevant in the physical domain.
- (2) *Completeness*: Every physical event that has a cause has an immediate and complete wholly physical cause.
- (3) *Exclusion*: There is no systematic causal overdetermination.

Therefore, mental events (that are causally relevant in the physical domain) are identical with physical events.

To explain this argument, in accordance with *Relevance*, say that *M* is a mental event and that *M* is a complete cause of bodily event *E* (or alternatively that the conjunction of *M* and some other event is a complete cause of *E*). Given *Completeness*, *E* must also have a complete *wholly physical* cause, *P*. (A 'complete cause' is the sum of all of the contributory or partial causes of an event in a particular instance of causation. If each contributory cause of an event is physical, then that event has a complete wholly physical cause.) The mere combination of *Relevance* and *Completeness* does not entail the identity of mental events with physical events. *Completeness* entails that there will be a seamless causal chain of purely physical events leading up to any bodily movement. The existence of such a causal

chain does not, by itself, exclude the existence of additional non-physical causes of bodily movement. *Completeness* is merely supposed to establish that to identify an immediate and complete cause of any bodily movement we never *need* to look beyond the physical domain. It is only when *Completeness* is combined with *Exclusion* that the possibility of a physical event having a non-physical cause is ruled out. *Exclusion* states that there is no *systematic* causal overdetermination. To give an example of causal overdetermination, two guns are independently fired and the bullets from both guns strike the victim at the same time. If each bullet striking was, on its own, a complete cause of the victim's death, the death was causally overdetermined by the strikings. Given *Exclusion*, there may be isolated cases of causal overdetermination, but events cannot be causally overdetermined as a general rule. The combination of *Relevance* and *Completeness* appears to give rise to precisely this kind of systematic causal overdetermination—whenever a mental event *M* causes a physical event *E*, *Completeness* guarantees that there will be an alternative wholly physical cause, *P*, that is enough to bring *E* about. The problem is removed if, contrary to the dualist, mental event *M* is identical with physical event *P*.<sup>2</sup>

Note that from the mere fact that *M* and *P* are both complete causes of *E* it does not follow that *E* is causally overdetermined. Hence, if it were the case that *P* caused *M* which in turn caused *E*, then, given the transitivity of causation, it would be true that *P* and *M* were both complete causes of *E*. But clearly this would not be a case of causal overdetermination. Thus if the completeness principle were simply formulated as the claim that 'Every physical event that has a cause has a complete wholly physical cause', then the combination of it with *Relevance* and *Exclusion* would be compatible with a dualist model of psychophysical causal relevance which held that neural events caused bodily movement via mental causal intermediaries. (For further defence of this point, see Lowe 2000.) In *Completeness*, the requirement that every physical event that has a

<sup>2</sup> Although not essential to my argument, for the sake of simplicity, I shall take events to be Kimian. That is, to be the exemplification of a property by a substance at a time. Thus, a mental event is the exemplification of a mental property by a substance at a time and a physical event is the exemplification of a physical property by a substance at a time. According to this account of events, two events are identical if and only if they involve the same property, substance and time. It follows that both substance and property dualism entail a dualism with regard to mental and physical events, and hence that both positions directly conflict with the conclusion of the argument from causal overdetermination.

cause has an *immediate*, complete, wholly physical cause is there to rule out the possibility of there being any such gaps in causal chains of physical events for non-physical events to fill. (Event *C* is an immediate cause of event *E*, if *C* does not cause *E* by causing some further event. That is, in other words, if, in the causal chain of events leading up to *E*, there is no event that is a causal intermediary between *C* and *E*.)

## II

Detailed arguments for the completeness principle are notoriously hard to find—presumably because many of its proponents assume that it can be inferred from facts of current physics, and hence that it require no further defence from those in the mental causation debate. However, if the principle is a working hypothesis of current physics, then it is one that is left wholly implicit—certainly it is not referred to in any physics textbook. Some argument is therefore needed for the claim that it can be inferred from facts of current physics.

