

Three Varieties of Causal Overdetermination

Eric Funkhouser

Abstract: Causal overdetermination worries arise in a number of domains, but most notably in the philosophy of mind. In discussions of such worries, alleged examples of causal overdetermination are uniformly viewed as *prima facie* problematic. While all alleged cases of overdetermination might (or might not) be problematic, I aim to show that they are so for different reasons. Examples of causal overdetermination neatly divide into three varieties, corresponding to the connections between the mechanisms and the properties of the causes. Future debates over overdetermination, and mental causation in particular, should pay heed to this distinction.

A commonly accepted restriction on theories of causation is that they should not countenance too much (or, some extremists argue, even *any*) causal overdetermination. Such overdetermination occurs when there are two or more (minimally) *sufficient* and *distinct* causes for the same effect. In some sense of ‘cause’ all effects have multiple causes—e.g., partial causes or overlapping causes. Such commonplaces are not cases of overdetermination. The lighting of a struck match is not causally overdetermined by the presence of oxygen and the striking—neither is sufficient on its own.¹ Nor is a window-breaking overdetermined by the baseball hitting it and the left and right (connected) halves of the baseball hitting it—the baseball is not distinct from its two (connected) halves.² Where, then, do we find serious worries about overdetermination?

Concern over causal overdetermination most frequently arises in discussions of mental causation, and we will return to this particular concern throughout. Beliefs and desires, common sense tells us, often combine to form sufficient causes of human action. But, as good physicalists, we are also committed to a wholly physical story—involving muscles, nerves, and other gory details—for why we move as we do. If we insist that these mental causes are distinct from the physical causes, then we appear to be countenancing massive causal overdetermination. The problem of mental causation is commonly motivated by “exclusion principles” outlawing such systematic multiple causes.³ Our disdain for overdetermination commonly manifests itself in discussions of mental causation, but such worries can easily generalize to all manners of macrocausation. Dealing with such problems is a burden for both counterfactual and nomic subsumption theories of causation.

Shortly, I will present some traditional candidates for cases of causal overdetermination. My primary aim in what follows is not to determine if such overdetermination ever really does occur, nor if such overdetermination should even be viewed as detrimental to a theory

of causation (though I take it to be *prima facie* problematic). Rather, I aspire to provide a relatively untendentious taxonomy of the *types* of overdetermination one could be concerned with. When categorized as such, we see that different types of alleged overdetermination concern us for different reasons—not all overdetermination is created equal. For example, mental overdetermination may not be problematic in the same way that standard examples of overdetermination (e.g., firing squad cases) are problematic.

This division of types of causal overdetermination rests on the assumption that all causes (at least in the actual world) have two components—a *particularity* and a *generality* component. In a realist metaphysical framework, an object or Davidsonian event (e.g., spatio-temporal region) plays the particularity role, and a property plays the generality role. Consider a baseball hitting a window and the window breaking. What is the cause of this window-breaking? Looking at the particular at hand goes a long way to answering this question—the baseball, or the baseball's spatio-temporal path to the window, caused the breaking. But we can go further than that. Not all the features of this baseball, or this baseball-throwing event, are responsible for the window-breaking. We can dismiss the baseball's white color and the autographed inscription as causally irrelevant to the window-breaking. Only features related to the ball's hardness, velocity, mass, etc. are relevant to the window-breaking. We know this because only such features result in similar breakings in similar situations. These are *general* features that can be had by other particulars.

The need for both components emerges when we return to the case of mental causation and examine reaction to Donald Davidson's well-known Anomalous Monism (AM). Davidson takes the reality of mental causation as a premise. However, he insists that all causal relations must be supported by a strict law and that there are no strict psychological laws. Absent such strict laws, how then can the mental be causally efficacious? Davidson's

answer is that only physics can provide such strict laws, so mental events must be identical to physical events.⁴ Critics of AM have largely agreed in the focus of their attacks. According to AM, it is only in virtue of having physical properties that a mental event is causally efficacious—the possession of mental properties is causally irrelevant.⁵ To save mental causation, an account must show that the mental properties are causally relevant. The criticism could be put another way. Causes are more than just particulars (objects or spatio-temporal regions). Causes also have a generality aspect—the property in virtue of which the effect occurs. Davidson’s AM *may* show that mental particulars are causally efficacious, but he does not show that the mental ever causes anything. To do this he needs to validate the relevance of mental properties.⁶

This division between the particularity and generality features should be acceptable to even the nominalist. The generality features could then be understood in terms of belonging to a certain class or falling under a certain predicate. However, I will continue to talk of properties when referring to this generality feature. I will use the term ‘mechanism’ when referring to the particularity aspect of causation. The mechanism is the object or spatio-temporal region/pathway that instantiates such properties. In our window-breaking example, the mechanism is the baseball and/or the spatio-temporal path it cut in flight. Our varieties of causal overdetermination are grouped according to the connection, if any, between the mechanisms and properties of the overdetermining causes. These varieties are “The 3 I’s of Causal Overdetermination.”

