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# KIM'S PAIRING PROBLEM AND THE VIABILITY OF SUBSTANCE DUALISM

by

J. R. VAUGHT

Under the Direction of Dr. Scarantino and Dr. Nahmias

## ABSTRACT

Mental causation between the material and the immaterial has been problematic for interactionist substance dualism ever since its first major proponent René Descartes. The contemporary philosopher Jaegwon Kim believes he has found an argument that shows exactly why an immaterial event cannot be said to cause a material event; he calls this the pairing problem argument. This thesis will argue that there is actually sufficient empirical evidence to suggest that Kim's argument is unsuccessful due to one of its premises being false. Furthermore, this thesis will also argue that interactionist substance dualism is actually a philosophically viable alternative, and lastly ways are sketched of how one might go about constructing such a view responsibly.

INDEX WORDS: Mental Causation, Substance Dualism, Jaegwon Kim, Pairing Problem

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by

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## DEDICATION

I'd like to dedicate this work to several people. First, I'd like to dedicate this work to my family and friends who have always given me a limitless quantity of support and encouragement throughout the years. In particular I want to dedicate it to my mother and father who were always there to read drafts for me and give me suggestions. Second, I'd like to dedicate this work to one special woman who has also read countless drafts, given me someone to bounce ideas off of, and helped me in countless other ways while I was producing this work—thank you Lindsey.

## ACKNOWLEDGEMENTS

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## I. INTRODUCTION

René Descartes had only recently published his work on substance dualism when a very astute reader of his, Princess Elisabeth of Bohemia, noted a unique problem with Descartes' idea of substance dualism.<sup>1</sup> If mind and body are really as distinct and separate as the thesis entails, how can they causally interact with one another? Descartes himself, it is commonly alleged, never seemed able to satisfactorily address this issue, and indeed the problem of mind-body causal interaction has continued to plague substance dualism ever since. Still few, if any, have ever been able to explicitly detail what it *is* about this problem of interaction that seems to imply substance dualism is false. Recently, however, Jaegwon Kim (2001, 2005) has offered explicit arguments for the conclusion that such causal interaction is incoherent. Kim offers a detailed explanation of what the difficulty is in an immaterial event (say a volition) causing a material event (say a bodily movement) to occur.<sup>2</sup> Kim states his argument shows us why substance dualism “is an idea that we cannot make intelligible” (Kim, 2001 31). Kim calls this objection against substance dualism the “pairing problem” argument.

The purpose of this thesis is firstly to examine Kim's pairing problem argument and to show that it fails in its attempt to show that interactionist substance dualism is not intelligible. In addition, I will argue that substance dualism is, at least, a viable philosophical option for those who are motivated to believe in it. Nevertheless, it should be noted that it is *not* my goal to argue that substance dualism is true, or even that it is particularly *likely*, but rather simply to argue that one should not dismiss substance dualism as a viable option based on the kind of argument Kim

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<sup>1</sup> Throughout the context of this paper I will be using the term “substance dualism” to refer to the belief that there are two fundamentally distinct kinds of substances in the universe (the material/physical, and the mental/immaterial) which causally interact. For the entirety of this paper, unless otherwise noted, substance dualism should be taken to refer specifically to the variety of that position that holds there is causal interaction between the mind and body.

<sup>2</sup> Interaction in reverse, from the physical to the mental, is also a problem for substance dualism, but the argument of Kim's I will be dealing with in this paper deals specifically with mind-to-body causation. Presumably the same pairing relation can be used in either direction, if it can be shown to be viable.

gives. Nonetheless given the scarcity of specific arguments against the possibility of causal interaction in substance dualism, I take my arguments to clear the way for the development of a positive account of such interaction.<sup>3</sup>

Kim insists that the pairing problem argument shows that substance dualism is unintelligible because it cannot offer any kind of causal pairing story either between two mental events or between a mental event and a physical event.<sup>4</sup> For one event *X* to cause another event *Y*, there needs to be a causal relationship between them on a metaphysical (ontological) level. However, given that we do not have direct access to this metaphysical level, to understand causal relationships we posit a “pairing relation” to explain why event *X* causes event *Y* (rather than some other event). Kim further suggests that every causal relation *must* have a pairing relation associated with it. To choose the correct pairing relation in a given case we must look for something to explain why the causal events unfold as they do. Kim argues that the only kinds of relations that may explain pairing relations would not intelligibly hold in the case of the interaction between mental events and physical events posited by substance dualism.

Kim believes substance dualism cannot provide a story that is intelligible, because pairing relations are *only* made comprehensible when the spatiotemporal relations between the relata allow one to pick out that appropriate pairing relation. But minds, by substance dualists’ own lights, have no spatial relations—they are entirely non-extended in space. Kim reasons that for causal interaction to be made intelligible there must be a causal relation between the events involved, and if there is a causal relation between the events then there must be a way for us to

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<sup>3</sup> Indeed, one should keep in mind that Kim is one of only a few philosophers to have offered a detailed account of this problem. Other accounts include Sosa (1996) and his problem of individuation to name one.

<sup>4</sup> Kim gives two basic versions of the pairing problem, mental-to-mental and mental-to-physical. However, in this essay I will only be addressing the mental-to-physical version of the problem. If one can supply a case for mental-to-physical interaction, then I believe mental-to-mental causation can be talked about *via* transitivity in terms of the following. Mind *A* interacts with body *A* which then affects body *B* that interacts with mind *B*. This solution gives an indirect way for mind *A* to interact with mind *B*, even if direct interaction may still remain problematic.

pick out the right pairing relation instantiated by the causal relation. Yet, if the only things that can play the role of allowing us to pick out the correct pairing relation are spatial relations, then it seems to follow that the possibility of there being causal interaction between mind and body in substance dualism is precluded. In this paper I will argue that it is not the case that spatial relations are necessary conditions for providing an appropriate causal pairing relation.<sup>5</sup> Moreover, I will argue that there is actually sufficient empirical evidence and accepted scientific theory to suggest that there is *at least one* case of physical-to-physical causation in our world in which the spatial coordinates, or relations, of either relata do not allow us to pick out the correct pairing relation even though they are *still* causally paired. That is to say, there are causal relationships which do not need spatial relations “underpinning” the pairing relation.

If I can show that there exists an accepted scientific theory which entails at least one causal relation in the physical world such that the spatial relations of the relata do not determine the appropriate causal pairing relation—this should be sufficient to show that Kim’s argument fails. The question then becomes: is there a way a substance dualist can provide a justified pairing relation between an immaterial mind and a material body? If there are cases in our world in which the spatial relations between events do not underlie the appropriate pairing relation between them, the two relata could in principle occur *anywhere* and still engage in the same causal interaction. I argue that it is only a small conceptual step from this possibility to the possibility that a pairing relation can be correctly picked out even if one of the relata is—literally—*nowhere*. Thus, the answer I propose to the original question is that there can be an intelligible way of picking out the appropriate causal pairing relation between a material relatum and an immaterial relatum. Hence, Kim’s argument that the pairing problem renders substance

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<sup>5</sup> While *spatiotemporal* elements are what Kim requires for picking out the appropriate causal pairing relations I will leave the temporal aspect out of the equation henceforth as it seems unlikely anyone would argue there is a problem with minds having temporal coordinates.

dualism unintelligible fails, and substance dualism is, at least, an intelligible option. If I can show there are ways of making substance dualism intelligible, then, barring other arguments that might show substance dualism false, I believe these examples will demonstrate that substance dualism is, at least, philosophically viable.

Why should one care if substance dualism is viable or not? Kim (2005) himself alludes to one *very* good reason one should care: it could be one of the few ways in which we can save mental causation from being rendered a fiction. Mental causation, the idea that our thoughts really do cause our actions, is an intuitive idea that few wish to give up. However, as Kim himself notes, physicalistic theories have not been able to offer few, if any, promising ways of saving mental causation. Moreover, other alternative theories such as property dualism commonly entail epiphenomenalism, and thus this option does not save mental causation either. Kim is concerned that this situation will cause some to be tempted by substance dualism, an idea he thinks is unintelligible, and thus he offers the pairing problem argument to try and dissuade others from being tempted by substance dualism in order to save mental causation. However, if I can show that Kim's argument fails, and that substance dualism is at least a viable option, then for those wishing to save mental causation substance dualism could be one of the few possibilities that offer promise.

