

Joe Gold

Senior Thesis

Lewis' Preemptive Causation and Kim's Theory of Particular Events

Introduction

The philosophical study of causation involves the analysis of the connection between a causal event and its effects. A modern attempt at explaining this connection is David Lewis' counterfactual theory of causes, which explains causation by saying if C causes E then without C, E would not have occurred, and from this we can say that E is counterfactually dependent on C. However, as appealing as this theory is, Lewis (in the same paper no less) introduced a very devastating objection to it in the form of causal preemption. A preempted cause is one that is prevented from causing an effect by a separate cause that fires at the same time or earlier. By definition, the existence of a preempted cause is problematic for the counterfactual theory because in the absence of the actual cause, the preempted one would suffice to cause an effect. Therefore we are unable to say that without the actual cause, an effect would not have occurred. In an attempt to solve the problem from preemption, I intend to utilize a modified version of Jaegwon Kim's fine-grained theory of events to provide a clear explanation of the connection between a causal event and its effect. By utilizing a fragile events concept causal events become separate and non-duplicative, thus there can be no causal preemption. Additionally, because a fine-grained or fragile theory of causal events is one that has been considered and rejected in the past, I will respond to the objections that

have been made to the influential theories that resemble mine, namely those raised by Lewis and Hall & Paul.

Section II: Hume's Theory of Causes

Hume first raises the concern regarding causation in the *Treatise of Human Nature*, where he points out the need to clear up the obscure connection between cause and effect by clearly identifying what a causal relation is. The traditional Humean analysis reduces causation to regularities in the objects. As Hume puts it:

“An object precedent and contiguous to another, and where all the objects resembling the former are placed in like relation of precedency and contiguity to those objects that resemble the latter.” (*Treatise of Human Nature* p.114)

To clarify, the given definition is the Regularity Theory of Causation, which states that if A is followed by B, and if at any time there is an event resembling A which will always lead to a B, then B will most likely follow. Hume believes that this is the only manner in which we can coherently talk about causal events.

Section III: Lewis' Third Definition and the Problem from Preemption

Lewis takes issue with the Regularity Theory of Causes because it allows for accidental regularities. A classic example utilized by Lewis is the assertion that every time the whistles in Manchester sound, people go home from work, therefore the Manchester work whistles cause people to go home (Russell, “On the Notion of Cause” 1912). Obviously it is not the whistle blowing causing people to go home, but the fact that it is time to quit for the day. The fact that the whistle blows at the same time as that which is designated quitting time does not mean it is the cause of the worker's departure. But this example raises a problem for the Regularity Theory of Causation, because under the pretenses of that theory it is a sufficient cause of the end of the Manchester work day

since we can find regularity between the whistle blowing and the worker's leaving work for the day.

To avoid regularities as a basis for interpreting causal events, Lewis introduces a third definition from Hume's *Enquiries* that was previously interpreted as merely a restatement of his first definition. The exact text says, "We may define a cause to be an object followed by another, and where all the objects similar to the first are followed by objects similar to the second. Or in other words, where if the first object had not been, the second never existed" (*Enquiries*, Section 7). Though Hume implies that the second part of the sentence expresses the same idea as the first part, Lewis wants to assert that this should be viewed as another definition in itself. This final definition became known as the counterfactual theory of causes. Lewis defines counterfactuals simply, by saying, "that if a cause had not been, the effect never had existed" ("Causation" p.557). What this means is, if C is the cause of E then without C, E would not have occurred, which means that the existence of E is counterfactually dependent on the existence of C.

Lewis takes it upon himself to examine possible objections to the counterfactual theory, the most devastating of which is the concept of causal preemption. Lewis explains the objection as such:

"Suppose that C1 occurs and causes E; and that C2 also occurs and does not cause E, but would have caused E if C1 had been absent. Thus C2 is a potential cause of E, but is preempted by the actual cause, C1. We may say that C1 and C2 overdetermine E, but they do so asymmetrically. In virtue of what difference does C1 and not C2 cause E?" ("Causation" p.567)¹

Late preemption is a situation in which there are two potential causes (C1 and C2) for one effect (E). C1 and C2 fire, but for whatever reason C1 manages to cause E before C2 can,

¹ In a later paper, "Causation as Influence," Lewis explains that there are a few different types of preemption but, for simplicity's sake, I will only discuss late preemption.

thus leaving no E for C2 to cause. This is a problematic situation for the counterfactual theory of causes, since in C1's absence, C2 would have sufficed to cause E, thus C1 was not necessary to cause E, and we are left with Lewis' question: "In virtue of what difference does C1 and not C2 cause E?" According to the definition of the counterfactual theory without C, E will not occur; however when there is a C1 *and* C2, then not C1 will not result in not E. Although we logically understand the difference between the actual cause and the preempted one by definition C1 fails to meet the criteria.