1. Independent Causal Overdetermination (Standard Overdetermination).

Alleged Example: *A convicted spy stands before a firing squad. Two shooters have live ammunition, and each, at precisely the same time, succeeds in shooting the spy in the heart. Either bullet on its own would have killed the spy in roughly the same manner. The spy dies.*

Standard overdetermination cases—like our firing squad case—are cases of independent causal overdetermination. The independence refers to the fact that the mechanisms of these overdetermining causes are separate. Independent overdetermination occurs when causally relevant properties had by different objects, regions, or along different causal pathways, are sufficient for the same effect. Our case at hand illustrates such independence. Note that different bullets and trajectories are involved in each. Each bullet cuts its own causal path sufficient for the death. As different causal mechanisms are involved, this is independent overdetermination.

A mental cause is an independent overdeterminer of an effect only if it is similarly independent of the accompanying physical cause.⁷ Substance dualism with parallel physical causation provides the clearest case of independent mental overdetermination. A cause operating in a mental substance would not share a causal pathway/mechanism with any physical cause. In contrast, theories that take all mental properties to be physically realized do not admit independent mental overdetermination. Within such a framework, common to all physicalists, mental properties and physical properties operate through the same mechanism. It would be an understatement to say that independent mental overdetermination is unlikely.

Because there are no connections between the mechanisms of independent overdeterminers, such overdetermination is either an odd coincidence or a carefully orchestrated occurrence. For example, when someone dies from two sufficient causes at the same time it is either a tragic coincidence, or else it must be very carefully arranged (e.g., with scheduled executions, trained shooters, a restrained prisoner, a call of “Fire!”, etc.). Most causal theorists acknowledge this point by allowing for occasional independent overdetermination, but denying that it can be systematic. Systematic independent

overdetermination, say a parallelism between mental and physical substances, would either be a coincidence on a cosmic scale or would require a divinely arranged pre-established harmony.

Nonetheless, it is not difficult to imagine a case like that of the firing squad. We can *see* how such independent causal pathways can converge on a common effect. However, some who accept this physical story will still dispute the metaphysical conclusion that this is a case of causal overdetermination. Those who deny independent causal overdetermination standardly construe such examples as cases of either causal pre-emption or joint causation. The pre-emptors insist that one of the bullets hits the heart first (say, a millisecond beforehand), and only that one is the real cause of the death. The pre-emptors' strategy fails for at least two reasons. First, there could be cases in which the causes arrive simultaneously. Second, even if they don't arrive simultaneously, the latter cause could still arrive in time to do its causal work in the same way it would have had the other cause not been present. Let me explain. A boy throws a rock at a window, and quickly follows it with another one before the first rock hits the window. The first rock hits the window and the window shatters. The second rock follows a short time later and passes through the hole where the window previously stood. The second rock does not break the window because the first rock already destroyed the conditions necessary for the second rock to do its damage. But a person's death can take longer than a window-breaking. A person shot once in the heart does not shatter, and can live long enough for another bullet to pierce him and run its course as well. Because each bullet runs its full course, a course sufficient for death, the death is overdetermined.

Others claim that the firing squad case is one of joint causation—both firings together caused the death *as it happened*.⁸ The objection is that the two bullet wounds combine to

cause a different death than either would in isolation. Since neither shot, by itself, is sufficient for the death *as it happened*, this is a case of joint causation. Again, one can object in two ways. First, one can concoct cases in which the effect, with alleged overdeterminers, is precisely the same as it would have been had only one of them occurred. However, if we insist on this requirement independent overdetermination would be rarer yet. A better objection is to deny that it would have been a different death had only one of the bullets struck. This second objection accuses the joint causation theorist of adhering to an overly fragile conception of effects. An effect is less fragile to the extent that it could differ, yet remain the same effect. We enter uncertain and vague territory when we ask how much this death could differ while remaining the same death. Note, however, that if any change in the manner of death is a different death, then whatever is responsible for a slight change in the manner of death is a (partial) cause of that death (for, that factor caused it to be *this* death, rather than another death). One is then committed, amongst other things, to death delayers (e.g., temporarily successful administrations of CPR) being causes of particular deaths.⁹ Alternatively, one can see causes as having less fragile effects—effects that could occur in slightly different manners and at slightly different times. Or, the fragility debate can be sidestepped by pointing out that either bullet is sufficient for *a* killing of the spy (within some reasonable time), though the precise manner of death is left open. Each bullet wound separately would have a death of the spy as an effect, and it is still a death of the spy when both bullets hit their target. In such a case the killing of the spy *simpliciter*, with no specification of the manner of death, is overdetermined.

