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A defense of the causal efficacy of dispositions

Jennifer McKittrick

I. Introduction

Disposition terms, such as ‘cowardice,’ ‘fragility’ and ‘reactivity,’ often appear in explanations. Sometimes we explain why a man ran away by saying that he was cowardly, or we explain why something broke by saying it was fragile. Scientific explanations of certain phenomena feature dispositional properties like instability, reactivity, and conductivity. And these look like causal explanations – they seem to provide information about the causal history of various events.

Philosophers such as Ned Block, Jaegwon Kim, Elizabeth Prior, Robert Pargetter, and Frank Jackson¹ have suggested reasons for thinking that dispositions are causally inert. I call this the “Inert Dispositions View.” According to this view, the glass’s fragility was not responsible for its breaking; the man’s cowardice was causally impotent as he fled. The Inert Dispositions View would call many of the explanations we give into question. By employing a disposition in an explanation, we might have thought we were giving a causal explanation of the event. Perhaps we took ourselves to be explaining an effect with some feature of its cause that was responsible for the effect. However, if dispositions are causally inert, we are explaining the event in some other way, or not really explaining it at all.

The Inert Dispositions View suggests that something is amiss with many scientific explanations. If properties like conductivity and volatility are causally inert, it is not clear how appealing to them provides us with information about why certain phenomena occur. This is especially problematic if one thinks, as some do, that the fundamental properties that scientists attribute to the ultimate

¹ Prior, Pargetter, and Jackson, ‘Three Theses About Dispositions’. *American Philosophical Quarterly*, 19 (1982): 251–257; Frank Jackson, ‘Mental Causation’. *Mind*, 105 (1996): 377–413; ‘Essentialism, Mental Properties and Causation’. *Proceedings of the Aristotelian-Society*, 95 (1995): 253–268; Ned Block, ‘Can the Mind Change the World?’, in *Meaning and Method: Essays in Honor of Hilary Putnam* (New York: Cambridge University Press, 1990); Jaegwon Kim, ‘Mechanism, Purpose, and Explanatory Exclusion’, ‘The Nonreductivist’s Troubles With Mental Causation’ in *Supervenience and Mind* (New York: Cambridge University Press, 1993).

constituents of matter – things like force, mass, charge, impenetrability – are dispositional. If, as Simon Blackburn says, “science finds only dispositional properties all the way down,”² and if dispositions are causally inert, it would seem that science does not provide us with real causal explanations.

The Inert Dispositions View implies that there is something amiss with psychological explanations as well. At least some psychological states are dispositional – being courageous or shy, being such that you would accept a drink if you were offered one. On some views, all mental states are like dispositions, since having a mental state is a matter of having some brain state or other that performs a certain causal role. If mental properties are relevantly similar to dispositions, and dispositions are inert, then mental properties make no difference to what a body does. However, it is natural to think that my believing and desiring certain things has much to do with my body moving in certain ways. It would take powerful arguments to cast these beliefs into serious doubt.

In this paper, I defend the causal efficacy of dispositions against two types of arguments that I call “Analyticity Arguments” and “No Work Arguments.” According to Analyticity Arguments, there is an analytic or necessary connection between a disposition and its manifestation, and this goes to show that there is no causal connection. I argue, on the contrary, that it shows no such thing. According to No Work arguments, manifestations of dispositions already have sufficient causes, and so there is “no work” for dispositions to do. I claim that these arguments rest on some questionable assumptions.

II. Dispositions

Proponents of the Inert Dispositions View assume a certain view of dispositions that I will adopt for purposes of this paper. A disposition is a property that several objects can have in common. (For example, all the glasses in my cupboard are fragile, or have fragility.) A disposition can be given a second-order characterization – a disposition is *a property of having some property* which plays a certain causal role. (A thing is fragile if it has some property which makes it such that it will break when struck.) Every disposition has a causal basis – a property that is causally efficacious for the manifestation, given the circumstances.³ (Glass has a particular sort of molecular bonding which is causally efficacious for breaking upon striking.) In sum:

² Simon Blackburn, ‘Filling in Space’. *Analysis*, 50 (1990): 255.

³ As I have argued elsewhere, it is possible that there are “bare dispositions” that have no causal bases (Jennifer McKittrick, ‘The Bare Metaphysical Possibility of Bare Dispositions’. *Philosophy and Phenomenological Research*, Vol. LXVI No. 2 (2003): 349–369). However, for the sake

To have *disposition* D to give manifestation M in circumstances C is to have some property P which is a *causal basis* for giving M in C.

and

To have a *causal basis* for giving M in C is to have a property that is causally efficacious for M in C.

Typically, dispositions are multiply realizable. (The causal basis of fragility might be one thing in glass, and another in eggshells.) Also, for all that has been said, a particular instance of a disposition can have more than one causal basis. (If a glass had two properties, either of which would be efficacious for breaking when struck, then both are causal bases of the glass's fragility.)