One such argument that is often alluded to in the mental causation debate (see, for example, Kim 2010, pp. 112–13; McLaughlin 1998, pp. 278–82; Melnyk 2003, pp. 288–90; and Papineau 1993, pp. 31–2), and which, following McLaughlin, I shall refer to as the ‘no-gap argument’, can be set out as follows. Contemporary physicists have been highly successful in identifying the complete causes of various kinds of physical events. To do so they have only needed to appeal to physical causes. Not once has it been necessary to invoke non-physical causes. It is, of course, true that current physics is not yet able to provide the complete and immediate cause of *every* physical event. Undoubtedly there are physical events that have not yet been examined, and physical events that have been examined but are yet to be causally explained. But it is one thing to acknowledge that there are gaps in the account that physics provides of the causes of physical events, and quite another to hold that these gaps need to be filled by mental events. Thus, for example, Papineau states that current physics aims to account for physical effects ‘in terms of the categories of energy, field and space-time structure’ (1993, p. 31). He reasons that while it is quite possible that these categories will need supplementation, given the ‘kind of causes’ that physics demonstrates to be responsible for physical events we have

sufficient grounds for concluding that they will not need to be supplemented by mental categories. In further support of this point, Kim observes:

If a physicist encounters a physical event for which there is no ready physical explanation, or physical cause, she would consider that as indicating a need for further research; perhaps there are as-yet undiscovered physical forces. At no point would she consider the possibility that some non-physical force outside the space-time world was the cause of this unexplained physical occurrence. (2010, p. 113)

One might worry about extrapolating conclusions reached about the events that physics studies to bodily events, but this worry is thought to be unfounded. Indeed, a similar no-gap argument can be presented at the level of neurophysiology (see Kim 2010, p. 113; McLaughlin 1998, p. 278; and Melnyk 2003, p. 187). The neurophysiological no-gap argument is as follows. Neurophysiological research provides good grounds for holding that the causal chains of neural events that give rise to bodily movement do not contain gaps that need to be filled by mental events. The thought is not that the picture that contemporary neurophysiology presents of the causal chains of neural events that give rise to bodily movement is seamless, as clearly the causal story that current neurophysiology provides is incomplete. As with the previous argument, what is considered to be objectionable is the idea that mental events are needed to fill these gaps. Neurophysiology hints at no gaps in the causal chains of neural events that give rise to bodily movement that it would be appropriate for mental events to fill. Certainly, if a neurophysiologist discovers a neural event for which there is no ready neural cause, at no point would she consider the possibility that some non-physical event was the cause of this unexplained neural occurrence. Rather, the discoveries of neurophysiology indicate that if we take any instance of bodily movement, say, for example, the moving of your arm, and trace the causal chain of events leading up to this event back from the muscle fibres contracting in your arm to the electrochemical activity in your nerves to the motor neurons firing in your brain and so on, and if we could examine this complex causal chain of events in flawless detail, we would be presented with a seamless causal chain of purely physical events.

## III

The aim of this paper is not to question the plausibility of the no-gap argument. Instead, it is to demonstrate that although the no-gap argument, in so far as it is correct, threatens what I refer to as ‘standard’ dualist models of psychophysical causal relevance, it does not threaten *all* dualist models of psychophysical causal relevance. Indeed, the combination of *Completeness* and *Exclusion* is perfectly compatible with the alternative dualist models that I here have in mind. Hence, if *Completeness* is the strongest version of the completeness principle that can plausibly be advanced, the notion that the argument from causal overdetermination can provide a general argument against interactive dualism is misplaced. In this section I shall consider some of the standard dualist models of psychophysical causal relevance that are threatened by the no-gap argument.

According to standard dualist models of psychophysical causal relevance, the causal role of a mental event in the physical domain is to cause (either by itself or in conjunction with other mental or physical events) some physical event or set of physical events—more specifically, some neural event or set of neural events—thereby initiating a causal chain of physical events that ultimately gives rise to some movement of the limbs.

The model of psychophysical causal relevance proposed by Descartes provides an obvious example of a standard dualist model of psychophysical causal relevance. According to Descartes, the causal role of the mental in the physical domain is to alter the direction of the motion of certain particles in the brain. These motions, Descartes claimed, are communicated, via nerve filaments, to the limbs, giving rise to their movement. Hence, in accordance with the standard dualist model, according to Descartes, a mental event is causally relevant in the physical domain because (in conjunction with physical events) it causes some brain event, that is, a certain motion of particles in the brain, which gives rise to a causal chain of physical events resulting in bodily movement.