## II. KIM'S PAIRING PROBLEM ARGUMENT

Prior to launching directly into Kim's pairing problem it is first important to understand how it is that Kim thinks we can pick out appropriate pairing relations in general. Kim begins by looking at causal relationships in general. He seems to think that if a causal relationship exists between two relata there must be some way of understanding that relation such that we can

appropriately pair the two relata together. Initially he examines two different ways one could provide a proper explanation of cause and effect pairing for two events. The first way is to trace a continuous causal chain between the two events in question. The second way is to construct a pairing relation that holds only between the events in the cause and effect pairing. Eventually Kim dismisses the first option as he asserts that the very idea of constructing such a causal chain begs the question. He writes, “the very idea of a causal chain makes sense only if an appropriate notion of causation is already in hand, and this requires a prior solution to the pairing problem” (Kim, 2005 111). Thus, Kim concludes that only the second option can give us a satisfactory understanding of cause and effect. There must be some relation between the two events that can help us pick out the correct pairing relation, which in turn implies there is a causal relation between the two events. Correct pairing relations will always supervene on causal relations.

As an example of how this second option might work, Kim points to a situation where two guns, *A* and *B*, are simultaneously fired and result in the simultaneous deaths of two individuals, Adam and Bob. In this situation the bullet from gun *A* strikes and slays Adam, while the bullet from gun *B* strikes and slays Bob. To understand the causation involved here he states:

We look for a “pairing relation”, R, that holds between A’s firing and Adam’s death and between B’s firing and Bob’s death, but not between A’s firing and Bob’s death or B’s firing and Adam’s death. In this particular case, when the two guns were fired, gun A, not gun B, was located at an appropriate distance from Adam and pointed in his direction, and similarly with gun B and Bob. It is these spatial relations (distance, orientation, etc.) that help pair the firing of A with Adam’s death and the firing of B with Bob’s death. (107)

Kim asserts, and most would agree, that in this situation we understand the pairing relations in light of the spatial coordinates of the events involved. Gun *A* slew Adam, and not Bob, because gun *A* was *oriented* toward Adam and was *located* at an appropriate distance from him whereas gun *B* wasn’t; and *vice versa*. Moreover, we can pick out the correct pairing relation of gun *A*

slaying Adam instead of Bob exactly because we can reference the specific spatial relations of the events involved as explaining to us *why* the objects in those events were disposed to undergo the processes they did. That is to say, we can choose the correct pairing relation between the events involved not because they each possess *some* spatial coordinates and relations, but rather because they each possess the *right* spatial coordinates and relations. Had gun *A* been positioned differently (let's say in some other country far, far away from Adam) then we could not have used the spatial relations to correctly choose a pairing relation where gun *A* slays Adam. Thus, for Kim a causal pairing relation can be ascribed correctly between two events when they each possess the appropriate spatial relations. He writes that the relata in the causal pairing relations must exhibit “‘contiguity’ in space and time, as well as constant conjunction and temporal precedence” (Kim, 2005 116). A pairing relation seems, he claims, to be the only way we are empirically validated in appropriately pairing a cause and effect relationship.

Nonetheless, Kim makes it clear that this option of direct spatial relations is not the only method of establishing a pairing relation. As he notes, there are several instances of causal pairings in which the events involved in the cause and effect relationship do not possess the appropriate spatial coordinates such that we can immediately pick out the appropriate pairing relation. Rather, there are many instances in which there exist intermediaries, or chains of events, that allow one event to properly be said to have caused another event even though they were spatially separated. Kim, who draws the majority of his necessary conditions for picking out appropriate causal pairing relations from Hume's work on causation, again draws on Hume noting that he “required that a pair of causally connected events that are spatiotemporally separated be connected by a chain of spatially contiguous events” (112). Kim concludes that these two methods seem to be the only ways in which one can satisfy the pairing problem: 1)

positing direct spatial relations of the relata or 2) positing a chain of spatially contiguous events that link the relata appropriately. He writes that directly contiguous spatial relations combined with, “Hume's contiguity condition—or the condition that a spatially separated cause-effect be connected by a chain of contiguous cause-effect pairs—can be seen as... [the] solution to the pairing problem” (Kim, 2005 116). Now that we have a clearer picture of what Kim intends as the proper ways to construct an accurate causal pairing relation between two events, we will now turn our attention to Kim’s pairing problem argument between material events and immaterial events in substance dualism.

Imagine the following situation: there are two identical immaterial events (say, volitions to raise a hand by two immaterial minds or souls), *A* and *B*, occurring at the same time *t*, followed by a material event *M* (say a hand raising). Kim invites us to try to come up with an intelligible account of how we could correctly pick out the pairing relation here. Ultimately, he claims that there is no possible story one can give without either 1) “begging the question” or 2) referencing spatial relations, either directly or via a chain of events, like in the gun example.<sup>6</sup> He writes:

What relation might serve to pair soul A's action with the change in M? That is, what could be the pairing relation in this case? Evidently, no spatial relations can be invoked to answer this question, for souls are not in space and are not able to bear spatial relations to material things. Soul A cannot be any “nearer” to material object M, or more propitiously “orientated” in relation to it, than soul B is. (108)

One can see that the kind of answer invoked with the gun case cannot begin to help here. Each mind (or soul) and its mental events have no spatial coordinates whatsoever, and as such there can be no story told of one mental event being more directly oriented toward the particular

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<sup>6</sup> By the phrase “question begging” Kim means explaining what needs to be explained in terms of itself. The following is one example: What explains mental causation? The mind causing something in the body explains mental causation. The reasoning is circular.

material event or being closer than some other mental event to the material event; nor can there be a story told about how the spatial coordinates of the mental event can cause an event in some other intermediary object which then, through a chain of events, comes to eventually cause a event in the body. According to substance dualism, minds have no spatial relations whatsoever, and hence their spatial relations obviously cannot help us in picking out the correct causal pairing relation here.

Kim briefly chooses to examine some other things that could perhaps play the role of allowing us to pick out the accurate pairing relation when spatial relations cannot (he looks at things like psychological relations for instance).<sup>7</sup> However, eventually concludes that there is no way of utilizing these notions in picking out a correct pairing relation without either understanding the relation in terms of the relation we are trying to understand (like in the question begging example above) or appealing to spatial relations which aren't there to be appealed to. Thus, Kim concludes that the lack of spatial relations demonstrates why substance dualism is unintelligible; there is no way to pick out the correct pairing relations between immaterial mental events and material bodily events, and these are prerequisites for causal relations.

One can thus standardize Kim's pairing problem argument against substance dualism as follows:

- (1) For substance dualism to be intelligible, the mental and the physical must be able to causally interact.
- (2) If there is causal interaction between any two events (say the mental act of the immaterial entity and the physical act of the material entity), then there must be a pairing relation between them.
- (3) In all physical cases, the specific spatial relations between relata allow us to pick out the appropriate pairing relation, either by having direct spatial relations or by being

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<sup>7</sup> Kim looks at different psychological relations like intentional relations such as the following: thinking of, picking out, referring to, and gazing into.

connected by a spatially contiguous chain of events. There seems to be nothing else that can play this role.

- (4) Thus, it is highly likely pairing relations are *only* possible when both entities involved occupy specific spatial coordinates.
- (5) The events in mental-to-physical causation in substance dualism do not both occupy specific spatial coordinates. Thus, there seems to be no way to construct the appropriate causal pairing relation in these cases.
- (6) Thus, substance dualism is not intelligible.