III. Causal Efficacy

Presumably, those who think that dispositions are "inert," "impotent," "causally irrelevant," and "inefficacious" believe nonetheless that some properties do not suffer from this inadequacy. It is thought that some non-dispositional properties have some relation to effects which dispositions lack. This relation is characterized in various ways: certain properties make a difference to what happens; they explain effects; an event caused what it did "in virtue of" instantiating certain properties; they are the *causally efficacious* properties. For example, the surprise party's being sudden and unexpected was efficacious for surprising me, but its lasting five hours was irrelevant to my being surprised.

Causal efficacy is a relation between some of the properties of an event and an effect of that event. However, it is also said that properties of *objects* are causally efficacious. For example, if a ball was thrown at a window and broke the glass pane, the mass and velocity of the ball was efficacious for the breaking, but the color of the ball, and its belonging to little Johnny are not relevant. I could recast this talk in terms of properties of events, such as the property *being a throwing of a ball with a particular mass*.⁴ However, such locutions are awkward. For convenience, I call all the properties of an event, together with the properties of the objects involved in that event, the "event-properties."

Though it is a matter of significant controversy, when philosophers talk about causal efficacy, they seem to have something like the following in mind: a causally efficacious property is a member of a set of properties which

of this paper, I am granting that all dispositions have causal bases.

⁴ A similar point is made by David Braun, 'Causally Relevant Properties'. *Philosophical Perspectives*, 9 (1995): 449.

is minimally sufficient for the occurrence of an effect. Given a set of event-properties, some subset of properties is causally efficacious for an effect of that event. These properties are such that, when instantiated together in this fashion, the effect necessarily occurs (or if the world is indeterministic, the effect has a certain probability of occurring). This set of causally efficacious properties is to be minimal, in that no subset of it would be sufficient for the occurrence of the effect. In sum:

If a property P is *causally efficacious* for an event e, then

P is a member of a set of event-properties S which is:

- i) sufficient, given the laws, for e; and
- ii) such that no proper subset of S has this feature.

This definition is probably incomplete as it stands. One might add such qualifications as: there are no inhibiting factors present, or the properties in S are natural properties. Despite the likely need for further qualifications, this definition helps to flesh out the intuitive idea of causal efficacy that is at work in the arguments to follow. However, note that this definition does not guarantee that a minimally sufficient set of properties will be unique. The mere definition of “causal efficacy” does not rule out the possibility of one event instantiating two sets of properties, each of which would be minimally sufficient for a certain effect.

We can now put the Inert Dispositions View more precisely: No disposition is a member of a minimal set of properties which is sufficient for the occurrence of the manifestation of that disposition. Now let’s consider the arguments which are supposed to convince us that the Inert Dispositions View is correct.

III. Analyticity Arguments

According to an Analyticity Argument, there is an analytic relation between a disposition and a manifestation, and therefore, there is no causal connection between them. Any adequate definition of a disposition will refer to its characteristic manifestation. For example, “fragility” is defined by reference to breaking or shattering. So, there is a definitional or conceptual connection between a disposition term and an event-type – between ‘fragility’ and breaking, for example. “Fragile objects tend to break when struck” is, in some sense, analytic. It is further assumed that causal claims are contingent, and not analytic. It follows that, if a statement is analytic, it is not a causal statement. Consequently, “The glass broke because it was fragile” cannot be a causal claim, and so fragility must be causally inert.

Analyticity arguments have long been disputed. As Donald Davidson points out, how events are described, what names they are given, neither determines nor precludes causal connections between them.

...there is something very odd in the idea that causal relations are empirical rather than logical. What can this mean? Surely not that every true causal statement is empirical. For suppose 'A caused B' is true. Then the cause of B = A; so substituting, we have 'The cause of B caused B', which is analytic. The truth of a causal statement depends on *what* events are described; its status as analytic or synthetic depends on *how* the events are described.⁵

Causal connections between events hold independently of our descriptions of them. The same can be said of properties. A property can be picked out via its efficacy for some effect. Consider the claim "The property that was causally efficacious for e was causally efficacious for e." The statement is analytic, but that should not lead us to think that the property that was causally efficacious for e was *not* causally efficacious for e!

However, these observations have not put an end to Analyticity Arguments. According to a more modest Analyticity Argument, our sense that the disposition is relevant to the manifestation is explained by the analytic connection, and this leaves us with no reason to suppose a causal connection holds. Absent a reason to suppose a causal connection holds, presumably we should assume one is absent. This is what Block suggests when he writes:

The fact that dormitivity is sufficient for sleep is perfectly intelligible in terms of this logical relation. What reason is there to suppose that there must *also* be a nomological relation between dormitivity and sleep?⁶

Block's rhetorical question suggests that there *is* no reason to suppose there is a causal connection between dormitivity and sleep, in addition to the logical one. The logical, or analytic relation between 'dormitivity' and 'sleep' fully explains (i.e. renders "perfectly intelligible") the fact that dormitivity is sufficient for sleep. Since we have a full explanation, we need not, and indeed should not, look any further. (Interestingly, this analyticity argument appeals to some principle of explanatory exclusion, which will be discussed at length later.)

In response, pointing out *one* reason that something is relevant does not show that that is the *only* reason. Dormitivity might be relevant to sleep both

⁵ Donald Davidson: *Essays on Actions and Events* (Oxford: Clarendon Press, 1980), p. 14.