To give another example of a standard dualist model, but one from the contemporary mental causation debate, take W. D. Hart’s model of psychophysical causal relevance (Hart 1988). Hart accepts the energy transference theory of causation, according to which causation is the transfer of energy-momentum from cause to effect. However, according to Hart, not all causation is the transfer of

physical energy. Hart claims that psychic energy exists. A mental event causes a neural event by transferring psychic energy to it, which is then converted into physical energy in accordance with the conservation laws. The mental event thereby initiates a chain of energy transference which results in some bodily movement. Hence, in line with the standard dualist model, according to Hart a mental event causes a neural event, thereby initiating a causal chain of physical events that brings about a bodily movement.

Quite clearly, the no-gap argument for *Completeness* threatens the dualist models of psychophysical causal relevance proposed by Descartes and Hart, and standard dualist models of psychophysical causal relevance more generally. All such models attempt to find a causal role for mental events in the physical domain by assuming that there is some gap in the causal chains of neural events that give rise to certain bodily movements—a gap that can only be filled by mental events. Hence, given these models, if we take any intentional movement of the body, and trace the causal chain of events leading up to this event far back enough into the brain there will be, contrary to *Completeness*, a physical event in this causal chain that lacks an immediate and complete wholly physical cause. But, to rehearse the no-gap argument for *Completeness*, a gap in the causal chains of neural events that give rise to bodily movement would be detectable by empirical means, and no gaps are empirically detectable that one would have any reason to think could not be filled by physical events.

A popular assumption in the mental causation debate is that the only available dualist model of psychophysical causal relevance is the standard one. That is, given dualism, the causal role of a mental event in the physical domain must be to cause some neural event or set of neural events which ultimately gives rise to some bodily movement, and hence to fill in gaps in causal chains of neurological events. However, recent dualist models of psychophysical causal relevance challenge this assumption. The first such model that I shall sketch is proposed by E. J. Lowe (1993, 1999, 2000, 2008). The second is one that I have recently outlined (Gibb 2013).

## IV

Lowe, a substance dualist, claims that as we trace the causal chain of neural events that results in a bodily movement back into the brain, it seems likely that this causal chain will begin to display a highly complex, tree-like structure that is fractal (i.e. the branches of the tree will be smaller trees, the branches of which will be still smaller trees, and so on). He argues that from a purely physical perspective, the fact that such a causal tree of neural events converges upon a particular event—the bodily movement—looks coincidental, for as physical science ‘traces back the physical causes of our bodily movements into the maze of antecedent neural events, it seems to lose sight of any unifying factor explaining why those apparently independent causal chains of neural events should have converged upon the bodily movements in question’ (Lowe 2000, p. 581). Indeed, from this purely physical perspective, the convergence seems no less of a remarkable coincidence than if a tree were to grow from the tips of its branches to its trunk (Lowe 1996, p. 68).

Lowe maintains that it is only by appealing to the mental that this convergence of neural events can be explained. It is, Lowe claims, the specific causal role of mental events to render the fact that a causal tree of neural events converges upon a particular bodily movement non-coincidental. And it is the special intentional nature of mental events—the fact that a mental event, unlike any neural event, is directed upon the occurrence of a particular bodily movement—that makes mental events suited to play this role.

Crucially, according to Lowe, mental events do not play this causal role by causing any single neural event or set of neural events in the causal tree of neural events that gives rise to bodily movement. Rather than suggesting that a mental event is ever the cause of any neural event or set of neural events, Lowe instead proposes that a mental event is causally responsible for the *fact* that a maze of neural events converges upon a particular bodily movement. According to this suggestion, mental events do not cause physical events. Rather, mental events cause physical facts. Thus Lowe is denying the homogeneity of the causal relata. Mental and physical events cause different categories of entity in the physical domain.

Lowe’s dualist model of psychophysical causal relevance is not threatened by the no-gap argument. It is consistent with the claim that the causal chains of neural events that give rise to bodily move-



ment do not contain gaps that need to be filled by mental events. More generally, it is consistent with the claim that there are no gaps in the account that physics provides of the causes of physical events that need to be filled by mental events. This is because, given Lowe's model, mental events do not cause physical events. Indeed, precisely because his model postulates no gaps in the causal chains of neurophysiological events that give rise to bodily movement, Lowe considers that the causal role that he provides mental events in the physical domain will be invisible to science. Hence:

Any scientist who was to examine that situation by empirical means, but who was restricted by his means of investigation to observing only purely physical events and causal relationships, would quite naturally come to the conclusion that the physical event ... had a complete and wholly physical causal explanation, in terms of its immediate causes ... and their antecedent physical causes ... (Lowe 2008, p. 74)

The aim of this section has not been to defend the dualist model of psychophysical causal relevance that Lowe has proposed. Indeed, there are certain aspects of Lowe's account that I find worrying. In particular, I am not convinced that there is a plausible and consistent way of understanding an 'event' and a 'fact' that would allow one to motivate a distinction between event causation and fact causation. I have this worry regardless of whether one is basing events and facts in a one-category ontology, a two-category ontology, or Lowe's own four-category ontology. But that is a topic for another paper. The aim of this section has simply been to observe that Lowe's dualist model of psychophysical causal relevance is not threatened by the no-gap argument.