The best example of late preemption, introduced by Ned Hall in his 2002 paper, "Two Concepts of Causation," is the thought experiment of Billy and Suzy throwing rocks at a glass bottle sitting on a fence post. In this scenario, both children throw a rock at the glass bottle with equal speed and accuracy, but Suzy manages to throw hers a fraction of a second earlier. Because Suzy's rock will be the first to shatter the glass bottle, it can be said that her rock preempted Billy's from causing the bottle to break; thus, it is intuitive for us to conclude that Suzy's throw is the cause of the broken bottle. However, this conclusion is problematic since, in the absence of the event of Suzy throwing her rock, the event of Billy throwing his rock would have sufficed to cause the same effect. Therefore, the counterfactual definition of cause is not complete because it has no means of explaining how one cause can produce an effect while another that is equally sufficient, but slightly too late, cannot. This situation is a problematic one given how we must view the event when doing so in a counterfactual scope.

Lewis attempts to respond to this matter himself saying:

"As far as causal dependence goes, there is no difference: E depends neither on C1 nor on C2. If either one had not occurred the other would

have sufficed to cause E. So the difference must be that, thanks to C1, there is no causal chain from C2 to E; whereas there is a causal chain... from C1 to E. ("Causation" p.567)

This passage seems to be implying that we are justified in calling C1 and not C2 the cause of E because there is a "causal chain" between C1 and E, where there is none between C2 and E. However, as a justification for holding C1 as the cause over C2, this is circular since the existence of the causal chain between C1 and E is just a different way of saying that C1 caused E. Therefore, Lewis seems to find satisfaction with the explanation that C1 is the cause of E because they are causally connected, but this does not even begin to address the problem regarding the existence of C2 as a backup cause, and the problems that this situation creates for counterfactuals.

Section IV: Kim's Fragile Events Theory

An effective way to work around Lewis' problem from preemption is to introduce and modify Kim's particular theory of events, and apply it to the counterfactual theory of causes. Applying a fragile concept of events to causation is not a unique idea. It has been considered and passed over several times by many including Lewis himself, Hall and Paul. I believe that by modifying Kim's theory to account for some of its known shortcomings, the fragile events concept can become a more appealing approach in defending counterfactuals than the one that was previously overlooked.

Kim believed that a description of events must contain three elements; the subject (x), the property that x is exemplifying (P), and the time at which x exemplifies P (t), thus formulations of events are written as [x, P, t]. From this, Kim formulated the Property-Exemplification account of events. By introducing the element of temporal fragility to his description of events, it becomes metaphysically impossible for two identical events to

exist. This works for two reasons. The first reason is that time itself is non-repeatable meaning that no matter how many variables of an event you were able to replicate, time is one that could never be turned back and repeated. The second reason is simply because of the nature of the passing of time. As we move throughout time there are countless variables that will change between t_1 , t_2 and so on. With these changes, it becomes less and less intelligible to believe that an event that unfolded in a certain manner in t_1 will likely unfold the same way at t_2 given the myriad of unknowable changes that have happened in that interval.

Kim creates two principles regarding fragile events. The first principle, known as the Existence Condition is:

Event $[x,P,t]$ exists just in case substance x has property P at time t .

This condition says that for every possible combination of a given substance exhibiting a given property at a given time, there is a designated event in case it was to occur. Thus Kim defines an event by means of property exemplification, meaning any time x is exemplifying property P , that is considered an event. This definition of events is somewhat problematic since, as Kim defines it, any given moment can be considered an event which allows for an infinite breaking down of time. To explain, under Kim's construction of events, every minute that passes could be described as an event, but from here we could say that every second is an event, and continue to break down time fragments infinitely. For simplicity's sake, as part of the modifications to Kim's theory, I believe that events should be defined as any change from one property to another. Therefore, the "event" of x continuously exemplifying property P will not be considered a new event for every unit of time that passes. Instead it only becomes an event when x