⁶ Block, 'Can the Mind Change the World?', p. 157.

conceptually *and* causally. We have additional reasons for supposing that causal connections hold between dispositions and events, especially when we think about mental properties as dispositions. Even if our language and explanatory practices did not give us reasons for supposing that there is a causal connection between dormitivity and sleep, there might nevertheless be one. Furthermore, our language and explanatory practices *do* give us reasons to suppose causal connections exist. Our descriptions of events seem to track causal connections. Examples of this are familiar: sunburn is caused by excessive exposure to sunlight; lethal injections and fatal accidents cause death. The existence of conceptual connections between our descriptions of events seems to *support* the idea that these events are causally connected. A similar point can be made about predicates tracking causally relevant properties.

IV. Hume's Principle

One might still be troubled by the thought that the connection between a disposition and its manifestation is too “tight” for there to be a causal relation as well. Frank Jackson claims that there is a metaphysically necessary connection between a disposition and its manifestation that is incompatible with a causal connection. According to Jackson, saying that fragility causes glass to break is to violate Hume’s Principle about the contingency of causal connections.⁷

According to Jackson, a thing’s causal powers are accidental properties, which depend on what world it is in, and which laws obtain. So, if two states have a necessary connection, they cannot be causally connected as well. According to Jackson, to allow that fragility causes breaking upon dropping –

would be to allow that there are properties that have causal powers essentially: in every world the property of having the property or properties responsible for breaking on dropping in that world is possessed only by objects which are such that were they dropped they would break. There is no way that the second-order property can be instantiated without the relevant causal power being instantiated. So, if we are to respect Hume’s insight, we must deny that fragility itself does the causing of the breaking...⁸

The key premise of Jackson’s argument is what he calls Hume’s Principle, which can be put as follows:

⁷ Jackson, ‘Essentialism...’, p. 257.

⁸ Jackson, ‘Essentialism...’, p. 257.

If events with event-property P cause events of kind K, they do so contingently; there is a possible world in which P-events occur, but do not cause K-events.

While Jackson doesn't provide an argument for this premise, perhaps it is supposed to be intuitively plausible. But is it? Consider the property of being negatively charged. If negative charge is causally efficacious for repelling negatively charged particles, according to Hume's Principle, this should be a contingent fact about negative charge – there should be a possible world in which a thing has negative charge, but is not disposed to repel negatively charged particles. Accordingly, there would be a possible world in which negatively charged particles come close to each other, but are not repelled, other things being equal. It is not at all obvious that such a world is possible – it seems inconsistent with the meaning of “negatively charged.” On the other hand, Jackson might say that negative charge is inert with respect to repelling negatively charged particles. That option also strikes me as counter-intuitive. Negative charge seems to be both conceptually and causally connected to the repulsion of negatively charged particles.

It is worth noting that Hume's Principle is hardly common ground among philosophers. Robert Stalnaker, for example, claims that there are certain properties, such as mass, charge, or impenetrability, that cannot be “separated, conceptually, from the laws in which they occur and from the causal powers they confer on objects that instantiate them.”⁹ On Sydney Shoemaker's view, what determines the identity of a property “is its potential for contributing to the causal powers of things that have it.”¹⁰ According to Shoemaker, *every* property has its causal powers essentially. So, if we decline to “respect Hume's insight,” we are not alone.

In sum, neither the straightforward Analyticity Argument, nor Jackson's appeal to Hume's Principle, succeed in showing that dispositions are causally inert. Now, let's turn to a different argumentative strategy of the Inert Dispositions View – the No Work Argument.

V. The No Work Argument

No Work Arguments are familiar in the literature on mental causation. Consider

⁹ Robert Stalnaker, *Inquiry* (Cambridge, MA: MIT Press, 1987), p. 160.

¹⁰ Shoemaker, 'Causality and Properties', in *Time and Cause*, ed. P. van Inwagen (Dordrecht: Reidel, 1980), pp. 109–35.

mental property M and physical property P, which are candidates for being causally efficacious with respect to a brain event with mental property M* and physical property P*. Kim argues that M has no causal powers of its own:

P is doing all the causal work, and M's causation of P*, or of M* turns out to be derivative from P's causal powers. Thus, M has no causal powers over and beyond those of P...¹¹

Regarding the causal efficacy of semantic properties, Block writes:

It seems that our cognitive processes exploit a correlation between the semantic and the syntactic. The syntactic properties of the representation do the causal work, and the semantic properties come along for the ride.¹²

Similarly, Prior, Pargetter, and Jackson (hereafter PPJ) support the Inert Dispositions View with a No Work argument. They write that since the causal basis and the circumstances of manifestation are sufficient for the manifestation, "there is nothing left for any other properties of the object to do."¹³

The relevant similarity among mental properties, semantic properties, and dispositions is that they are all, on these accounts, second-order properties. The base (or realizer) properties are causally efficacious for a certain event, and this excludes the second-order property from being causally efficacious as well. The circumstances of manifestation and the base properties are sufficient for the manifestation, and unless there's overdetermination, all other properties are inert.

