

MONISTIC DISPOSITIONAL ESSENTIALISM

Abstract

In this paper I explain why I favour a metaphysics in which all fundamental natural properties are essentially dispositional. First, by considering what a world might be like that has no laws, I argue that properties can necessitate laws, and that this is best explained by dispositional essentialism concerning those properties. I then argue that we should not regard any properties as being exceptions in this respect: and so all fundamental natural properties are essentially dispositional.

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According to David Armstrong, all fundamental natural properties are categorical. According to Brian Ellis, this is mistaken, since some properties are essentially dispositional. Ellis also thinks that some are categorical and are as David describes them. As regards Ellis's first point, I am with him; but I disagree on the second. Armstrong is right, all fundamental properties are metaphysically on a par. David is a monist, and so am I; but they are not all categorical, they all have a dispositional character essentially.

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The best way of explaining why I think that not all properties can be categorical is to focus on laws. Looking back at the history of my own thinking about laws, I was once a convinced Armstrongian. But then I asked myself, what would the world be like if there were no laws? Indeed could there a world anything like ours but without laws? For David Lewis it would be difficult to there to be a world without laws at all, since some systematisation of the actual non-nomic facts (the arrangement of the Humean mosaic) will be the best system. But perhaps that's not very interesting, since for Lewis laws do not have the metaphysical significance they have for David Armstrong, Ellis Ellis, or me. Tea leaves in a cup can leave patterns. Despite what some would-be clairvoyants might think, there is no significance to such patterns. Likewise, from the perspective of Humean supervenience there ought to be no significance to the patterns to be found in the Humean mosaic. Laws are metaphysically much more significant for David Armstrong, and so the question of their possible non-existence is correspondingly rather more revealing. And it would seem that there is no reason why a world could not be exactly like ours in non-nomic respects (i.e. the details of which particulars instantiate which first-order universals), but lack our laws. Such a world would be metaphysically very different, since there would be no second-order relations among universals. And consequently there would be no *explanation* of why particular possess and change their properties and relations.

But such a world would be possible since, the possession and changing of properties does not constrain the laws metaphysically—the relationship of metaphysical constraint is the other way around.

On close inspection I regard such a world as deeply worrying and of dubious possibility. Laws are responsible for the existence and nature of things. Common salt, NaCl, for example is an ionic compound held together by Coulomb force of electrostatic attraction. But no laws means no forces, and so no ionic bonding, and so no salt. I think it is a mistake to think of laws simply as determining what *events* happen or do not happen, or their chances of happening. They also enter into the nature and essence of *things* and *kinds* of thing.

But this concern, it might appear, would only apply to complex items and kinds, not to fundamental entities and their properties and kinds. However, it seems to me that related objections do arise. Without laws of electromagnetism, what distinguishes electrons and positrons? In the actual world, the one kind is constrained to behave in different ways from the other kind. But in the lawless world, there are no such constraints. If we go further and remove the law of gravitation and Newton's second law, then we have no distinction between these particles and their related neutrinos; remove further laws and the distinctions between these fermions and other fermions disappear and so on. What it is to be a certain kind of particle is a matter of which laws the particles obey and in which way; remove the laws and one removes the distinctions between the kinds. And that occurs because we lose the distinctions between the *properties* that characterise the kinds. Without laws governing electromagnetism, there is no distinction between positive and negative charge, and between these and having no charge at all.

Arguments of this kind lead me to conclude that there is some metaphysically necessary relationship between laws and natural properties—and of a certain kind: the existence of properties entails the truth of at least some nomic facts concerning them. But they do not tell us how such a relationship arises. Does it arise from the nature of the laws, so that laws are the primary entities, the properties being secondary? Properties would just be 'nomic roles'. I find it difficult to make much of this idea. What then are laws on this view? How do they connect with one another, as laws do? Perhaps further thought will reveal the answer. But for my money a much more palatable approach is the reverse, which takes properties to be the primary entities and laws to be derivative. According to this picture, properties have relationships between them, that are essential to the natures of those properties. Laws just drop out as consequences of those relationships. This view is non-atomistic, in the Wittgensteinian sense of 'atomistic'. There are necessary relations between basic entities and so between propositions concerning those entities.

There may be more than one way of articulating the idea that properties have essential relations with one another. My preferred option is to think of properties as having a dispositional nature. This nature, being essential, forges the necessary relations among properties, since, typically, the manifestation and stimulus of a disposition will involve different properties. A property that is essentially dispositional is often called a *power* in the literature, though I prefer the term *potency*, which Armstrong uses on occasion, since being less usual in this context is less liable to confusion. ('Power' is often used to denote a something that is, roughly, a disposition with an unspecified stimulus, without any suggestion that such a property is essentially that way.) To rephrase the differences between us, David Armstrong think there are no potencies, and that they are all essentially categorical. I think all fundamental

properties are potencies, and none are essentially categorical; Ellis Ellis thinks that some are potencies and some are essentially categorical.