## V

I shall now turn to my own dualist model of psychophysical causal relevance.<sup>3</sup> Unlike those who accept a standard dualist model, I deny that mental events cause physical events. But, unlike Lowe, nor do I consider that mental events cause physical facts—I do not wish to deny the homogeneity of the causal relata. I distinguish between events that cause other events and events that enable other events to

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<sup>3</sup> Gibb (2013, forthcoming a, forthcoming b).

be caused. And I hold that the causal role of mental events in the physical domain is not to cause physical events, but rather to *enable* certain physical events to be caused.

I accept a powers theory of causation, and the model of psychophysical causal relevance that I advance is not to be divorced from it. To explain this model, I therefore need to start by briefly outlining this theory of causation. According to it, powers or dispositions (I use these terms interchangeably) provide the basis for an account of causation. Two claims are central to this account.

First, all intrinsic properties bestow *irreducible* powers on their bearers. Hence, for example, a porcelain vase is disposed to break when dropped on a hard surface. The power to break is built into some property of the vase. In virtue of having this property, the vase is disposed to break when dropped.

Secondly, causation just is the manifestation of these powers. Different interpretations of this claim give rise to different variations of the powers theory of causation. Here I shall adopt C. B. Martin's interpretation, according to which causation is the mutual manifestation of reciprocal disposition partners (Martin 2008).<sup>4</sup> The fact that the vase breaks when it is dropped does not just depend on the vase being fragile. It also depends on the surface on which it lands being hard. When the vase breaks, this is therefore not just a manifestation of the vase's fragility, but also of the surface's hardness. The vase's fragility and the surface's hardness are 'reciprocal disposition partners' and the breaking of the vase is their 'mutual manifestation'. Causation is the mutual manifestation of reciprocal disposition partners. That is, the vase's breaking is the mutual manifestation of the vase's fragility and the surface's hardness.

I consider that the powers theory of causation allows one to differentiate two different roles that an event might play in a causal system—the role of causing and the role of enabling a causing. That is, the distinction between an event that causes another event and an event that *enables* an event to cause another event (see Gibb forthcoming b).

The distinction between events that are causes and events that are 'causal enablers' becomes apparent when one considers causal sequences involving double prevention—that is, causal sequences in which an event that would prevent another event from having a cer-

<sup>4</sup> See also Heil (2003, 2012).

tain effect is itself prevented from doing so. To give an example of double prevention, a barrier is positioned in front of a porcelain vase to protect it. The barrier is wired up to an explosive device. Pressing the device's button will cause the barrier to explode. A rock is thrown at the vase. Provided that the device's button is not pressed, the barrier will prevent the rock from coming into contact with the vase. But, by pressing the device's button one destroys the barrier, enabling the rock to hit, and hence break, the vase. The pressing of the button is a 'double preventer' event. The barrier would have prevented the rock from breaking the vase, but by pressing the device's button the barrier is prevented from preventing the rock breaking the vase.

How should the powers theory of causation analyse cases of double prevention? Often, a manifestation of a disposition will depend on the *absence* of certain dispositions. This is because one disposition can block a manifestation of another. Thus, the solidity of the barrier blocks the mutual manifestation that is the vase's fragility and the rock's momentum and hardness. The pressing of the device's button blocks the mutual manifestation that is the barrier's solidity and the rock's momentum and hardness. In a case of double prevention, a disposition that would block a manifestation of another disposition is prevented from doing so by a further disposition. Hence, the solidity of the barrier would prevent the mutual manifestation that is the vase's fragility and the rock's momentum and hardness, but is prevented from doing so by the pressing of the device's button.