PPJ's argument from "Three Theses about Dispositions" is typical of No Work arguments.¹⁴ It can be summarized as follows:

- 1) Every disposition has a causal basis.
- 2) The Distinctness Thesis: Causal bases are distinct from their attendant dispositions.
- 3) Given the circumstances of manifestation, a causal basis is sufficient for the manifestation of the disposition.
- 4) The Exclusion Principle: If the instantiation of a set of properties is sufficient to bring about a certain effect, then all other properties are

¹¹ Kim, 'Nonreductivist Troubles with Mental Causation'. *Supervenience and Mind*, p. 353.

¹² Block, 'Can the Mind Change the World', p. 145.

¹³ PPJ, 'Three Theses About Dispositions', p. 255.

¹⁴ PPJ, 'Three Theses About Dispositions', p. 255.

causally inefficacious with respect to that effect.

Therefore,

5) Dispositions are causally inefficacious.

I grant premise (1) since it follows from our working definition of “disposition.”¹⁵ I also grant premise (3) for the sake of argument.¹⁶ This leaves two principle ways of attacking the No Work argument – by denying The Distinctness Thesis (premise 2), or by denying The Exclusion Principle (premise 4). First, I will consider denying The Distinctness Thesis, and raise some difficulties for that approach. I then pursue my favored strategy, challenging The Exclusion Principle.

VI. Denying Distinctness

According to the Distinctness Thesis, a disposition is distinct from its causal basis. To deny this thesis is to identify a disposition with its causal basis. This would solve the problem of “dispositional causation” and refute the Inert Dispositions View. If the causal basis is causally efficacious, and the disposition is the causal basis, then the disposition is causally efficacious.¹⁷

The fact that dispositions can be multiply realized poses a difficulty for this approach. A disposition can have different causal bases in different objects. Crystal, porcelain, and egg shells are all fragile, and presumably they have different micro-structural properties that account for this. So, it seems that you cannot identify a disposition with its causal basis in every instance. For example, you cannot say both that fragility is identical to molecular bonding P and that fragility is identical to crystalline structure Q, because P and Q are distinct.

¹⁵ Recall: x has disposition D to give manifestation M in circumstances C iff x has some property P which is a causal basis for giving M in C.

¹⁶ PPJ define causal basis as the properties of the disposed object that would be sufficient for the manifestation in the circumstances (‘Three Theses About Dispositions’, p. 251), and so premise (3) follows. We could contest this way of defining “causal basis,” but PPJ’s argument could be restated easily enough. (Consider a set of x’s properties that are sufficient for M in C. Call it S. etc.)

¹⁷ This may seem to be at odds with the second-order characterization of dispositions. If a disposition is a second-order property, how could it be identical to its first-order realizer? However, I’m assuming that if a property P has the same extension as a property Q, then P and Q are the same property. So, the property of having property P = property P, since they necessarily have the same extension.

VII. The Disjunctive Solution

One way to respond to this problem is to suggest that a disposition is identical to a disjunction of its realizers. Consider a case where there are only two realizers of fragility, P and Q. According to this Disjunctive Solution, being fragile is identified with having $(P \vee Q)$. The causal efficacy of fragility is just that of P or Q.

It may seem as though identifying a disposition with a disjunction of its causal bases is not to deny the Distinctness Thesis at all. Even if a disposition is a disjunction of its various causal bases, that is not to say that the disposition is identical to any particular causal basis. So, if the causal basis of fragility were P in some instances, and Q in others, even if fragility is identical to $(P \vee Q)$, it still wouldn't be identical to P, nor identical to Q.

However, perhaps a given instance of a disposition can have more than one causal basis. A particular instance of fragility might have P as a causal basis, and $(P \vee Q)$ as another causal basis. The disjunction of various causal bases could itself be a causal basis, and *that* causal basis would be identical to the disposition, on this view.

Notice, however, that this approach to attacking the No Work Argument will run afoul of the Exclusion Principle. It seems that there would be a set of properties which included P, but excluded $(P \vee Q)$ which would be sufficient for breaking. If P is responsible for the breaking, as far as the properties of the glass are concerned, what is the role of the disjunctive property $(P \vee Q)$? If the property $(P \vee Q)$ were also causally efficacious, it would seem to *overdetermine* the breaking. If we accept the Exclusion Principle, we cannot say that both $(P \vee Q)$ and P are efficacious with respect to breaking. So, in order for the Disjunctive Solution to succeed, it will have to be coupled with an argument against the Exclusion Principle, such as the one I will offer in the next section.

There are other reasons for doubting the Disjunctive Solution, irrespective of the Exclusion Principle. Disjunctive properties are suspect. Lewis says that a disposition "unlike the various bases, is too disjunctive and too extrinsic to occupy any causal role."¹⁸ Likewise, Kim says:

the first-order realizing properties are extremely diverse and heterogeneous, so much so that their disjunctions cannot be considered well-behaved properties with the kind of systematic unity required for propertyhood.¹⁹

¹⁸ Lewis, 'Causal Explanation', in *Philosophical Papers. Volume 2*. (Oxford: Oxford University Press 1983), p. 224.

If this is right, and dispositions are disjunctive properties, then the problem is not that there is no causal work for dispositions to do once the base properties do their job; it is that dispositions are not the kinds of properties that are capable of doing any causal work at all.