That, in abbreviated form, is Kim's argument for why substance dualism is unintelligible: spatial relations seem to be required for us to correctly pick out the pairing relation in all causal interactions. "If [my] reflections are essentially right," Kim concludes, "our idea of causation requires that the causally connected items be situated in a space-like framework" (Kim, 2005 112).

To object to Kim's argument, one would either have to 1) show that the argument has bad form, or 2) show that (at least) one of the premises is false. I concede that Kim's argument does in fact have strong inductive form, but I plan to argue in the next section that there is sufficient empirical evidence to show that premise (3) is false.<sup>8</sup> There is a substantial body of evidence to show that there are physical causal interactions in our world in which the specific spatial relations of the causally related events play no role *whatsoever* in picking out the pairing relation. That is to say, there seems to be causal interactions which either have something "underpinning" them besides spatial relations, or perhaps nothing at all. There are causal events in which there are no unique spatial locations possessed by the relata that them to engage in the particular causal relationship they do. This example from an accepted scientific body of knowledge, I argue, is enough to show Kim's third premise is false: appropriate pairing relations can be established on the basis of relations other than spatial ones, thereby allowing for a causal relation between two events which do not both occupy spatial coordinates.

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<sup>8</sup> This of course would mean that (4) does not follow from (3) given that (3) is false.

### III. THE EINSTEIN-PODOLSKY-ROSEN/BOHM EXPERIMENT

In the gun example, spatial relations allowed us to pick out the appropriate pairing relation. One way to show that something else can play this role would be to find a case where there is a causal relation in which the *specific* spatial relations of the causal relata are irrelevant.<sup>9</sup> That is to say, an example in which the spatial relations do not affect how the causal interaction unfolds. If such is found it would indicate that something else can correctly pick out the right pairing relation other than the spatial relations of the relata, which thereby ensures us there is also a causal relation between the relata. I believe I have found just such an example.

In 1951, David Bohm formulated an experimental version of a rather famous thought experiment originally proposed by Einstein, Podolsky, and Rosen in 1935.<sup>10</sup> It goes roughly like this. Pairs of subatomic particles, specifically pairs of photons, are shot from an emitter in what is called the *spin singlet state* and are forced in opposite directions, left and right.<sup>11</sup> When these photons reach a certain distance (this distance can be varied), they encounter a kind of measuring apparatus that is programmed to gauge the spin component of each photon; that is to say, the apparatus measures if the photons are in a clockwise spin state or a counterclockwise spin state.<sup>12</sup> The surprising result is that even if these measurements are made *simultaneously*, and even if these measurements are taken *so* far apart that no light signal (or thus any signal slower

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<sup>9</sup> To be precise one would need an example where we can *consistently* and *correctly* pick out the appropriate pairing relation, not just an example that did this by means of a one-time fluke.

<sup>10</sup> Ironically, Einstein's reason for coming up with the experiment was to show that quantum theory was false, or at least not complete. He thought the theory called for certain results, and claimed such results would surely not happen experimentally. However, by the 1980s it had been widely confirmed that those results do happen experimentally just as quantum theory predicted.

<sup>11</sup> The term "spin" in quantum mechanics is a confusing one; while the property that spin quantizes is not literally spinning it is related to the angular momentum of the elementary particle. Thus my use of the word spin in this section coincides with the quantum mechanical use of the term. Additionally the phrase "the spin singlet state" in this case refers to a set of two or more particles prepared in a correlated state, such that the total angular momentum of the state is equal to zero.

<sup>12</sup> Technically the spin of a particle such as a photon has a mathematical value like  $\frac{1}{2}$  or  $-\frac{1}{2}$ , but by convention most physicists refer to these values respectively as one of several names: spin up (or right, or clockwise), and spin down (or left, or counterclockwise).

than light) can travel between them while the measurements are being made, the photons' spins *still* are perfectly inversely correlated. If one is measured to be in a counterclockwise spin state, the other will be measured to be in the clockwise state—even though the moment before they were measured neither of them had any determinate spin whatsoever, rather they both had some (independent) probability according to which their spin is determined.<sup>13</sup> These results are the same regardless of how far or how close the photons are from each other when the measurement is carried out.

Why is this result significant for my purposes? Prior to the measurement being made, each of the photons has its own independent probability of being in a certain spin state; each is indeterminate with regard to spin prior to the measurement and has no particular spin either clockwise or counter-clockwise. Yet when measured the two photons are always perfectly coordinated: whatever spin state the photon shot left is measured in, the spin state of the photon shot right is just the opposite, and *vice versa*. So, if the left one was determined to be in the clockwise spin-state, then the right one will instantaneously be found to be in a counterclockwise spin-state; even though neither had any particular spin-state prior to that moment of measurement, they are perfectly inversely correlated when gauged. This result seems to imply that there is something like causation at a distance at work here. The photon being measured to be in a particular spin-state appears to *cause* the other photon to fall into the opposite spin state, when it previously had no particular spin state at all. The one particle's spin state being measured seems to cause the other particle's spin to become determinate *regardless* of the spatial distance between them; the two systems can be light-years apart and this causal pairing will still

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<sup>13</sup> For evidence that the spin states are really indeterminate prior to the moment of measurement see Bell (1964) and Aspect et al. (1982).

hold.<sup>14</sup> Granted, each of the photons do occupy spatial coordinates, but the spatial locations seem to be irrelevant from the viewpoint of the causal story. Whatever spatial coordinates the photons may be found to have do not seem to affect the causal interaction between them. There is no “right place” for the two photons to be in order to have the causal interaction that they have. This seems to suggest that there is at least *one* instance of causation in the physical world in which the specific spatial relations are irrelevant to choosing the right pairing relation.

Following the work of John Bell (1964) on the Einstein, Podolsky, Rosen/Bohm experiment (or the EPR/B experiment), the belief that in the quantum mechanical realm there really does exist some kind of non-local, or distant, causation of the kind described above has become *very* widespread in modern physics.<sup>15</sup> D. Bohm and D. J. Hiley from London University’s Department of Physics remark that “all the commonly accepted interpretations of the quantum theory that have been proposed thus far imply some kind of non-locality” (Bohm and Hiley, 1989 95). A theory, quantum or otherwise, is said to have a kind of “non-locality” if the particles it posits can have a causal effect on other particles regardless of how distant those other particles might happen to be, even if this distance is light-years or farther.

Now some may argue that even if the quantum world does include non-locality, this is not necessarily the same thing as the quantum world involving action-at-distance or causation-at-a-distance. Are they necessarily the same thing? There are several examples in modern physics, examples in various different quantum mechanical interpretations, of the consensus that this specific case demonstrates just that.<sup>16</sup> Causation can occur between particles regardless of the spatial relations involved. Physicists Nicola Cufaro Petroni and Jean-Pierre Vigièr write: “the

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<sup>14</sup> For the evidence of this see Gisin et al. (2000).

<sup>15</sup> For examples of this consensus one can see works such as Clauser and Horne 1974, Jarrett 1984, 1989, Shimony 1984, Redhead 1987, Butterfield 1989, 1992a, b, 1994, Howard 1989, Healy 1991, 1992, 1994, Teller 1989, Maudlin 1994, and Berkovitz 1995, 1998a, b.

<sup>16</sup> The case I’m referring to is of course the behavior of the photons in the EPR/B experiment.

[mathematical] relations [in the EPR/B experiment] ...represent a pair of causally bound photons connected by a causal action-at-a-distance...the elements of the photon pairs interact permanently not by exchanging tachyons [that is some kind of information or signal] but through action-at-a-distance” (Petroni and Vigier, 1983 384-386).<sup>17</sup> Along similar lines, noted philosopher of physics Joseph Berkovitz writes:

A wide consensus has it that the quantum realm involves some type of non-locality...In orthodox quantum mechanics as well as in any other current quantum theory that postulates non-locality...the influences between the distant measurement events in the EPR/B experiment do not propagate continuously through space-time. They seem to involve *causation at a distance*. (Berkovitz, 2007 3-8, my italics)

Hence, the consensus in the modern quantum physics community seems to be that there at least one case of causation in our physical world in which the specific spatial relations are *irrelevant* to picking out the actual pairing relation. Physicists have found that particles can be anywhere and still have the *exact same causal interaction*. Yet we can reliably, and consistently, pick out the proper pairing relation for the particles. Granted, it is not fully clear what the proper analysis of the pairing relation R ought to be in such cases, but we know that what underpins R are not the spatial relations between the relata.