Importantly, given the powers theory of causation, a double preventer event is not to be counted as a cause of the event that it has prevented from being prevented. For example, the pressing of the explosive device's button—the double preventer event—is not, according to the powers theory of causation, a cause of the vase's breaking. The vase's breaking is a mutual manifestation of reciprocal disposition partners that include the vase's fragility and the rock's momentum and hardness, but not the pressing of the device's button. Ultimately this is because, given the powers theory of causation, absences cannot be causes, for an absence cannot bear powers. If absences are not causes, there cannot be a chain of unbroken causation from the double preventer event to the event that it has prevented from being prevented—the pressing of the device's button causes the destruction of the barrier, but, given the powers theory of causation, the destruction of the barrier (or, in other words, the bar-

rier's absence) cannot be a cause of the vase's breaking.<sup>5</sup>

Although not a cause of the vase's breaking, the pressing of the device's button is what I call an 'enabling event'. Assuming the powers theory of causation, for an event that is prevented from being prevented to be brought about, in addition to its complete cause, a further event (the double preventer event) must also exist. This further event is an enabling event, where an enabling event is not a cause of the event in question, but one which enables it to be caused or which, in other words, provides the required structure for the relevant causal relation to take place. A double preventer event enables an event to be caused by preventing an event from preventing it from being caused.

Given the distinction between causes and enabling events, one event does not have to cause another to be causally relevant to it. Enabling events are causally relevant to the events that they enable to be caused—and not just in a merely explanatory sense. In causal situations involving enabling events, for the effect to be brought about, in addition to its complete cause, a further event must occur whose role is to enable the causal relation to take place. The fact that a further event is required to enable the causal relation to take place is quite independent of our attitudes and interests.

These considerations raise the question, what if *sui generis* mental events were causally relevant in the physical domain, not because they cause physical events, but because they enable physical events to be caused? More specifically, what if mental events were double preventers in the physical domain? To see roughly what such a dualist model of psychophysical causal relevance would look like, consider the following specific case. Assume that dualism is true, and hence that mental events are not identical with physical events. Call the event that is neuron 1 firing in Fred's brain ' $n_1$ ', the event that is neuron 2 firing in Fred's brain ' $n_2$ ' and the event that is Fred's arm's moving ' $b_1$ '. The firing of neuron 1 is disposed to make neuron 2 fire, which, in turn, is disposed to make muscle fibres contract in Fred's arm and his arm move. For the sake of simplicity, assume that no additional dispositions are required for these manifestations. Hence,  $n_1$  causes  $n_2$  and  $n_2$  causes  $b_1$ . Now, say that  $n_2$ 's causing  $b_1$  would be prevented by Fred's desire to keep his body still. (Call this

<sup>5</sup> For a more detailed account of the powers theory of causation's analysis of double prevention and why it is not causation according to this theory, see Gibb (2013, pp. 198–201).

mental event ' $m_2$ '). But Fred has a conflicting desire. Although he has the desire to keep still, he also has the stronger desire to move his arm—call this mental event ' $m_1$ '—say due to pins and needles. This overriding desire to move his arm prevents the manifestation of his desire to keep his body still. Hence  $m_1$  prevents  $m_2$  from preventing  $n_2$  from causing  $b_1$ . Consequently, Fred moves his arm.<sup>6</sup> This causal structure is presented in figure 1.

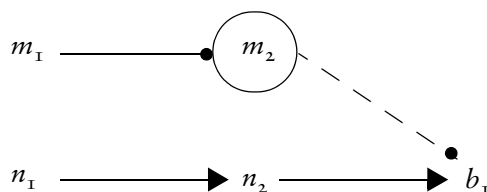


Figure 1

In figure 1, a solid line ending in an arrow depicts a causal relation; a solid line ending in a dot depicts an inhibitory connection; a broken line ending in a dot depicts an inhibitory connection that failed to occur and a circle around a letter signifies the non-existence of the relevant event.

In this example,  $m_1$  is a double preventer event in the physical domain—it prevents  $m_2$  from preventing  $n_2$  causing  $b_1$ . Consequently,  $n_2$  is able to cause  $b_1$ . Given the powers theory of causation, for the reasons explained earlier,  $m_1$  is not a cause of  $b_1$ . Rather, the complete cause of  $b_1$  is  $n_2$  and  $n_2$ 's complete cause is  $n_1$ . However,  $m_1$  is still causally relevant to  $b_1$ , because  $m_1$  enables  $n_2$  to cause  $b_1$ . Given the double prevention model of psychophysical causal relevance that I advance, any mental event that is causally relevant in the physical domain is so, not because it is a cause in the physical domain, but rather because it enables one physical event to cause another in the kind of way just explained.