Kim and Lewis seem to be claiming that a property such as $(P \vee Q)$ cannot be eligible for any causal or nomic role, simply by virtue of being a disjunctive property. In order to assess these claims, we must clarify the nature of disjunctive properties. Intuitively, if P is a property and Q is a property, the disjunction of P and Q will be a disjunctive property. But consider the case where P is the property *being a female cat*, and Q is the property *being a male cat*. If all cats are male or female, then *being a female cat or a male cat* is the same property as *being a cat*, which does not seem like a disjunctive property. Being named by a disjunctive predicate does not make a property disjunctive in the relevant sense. (We could make up disjunctive names for any property, e.g., *being blue is being blue and square or being blue and not square*.) To call a property “disjunctive” is to say that the things which have this property do not form a natural class. Disjunctive properties are *unnatural* properties.

The problem with drawing conclusions about properties from predicates is that, in natural languages, the distinction between simple and disjunctive predicates does not line up neatly with the distinction between natural and unnatural properties. But imagine a language L . In L , all natural properties are named by simple predicates. However, if a disjunctive predicate refers to a property P in L , it wouldn't follow that P was unnatural. Possibly, a simple predicate could also refer to P . One might think that this is impossible, because the disjunction of two natural properties is always a less natural property. However, this view is mistaken. Naturalness is not an all or nothing thing, but rather a matter of degree. So, the disjunction of two properties might turn out to be a *more* natural property, or at least natural enough to play some causal role.

Even if dispositions can be characterized in disjunctive terms, they might still be natural properties. If a disposition D is a property of having some property or other that fills causal role R , even if D is multiply realizable, all the properties that realize D will have at least one thing in common – they fill causal role R . If P and Q both realize D , they play the same causal role. Recall that Shoemaker says that properties can be classified by their causal roles. In a similar vein, Kim says:

¹⁹ Kim, *Philosophy of Mind* (Boulder, Colorado, Westview Press 1996), p. 117.

kinds in science are individuated on the basis of causal powers; that is, to be recognized as a useful property in a scientific theory, a property must possess (or be) a determinate set of causal powers. To put it another way, the resemblance that defines kinds in science is primarily *causal/nomological resemblance*: Things that are similar in causal powers and play similar roles in laws are classified as falling under the same kind.²⁰

On such an account, P and Q would seem to be the same kind. If they are of the same kind, their disjunction is not diverse and heterogeneous. Maybe P and Q can play other causal roles, and this fact can serve to differentiate them. But that does not show that they are of different kinds. Things of the same kind need not be qualitatively identical in every respect.

Think of the role of alleviating pain in humans. There are a number of chemicals that fill that role that have different constituents and different structures. However, by filling that role, many of them are considered to be of a kind – opiates.²¹ For one reason or another, these various natural and synthetic molecules bind to opiate receptors in the brain. The class of opiates does not seem to be a heterogeneous, gerrymandered group. We are justified in classifying them as the same kind because they have similar effects.

It is important to point out that disjunctive predicates can sometimes refer to natural, causally efficacious properties. However, this approach to saving the causal efficacy of dispositions has its limitations. While this approach may work for some dispositions, like the disposition to relieve pain in humans, it seems less plausible in other cases. Think of provocativeness – the disposition to elicit an aggressive response. Something can elicit an aggressive response in an animal, suppose, if it is a certain color, if it has a certain odor, or if it is moving in a certain way. But it is hard to believe that a disjunctive property like (being red or oscillating or smelling like blood) is a natural property that is apt for figuring in causal laws.

One response is to say that some disposition terms refer to natural properties, while others do not. Perhaps terms like ‘provocative’ are merely terms we use

²⁰ Kim, *Philosophy of Mind*, p. 119.

²¹ “The term ‘opioid’ has been adopted as a general classification of all of those agents that share chemical structures, sites, and mechanisms of action with the endogenous opioid agonists. Opioid substances encompass all of the natural and synthetic chemical compounds closely related to morphine, whether they act as agonists or antagonists.” (<http://www.britannica.com/bcom/eb/article/6/0,5716,108956+15+106187,00.html?query=opiates>)

to make causal generalizations about objects which are not intrinsically similar in any relevant respect. But another disposition could be a natural property if all of its realizer properties formed a natural class. By this strategy, one would not support the causal efficacy of every property we have been calling 'dispositional,' but only the dispositions which are plausibly natural properties. Perhaps there are other moves that the proponent of the Disjunctive Solution could make, but if he takes this route, he winds up with a somewhat qualified defense of the Efficacious Dispositions View. Without further investigation, and without some guide as to how to determine the naturalness of a property, it is not clear which dispositions would come out causally efficacious on this approach. While others may pursue this strategy further, I will turn my attention to a different response to the Distinctness Thesis.

VIII. The Trope Solution

Cynthia and Graham MacDonald, among others, appeal to the idea of tropes in order to respond to the No Work Argument.²² The view can be summarized as follows. While the Distinctness Thesis applies at the level of properties, understood as classes or universals, it does not apply at the level of property instances, or tropes. So, a property instance of a disposition is identical to a property instance of a base property. Furthermore, particular property instances are causally efficacious for events. So, it is not a problem if fragility is not causally efficacious for breaking, since particular havings of fragility are. Let me explain in more detail.