begins to exemplify a different property. Involving time, then, is only helpful insofar as it helps to make events more fragile, thus making duplication impossible. This property is introduced in the second principle, known as the Identity Condition, which says:

$$[x,P,t] = [y,Q,t'] \text{ just in case } x = y, P = Q, \text{ and } t = t'$$

This condition basically says that two events share the same identity if the same substance exemplifies the same property at the same time. It is with the Identity Condition, also known as the non-duplication principle, that Kim shows why two events can never be the same, since it is possible that x and y could be the same substance, and that Q and P could be the same property, but t and t' could never be the same point in time because no two different points in time are alike. Therefore, when the element of time is integrated into the definition of an event, replication becomes impossible. The non-duplication of events is important in solving the problem from preemption. If every causal event is unique, then $C1$ and $C2$ cannot both cause E , instead $C1$ would cause $E1$, and $C2$ would cause $E2$, an event will never be the same if coming from different causes. This solution also works in the situation where $C1$ and $C2$ occur at the same time. If the two causes would result in events that occur at different times, then they would each produce genuine effects. If both causes and both events would occur at the same time then this would fall under the umbrella of redundancy or overdetermination.

Fortunately, a fragile concept of events can be used to alleviate the problem from overdetermination as well. Take the bottle breaking example again. If Billy and Suzy were to both cause the bottle to break by hitting the bottle at the same time, then under our normal understanding of events, this would be considered overdetermined because either of the rocks could have been absent and the bottle would still have had sufficient

cause to break. However, by appealing to a fragile understanding of events, then the bottle breaking by the force of both rocks should be understood as a different event than had only one rock struck the bottle. In “Postscripts to Causation” Lewis designates how to understand this phenomenon:

“Is this vigorous firing of E a different event from the feeble firing that would have occurred if either one of C1 and C2 had fired alone? Then we have a joint causation, in which the effect depends counterfactually on each of the causes, and there is no redundancy” (196).

I would argue, according to the fragile events theory, that any “overdetermined” or redundantly caused effect is actually a joint effect since the nature of that effect (the manner in which it unfolds) is counterfactually dependent on both causes, except now we must see them as a single cause. From this we can see that a fine-grained understanding of events does have its benefits.

Section V: The Modified Kimean Causal Events

We can apply this theory of events to the theory of counterfactual causes in order to solve the problem from preemption. Since every event is unique under the Kimean view, then similarly, every causal event is unique as well. Therefore, there is no preemption because the effect produced by the Suzy-type event will yield a different effect from the Billy-type event. However, I will concede that event replication is possible under the circumstances that every variable of the Suzy-type event was replicated. If this were to occur we could expect the same effect that we got from the last Suzy-type event, since under those circumstances, all of the variables would have been

replicated. The problem is that a Suzy-type event cannot realistically be reconstructed without a time machine and other metaphysically questionable machinery.

By adopting the Kimean view, it becomes clear how we can solve the problem from preemption. Kim's theory points out that events are non-duplicable when time is introduced as part of the definition since time (being introduced by Kim's theory as the part of an event's definition) is itself non-repeatable. Causation is the connection between two events, one the cause and the other the effect. If we cannot duplicate events then no two causes can produce the same effect since it would entail that an event can be caused by two events of differing properties. Therefore, there is a clear connection between a cause and its effect since their relation is unique. The counterfactual theory of causes made a distinct connection between a cause and effect by saying an effect would not have existed if its cause had not existed first, until this relation was called into doubt by preemption. But when we apply the theory of highly particular events, there is a similar connection that works around the problem of multiple causes. It does so by distinguishing the effect that we can receive from C1 from the effect we would receive from C2.

Therefore, we have a cogent explanation of why we should accept C1 as the cause of E and not C2, and that is: if it was the case that C2 or any other cause (Cx) was acting as the cause then it would have been E2 (or Ex) that resulted. This is a new effect since a cause would always produce an effect that is unique to it. This is important because not only is each cause unique because of the numerous elements that constitute it, but each effect that aligns with a cause is unique as well because there will always be parameters of an effect that are genuine to it as well. Essentially the relation between a cause and its

effect is numeric. By this I mean that because no event is repeatable, cause 1 and effect 1 are directly related just as cause x and effect x are.