Thus far we have expressed a general skepticism about systematic independent overdetermination. But while systematic independent overdetermination seems like a great coincidence in some domains, in others there are perfectly reasonable explanations for such

overdetermination. Human artifice and planning can explain many cases of independent overdetermination—like our firing squad example. Oftentimes when we want to be certain that a job is done we establish backups which independently overdetermine the outcome. Indeed, *systematic* independent overdeterminers may even be seen as less offensive to theory than occasional independent overdeterminers. For, if the overdetermination is systematic at least it is an observed regularity. And such systematic independent overdetermination is found in the natural world. For example, evolution often bestows organisms with redundancies and backups, and these can be explained naturalistically. Such redundancies may have arisen because of the importance of the function they perform, to serve as a backup system, or merely because of historical accident (e.g., if one of the redundancies was primarily selected for another function it performs).

2. Incorporating Causal Overdetermination.

Alleged Example: A group of significant investors sell off their stocks in a panic, causing the stock market to crash over 500 points in one day. These investors, their advocates, and others involved in the economic transactions, go through a series of bodily motions and physical exchanges which constitute their selling panic. These “lower level” actions also cause the stock market crash.

In contrast with our first brand of overdetermination, with the next two types there is an intimate connection between the particularity aspects of the overdetermining causes. With incorporating causal overdetermination the alleged overdetermining causes “work through” the same mechanism. The causally relevant properties of the incorporating causes are different, but they are predicated of the same mechanism. The standard case of such overdetermination is micro/macro overdetermination. Macro causes incorporate micro causes. One cause incorporates the other if and only if, *only as a matter of fact*, they share their causal mechanism and a realization relation obtains between their instantiations. Instances

of some macro property, like *being a financial transaction*, are realized in instances of lower level properties. But this incorporation of lower level properties is not part of the *definition* of a financial transaction. Financial transactions could occur *via* almost any medium. The configuration at the lower level is quite accidental as far as generalizations at the higher level are concerned.

Realization

Such macro properties supervene on, or are realized in, these lower level properties. For example, the economic behavior in our above example is realized in lower level bodily actions, physical movements, etc. In this case supervenience does not hold, because an embedding in a proper economic environment is also needed for those movements to be *economic* behavior. However, other macro properties do supervene on lower level properties. The water in my glass is water in virtue of a certain arrangement of microphysical properties. Its being water supervenes on its having microphysical arrangement X—anything else with that precise microphysical arrangement is necessarily water as well. A relationship like that captured by the terms ‘supervenience,’ ‘realization,’ or ‘constitution,’ holds between incorporating causes, though for present purposes we needn’t be particular and settle the relevant relation for individual cases. ‘Realization’ is the more general relation that holds between incorporating causes.

Given this connection between incorporating causes, we can already mark a significant contrast with independent overdetermination. Independent overdeterminers can “come apart”—that is, either one of those causes could occur without the other. This observation supported the original intuition that independent overdetermination would be an odd coincidence. However, if incorporating causation occurs at all, it is necessarily systematic. Since macro properties are instanced in virtue of microphysical instantiations and physics is

causally closed, every case of macro causation has an accompanying microphysical cause. Since a given macrophysical property instance is realized in some particular microphysical property instances, it is no coincidence that they both converge on the same effect—the macrophysical property *had* to be there.

What Incorporation is Not: Two Contrasts

Reduction

The realization point shows that incorporating causes are not independent.¹⁰ However, we should not think that a more intimate relation holds between incorporating causes. In particular, incorporating causes are not reducible to one another—reduction violates the “distinctness” requirement of overdetermining causes.

There are many senses of reduction, but I will offer just two here.¹¹ For present purposes, reduction is a metaphysical doctrine involving an identification. The two general kinds of identities as discussed in philosophy of mind debates—type identities and token identities—are representative of these two senses of reduction. The first sense views reduction as mainly an issue of vocabulary and concerns properties and/or theories. A type reduction requires that the laws and properties of one theory be identified with the laws and properties of another theory *via* bridge laws in the traditional Nagelian fashion.¹² The second sense is a token reduction. According to this sense the properties of the two theories cross-cut one another, but the particulars of the theories (events, objects, or tropes) are token identical. Donald Davidson’s AM is an example of such a token reduction.

How would such reductions bear on causal overdetermination? A type reduction would surely allay all overdetermination worries—the mechanism *and* causally relevant properties involved in such cases would be identical, so there would not be the distinctness that is required for overdetermination. So, our incorporating overdetermination worry must

concern theories postulating properties and laws that are not reducible to one another. The philosophical consensus is, quite rightly in my view, that psychological properties and laws are not reducible to physics. These psychological properties do “work through” physiological and chemical mechanisms, though the particularities of these lower level realizers are quite irrelevant and accidental as far as the psychological laws go. The mental-physical causal situation is looking like a case of incorporating causal overdetermination.