Redness is something shared by all red things. The redness of the apple on my desk is a particular instantiation of redness, also called a red trope. Suppose that the apple is a particular shade of red, say russet. Red and russet stand in the relation of determinable to determinate. Now, this apple's "russetness" bears a relation to its redness that it does not bear to, say, its roundness. One might say

²² Graham and Cynthia MacDonald, 'Mental Causation and Explanation of Action', in *Mind, Causation and Action*, ed. L. Steveson, R. Squires and J. Haldane (Oxford: Basil Blackwell, 1986), p. 38. See also Douglas Ehring, 'Mental Causation, Determinables and Property Instances'. *Nous*, 30 (1996): 461–80. The target of this attack is epiphenomenalism about mental properties; however, the same arguments can be applied to dispositions.

²³ Incidentally, I do not share the intuition that the apple's redness is identical to its russetness. I could pick the apple out of a barrel of crimson apples because of its russetness (not its redness). The apple might change its shade as it ripens, losing its russetness, but not its redness. These considerations are perhaps not decisive, but further discussion of them would take us too far afield.

that the apple's redness is nothing "over and above" its russetness. Redness and russetness are two different *properties*, having different extensions. However, on this view, this apple's russetness is the same thing as its redness. Its red trope is identical to its russet trope.²³ In the same way, it is thought, a particular glass's fragility is the same thing as its crystalline structure. Its crystalline structure is its particular way of being fragile, just as the apple's russetness is its particular way of being red. This is to deny the Distinctness Thesis for tropes – a disposition trope is not distinct from its causal basis trope.

A key to this strategy is the claim that causal efficacy is a relation between a trope and an event, rather than a property and an event. Couple this with the claim that one trope is an instance of a determinate and its determinables, and this view is subject to a serious difficulty, which can be brought out by certain counterexamples.

To adapt an example from Stephen Yablo,²⁴ suppose you are shipping packages, and you are constrained by a 20 pound weight limit. You have a crude scale that will only tell you if your package is over 20 pounds. So, you put a package on the scale which happens to weigh 21 pounds. The scale indicates that the package is over the weight limit. Now, it seems that *weighing 21 pounds* was causally efficacious for tipping the scale. Since tropes of determinables are identical to tropes of their determinates, the package's *weighing over 20 pounds* is the same trope as its *weighing 21 pounds*. And since the package's *weighing 21 pounds* was efficacious, and its *weighing 21 pounds* is identical to its *weighing over 20 pounds*, its *weighing over 20 pounds* was causally efficacious. So far, so good.

The problems arise when we note that *weighing 21 pounds* is also a determinate of other determinables, such as *weighing less than 30 pounds*. It follows that the package's *weighing less than 30 pounds* trope is also identical to its *weighing 21 pounds* trope. By the transitivity of identity, the package's *weighing less than 30 pounds* is identical to its *weighing over 20 pounds*. Furthermore, it follows that the package's *weighing less than 30 pounds* was causally efficacious for tipping the scale, as was its *weighing an odd number of pounds*. We can generate infinitely many causal efficacy claims along these lines, most of them wildly counter-intuitive.

What's worse is that, on this view, we lose the sense that it is in virtue of instantiating a certain property that an event has the effect that it does. Some philosophers think that to be causally efficacious, a property must be apt to

²⁴ Stephen Yablo, 'Mental Causation'. *The Philosophical Review*, 101 (1992): 259 (footnote 32).

figure in causal laws. But tropes, being particulars, are not apt for this role, and they provide us with no way of generalizing from a particular causal claim. Assuming regularity of the laws, if an instance of a property was causally efficacious for a certain effect in a certain circumstance, that should give us some reason to think that an instance of the same property in a similar circumstance will be similarly efficacious. However, if we are inclined to think that a *weighing less than 30 pounds* trope was causally efficacious for tipping the scale in a particular instance, we would be mistaken in concluding that further instantiations of *weighing less than 30 pounds* will be causally efficacious for tipping the scale. One might think that causal efficacy claims should support counterfactuals, but if causal efficacy claims are claims about tropes, they will not.

One might try to avoid these problematic implications in a couple of ways. One way is to distinguish tropes of determinables from tropes of their determinates. One would avoid saying that the package's *weighing less than 30 pounds* is identical to its *weighing over 20 pounds*. One would also avoid having to say that weighing less than 30 pounds is causally efficacious for tipping the scale. But one would avoid these problems at a significant cost. Identifying tropes of determinables with tropes of determinates is a key part of the Trope Solution. To distinguish them would be to embrace the Distinctness Thesis for tropes. That would be to say that a disposition trope is distinct from its causal basis trope. While this might be a plausible view for independent reasons, it has no place in this challenge to the No Work argument.

Another approach is to say that the trope is causally efficacious in virtue of being a trope of a particular property. So, the package's trope tips the scale in virtue of being a trope of the property *weighing over 20 pounds*, but not in virtue of being a trope of the property *weighing less than 30 pounds*. However, now we are back to talking about properties, and our introduction of tropes has not advanced our argument. For these reasons, I am inclined to stick with thinking of properties, rather than tropes, as the relata of causal efficacy.