Yet, as was seen in the previous section, premise (3) of Kim’s argument seems to state that in every causal interaction spatial relations must pick out the correct causal pairing relation. Contra Kim, I have argued that the event of one photon’s being measured can exert a causal influence on the other photon’s acquiring a determinate spin state regardless of how the two events are spatially related. Imagine now two distinct instances of the EPR/B experiment being run parallel and simultaneous to each other. Let us call the left particle being measured in the first run of the experiment event  $L_1$ , and the left particle being measured in the other run of the

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<sup>17</sup> Tachyons are *hypothetical* particles which in theory can travel at superluminal speeds.

experiment event  $L_2$ , and so on with the other respective particles and their respective events of measurement ( $R_1$  for the event of measurement in the right particle in the first experiment and  $R_2$  for the event of measurement in the right particle of the second experiment). So in this example we are imagining events  $L_1$  and  $R_1$  belong to the first experiment and events  $L_2$  and  $R_2$  belong to the second experiment. According to Kim's understanding of causal pairing relations, what allows us to pick them out are the unique spatial relations of the relata. In Kim's original gun example, we say that gun *A* slew Adam instead of Bob because gun *A* was in a specific location that allowed for that event to enter into a causal pairing relation with Adam's death, whereas gun *B* wasn't. If one had switched the spatial location of gun *A* with that of gun *B*, then gun *A* would have not slain Adam; the causal pairing relation would have no longer held. Contrast this example with the photon's case. If we were to (somehow) switch the position of the photons in events  $L_1$  (the measurement of the left particle in the first experiment) and  $L_2$  (the measurement of the left particle in the second experiment) after each has been shot away from its respective partner, the *exact same causal pairing relation* would hold. In other words, even if  $L_1$  and  $L_2$  were to magically switch spatial positions when the measurement of  $L_1$  was taken  $R_1$  would still be caused to be measured in the opposite spin state found in event  $L_1$ , and not the opposite of the one in event  $L_2$ 's which would now be the particle across from it.<sup>18</sup> Event  $L_1$  is paired with event  $R_1$  and not  $R_2$  regardless of what spatial coordinates any of them occupy, and physicists reliably pick out this pairing relation based on the body of empirical evidence and quantum theory as a whole. Something other than their spatial relations must be playing the role of allowing us to

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<sup>18</sup> That is, unless by coincidence event  $L_1$  measures the exact same spin state in its photon as  $L_2$  does, then the inverse correlation would follow trivially.

choose the correct causal pairing relation here. This phenomenon is labeled as “quantum entanglement”. The two photon’s spin state systems are “entangled”.<sup>19</sup>

Thus, I conclude that, in light of a substantial body of empirical evidence in modern quantum physics, Kim’s third premise is false: pairing relations do not necessarily presuppose specific spatial relations for the events involved. Pairing relations are possible when the entities involved do not occupy any specific spatial coordinates.

However, a critic of my argument may reply that Kim’s third premise has not really been shown to be false by the above reasoning. As was noted in Section II, both Hume and Kim allow that an event *A* can still be said to cause a change in another event *B* even if they are not in spatial proximity given that they are connected by a chain of spatially contiguous events. Consequently, some may refer to this qualification and point out that the pair of photons does in fact have a history of being in spatial proximity and interacting in at least some fashion. Can Kim not simply appeal to this history as a means of picking out the correct pairing relation?

Consider the following example. On a pool table, in a straight line aimed at a corner pocket are a cue ball, an eight ball, and a ten ball starting from the shooter and progressing toward the corner pocket. Now, say a person uses a pool cue to strike the cue ball and the cue ball then in turn strikes the eight ball which then strikes the ten ball and pushes it into the corner pocket. Can we say the event of the cue ball being struck by the pool cue caused the event of the ten ball entering into the corner pocket even though they were spatially separated? The answer, of course, is yes; you can make this claim because there exists a chain of spatially contiguous events between the cue ball and the ten ball that can allow us to pick out the proper pairing relation.

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<sup>19</sup> The term “entanglement” is one that was first coined by Schrödinger (1935) and is illustrated in his famous cat example.

Can an analogous argument help Kim with respect to the EPR/B experiment? Are there any spatially contiguous chains of events that could possibly account for the one photon causing the spin state of the other photon to be exactly inversely related to its own? Granted, it is true that originally, at some point in the past, the two photons are in states which are not spatially separated, and again this fact does seem to be important for the photons' behavior.<sup>20</sup> However, does it therefore follow that there exists a chain of events that connects the event where the two particles are in spatial proximity with one another to the actual caused event where the measurement of the photons in the EPR/B experiment?

It is hard to see how it could. There does not seem to be any intermediary event between the two photons that could establish such a chain of events. The events in the EPR/B experiment are the first event *X*, the left photon's spin state being measured, and the second event *Y*, the right photon's spin state being measured. When the causal event occurs, namely when one photon's spin becomes the inverse of whatever the other photon spin state was determined to be, the only entity spatially contiguous with either photon is the measuring apparatus. For there to be a chain of spatially contiguous events that allows us to pick out the correct causal pairing relation in this case there would have to be an event *Z* where the original pair of photons is spatially related that was connected spatially to event *X* that was then connected spatially to event *Y*. There perhaps is a spatially contiguous chain of events from event *Z* to event *X*, or from event *Z* to event *Y*, but there is *none* from event *X* to event *Y*.<sup>21</sup> Thus there certainly cannot be any chain from *Z* to *X* to *Y*. The measuring apparatus gauging the right photon is the only thing that could possibly be a candidate for the location of the last link in that spatially contiguous chain; it alone is in spatial

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<sup>20</sup> There once interacting in close proximity is important because that is what makes them enter into the entangled state to begin with, and the correlation will not hold between two photons if the two are not in an entangled state with one another.

<sup>21</sup> Keep in mind the spatial coordinates of the events where the two photons are measured (what I'm calling events *X* and *Y*) can be anywhere—i.e. widely separated—and these events are supposed to happen *simultaneously*.

proximity with the photon being affected (that is to say the event *Y*). Recall the Petroni and Vigier quote from above: “the [mathematical] relations [in the EPR/B experiment] ... represent a pair of causally bound photons connected by a causal action-at-a-distance...the elements of the photon pairs interact permanently *not* by exchanging tachyons [that is some kind of information or signal] but through *action-at-a-distance*” (Petroni and Vigier, 1983 384-386, my italics).

Given that there is no way event *X* can be said to have a set of spatially contiguous events linking it to event *Y*, this choice cannot be an option for Kim. There are events in which the two photons being in proximity to each other and interacting, but those events are then spatially separated and temporally separated from the event *Y* (where the causation in the EPR/B experiment occurs). Nevertheless, let us look more carefully at this case to be sure Kim cannot employ this strategy.

Between event *X* and event *Y* there are no intermediary events that transfers causal force or any kind of information from the causal event to the caused event, as there was in the case of the cue ball and the eight ball—events *X* and *Y* were said to be simultaneous. A history of at least one event where the two photons are just in spatial proximity of each other, and interacting, is not something that can, according to Kim, allow us to pick out the correct pairing relation. There *has* to be a spatially contiguous chain of events, and there seems to be no candidate for such a chain in the EPR/B experiments.