The impact a token reduction would have on alleviating causal overdetermination is less clear. If the particulars identified in such a token reduction are the causal *relata*, then the relevant distinctness has been lost. Davidson, for example, claims that each mental event (with physical effects) is identical to some physical event, and events in extension are the causal *relata*. Even though mental properties are type irreducible to physical properties according to his view, the mental and the physical do not causally overdetermine. However, as was advocated above, one may hold a theory of causation according to which the generality aspect (e.g., the properties) is a component of the causal *relata*. For such a theorist, a token reduction without a type reduction would not be enough to eliminate the causal overdetermination. Again, this is the same worry that commonly arises in criticism of Davidson’s AM—AM denies mental *properties* a causal role.

Downward Causation

Absent a type reduction, some have held that incorporating causes must exert “downward causation,” if they are genuine causes at all. Jaegwon Kim, at one time at least, argued that non-reductive incorporating causes are ones in which the higher level cause exerts such downward causation on the lower level cause.¹³ Kim used this as an argument against non-reductionism in general. For, countenancing such downward causation is tantamount to denying the closure of physics. Such a view sees chemical, biological, and

psychological states (if truly irreducible) as introducing wholly new forces, from outside the world physics knows, to change the behavior of physical particles. We should examine Kim's argument to see if advocates of non-reductive incorporating causes are committed to such an unwelcome result.

Kim begins his argument that non-reductionists are committed to downward causation by noting that each property must bring with it new causal powers.¹⁴ While Kim directs the argument that follows against mentality, it can apply to any non-reducible higher level property. Kim argues as follows: If you are a realist about mental properties, then you are committed to mental properties bringing new causal powers into the world. These must be *new* causal powers if the mental is really non-reducible. If the mental were reducible to lower level properties, then it would have causal powers, just not new ones. But since all mental properties are physically realized (as our non-reductive physicalist holds), then any case of mental causation, even if it is ostensibly just mental-to-mental, is a case of mental-to-physical causation as well (e.g., to cause the mental state the physical realization base must be caused). But, mental-to-physical causation is downward causation. The non-reductionist wants to say that what occurs at the higher levels is "fixed" or "determined" by what happens at the lower levels, but yet is committed to novel causal powers acting downwards and determining the lower level occurrences. This is a devastating tension, if not contradiction, in the non-reductionist's position. Perhaps even worse, it amounts to a denial of the causal closure of physics. For these reasons, mental properties in particular, and higher level properties in general, are not distinct from the lower level properties that realize them.

The key premise of Kim's argument is that each property brings with it new causal powers. I agree with this criterion for property-hood, however higher level properties can introduce new causal powers without exerting downward causation. The non-reductionist

does not want to preserve the autonomy of the special sciences at the expense of losing the causal closure of physics. Since the same mechanism is involved in cases of incorporating causation, these new causal powers should be closely aligned with the distinctive properties at these different levels. Incorporating causes possess distinct causally relevant properties sufficient for the effect. Thus the overdetermination worry arises.

However, note that an instance of downward causation (which is possible, but just not actual)¹⁵ does not present us with causal overdetermination. In such a situation it is *not* the case that both the higher level property and the lower level property are sufficient for the effect. Rather, the higher level property introduces new forces, which are then added to those at the more fundamental level, and they jointly combine to form a resultant force that leads to the effect. This is not a case of causal overdetermination (i.e., two sufficient causes), but joint causation with one sufficient cause. Alternatively, either the “downward” or “upward” force might succumb to the authority of the other, again presenting us with one sufficient cause rather than two. If the downward mental force bosses the physical particles around, as it were, then we no longer have a sufficient physical cause (at best, we have a pre-empted one). Similarly, if the mental provides downward forces to alter the physical particles, but only ever so slightly (like the wind blowing behind a train already moving along to its destination), then we no longer have a sufficient mental cause.

The non-reductionist is offering two sufficient causes for the effect, however. These higher level properties do bring with them new causal powers. However, it is a mistake to think of these new causal powers as exerting downward causation, or as otherwise being in the “emergentism” tradition. Rather, the non-reductionist’s higher level properties offer a separate reason, perhaps accompanied with a separate causal law, for the effect to occur. Further, this new reason does not make use of the same classifications of entities and

properties as causal explanations at the lower levels. The pattern at the higher level, with its distinctive entities and properties, is silent with regard to the lower level mechanism, if any, through which it operates. Things could be (or could have been) transparent without having a molecular makeup, human without DNA, or a belief that *p* without this particular physical constitution. It is just a fact that there are such lower level accompaniments, in our world, corresponding to these higher level properties.