In sum, I have considered two approaches to denying the Distinctness Thesis, the second premise of the No Work argument. One is the Disjunctive Solution, according to which a disposition is identical to a disjunction of its realizers. The other is the Trope Solution, according to which instances of a disposition are identical to instances of its realizers. I think that both of these approaches face difficulties, though perhaps they are not insurmountable. Now I turn my attention to the fourth premise of the No Work argument – the Exclusion Principle.

IX. The Exclusion Principle

As we have seen, even if we deny the Distinctness Thesis via the Disjunctive Solution, we still need to deny the Exclusion Principle. According to the Exclusion Principle:

If the instantiation of a set of properties is sufficient to bring about a certain effect, then all other properties are causally inefficacious with respect to that effect.

Suppose a particular causal basis and the properties of the circumstances of manifestation are sufficient for the manifestation. It would follow from the Exclusion Principle that a disjunction of causal bases (i.e., the disposition, according to the Disjunctive Solution) would be inert. If denying the Distinctness Thesis requires the Disjunctive Solution and a denial of the Exclusion Principle, but denying the Exclusion Principle is sufficient to defeat the No Work argument, then we might as well go straight for the Exclusion Principle. Even if we are inclined to accept the Distinctness Thesis, we can still attack the No Work Argument by denying the Exclusion Principle.

Kim says:

The general principle of explanatory exclusion states that two or more complete and independent explanations of the same phenomenon cannot coexist.²⁵

PPJ succinctly echo “a complete causal explanation excludes competitors.”²⁶ PPJ and Kim seem to be making a claim about explanation, which is not obviously about properties. However, the Exclusion Principle is used to draw conclusions about which properties are causally efficacious. I take it that this principle has metaphysical import. The formulation I give above is stated in terms of properties, and I assume it is at least a corollary of the principle articulated by Kim and PPJ.

Proponents of the Exclusion Principle say that to deny it is to allow for spurious over-determination. Denying the Exclusion Principle amounts to saying that both the causal basis *and* the disposition are each sufficient for the effect, given the circumstances of manifestation. If this happened every time any disposition is manifest, we would have, as Block says, “bizarre, systematic over-determination.”²⁷

²⁵ Kim, ‘Mechanism, Purpose, and Explanatory Exclusion’, in *Supervenience and Mind*, p. 250.

²⁶ ‘Three Theses About Dispositions’, p. 225.

Standardly, an event *e* is causally overdetermined if two or more distinct events occur, each of which is sufficient to cause *e*. Admittedly, there is something wrong with postulating too many coincidences. And if a great many effects systematically had two distinct events that were sufficient for causing them, that would run counter to our understanding of the causal structure of the world. Maybe that would be too high a price to pay for saving the causal efficacy of dispositions.

However, one should not overlook the fact that these considerations and intuitions about overdetermination apply to two (or more) *events* overdetermining an effect. But what we are concerned with in the case of dispositions and causal bases are *the properties of a single event* (or of a single object involved in an event). But it is not clear what it means to say an effect is overdetermined by an object's *properties*. Perhaps it would be to say that there are two different sets of properties, both of which are such that their instantiations are sufficient for a certain type of effect.

Is this kind of "overdetermination" so worrisome? Most events instantiate a huge number of properties, many of which bear logical or nomological relations to one-another. A property is causally efficacious if it is a member of a set of event-properties *S* that is minimally sufficient for a certain effect. But there is no guarantee that, for any event, there is a unique set *S*. It seems that any time an event is caused, the cause instantiates several sets of properties, each of which is sufficient for the effect. One can "carve things up" in a number of ways, depending on one's interests or purposes. Suppose redness were a member of a set of properties that was sufficient for provoking a bull. It seems that there would be another set of properties, that included crimson instead, that would also be sufficient.

The Exclusion Principle asks us to single out one special set of event-properties that are minimally sufficient for an effect, and declare the rest causally inert. This may prove difficult to do, especially when properties are so intimately related, as a disposition is to its causal basis. Furthermore, it is not clear that we have any compelling reason to suppose that, for any effect, there is only one minimally sufficient set of causally efficacious properties.

Imagine how the Exclusion Principle would work in practice. Let us make the following suppositions:

An event occurs, which involves an object *o*.

²⁷ Block, 'Can the Mind Change the World?', p. 159.

- o has property F.
- F is causally efficacious for some event e.
- o has G, and G differs from F.

We are wondering whether G is causally efficacious for e. o's having one property can necessitate or entail that it has another property. Suppose that o's having F entails that o has G. It follows from the Exclusion Principle that G is causally inert with respect to e. A set of properties which included F and *excluded* G would be sufficient for e, and so a set of properties which included both F *and* G would not be a *minimally* sufficient set, which is what is required for causal efficacy. Conversely, if o's having G entails that o has F, we know that G is not causally efficacious, for if it were, by the same reasoning as above, then F would not be, and by stipulation, it is.