However, although *most* physicists agree with the finding that the events take place instantaneously, there are scientists referencing Einstein’s General Theory of Relativity (1916) that point out that according to Relativity Theory there is no such *thing* as simultaneity.<sup>22</sup> So let us grant that perhaps the events are not *simultaneous*. Perhaps event *X* occurs some unimaginably small moment of time prior to event *Y*. There is another problem for this kind of

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<sup>22</sup> In many, if not most, interpretations Relativity Theory is often incompatible with Quantum Theory, and so this disagreement shouldn’t come as a surprise to the reader. However, this subject is a hot topic in the world of theoretical physics.

defense, and that is temporal precedence. Remember, event *Z* occurs *before* events *X* and *Y*. To be the intermediary event link between *X* and *Y*, *Z* must happen *after X* but *before Y*. In Section II we noted that Kim required several things of the direct-like and the chain-like spatial relations that were necessary for causal interaction, and one of them was temporal precedence. If *Z* occurs before event *X*, and the causation occurs from *X* to *Y*, then *Z* doesn't seem to be able to be a candidate for a chain-like spatial relation that might work to pick the correct pairing relation between the two events. Hence, I assert that the answer to the original question at hand is no; the two photons do have a history of being spatiotemporally connected, but this fact is not sufficient to pick out the pairing relation according to Kim's criteria. Thus, this strategy cannot be used to save Kim's argument. The events of causation in the EPR/B experiment lack both the specific spatial relations that could play the role of picking out the right pairing relation, and the spatially contiguous chain of events that could also serve in this manner.

Many physicists view this experiment as sufficient empirical grounds to adjust our conceptions of space and causation. Physicist Brian Greene of Columbia University writes:

Einstein's paper [the one in which the EPR/B experiment is originally proposed]...implies that something you do over here can be *instantaneously* linked to something happening over there, regardless of the distance...by the 1980s...researchers confirmed that there *can* be an instantaneous bond between what happens at widely separated locations...Many scientists, myself included, view [the implications of the EPR/B experiment] as part of a radical quantum updating of the meaning and properties of space. Normally, spatial separation implies physical independence. If you want to control what's happening on the other side of a football field, you have to go there, or, at the very least, you have to send someone or something (the assistant coach, bouncing air molecules conveying speech, a flash of light to get someone's attention, etc.) across the field to convey the your influence. If you don't—if you remain spatially isolated—you will have no impact, since intervening space ensures the absence of a physical connection. Quantum mechanics challenges this view by revealing, at least in certain circumstances, a capacity to transcend space; long-range quantum connections can bypass spatial separation. (Greene, 2005 11-12)

As stated previously, it seems that Kim's third premise is in fact false; by referencing either direct spatial relations or a chain of spatially contiguous events (the two options allowed by Kim) we cannot pick out appropriate pairing relations. There seems to be at least one physical-to-physical case where something *else* is filling this role. What is serving that role here? The answer is simply sufficient empirical evidence. That is to say, there is a substantial body of evidence that says one event is correlated in an inverse fashion with another event, there seems to be no third event causing both of them, and the two events do not seem to be coincidentally correlated. From a scientific point of view this is sufficient to form the belief that the two events are causally related, and thus have a pairing relation as well. The huge amount of empirical evidence obtained by physicists and experiments like the EPR/B experiment, allows us to correctly pick out the proper pairing relation in this case.

As a direct consequence of this reasoning, it seems that Kim's argument that substance dualism is unintelligible does not succeed. If we are going to reject substance dualism, it should not be on the grounds that Kim gives. It could be the case that substance dualism is unintelligible based on some other argument, but that has yet to be shown. Kim has actually offered one of the few attempts to articulate what the problem with interactionist substance dualism is. To demonstrate that substance dualism is not only intelligible but also more viable than traditionally held, I will examine in the next section several accounts of how a pairing relation between an immaterial mind and a physical body could in principle be instantiated.

#### IV. TOWARDS ESTABLISHING A PAIRING RELATION BETWEEN IMMATERIAL EVENTS AND MATERIAL EVENTS

If there is at least one case of a physical-to-physical pairing relation in which spatial relations do not play a key role, why could there not be a way to pick out proper mental-to-

physical pairing relations in whom the spatial relations do not serve this role either? Why should we hold substance dualism to stricter requirements for causal interaction than we hold quantum mechanics? My answer is that we should not. If pairing relations (and thus causal relations) do exist such that spatial relations between relata do not play a crucial role, then the possibility of there being some kind of causal interaction between an immaterial mind (or soul) and a material body is not precluded.

However, it is one thing to say that our understanding of pairing relations does not preclude something from happening, and another to say that that same something is viable. Here is how a positive account may go. In a recent paper, David Jehle (2006) has also argued that Kim's argument against substance dualism fails. The example Jehle sketches of a pairing relation for mental events and physical events is worth looking at as one viable way to understand the correct pairing relation between immaterial minds and material bodies.<sup>23</sup> To offer such a causal pairing relation, Jehle notes, the substance dualist must basically assert the following:

$$\diamond \exists x \exists y [(x \text{ is a soul} \ \& \ y \text{ is a body} \ \& \ x \text{ is paired with } y) \ \& \ \forall z ((z \text{ is paired with } x) \rightarrow (z = y))]$$

That is to say, it is possible that there exist minds and bodies that are paired together such that *only* one mind is ever paired with one particular body. If the substance dualist can offer an account of how this kind of pairing relation can be correctly picked out, then she will have given an account of how a mind can be uniquely paired with a single body (or how a mental event can be paired with a physical one).

Jehle suggests that one way of understanding the pairing relation non-spatially is to ground it in the powers and dispositions of the relata. A pairing relation could be understood in

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<sup>23</sup> I would say Jehle seems to be arguing that Kim's argument fails because of the form (fallacy of ambiguity), whereas I am arguing Kim's argument fails not for that reason but because of a false premise.

terms of “a mutual manifestation of reciprocal dispositional partners” (Jehle, 2006 573). One could talk about a pairing relation between a material body and an immaterial soul as follows:

Some soul is such that it possesses a unique and singular property, such that in virtue of its possession of this property, it is able to causally interact directly with one and only one material substance by virtue of a property the material substance possesses and that property (of the material substance) also only allows for interaction with the particular soul in question. (574)

This kind of pairing relation does not seem to generate any glaring absurdity or contradiction; it does not seem *prima facie* to be unintelligible. However, I imagine many, probably Kim included, would argue that such a pairing relation just begs the question because it ultimately seems to be explaining the mental causation involved *via* properties that entail mental causation being possible; he would mostly likely say that it does no better than Descartes’ original answer at providing us with an understanding of how such a causal interaction might work.

One answer this kind of objection is proposed by Jehle himself. The objection that states that such a pairing relation is question begging “trades on a confusion of epistemology and metaphysics” (574). It is one thing to say of something that it is possible, but it is an entirely different thing to explain how that thing *operates*. As Jehle writes:

That is, knowledge of the specific properties that explain the possibility of singular and unique paired causation between a soul and body is not a prerequisite for being warranted in believing that such properties exist. Put differently, what warrants our acceptance of (P) is different than what makes (P) true. True, we are not in epistemic position to know what makes (P) true. That does not imply, though, that we are not (or cannot) be reasonable in believing something like (P). (574-5)

While one might be able to construct a good argument that this pairing relation is improbable, based on the absence of a more intricate or detailed account of the causal story, that is not the same thing as arguing that the pairing relation is not viable. This account is one way substance

dualism can be rendered intelligible, at least in the sense that it can give a comprehensible account of how the material body and the immaterial mind are causally paired.

Nevertheless, for the sake of argument let us say that this unpacking of the pairing relation above is not sufficient. How else might a substance dualist answer this charge? Is there anyway to causally unpack this causal pairing relation more thoroughly? How are we to understand what it *means* to say that immaterial event *X* cause material event *Y*? The answer to this question, for the substance dualist, can come from a counterfactual understanding of causation. If we employ a counterfactual theory of causation, we can make sense of how an immaterial event can cause an effect in a material event (and *vice versa*). The counterfactual theory of causation attempts to explain what it is for one event to cause another event. The proposal is that event *A* causes event *B* just in case had event *A* not occurred, event *B* would not have occurred either. Under this view, there aren't any special properties or relations that the cause possesses in virtue of which it leads to the effect. All there is to causation is counterfactual dependence.