Section VI: Objections and Responses to Kim's Thoery

Kim's theory is not without its share of controversy. A common problem that is raised against Kim's exemplification view of events is that it unnecessarily holds the temporal aspect of an event description as important. To clarify, wouldn't the event of Suzy throwing rock x at bottle x, be the same event if it merely happened at a later time? On this point Kim waffles, conceding that the temporal aspect of an event description is not necessary since intuitively it does not seem to be relevant to the manner in which an event takes place.

This is where Kim's theory requires some work. My problem with Kim conceding this issue is that one of the tenets of his exemplification theory is that events cannot be replicated, but we cannot hold that a walk at time t, would be the same as a walk at time t' without accepting the possibility of an identical event in a walk at different times. Instead of dropping the temporal aspect of descriptions he should have insisted on it. While Kim may not have wanted to draw such a controversial conclusion, I believe that the only stance to take is that time is a vital part of an event description. I would assert that Suzy throwing rock x at bottle x at time t, is a vastly different event from Suzy throwing rock x at bottle x at time t', since there is an incalculable amount of variables that could have changed between t and t' that would augment the outcome of the event. My response to the argument that Kim's theory is too fine-grained is to make it even more fine-grained, so as to maintain the unique, non-repeatable nature of every event

because time is a vital factor, and there can never be a repetition of moments, thus no identical events.

Many would say that this is an extremely unintuitive understanding of causal events, Lewis among them, since it would seem that if Suzy threw another rock and hit another bottle, then she had just replicated the event. This is due to an error in our thinking about causal events rooted in the fact that the less we know about them, the more similar they seem to past events that resemble them, but to claim that the events are identical is erroneous. We must examine an event in great detail in order to truly understand its nature, and when we do this it will become clear why we are in error when we claim that the events are identical, as previously unrealized variables become visible. Hume claims that “quantities in themselves may be entirely distinct, ‘tis certain we commonly regard the compound, which they form as one thing, and as continuing the same under very considerable alterations. The acknowledged composition is evidently contrary to this supposed simplicity, and the variation to the identity” (Hume’s *Treatise* 145). By this he means that we have an erroneous tendency to consider something as having the same identity even if some of its constituents have changed drastically. I am claiming that the connection of the identity of one cause to that of another is a similar psychological tendency to find identity in differently constituted events, and it must be fought.

The concession we must make by adopting the fragile events view is an expulsion of our use of particular causal events for predictive purposes. It would follow from Kim’s augmented theory that we can not induce from Suzy’s last throw of rock x at bottle x at time t, how her next throw of rock y at bottle y at time t’, will play out. To try and induce

a prediction from the former event would be contrary to the very nature of our new understanding of events. I do not see this as a problem, however, since our desire to make such connections is the result of the aforementioned causal error theory.

The expulsion of using causal events for predictive purposes leads me to a relevant objection to Kim's theory that comes from Brand. His objection is that Kim's theory "[lacks] a criterion for property identity" (Brand, 1997 p.335). By property reduction Brand means the ability to view events as the same based on the reduced view of their similarities. An example of a reduced events description would be two events where rocks are thrown at bottles and the bottle breaks. This is a simple understanding of causal events, but the ability to reduce properties for the purposes of generalization and prediction are important to everyday life as well as the scientific process. However, I believe that Kim acknowledges the necessity for a generic description of events in his theory, but the section is often overlooked as it is a minor detail in the way of the more tantalizing elements to his essay. Kim differentiates between generic and particular events. A rock breaking a bottle is a generic event one that can be utilized for property reduction and scientific classification. On the other hand, Suzy throwing rock x at bottle x at time t, is a particular event. It is acceptable to use general terms and causal descriptions for the purposes of scientific advancement because it requires patterns of regularity. However, when the discussion turns to concrete and specific examples of a causal event, we must use particular descriptions because not only is that event fragile, but the events that follow from that are as well. The minute details of every effect determine the manner in which the next causal event will unfold. Therefore, by differentiating between generic and particular events, Kim allows for property reduction while retaining his desired

notion of fragile events. The idea of using reduced event descriptions to predict what will *likely* happen is no different than how we currently approach science. But it is important that there is basically no way to provide a guaranteed prediction.