Unlike standard dualist models of psychophysical causal relevance, the double prevention model denies that the causal role of mental events in the physical domain is to cause some neural event or set of neural events which ultimately gives rise to some bodily movement. Rather than causing any neural event, the causal role of

<sup>6</sup> For a more detailed account of this example, see Gibb (2013, §3).

mental events in the physical domain is to enable neural events to give rise to bodily movement. Consequently, the double prevention model is not threatened by the no-gap argument. It does not imply that the causal chains of neural events that give rise to bodily movement will contain gaps that need to be filled by mental events. Hence, consider figure 1. There are no gaps in the causal chain of neurological events that cause  $b_1$ . The complete cause of  $b_1$  (that is, the combination of *all* of the contributory causes of  $b_1$ ) is  $n_2$  and its complete cause is  $n_1$ . More generally, the double prevention model does not imply that there will be gaps in the account that physics provides of the causes of physical events that need to be filled by mental events—given the double prevention model, mental events do not cause physical events.

Furthermore, as with Lowe's model, the causal role that the double prevention model provides mental events in the physical domain will be invisible to science. Given the causal structure presented in figure 1, if the neuroscientist traces the causal chain of events leading up to the movement of Fred's arm back from the muscle fibres contracting in his arm to the electrochemical activity in his nerves to the motor neurons firing in his brain, she will be presented with a seamless causal chain of purely physical events. Indeed, no matter how closely she investigates this particular causal chain of neurophysiological events, the causal role that  $m_1$  plays in bringing about  $b_1$  will not be revealed. This is because the causal role that  $m_1$  plays in bringing about  $b_1$  does not involve  $m_1$  acting on any physical event or set of physical events. Rather, it involves  $m_1$  acting on another non-physical event ( $m_2$ ). Nor, in the causal structure presented in figure 1, is there any physical event or set of physical events that  $m_2$  acts upon, for the whole point is that  $m_1$  prevents  $m_2$  from acting on any physical event.

## VI

Unlike standard dualist models of psychophysical causal relevance which commonly respond to the argument from causal overdetermination by attempting to reject *Completeness*, and hence the no-gap argument for it, given both Lowe's dualist model and my own, one can accept *Completeness*, because neither of these accounts is committed to the idea that any physical event lacks an immediate, com-

plete, wholly physical cause. Instead, what both Lowe's dualist model and my own suggest is that the argument from causal overtermination is invalid. If mental events are causally relevant in the physical domain because they cause physical facts (as Lowe claims) or because they enable physical events to be caused (as I claim), then the combination of *Relevance*, *Completeness* and *Exclusion* does not entail that mental events are identical to physical events. Hence, take the double prevention model and consider the example given in figure 1.  $m_1$ , a non-physical event, is causally relevant to  $b_1$ , a physical event, because it enables  $b_1$  to be caused. Despite the fact that  $m_1$  is non-physical and causally relevant in the physical domain, this requires the rejection of neither *Completeness* nor *Exclusion*. As observed, it does not require the rejection of *Completeness* because the causal structure presented in figure 1 does not entail that any physical event lacks an immediate and complete wholly physical cause. It does not require the rejection of *Exclusion*, because, as  $m_1$  does not cause  $b_1$ , it does not threaten to causally overdetermine it.<sup>7</sup> To make the argument valid, a further premiss must be added to it, namely, that for mental events to be causally relevant in the physical domain, mental events must cause physical events. As I hope this paper has made plain, the rejection of this premiss is what divides non-standard dualist models from standard dualist models. And it is precisely because they reject this premiss that the no-gap argument presents no threat to non-standard models.<sup>8</sup>

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<sup>7</sup> What if  $m_1$  wasn't there to prevent  $m_2$  from preventing  $n_2$  from causing  $b_1$ ? Then  $m_2$  would be the cause of some physical event, hence violating *Completeness*. For a detailed reply to this point, see Gibb (2013, pp. 204–5). There I propose that the existence of  $n_2$  entails the existence of  $m_1$ , because whatever neurological event causes  $n_2$  also causes  $m_1$ . (This is consistent with the kind of causal emergentism that I wish to advance.) Hence, such a situation could not arise.

<sup>8</sup> I am grateful to the John Templeton Foundation for funding the Durham Emergence Project, of which this paper is a consequence. I am also grateful to participants at the Aristotelian Society meeting at which a draft of this paper was delivered.

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