So, according to the Exclusion Principle, if a set of properties is causally efficacious for a given effect, all properties which entail them and all properties which are entailed by them are causally inert.²⁸ This implication seems counter-intuitive. Consider the following propositions:

- The cape has surface reflectance property R.
- The cape is red₂₁.
- The cape is crimson.
- The cape is red.
- The cape is colored.²⁹

Now, suppose that each proposition entails its successor. If one of the above properties is causally efficacious for a certain effect, it follows that all of the others are causally inert with respect to that effect. How do we decide which property is the efficacious one? It is not clear how to answer, and this does not seem to be just an epistemic problem. It is not clear what would determine the level of specificity at which the causal action is going on. One might assume that all of the causal action happens at the most fundamental level. But what is the basis of that assumption? Such an assumption has serious counter-intuitive consequences, for example, that all of the macro-properties we regularly observe are causally impotent. Furthermore, assuming that all

²⁸ Properly speaking, propositions about properties entail or are entailed.

²⁹ This expands on a point made by Stephen Yablo, 'Mental Causation', p. 257.

causal action happens at the level of fundamental properties may not serve the Inert Dispositions View; it is not at all obvious that the fundamental properties are wholly non-dispositional. Strawson, for example, claims:

It seems that our search for the properties of the categorical base must finally lead us to the undeniably theoretical properties which physics assigns to the ultimate constituents of matter – perhaps force, mass, impenetrability, electric charge. But these properties seem to be thoroughly dispositional in character...³⁰

The implausibility of the Exclusion Principle in practice may be better illustrated by returning to the example of the scale. Recall that our scale will tell you if your package is over 20 pounds, and your package is, in fact, 21 pounds. The scale indicates that the package is over the weight limit. Now, what property of the package was causally efficacious for tipping the scale? Was it the property of weighing 21 pounds, or the property of weighing over 20 pounds? If it was the property of weighing 21 pounds, does that mean that the property of weighing over 20 pounds was causally impotent?

Intuitively, it seems not. Either weighing 21 pounds or weighing over 20 pounds could be causally efficacious. The causal efficacy of one property does not preclude the other property from being causally efficacious as well. Either could be a member of a minimally sufficient set of properties. The fact that we already have a sufficient set of properties is not a sufficient reason for declaring a property outside of this set inert.

The worry that we are going to end up with too many causally efficacious properties is an unfounded one. We might want to limit the number of events that we consider sufficient to cause a given effect. However, the drive to put a cap on causally efficacious properties is unmotivated. This is especially true when the properties in question have some logical or law-like connection. There are many ways to describe an event, many properties of the event we can cite, different levels of specificity that we can appeal to. Our choice of descriptions, predicates, and details is determined by epistemic and pragmatic considerations, but they are no less legitimate or real for that.

In the preface to *Supervenience and Mind*, Kim writes

...I am now inclined to think that ontological schemes are by and large optional, and that the main considerations that should govern the choice

³⁰ 'Reply to Evans', in *Philosophical Subjects*, ed. Zak van Straaten (Oxford: Clarendon Press, 1980), p. 280.

of an ontology are those of utility, simplicity, elegance, and the like. Concerning such questions as whether there ‘really are’ events (over and beyond substances and their properties) . . . it just seems wrong-headed to think that there are ‘true’ answers, answers that are true because they correctly depict some pre-existing metaphysical order of the world. I think that the heart of ontological inquiry is construction rather than description.³¹

This pragmatic or conventionalist approach to metaphysics is at odds with clinging to the Exclusion Principle at all costs. The ontological picture of the No Work Argument is one in which only one set of fundamental properties is, in fact, causally efficacious for a particular event. All the rest are inert. We may talk as if these other properties are causally efficacious, but this is not strictly speaking so. If anything, they piggy-back on the *really* efficacious properties. But if we are going to construct an ontology, why not construct one that makes sense of our explanatory practices and deep commitments, such as the causal efficacy of mental properties? Instead of the ontology of exclusion, we could develop one of inclusion, allowing a plurality of adequate explanations, and multiple, overlapping sets of properties, any of which are candidates for telling the causal story.

X. Conclusion

As mentioned at the outset, the idea that dispositions are causally efficacious is a background assumption of many of our explanatory practices, including ordinary, day-to-day explanations, psychological explanations, and scientific explanations. Perhaps it is even an assumption behind our conception of ourselves as agents. Absent good arguments to the contrary, we should not relinquish the view that dispositions are causally efficacious.

I have tried to show that we do not have good arguments to the contrary. The Inert Dispositions View is supported primarily by Analyticity Arguments and No Work Arguments, and both have significant weaknesses. Analyticity Arguments fail because conceptual connections do not preclude causal connections, and Hume’s Principle is unsupported. No Work arguments employ two controversial premises, the Distinctness Thesis, and the Exclusion Principle. If a disposition is a disjunction of its causal bases, or if a disposition trope is a causal basis trope, then the Distinctness Thesis is false. If, as I suspect, there is no privileged

³¹ *Supervenience and Mind*, p. ix.

explanation nor any special set of properties which preclude all other properties from playing a role in the causal story, then the Exclusion Principle is false. Undermining our explanatory practices and our belief in mental causation would require more powerful arguments than these.

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