David Lewis is famous for having defended just such a theory of causation. He writes: "The best reason to persist in trying to make a counterfactual analysis of causation work is that the difficulties that confront rival approaches seem even more daunting" (Lewis, 2007 466).<sup>24</sup> Now it is not the purpose of this paper to argue that the counterfactual theory of causation is correct. Rather, I aim to demonstrate that this approach to causation can help a substance dualist provide a viable solution—at any rate a solution as viable as the counterfactual theory—to the problem of understanding the causal pairing relation between minds and bodies.

Originally, Lewis (1973) outlined a rather simplistic view of how the counterfactual theory of causation works; however, later he refurbished the theory to deal with more

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<sup>24</sup> Rival approaches include: the deductive-nomological theory, the trope theory, as well as others.

complicated cases (1986). Initially, Lewis felt it sufficient to say simply “that event C is a cause of event E iff E depends counter-factually on C; iff, if C had not occurred, E would not have occurred” (Lewis, 2007 468). But he recognized that there are two very important qualifications that must be added to this formulation of causation. First, it must be stipulated that C and E are “the right kind of relata” (468). That is to say, it must be stipulated that C and E need to be distinct events, and distinct not only in the sense of their not being identical but also in that they do not entail either events which overlap each other or events that imply one another. Lewis writes:

C and E must be distinct events—and distinct not only in the sense of nonidentity but also in the sense of nonoverlap and nonimplication. It won’t do to say that my speaking this sentence causes my speaking this sentence; or that my speaking the whole of it causes my speaking the first half of it, or vice versa; or that my speaking it causes my speaking it loudly, or vice versa. (468)

Second, we must adjust our understanding of this theory such that it has the right kind of counterfactual conditionals. Why does our counterfactual analysis of causation need this qualification exactly? As Lewis himself states:

Why can’t we say, given the laws connecting barometer readings and air pressure, that if the barometer hadn’t fallen, that would have been because the pressure wasn’t low? Why can’t we then conclude that if the barometer hadn’t fallen, there wouldn’t have been a storm?...if we say such things...our counterfactual analysis [will] fail in just the same way that the deductive-nomological analysis [one of the rival analyses of causation] did...Here the much-bemoaned flexibility of counterfactual conditionals is our friend...when we imagine the barometer not falling, we have a choice: we can hold fixed the previous history, or we can hold fixed the lawful connections between that history and what the barometer does. For purposes of analyzing causation, our policy in all such cases must be to prefer the first choice to the second. If need be, we hold history fixed even at the price of a miracle. (468)

Thus, we need to define our counterfactual theory of causation as involving only those counterfactual conditionals that are appropriately structured as to reflect this feature of rigid

history; the counterfactuals must hold the previous events rigid, or fixed. If we do not treat our counterfactuals in this way we would easily fall victim to the kinds of problems that nomological causation theories fall victim to—problems like overdetermination and pre-emptive causation.<sup>25</sup> Lastly, we must also formulate our theory of causation such that it allows for transitivity; as Lewis writes, “we need to provide for causation not only by direct dependence, but by chains of step-wise dependence. We can do so by defining causation as the ancestral of dependence” (Lewis, 2007 468).<sup>26</sup> Our counterfactual theory of causation, thus equipped, can now be said to be able to deal with most, or at least the most common, kinds of causation. Granted, this account is not equipped to perfectly deal with certain problems like probabilistic causation, preemptive causation, and causation by absences. However, it is not the aim of this paper to engage too deeply in these matters. Suffice it to say that the counterfactual theory is a viable competitor among contemporary theories of causation.<sup>27</sup>

The point is that a counterfactual account of causation would give us a [non-question begging] way to unpack what it means for an immaterial event to cause a material event. Imagine the following situation: immaterial mind  $M_1$  has a certain kind of volition at the same exact moment in time another immaterial mind  $M_2$  also has that same kind of volition, and these both are followed in time by act  $A_1$  in material body  $B_1$ . Moreover, it is the case that in all possible worlds where  $M_1$  does not happen—which are close to the actual world (i.e. not

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<sup>25</sup> Overdetermination simply occurs when a single event has multiple sufficient causes. Pre-emptive causation however is more involved. Pre-emptive causation is usually broke into two kinds: early and late preemption. Early preemption occurs when one cause brings about the same effect as another cause where the causation ensuing from the preempted alternative cause is cut short *prior to* the preempting cause’s complete operation being carried out. Late preemption rather occurs when one cause brings about the same effect as another cause where the causation ensuing from the preempted alternative cause is cut short *after* the preempting cause’s complete operation being carried out.

<sup>26</sup> For more regarding this see Lewis (1986).

<sup>27</sup> For a good defense of this kind of counterfactual analysis of causation see Lewis (2007) in which he handles all three of these problems in detail.

significantly different from the actual world)— $A_1$  does not happen either.<sup>28</sup> According to our counterfactual theory of causation we can say that volition  $M_1$  *caused*  $A_1$ . We are also right to say that  $M_2$  did not cause the action in  $B_1$  despite having the same type of volition. Once equipped with a theory of causation *à la* Lewis, we have a perfectly legitimate way of unpacking how one immaterial mental event, rather than another, can be causally paired with a particular material bodily event, rather than another—no spatial relations between immaterial and material events are needed.

Notably, Kim has anticipated just such an answer to his pairing problem in some of his earlier work. In his book, *Physicalism or Something Near Enough*, Kim considers the possibility that there may be some kind of counterfactual supporting constant conjunction between an immaterial event (e.g. a mental event) and another immaterial or material event (e.g. an action).

Kim writes:

[S]uppose that there is a "necessary", counterfactual-sustaining regularity connecting properties  $\underline{F}$  and  $\underline{G}$  of immaterial mental substances. A mental substance,  $\underline{A}$  has  $\underline{F}$  at  $\underline{t}$ , and an instant later, at  $\underline{t}^*$ , two mental substances,  $\underline{B}$  and  $\underline{C}$ , which share identical intrinsic properties, acquire property  $\underline{G}$ . I think we must countenance the following to be a possible situation:  $\underline{A}$ 's having  $\underline{F}$  at  $\underline{t}$  causes  $\underline{B}$  to have  $\underline{G}$  at  $\underline{t}^*$ , but it does not cause  $\underline{C}$  to have  $\underline{G}$  at  $\underline{t}^*$ . Suppose it is claimed that what distinguishes the two cases is that the counterfactual "If  $\underline{A}$  had not had  $\underline{F}$  at  $\underline{t}$ ,  $\underline{B}$  would not have had  $\underline{G}$  at  $\underline{t}^*$ " is true, whereas the counterfactual "If  $\underline{A}$  had not had  $\underline{F}$  at  $\underline{t}$ ,  $\underline{C}$  would not have had  $\underline{G}$  at  $\underline{t}^*$ " is false. Well and good. But if that is the case, there must be an intelligible and principled account of why the first counterfactual is true and the second false. (Kim, 2005 113-114)

This example deals specifically with two immaterial minds interacting, but nonetheless, it is rather easy to imagine what Kim's response would be to the argument that a counterfactual understanding of causation can give us a way of unpacking how a immaterial event could cause an effect in a material event. In all likelihood, Kim would assert that this answer does no better

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<sup>28</sup>Significantly is used in this sentence meaning worlds that have incredibly different laws of physics, and/or other variations that would render the world gratuitously different from the actual world.

job than the answers offered by Jehle or Descartes. That is to say, Kim would probably argue that the counterfactual theory of causation we have outlined here would not be able to give us a viable account of interactionism—a detailed enough account of why one immaterial event causes another particular material event as opposed to any other immaterial event. He would argue that this answer too begs the question.