To review, with incorporating overdetermination: a) the properties of the incorporating cause are realized in the properties of the lower level cause, b) the incorporating properties cannot be reduced to those it incorporates, c) nor do the incorporating causes exert downward causation. One can object on at least three grounds that particulars with properties related as such do not present overdetermining causes.

- 1) One could deny that properties should be used to individuate the causal *relata*.

This is the Davidsonian approach mentioned above—i.e., the causal mechanism is all there is to the cause. Since alleged incorporating causes have the same mechanism, they are cases in which there is only one cause.

- 2) One could allow properties to be used in individuating the causal *relata*, but still claim that so long as the property *instances* are identical there is only one cause.

This is a form of token reductionism, but it is still consistent with type non-reductionism. For example, while *being a financial transaction* is type irreducible to microphysical properties, a token financial transaction could be identical to particular microphysical instantiations. To buttress this maneuver one needs a theory of property instances—e.g., are they exemplifications of universals, or tropes? Presumably, only with tropes could such an identity possibly succeed.

This is the second way in which alleged incorporating causes could fail to be distinct.

- 3) Instead of identifying the incorporating causes, one could distinguish between the effects of such causes. If they have different effects, then they are not overdeterminers. For example, the economic behavior might have an economic effect, whereas the microphysical properties might cause microphysical effects, and these effects are not identical. This is the dual *explananda* approach. This approach accepts that causes should be individuated with respect to properties, but insists that effects should be as well. Higher level causes then have higher level effects, and lower level causes have lower level effects. There is no incorporating overdetermination. However, the advocate of this position has the burden of explaining the non-identity relation which holds between a higher level effect and the distinct lower level effect serving as its realization base.

Pre-established Harmony?

Whether or not there is incorporating overdetermination, there is something *prima facie* problematic with incorporating causation. Namely, it appears miraculous that there are these irreducible patterns at distinct levels, systematically acting in accord with one another as a mere matter of fact. There is an appearance of a *Pre-established Harmony among Levels*. How amazing that there are two sufficient causes operating through the same mechanism, but they are distinct! Furthermore, such co-habiting causes are present *whenever* there is a chemical, biological, or psychological cause! The sentiment expressed here is similar to the amazement Jerry Fodor expresses regarding why (and how) there could be such higher level regularities. He writes (of Kim):

He just doesn't see why there should be (how there could be) [irreducible] macrolevel regularities *at all* in a world where, by common consent, macrolevel stabilities have to supervene on a buzzing, blooming confusion of microlevel interactions . . . So, then, *why is there anything except physics?* That, I think, is what is *really* bugging Kim. Well, I admit that I don't know why. I don't even know how to *think about* why. I expect to figure out why there is anything except physics the day before I figure out why there is anything at all, another (and, presumably, related) metaphysical conundrum that I find perplexing.¹⁶

Fodor seems puzzled by the *need* for irreducible regularities—their presence strikes him as “perplexing.” They strike me as such too—not just because they are unneeded, but because the micro/macro level patterns can co-habitate so nicely.

We should be skeptical of talk of pre-established harmonies and design. Too many times we have been provided with perfectly naturalistic reasons for why such apparent pre-established harmony, design, or once unexplained coincidence occurs. The notions of pre-established harmony and design conjure up thoughts of an architect giving order to our world from *outside* of it. Such suggestions rail against the naturalistic constraints on good explanations that any scientist should accept. Fortunately, over the past few decades, the emergence of computer simulations and the study of complex adaptive systems has put us on the path to discovering naturalistic and mathematical explanations for these higher level patterns and the hierarchical ordering of nature in general. Such explanations show this order to be the *self*-organizing behavior of a complex adaptive system.

As an example, consider the explanations for higher level properties that emerge in Craig Reynolds' “boids” computer simulations. Boids are computer representations of birds, fish, or other animals that organize themselves into flocks, schools, herds, and the like. It was

obvious to Reynolds that such collective patterns emerge from individual animals, say birds, choosing their own course of flight, yet these collective choices have the effect of apparently unified behavior at the level of the flock. As he describes it:

A flock exhibits many contrasts. It is made up of discrete birds yet overall motion seems fluid; it is simple in concept yet is so visually complex, it seems randomly arrayed and yet is magnificently synchronized. Perhaps most puzzling is the strong impression of intentional, centralized control. Yet all evidence indicates that flock motion must be merely the aggregate result of the actions of individual animals, each acting solely on the basis of its own local perception of the world.¹⁷

Reynolds set himself the task of discovering the behavioral rules that individual animals follow to produce this group structure. He found that if his boids follow three simple rules flock simulation results.