A better explanation of how Kim's theory accounts for the need for generic event descriptions may be found in a scientific example. It is logical to hold Kim's assertion that there can be generic events based on induction since science is completely based on it now anyway. To say, "potassium and water will lead to combustion" is different from claiming "potassium chunk x and water molecule x will lead to a combustion at time t." The first claim is based on past experience which is fine, though the prediction should be taken in stride as any scientific theory should, whereas the second claim is not fine since it is making a predictive claim out of a description of a particular event. When we bring our events into the particular realm it complicates the description since there could be any number of factors that would alter the outcome of the expected chemical reaction, therefore it cannot be used predictively, as generic event claims can.

Section VII: The Rejected View

Interestingly, there has been a bevy of philosophers who have come upon a view that resembles this one, and have turned the opposite direction so as to avoid the controversial and unintuitive claims made by a fine-grained theory. Among them are Kim, for the reasons mentioned earlier, Lewis, and Hall and Paul who made concessions for the view that opposed the theory after discussing it in "Causation and Preemption," a paper that I will consider.

Hall and Paul anticipated and rejected the line of thought that I am currently supporting in their aforementioned paper. As they explain:

“An extremely natural thought, at this point, is to fix on the observation that without Suzy’s throw, the bottle would not have shattered *just when it did*... One could try to exploit this observation by building an extreme sensitivity to the time and perhaps manner of occurrence into the individuation conditions for events... Thus, the shattering of the bottle that actually occurs-that very event- would not have occurred without Suzy’s throw... The fatal problem... is that...it is perfectly easy to construct late preemption examples in which, had the cause not occurred...the effect would have occurred at exactly the same time, and in exactly the same manner.” (Hall and Paul, “Causation and Preemption” p.17)

From here, Hall and Paul construct a situation, similar to the frequently used neuron diagrams. A neuron diagram (see figure 1) is essentially the simplest depiction of a causal event where one circle represents a cause, and another represents an effect. The causal influence is represented by an arrow from the cause circle to the effect circle. These diagrams allow philosophers to discuss and depict certain causal situations without painting complex concrete examples. In Hall and Paul’s example, causes C and A are triggered simultaneously, however when C is triggered not only does it set out to cause E, just as A plans to, but it also sends a signal that retards A’s triggering of E. This is an illustration of late preemption at work where all of the excess factors have been trimmed. Therefore, according to Hall and Paul, we have no reason to claim that two causes cannot be identical in this type of construct (Hall and Paul “Causation and Preemption”).

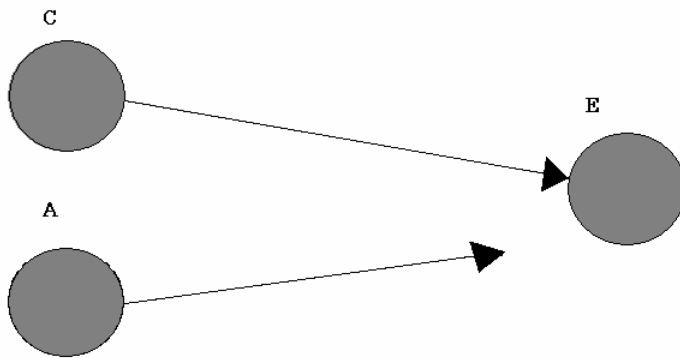


Figure 1

I take issue with this example since it can only exist in theory. By this I mean that it is not an example of a real life occurrence that they are utilizing to expose holes in the particular events theory, but instead, they are painting an abstract picture using symbols to illustrate their point, and because of the intangible nature of their example, it does not apply to my theory because the causal event they depict is more along the lines of a general event description. There is not a concrete example of a causal event that exists as simply as the neuron diagram created by Hall and Paul. Even if we were operating in an abstract realm, their example would be no more problematic for my theory than the assertion that it is *logically* possible for the variables in C1 to be replicated and hence for E1 to be replicated as well. The fact that these ideas will always work in an abstract framework, does not mean that these logically possible concessions can serve as the descriptive explanations of causes that we need in order to formulate a more precise theory.

However, it has been brought to my attention that there may be an example of a situation that resembles that of Hall and Paul except that it exists in the physical world,

and not just an abstract one. The scenario is that of ionization. When an atom inches closer to another atom with several excess electrons, naturally one of the several electrons will jump to the ever-nearing atom, however, these electrons are not only indistinguishable, but it is also impossible to tell which ion actually made the jump even to one observing the ionization. Truly, this seems to be a real-life example of a neuron diagram, in that it is a causal event with the excess stimuli and variables trimmed, and one that seems to pose a problem for the particular theory of causes, as these several distinct causes will apparently be indistinguishable.