One could interpret this objection to say: the substance dualist still hasn't told us on what *grounds* he or she can correctly pick out the right causal pairing relation. On what basis can we say that we are correctly picking out the right pairing relation given that we cannot rely on spatial relations? Several notable philosophers have suggested that Descartes himself did not beg the question quite as badly as Kim suggests concerning mind-body causation, but rather had good grounds for picking out a causal pairing relation between an immaterial event and a material event. The philosopher Louis Loeb, for instance, suggests that when Descartes described his understanding of the causation occurring between the immaterial and the material he had in mind an understanding of causation that was proto-Humean.<sup>29</sup> That is to say, Descartes envisioned causation to be simply a matter of temporal precedence and constant conjunction between the two events. Loeb writes:

Descartes sees no problem for the view that physical events cause mental events 'which they in no way resemble.' His position is that pointing to the qualitative difference between mind and body is insufficient to show that their causal interaction is impossible. Simply labeling the difference 'immense' or 'radical' does not magically preclude causal interaction. The critic must explain precisely why specific qualitative differences between mind and body render interaction impossible. Until such time, Descartes persists in a disarming reply to those who hold that an unextended thinking substance cannot interact with body. While the mind is not 'corporeal' in the sense of being 'made up of the sort of substance called body,' nevertheless there is a good sense in which the mind is corporeal: 'If 'corporeal' is taken to mean anything which can in any way

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<sup>29</sup> For another example see Eileen O'Neill (1987) and Dan Garber (1983).

affect a body, then the mind too must be called corporeal in this sense' (K 112). (Loeb, 1981 137)

Thus, one could put the shoe on the other foot, as it were. That is to say, a substance dualist could respond to Kim that it is the critic's burden to explain why one substance, or event, lacking spatial relations means we cannot pick out a pairing relation between it and another spatial substance, or event. An interactionist substance dualist could state that there is no apparent reason that precludes a pairing relation between two events, one of which lacks any spatial relations whatsoever. Loeb claims that what Descartes envisioned as the grounds for picking this pairing relation out correctly is perhaps the one thing we have the *most* empirical evidence for. Loeb writes that "Descartes found mind-body interaction obvious on empirical grounds, and unproblematic..." (140). No constant conjunctions are more present and numerous than the ones between volition and action. Thus, the answer for a substance dualist could be that sufficient empirical evidence allows us to pick out the proper pairing relations in this case, and not the spatial relations of the relata.<sup>30</sup> Recall the comment from section III, it is a common scientific practice to say the following (given the empirical evidence supports it):

- 1) Event *A* is correlated with event *B*.
- 2) Event *B* did not cause Event *A*.
- 3) There seems to be no event *C* causing both *A* and *B*.
- 4) Events *A* and *B* do not seem to be coincidentally correlated.
- 5) Therefore, event *A* causes event *B*.

Quantum entanglement was formulated in a somewhat similar manner, as are many scientific beliefs and theories.

One may object however and say that while we do have evidence of the volitions and actions unfolding as the substance dualist claims, we do not have proof that the events, or volitions, are *immaterial*. What is to say that these volitions may not be material things? Well it

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<sup>30</sup> Note this grounding for how to pick out the right pairing relation is much like that adopted by physicists in the EPR/B experiment mentioned earlier.

would depend on what one means by “material”. If by material one means: “that which interacts with matter and energy,” then yes perhaps we do have evidence of volitions being material.

However, if by material one means: “extended in space and time as in the same sense matter is,” then it is plausible that the answer might be that we do have evidence that volitions are not the kinds of things that can be material. There seems to be a deep-seated intuition that volitions have *feels* to them; there is a way it is like to have a volition and a way it is to not have a volition.

Feelings are not the *kind* of thing that are spatially extended. It is not just that no one has ever seen a volition in space; the intuition here is that there is something more fundamentally wrong here. The intuition is that saying a volition exists in space seems like saying one can create a round square, or make an orange sound. It seems like saying volitions exist in space is a category mistake; volitions do not seem, intuitively, to be the type of thing that can be extended in space. Recall what Loeb said in the quote before the previous one, this reasoning could have been Descartes’ logic to begin with. Now, granted this argument against volitions extended in space is based solely on intuitions, but nonetheless it seems that it is at least a *plausible* interpretation of the empirical evidence that it gives grounds to justify the belief that we have witnessed numerous accounts of specific immaterial events (i.e. things like volitions) being in conjunction with specific material events (i.e. things like a hand raising).

Regardless of whether Descartes intended substance dualism to be taken this way or not, we have now looked at ways of how a substance dualist could responsibly begin formulating their position. Yet, with regards to all of these, I would imagine Kim would time and again offer virtually the same criticism: this account merely begs the question. Even so, it is not entirely clear, if it does beg the question, *why* it begs the question. Kim seems to suggest that it somehow assumes its conclusions buried somewhere inside of the premises; that we have explained the

relation in terms of the relation itself. Or perhaps he means that we have merely labeled the phenomenon rather than grounding, or explaining, it. Perhaps Kim feels that these kinds of answers beg the question in light of their positing things like brute facts; that brute facts must never be posited as they always are indications of begging the question. However, if this is the case then *many* practices, including many in the sciences, are guilty of begging the question. For examples, one could look at axioms from the sciences (i.e. that the world operates according to laws and not erratically), or if the reader will recall from the previous section quantum entanglement. Quantum entanglement is a phenomenon, one granted by science, that has no more justification for it being the way the world is than that's what the empirical evidence tells us.<sup>31</sup> Not what the *spatial relations* tell us, but what our *empirical evidence* tells us. Granted this route does involve accepting the idea that there are just fundamental kinds of causation in our world, but if one is persuaded by the arguments I have given perhaps the quantum mechanical world has accepted as much. Moreover, there are philosophers of causation who find the idea that mental causation may be one of the most fundamental kinds of causation, if not *the* most fundamental kind, to be a perfectly logical one. Alvin Plantinga (2007) is one such philosopher.

However, if it would help answer this problem for opponents like Kim, perhaps an account via more concrete laws of nature could be given. The existence of psycho-physical laws is not an impossibility by any stretch of the imagination. What is to say that we may not find good evidence that there is such a law of nature that every time psychological (immaterial) event  $\psi$  occurs it is followed by physical (material) event  $\phi$ ? Indeed, if one is persuaded by the kind of argument Loeb claims Descartes had in mind, perhaps we already have. One could respond

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<sup>31</sup> Indeed one could argue “quantum entanglement” is just labeling the phenomenon and not explaining it in Kim’s sense of the word. Yet, the modern scientific community seems to have no problem with this “mere labeling”.

that such a claim is preposterous, but the same was said of earth being round or of proving two parallel lines could meet.<sup>32</sup> The existence of a psycho-physical (that is to say from the immaterial psycho to the material physical) law could perhaps be the next “unintelligible” thing we can fashion into an intelligible law. Again, recall the comments made by Loeb of Descartes’ position—there is nothing we have *more* empirical evidence of than mental phenomena (or events) corresponding with temporal precedence and constant conjunction with particular physical phenomena (or events).

The argument here is that interactionist substance dualism is viable enough not to be disregarded out of hand as “quaint” or “superstitious”. I am not trying to argue any of these ways of understanding how mental causation might be possible makes substance dualism any more or less likely true in our world; I am only trying to argue that these ways would give one a completely intelligible way of understanding this kind of substance dualism. Perhaps that does not make this variety of substance dualism more plausible than any other competing theory, but that isn’t necessary to support the thesis offered herein—only its viability.

## V. CONCLUSION

I have argued that Kim’s argument that substance dualism cannot be a viable option because it is unintelligible fails. Moreover, I have argued that there are in fact ways in which an intelligible pairing relation can be correctly picked out for substance dualism, and thus ensuring that there is also a causal relation at hand given that one is motivated to believe in substance dualism. If I am right, and these ways are legitimate, this then entails that substance dualism is—at least—a viable option. Is that to say that substance dualism is true or even probable then? No, it is not. All of this paper is simply to assert that it is a *viable* philosophic option for those

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<sup>32</sup> Two parallel lines can in fact meet given a non-Euclidean geometry.

who have reason to believe it is true. One might have very good grounds for rejecting substance dualism, but it should not be on the kind of grounds Kim gives—that there is no intelligible way to give a causal pairing relation between souls and bodies. We have seen that there is at least an intelligible way of doing so, and thus substance dualism should at least be treated as a serious possibility. Again, I am not trying to assert that substance dualism is true, perhaps it's not, but if one has sufficient motivation to believe substance is true (or even likely) then they should not be dissuaded by Kim's kind of argument.