1. Collision Avoidance: avoid collisions with nearby flockmates
2. Velocity Matching: attempt to match velocity with nearby flockmates
3. Flock Centering: attempt to stay close to nearby flockmates¹⁸

This explains the group behavior, while still allowing it to be “emergent” in some sense.

Namely, the higher level patterns *emerge* from the boids following the lower level rules, in the sense that they cannot be predicted prior to actually running the computer simulation with those rules.

Computer simulations of complex adaptive systems from other domains have offered similar explanations of economic, biological, psychological, and other higher level patterns and organization.¹⁹ Such successes provide hope that the illusion of a pre-established harmony between levels can be mathematically and scientifically explained away. But do such simulations support the non-reductionist’s claim that there are *causally efficacious*

properties at higher levels that cannot be reduced to the properties at the lowest level? I confess that such simulations have the effect on me of making epiphenomenal or supervenient causation, like Kim once advocated²⁰, seem more palatable. In such simulations, it is clear that only the lower level rules—e.g., Reynolds’ three rules above—are causally efficacious. The flock properties at the higher level don’t exert any causal influence. And if such is the case in the “real world” there would be no incorporating overdetermination, but only microphysical causation.

3. Iterative Causal Overdetermination.

Alleged Example: Mac is anxious and wants to get a good night’s sleep, so he takes a sleeping pill. The pill he takes has the property of being dormitive—that is, the pill has some property or other that causes people to go to sleep. In fact, this particular pill puts people to sleep in virtue of having chemical property P. Mac takes the pill and falls asleep twenty minutes later. The pill’s dormitivity and property P each cause Mac to fall asleep.

The third type of overdetermination, iterative overdetermination, occurs when (ostensibly) two properties operate through the same mechanism, but the properties and causes are conceptually or definitionally connected. This differs from incorporating overdetermination in that incorporating causes include specific lower level properties merely as a matter of contingent fact. If iterative properties are conceptually connected, one may go so far as to argue that there is only one instantiation of the two properties or even that the alleged two properties are identical as types. Examples will be helpful to illustrate such properties and causation.

Iterative overdetermination typically involves either second-order or disjunctive/conjunctive properties causally overdetermining alongside their first-order companions or disjuncts/conjuncts, respectively. Second-order properties are properties

involving quantification over other properties—e.g., the property *having the property of owning a car* is a second-order property. Such second-order (and higher) properties are clearly iterative in that they consist in the having of some lower-order property by definition. At least since Hilary Putnam formulated his account of functionalism in the 1960's, dispositions and functional properties have been commonly understood to be such second-order properties.²¹ For X to have the dispositional property *dormitivity* is for X to have some property or other that puts one to sleep. No independent understanding of dormitivity apart from this connection to the first-order realizers is offered. *If* dispositions and functional properties are causally relevant and *if* they are second-order properties, then iterative overdetermination threatens to be systematic. In particular, many mental properties are thought to be dispositions or functional properties, and iterative overdetermination worries arise for them. Of course, the most prominent threat of iterative overdetermination would be avoided if we simply opted for a first-order causal understanding of dispositions and functional properties, instead of a redundant second-order formulation.

An assortment of other properties also presents iteration worries. Disjunctive and conjunctive properties, by explicit definition, consist in the having of certain other properties. In a particular case does the instantiation of a disjunctive/conjunctive property causally overdetermine with its instantiated disjuncts/conjuncts? One may think that such properties are not fit for causal roles in the first place. But other properties, like determinables/determinates and “range” properties, are frequently cited in causal judgments and are similarly iterative. To be red is to be some shade of red or other. Does X's *being red* and *being scarlet* ever causally overdetermine an effect, though? Or consider a range property, such as *being between 80 and 90*. Johnny earns a “B” because his average is an 84.56% and anyone with an average between 80 and 90 percent gets a “B.” Does Johnny's average *being*

between 80 and 90 percent and its being 84.56% overdetermine his grade? Is his grade iteratively overdetermined by causes comprising these different properties?

The sense of coincidence we experience when contemplating independent and incorporating overdetermination is missing when we consider these alleged cases of iterative overdetermination. While one may wonder why distinct particulars coincide in producing the spy's death, or why properties at different levels operating through the same mechanism coincide to cause the same economic effect, one is not similarly motivated to wonder why it is that second-order properties coincide with their first-order constituents. Whenever any property is instantiated a bevy of higher order and disjunctive properties necessarily are as well.