As a response I would suggest that at root, this is an argument from ignorance. We are far away from a completed science regarding the nature of electrons and atoms, so how can we say that there is no method of telling which electron will make the jump, since there could be an existing reasoning that we have yet to discover because we have no method of distinguishing the electrons in the first place. It could be that in the near future we discover that there are some electrons that are pre-coded to make the jump and some that are not, and as such these variations will determine whether or not an atom becomes ionized in the first place, and could also determine some distinctive traits of an individual ionization.

Additionally, it would seem that even if it were determined that the electrons were indistinguishable, and chosen at random, that this could actually help my theory.

Consider an example that is easier to comprehend; let us say that Suzy and Billy are throwing rocks again, and they both throw their rocks at the same time, but instead of Suzy's rock breaking the bottle first, both rocks are sucked into a mechanical randomizer that will take in both rocks, but only expel one toward the bottle. Even if we were to use

high tech video equipment to determine whose rock actually was expelled from the randomizing machine, we would still have no method of determining whose rock will be the one to be expelled in future instances, thus once again we are left with a situation where we cannot make predictions about the relevant causes and effects. I believe that the connection between the more comprehensible example and the ionization example is explicit enough, that we would come to a similar conclusion regarding a method for predicting which electrons will become part of the ionization process.

Section VIII: Lewis Objection

The final objection I wish to consider is Lewis' claim that we must neglect the "spurious causes" of an event. As Lewis says:

"All manner of things that we would not ordinarily count among the causes of the effect can be expected to make some slight difference to its time and manner...If we heed...smaller differences, almost everything that precedes an event will be counted among its causes. By the law of universal gravitation, a distant planet makes some minute difference to the trajectory of Suzy's rock, thereby making a tiny difference to the shattering of the bottle. So by adopting the fragility strategy, in whichever form, we open the gate to a flood of spurious causes." (Lewis, "Causation as Influence" p.188)

Lewis' objection is explicit and daunting, but I believe that his claims can actually prove harmonious to my theory instead of damaging. I believe that Lewis's claim about spurious causes is something to be embraced because it is a perfect expression of why we can never take two events to be the same.

I do not feel compelled to argue against the fact that oddly "spurious" elements will act as a variable in a causal event, since it only reinforces my claim that they are impossible to replicate. As such, I would accept and embrace Lewis' assertion as it serves

as an eloquent testament to the complexity of a causal event, and why they are unfit to be regarded in generic terms. Next, it seems as though a form of this objection could plague any theory of causes because of the inherent nature of causes themselves. To elaborate, causal events unfold in a chain, meaning an effect I cause will in turn cause something else which in turn will cause something else. Therefore, every causal event we come across is in some part the result of countless causes that came before it, and there is no understanding of causes that can alleviate this fact. If I were to kill a bug today, this innocuous act could have an effect on things for years and years to come, the true impact of which we may never know. But the idea of a causal chain is not unique to my theory, and so long as we posit the existence of this chain, it can be said that “spurious” causes from centuries ago contributed to the cause of an effect, and thus we must accept that there is an underlying and incomprehensibly complex fabric of events that are always playing a role. Lewis cites influences and parts of a cause that are so far removed from the main elements of the cause, that we cannot help but believe that their influence is weak if not non-existent. But we cannot simply ignore the fact that so many different influences constitute a cause, instead we must adopt a theory of events and causes that is able to account for and incorporate this. My modified version of Kim’s theory has accounted for it by embracing the unfathomably complex mesh of events that influences everything, and in that respect, it may be more attractive than theories that wish to deny this deeper connection.

Lewis’ problem from preemption has been a truly challenging consideration to those who have attempted to formulate a new theory of causes. While I believe that Kim’s exemplification theory of events was a productive step towards a solution to the

problem, I found it discouraging that he gave up on the fine-grained theory. Many of the issues that faced Kim's theory discouraged other philosophers from accepting a fine-grained view, but ironically, these problems were able to be solved by pushing the theory into more fine-grained territory. This may have been a controversial move, but I believe that I formulated the theory with enough care that it can actually serve to better solve, and account for some of the more metaphysically perplexing puzzles that have plagued the philosophy of causation, as well as expose the erroneous manner that we currently view causal events.