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What are the advantages of the view just outlined? And what are the disadvantages and challenges for it?

As is fairly obvious, my view makes the laws of nature all metaphysically necessary. David's view makes them all contingent. Ellis's view and mine align in this respect.

I think that the consequence that laws are metaphysically necessary is an advantage, because the thought that the laws are in some way necessary is an appealing and widely held one. The view is of course radically anti-Humean. Fundamental properties are independent existences in the relevant sense: none is a part of any other, nor do they share parts in common (if they did they would not be fundamental). But they do have necessary connections. I think it is possible to show that an attempt such as Armstrong's to maintain a Humean conception of properties but nonetheless to have a robust notion of necessity is unstable. If that notion is too robust (i.e. metaphysical necessity), then we have abandoned Humeanism. If it is less robust, then we need an explanation of how it does what it does (i.e. generate regularity). But in examining the resources for that explanation we find that the same question arises. If the explanation has any robustness (i.e. is not mere correlation) then we need some kind of necessity. The latter is either metaphysical necessity of something less. If the former, then the position is no longer Humean (we have metaphysically necessary connections). If the latter, we are now a further step along an infinite regress. So Humeanism about properties must be given up. The appropriate notion of necessity for laws is metaphysical.

This does present the difficulty that many also regard the laws of nature as metaphysically contingent. That fact raises interesting questions of methodology in metaphysics. I am willing to regard this intuition as misguided, fallaciously depending on the ability to conceive laws being otherwise. But at the same time, I am willing to employ intuition elsewhere in making my case (e.g. in the initial arguments concerning the essences of kinds and properties). Thus a question is raised, when is intuition to be relied upon and when not? I'm not in a position to answer that question, but here are some thoughts. First, where there is a strong intuition that one rejects one ought to look for an explanation of where it has gone wrong. Intuitions are *prima facie* plausible, but that is defeasible. Secondly, and moreover, intuitions do not have compelling probative force on their own, but only as parts of a larger theory, which may have other kinds of evidence on its side. Thirdly, one might suggest that intuitions concerning necessity, possibility, and contingency, are, on their own, not especially reliable; more reliable are general intuitions concerning facts about the essence, nature, and identity of things. Then the question is, why should we have especial intuitive understanding of the latter. (The answer is not, of course, that essences are *a priori*, though it is interesting that Kripke thinks that while essences are not *a priori*, knowledge of the sort of essence a thing or kind has is *a priori*—as it happens, I don't think that this is always the case.)

One of the principal advantages of dispositional essentialism about properties is that it avoids the problems of quidditism associated with categoricism about properties. Quidditism is the view that there are no essential differences between

properties, at least as far as they interact with one another (e.g. in laws). The identity and difference of properties are primitive facts about the relevant properties. Consequently, any nomic role performed by a certain property could be performed by any other property. So there are pairs of worlds that differ simply in the fact that the properties have swapped their nomic roles. An argument based on one of Chisholm's, suggests that this is implausible. The line of thought outlined above, which takes to be impossible a world in which there are the properties of the actual world but with no laws, also trades on the commitment to quidditism that is present in Armstrong's view.

If quidditism is not a plausible view, it is not a plausible view about *any* properties. Rejecting quidditism requires us to reject not only David Armstrong's view, but also Brian Ellis's mixed view. I don't think that spatial and temporal properties are any exception to the rejection of quidditistic, categorical properties. It is, I concede, intuitively attractive to think that spatial and temporal properties and relations are not dispositional, and so at least must be exceptions that favour the mixed view over monistic dispositional essentialism. This is, however, a case where we should be wary of our intuitions. On the one hand we have the argument against quidditism presented in terms of the question, 'what would differentiate properties in a world with no laws?'. On the other hand, intuition suggests that we can differentiate the spatial relation of 'being 2m apart' from the temporal relation of 'occurring 3s apart' independently of any considerations concerning dispositional features of these relations.

While intuition is valuable, it can be trumped by science. We should reflect on the plausibility of the view that some physicists hold, that a good theory should be background-free. In classical physics time and space are a background. Space-time is rather like the empty stage before the props and actors are placed upon it. The stage is no part of the action but features in our description of the action ("Enter Benvolio and Mercutio stage left"). Likewise space and time play a part at least in our description of the laws. Yet because they themselves are unchanging, being a mere background, it is difficult to think of their role in the equations as genuinely causal. A generalized action-reaction principle proposes that only what is itself capable of change can be a cause of change. Newton's absolute space-time seems to violate this principle. And so one tempting direction to go in, is one we may associate with Leibniz or Kant one—space-time is not part of the noumenal world but is part of our framework for experiencing and describing it. However, an alternative is to give up the background conception of space and time, in which case space and time may be genuine patients of change and so genuine agents too. This indeed is the way that the general theory of relativity enjoins us to see space-time. As a consequence it seems possible for spatio-temporal properties to be considered genuinely causal, and hence dispositional.