Such intimacy between iterative properties and their constituents leads naturally to an identification of the alleged iterative overdeterminers. To count both the first-order property instance and its corresponding second-order property instance as distinct causes of the same effect is to be guilty of what David Lewis calls "double counting."²² The pill's dormitivity *just is* its having property P. In the spirit of Lewis, Stephen Mumford holds that dispositional and categorical terms are two different ways of referring to the occupants of the same causal role. Since dispositional manifestations are not overdetermined by those causal roles, Mumford concludes that the disposition instance is identical to the categorical instance.²³ Here, the impossibility of iterative overdetermination is offered as a reason for the identification. Regardless of what direction you come from, there is a strong intuitive pull to identify iterative causes with their constituents, and to reject iterative overdetermination.

However, iterative overdetermination is rejected on other grounds besides identification. David Lewis also notes that disjunctive properties are not capable of playing a causal role,

and many others would agree on the grounds that such properties aren't projectible into laws. And Stephen Yablo holds that instances of determinables are different events than their corresponding determinate events. Yet, Yablo has argued that these events do not overdetermine their effects. That is, something's *being red* can be distinct from its *being scarlet*, each of these events can be causes of the same effect, and yet the effect is not overdetermined.²⁴ However, this seems like an *ad hoc* exception to the commonly understood notion of overdetermination. Outright identification of determinable instances with their determinate instances would avoid this sense of arbitrariness.

Conclusion

By distinguishing between the mechanism and causally relevant property, causal overdetermination divides neatly into three varieties. It should be clear by now that the same response against the possibility of overdetermination cannot be given to all three types. The most general form such a response would take is to look for an identification. The needed identification takes a different shape for each type. Independent overdeterminers operate through different mechanisms, so the identification must show them jointly combining to form one sufficient cause. But fragility concerns are generally raised to encourage skepticism about such an identification. Incorporating causes could be identified in one of two ways. First, the individuation of causes by properties could be rejected, and the sameness of mechanism would then be sufficient for sameness of cause. Second, one could accept that causes are individuated by properties, but argue that the higher level and lower level property *instances* are identical. Finally, the prospects for identification are best with iterative overdetermination—the illusion of overdetermination really does seem to arise from a “double counting” of causes.

The most common worries regarding overdetermination fall within the incorporating overdetermination camp—e.g., the contemporary problem of mental causation, and concern over the causal autonomy of the special sciences in general. Further thought needs to be given regarding the similarity of incorporating overdetermination to independent overdetermination. Oftentimes a “no overdetermination” principle is supported by citing the oddness of independent overdetermination examples—e.g., haystack fires started by simultaneous lightning strikes and cigarette droppings. However, this principle is then used against theories that countenance *incorporating* overdetermination. As the above taxonomy and discussion shows, it is not clear that both types are problematic in the same way. In particular, it is not clear that the convergence of distinct properties on a common effect is as odd as the convergence of distinct mechanisms on a common effect. Without going so far as providing a reduction, science may yet show that such convergence, and maybe even overdetermination, can be explained naturalistically. But for now mental overdetermination is still a serious philosophical concern. Though, we have seen that it should no longer be thought of according to the model of “firing squad” causal overdetermination.²⁵

Eric Funkhouser
Department of Philosophy
Syracuse University

ENDNOTES

¹ I am sympathetic, however, to a loose sense of ‘sufficiency’ according to which something can be a sufficient cause without being *strictly* sufficient. Strict sufficiency requires reference to countless omissions (e.g., the fire was caused by the lack of rain, God’s failure to blow it out, etc.), in addition to citing what are normally taken as standing, or background, conditions. In the spirit of J.S. Mill, strict sufficiency may also require reference to the entire history of the world (or at least the light cone of the effect). However, overdetermination worries rest on the truth of counterfactuals, or laws, to the effect that either (allegedly) overdetermining cause on its own would have “made the difference” in the effect’s occurring. With this intuitive notion in mind we can proceed with a softer understanding of ‘sufficiency.’

² As with ‘sufficiency,’ ‘distinct’ also stands in need of clarification. This is partly done in discussions of the three varieties of overdetermination below. It may be that non-identity is not enough for distinctness. In particular, part-whole relationships threaten to raise widespread overdetermination worries if parts are distinct from the wholes they compose. Such worries may motivate us to require more than non-identity for distinctness. For a detailed consideration of part-whole overdetermination worries see Trenton Merricks, *Objects and Persons*, (New York, NY: Oxford University Press Inc., 2001).

³ Arguments utilizing such exclusion principles as a critical premise have been put forth, most prominently, by Jaegwon Kim, “Mechanism, Purpose, and Explanatory Exclusion,” *Supervenience and Mind*, (Cambridge, UK: Cambridge University Press, 1993); Stephen Yablo, “Mental Causation,” *The Philosophical Review*, Vol. 101, No. 2 (April 1992), 245-280; Norman

Malcolm, “The Conceivability of Mechanism,” reprinted in *Free Will*, ed. Gary Watson, (New York, NY: Oxford University Press Inc., 1982).