It is tempting to simply disregard substance dualism in light of its traditional association to certain archaic folk concepts which may have become obsolete in our contemporary scientific world.<sup>33</sup> However, these elements are not intrinsic, or necessary, to the idea of substance dualism, and they can easily be shed. Substance dualism can in fact be understood as intelligible, as this paper has tried to show, and considering the serious problems that face physicalistic views and views like property dualism, then it may indeed behoove us to at least consider substance dualism as a viable option if we wish to save mental causation. Thus, I take my account to clear the way for one to do just that; engage in the serious development of a positive account of causal interaction between immaterial and material events.

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<sup>33</sup>Examples of such traditional “baggage” substance dualism has associated with it are things such as the necessitation of a God, or life after death.

BIBLIOGRAPHY:

- Aspect, Alain, Dalibard, and G. Roger. "Experimental Test of Bell's Inequalities Using Time-Varying Analyzers." *Physical Review Letters*. Vol. 49, No. 25. (1982), pp. 1804-1807.
- Bell, John. "On the Einstein-Podolsky-Rosen paradox." *Physics*. Vol. 1. (1964), pp. 195-200.
- Berkovitz, Joseph. "Action at a Distance in Quantum Mechanics." 26 Jan., 2007. *Stanford Encyclopedia of Philosophy*. Ed, Edward N. Zalta. Fall 2007 ed. Center for the Study of Lang. and Information, Stanford U. 16 Nov. 2007  
<<http://plato.stanford.edu/entries/qm-action-distance/>>.
- . "Aspects of Quantum Non-Locality I: Superluminal Signaling, Action-at-a-Distance, Non-Separability and Holism." *Studies in History and Philosophy of Modern Physics*. Vol. 29. (1998a), pp. 183-222.
- . "Aspects of Quantum Non-Locality II: Superluminal Causation and Relativity." *Studies in History and Philosophy of Modern Physics*. Vol. 29. (1998b), pp. 509-545.
- . "What Econometrics Cannot Teach Quantum Mechanics?" *Studies in History and Philosophy of Modern Physics*. Vol. 26. (1995a), pp. 163-200.
- Bohm, David. *Quantum Theory*. New York: Prentice Hall, (1951).
- Bohm, D. and B. J. Hiley. "Non-Locality and Locality in the Stochastic Interpretation of Quantum Mechanics." *Physics Reports (Review Section of Physics Letters)*. Vol. 172, No. 3. (1989), pp. 93-122.
- Butterfield, J. N. "A Space-Time Approach to the Bell Inequality." *Cushing and McMullin*. (1989), pp. 114-144.

- . "Bell's Theorem: What It Takes." *British Journal for the Philosophy of Science* Vol. 42. (1992a), pp. 41-83.
- . "David Lewis Meets John Bell." *Philosophy of Science*. Vol. 59. (1992b), pp. 26-43.
- . "Outcome Dependence and Stochastic Einstein Locality." *Logic and Philosophy of Science in Uppsala*. Eds. D. Prawitz and D. Westerståhl. Dordrecht: Kluwer, (1994).
- Clauser, J. F. and Horne, M. A. "Experimental Consequences of Objective Local Theories." *Physical Review D*. Vol. 10. (1974), pp. 526-535.
- Clifton, R. K., Butterfield, J. N. and Redhead, M. L. G. "Nonlocal Influences and Possible Worlds—A Stapp in the Wrong Direction." *British Journal for the Philosophy of Science*. Vol. 41. (1990), 5-58.
- Einstein, Albert. The Foundation of the General Theory of Relativity. *Annalen der Physik*. Ser. 4, No. 49. (1916), pp. 769–822.
- Garber, Dan. "Understanding Interaction: What Descartes Should Have Told Elisabeth." *Southern Journal of Philosophy*. Vol. 21 (Supplement). (1983), pp. 33-38.
- Gisin, Nicolas, Grégoire Ribordy, Jürgen Brendel, Jean-Daniel Gautier, and Hugo Zbinden. "Long-distance entanglement-based quantum key distribution." *Physical Review A*. Vol. 63, No. 1. (2000), pp. 12309-12321.
- Greene, Brian. *The Fabric of the Cosmos: Space, Time, and the Texture of Reality*. New York: Vintage Books, 2005.
- Healey, R. "Holism and Nonseparability." *Journal of Philosophy*. Vol. 88. (1991), pp. 393-421 1992

- . "Nonseparable Processes and Causal Explanation." *Studies in History and Philosophy of Modern Physics*. Vol. 25. (1994), pp. 337-374.
- Howard, D. "Holism, Separability and the Metaphysical Implications of the Bell Experiments." *Cushing and McMullin*. (1989), pp. 224-253.
- Jarrett, J. "On the Physical Significance of the Locality Conditions in the Bell Arguments." *Noûs*. Vol. 18. (1984), pp. 569-589.
- . "Bell's Theorem: A Guide to the Implications." *Cushing and McMullin*. (1989), pp. 60-79.
- Jehle, David. "Kim Against Dualism." *Philosophical Studies*. Vol. 130. (2006), pp. 565-578.
- Kim, Jaegwon. "Lonely Souls: Causality and Substance Dualism." *Soul, Body, and Survival: Essays on the Metaphysics of Human Persons*. Ed. Kevin Corcoran. Ithaca: Cornell University Press, 2001.
- . *Physicalism or Something Near Enough*. Princeton: Princeton University Press, 2005.
- Lewis, David. "Causation as Influence." *Philosophy of Science: An Anthology*. Ed. Marc Lange. Malden: Blackwell Publishing, 2007.
- . "Events." *David Lewis: Philosophical Papers*. Vol. 1. Oxford: Oxford University Press, 1986.
- . *Counterfactuals*. Cambridge: Blackwell & Harvard University Press, (1976).
- Loeb, Louis. *From Descartes to Hume: Continental Metaphysics and the Development of Modern Philosophy*. Ithaca: Cornell University Press, 1981.
- Maudlin, T. *Quantum Nonlocality and Relativity*. Oxford: Blackwell, 1994.
- O'Neill, Eileen. "Mind-Body Interaction and Metaphysical Consistency: A Defense of Descartes." *Journal of the History of Philosophy*. Vol. 25, No. 2. (1987), pp. 227-245.

- Petroni, Nicola Cufaro and Jean-Pierre Vigièr. "Causal Action-at-a-Distance Interpretation of the Aspect-Rapisarda Experiments." *Physics Letters*. Vol. 93A, No. 8. (1983), pp. 383-387.
- Plantinga, Alvin. "Materialism and Christian Belief." *Persons: Human and Divine*. Eds. Peter van Inwagen and Dean Zimmerman. Oxford: Oxford University Press, (2007).
- Redhead, M. L. G. *Incompleteness, Nonlocality, and Realism*. Oxford: Clarendon Press, 1987.
- Schrödinger, Erwin. "Die gegenwärtige Situation in der Quantenmechanik." *Naturwissenschaften*. Vol. 23. (1935), pp. 807-812; 823-828; 844-849.
- Shimony, A. "Controllable and Uncontrollable Non-Locality." *Foundations of Quantum Mechanics in Light of the New Technology*. S. Kamefuchi *et al.* eds. Tokyo: Physical Society of Japan, 1984.
- Sosa, Ernest. "Subjects Among Other Things." *Material Constitution: A Reader*. Lanham: Rowman & Littlefield Publishers, Inc., 1996.
- Teller, P. "Relativity, Relational Holism and Quantum Mechanics." *Cushing and McMullin*. (1989), pp. 208-223.