If all properties are on board as essentially dispositional, we face a problem not faced by Ellis, which is the regress problem: since the identity of a potency depends on the identities of its stimulus and manifestation properties, then the claim that all properties are dispositional leads to the worry that there is a vicious regress. Ellis stops this by taking some properties out of the equation: the buck stops with the categorical, non-dispositional properties. Instead I espouse a kind of holism or structuralism: the identity of a property is given by the role it plays within the whole structure of properties. This can be shown to be non-regressive, if the structure has certain graph-theoretic properties. Appropriate asymmetry in the total set of relations among potencies can ensure the identity of each of them.

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How should we understand natural quantities? I have used electric charge as an example, but there are respects in which it is imperfect. (i) the presence of a constant, ϵ_0 , in Coulomb's law:

$$\mathbf{F} = \epsilon_0 \frac{q_1 q_2}{r^2}$$

suggests that there could be a similar property governed by a law with a different constant; (ii) electric charge is involved in other laws of nature (e.g. the Biot-Savart law); (iii) possession of a particular value of charge is associated with a multiplicity of dispositions, even if we focus just on electrostatic attraction. None of these observations is inconsistent with the picture outlined above. But they do make it a less clean picture.

Considering (i) would *shmerge*, which obeys an equation like Coulomb's but with a different constant in place of ϵ_0 be the same property as charge? I have some sympathy with the thought that the value of the constant in the law does not determine the identity of the property. In which case there would be some nomic facts (e.g. the value of the permittivity of free space) that would not be fixed by the essences of properties. On the other hand one could have a fine-grained conception of properties and their essences. For various reasons I am inclined to take a platonic view of properties as universals that exist independently of their being instantiated. The fine-grained view would then imply a world full of properties of slightly differing natures, most of which are uninstantiated.

The fact that charge also participates in the Biot-Savart law:

$$d\mathbf{B} = \frac{\mu_0}{4\pi} \frac{(\mathbf{J}dV) \times \hat{\mathbf{r}}}{r^2}$$

(where \mathbf{J} is the current density, i.e. the density of charge flowing per unit time) suggests that charge is a multi-track disposition: one that has a multiplicity of manifestations for a multiplicity of stimuli. Again, one could accept this as a basic fact. But my intuition is that multi-track dispositions ought to be explained rather than posited as fundamental. If one and the same property does more than one thing, then one might wonder whether in fact this property is not basic but is in some way complex, the reflection of simpler dispositions compounded together at a more basic level. Understanding French is a multi-track disposition which we do not think of as fundamental, but in some way or other is compounded out of simpler dispositions.

A similar conclusion may be reached from consideration (iii): possession of a particular charge, say 10mC, confers on its possessor a range of dispositions to exert and to experience a force, depending on the charges and positions of other charged objects. If we think of dispositions as being individuated by stimulus and manifestation pairs, then such properties must be understood as conjunctions of dispositions, not as single dispositions. Or maybe the stimulus-manifestation conception of dispositions needs to be reconsidered: maybe they should be considered more like mathematical functions. (A mathematical total function could be considered as the fusion of many partial functions, one for each value in the domain of the total function. But that would be an unnatural way of looking at things.) However, this does raise questions of the kind we have seen already. For any function there are similar functions in the vicinity. These are also possible properties, and on my platonic view are therefore actual if uninstantiated properties. My intuition is that any

relationship between property values as exemplified by Coulomb's law is not basic but stands in need of explanation. That of course is speculative metaphysics. But the kind of speculation is, I think, in tune with the sort of speculation that some scientists are apt to make (I'm thinking of Steven Weinberg here). To speculate wildly, the best way the world could turn out to be, for my theory, is a world of on-off properties standing in simple, single-track relations to one another. It would be interesting to model such a world, and to show that a world of apparently multi-track, functionally related properties could supervene upon it.

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The last few years have seen a great deal of fruitful work on the questions being addressed in this symposium, much of it by Armstrong and Ellis, while most of rest has been inspired by them. While we have not resolved these big questions, and are perhaps unlikely to do so to everyone's satisfaction, I do think that we have made significant progress in understanding what the key issues are and in developing the arguments that even if not decisive, play a significant role in shaping the landscape. Fruitful philosophical contributions to these debates are still forthcoming. At the same time, our metaphysics must be naturalistic to the extent that its purpose is to contribute to a coherent overall picture of the world, a major component of which is supplied by natural science. While metaphysics should not be enslaved to science, it is nonetheless true that harmony between a metaphysical view and the deliverances of science is a point in favour of that view. And so in adjudicating between our proposals, we should keep an eye on how science, fundamental physics in particular is developing. My own view involves certain implicit bets as to how things may turn out in that science. It will be interesting to see how those bets turn out.