⁴ Davidson, “Mental Events,” *Essays on Actions and Events*, (New York, NY: Oxford University Press Inc., 1980).

⁵ For objections and discussion along these lines, see: Ted Honderich, “The Argument for Anomalous Monism,” *Analysis* 42 (1982), 59-64; Frederick Stoutland, “Oblique Causation and Reasons for Action,” *Synthese* 43 (1980), 351-67; Terence Horgan, “Mental Quausation,” *Philosophical Perspectives* 3 (1989), 47-76; and the discussion of Anomalous Monism by Jaegwon Kim, Brian McLaughlin, and Ernest Sosa, in *Mental Causation*, eds. John Heil and Alfred Mele, (New York, NY: Oxford University Press Inc., 1993), 19-50.

⁶ Properties are introduced into the causal *relata* not merely out of concern over mental causation. For example, L.A. Paul has provided strong reasons for holding that the features of events—property instances—are the causal *relata* in general. See her “Aspect Causation,” *The Journal of Philosophy*, (2000), 235-256.

⁷ In this paper it is assumed that every effect in our world has a wholly physical cause.

⁸ Martin Bunzl takes this line in his “Causal Overdetermination,” *Journal of Philosophy*, (1979), 134-150.

⁹ David Lewis makes similar points against fragile conceptions of the causal *relata* in “Postscripts to ‘Causation’,” *Philosophical Papers, Vol. II*, (New York, NY: Oxford University Press Inc., 1986), 196-199.

¹⁰ Note that under my usage ‘independent’ is not a synonym of ‘distinct.’ I take it that two things can be distinct, even though one is dependent on the other.

¹¹ For a comprehensive overview of such senses, see Robert Van Gulick's "Reduction, Emergence and Other Recent Options on the Mind/Body Problem: A Philosophic Overview," *Journal of Consciousness Studies*, No. 9/10, (2001), pp. 1-34.

¹² See Ernest Nagel, *The Structure of Science*, (New York, NY: Harcourt Brace and World, 1961), Chapter 11.

¹³ See his "The Non-Reductivist's Troubles with Mental Causation," in *Mental Causation*, eds. Heil and Mele. Kim makes similar arguments in "Downward Causation? in Emergentism and Nonreductive Physicalism," *Emergence or Reduction?*, eds. Beckermann, Flohr, and Kim, (Berlin: De Gruyter, 1992). Kim appears to disavow this argument in *Mind in a Physical World*, (Cambridge, MA: The MIT Press, 1998).

¹⁴ The synopsis that I give here is from "The Non-Reductivist's Troubles with Mental Causation."

¹⁵ For a helpful discussion of emergentism/downward causation, and its intellectual history, see Brian McLaughlin's "The Rise and Fall of British Emergentism," in *Emergence or Reduction?*, eds. Beckermann, Flohr, and Kim, 1992.

¹⁶ "Special Sciences: Still Autonomous After All These Years," *Philosophical Perspectives*, 11, *Mind, Causation, and World*, ed. James E. Tomberlin, (1997), 161.

¹⁷ Craig Reynolds, "Flocks, Herds, and Schools: A Distributed Behavioral Model," *Computer Graphics*, 21, 4, (July 1987), 25.

¹⁸ *Ibid.*, 28.

¹⁹ See, for example, John Holland, *Adaptation in Natural and Artificial Systems*, (Ann Arbor: University of Michigan Press, 1975).

²⁰ Kim, "Epiphenomenal and Supervenient Causation," in *Supervenience and Mind*.

²¹ Hilary Putnam, “On Properties”, *Mathematics, Matter and Method: Philosophical Papers Volume 1*, (New York, NY: Cambridge University Press, 1975), 313. This understanding of dispositions and functional properties is also articulated in: Ned Block, “Can the mind change the world?” *Meaning and Method: Essays in Honor of Hilary Putnam*, Boolos, G. ed., (New York, NY: Cambridge University Press, 1990), 155-162; David Lewis, “Lewis, David: Reduction of Mind”, *A Companion to the Philosophy of Mind*, ed. Samuel Guttenplan, (Cambridge, MA: Blackwell, 1994); and Jaegwon Kim, (1998).

²² This objection is raised in Guttenplan (1994), 420. Also, see Lewis’s “Causal Explanation,” in *Philosophical Papers, Vol. II*, 223-224.

²³ Stephen Mumford, “Dispositions, Bases, Overdetermination and Identities,” *Ratio*, (April 1995), 42-62.

²⁴ This is how I read his position in “Mental Causation,” *The Philosophical Review*, Vol. 101, No. 2, (1992), 245-280.

²⁵ Thanks to Robert Van Gulick and an anonymous referee for helpful comments.