

JOHN HEIL

DISPOSITIONS*

ABSTRACT. Appeals to dispositionalism in explanations of phenomena in metaphysics and the philosophy of mind, require that we first agree on what we are talking about. I sketch an account of what dispositionalism might be. That account will place me at odds with most current conceptions of dispositionalism. My aim is not to establish a weighty ontological thesis, however, but to move the discussion ahead in two respects. First, I want to call attention to the extent to which assumptions philosophers have made about dispositionalism are far from innocent. The assumptions incorporate substantive theses that, by constraining the space of 'acceptable' answers to particular philosophical questions, have inhibited the search for answers to those questions. Second, and more positively, I hope to open up the space of possibilities by offering an alternative way of conceiving dispositionalism developed by C. B. Martin.

1. WHAT *is* A DISPOSITION?

'Disposition' is a term of art: you can define dispositions as you please. Some conceptions of dispositionalism, however, are more felicitous than others. As I use the term, a disposition is a power or capacity. Locke makes powers the cornerstone of his ontology. A signet has the power – is disposed to – imprint wax in a particular way; wax has the reciprocal power – is reciprocally disposed – to be so imprinted by signets of that kind. I shall say more about Locke presently. For the moment I want only to note that many philosophers – from Boscovich and Priestley in the 18th century, to Harré and Madden, Sydney Shoemaker, and Nancy Cartwright more recently – have been attracted to the idea that our world is a world of 'powerful particulars'.¹

Before we can make use of dispositionalism to explain assorted phenomena in the philosophy of mind and elsewhere, we need to agree on

*This paper was written for a conference on Dispositions and Laws of Nature held at the University of Alabama, Birmingham, 7–8 February 2003; Michael Watkins commented. I have benefited from those comments, from remarks by other participants, and from discussions with David Armstrong and my colleague, David Robb, on the topic. The account sketched here is based on C. B. Martin's work on dispositions. See Martin (1992, 1993, 1994, 1997), Martin and Heil (1999), and Martin's contribution to Armstrong et al. (1996). The position is developed in detail in Heil (2003).

what we are talking about. In what follows, I sketch an account of what dispositionalism might be. The account I favor places me at odds with most current conceptions of dispositionalism and no doubt at odds on one or more points with most readers of this volume. My chief aim is not to establish a weighty ontological thesis. Rather, I hope to accomplish two goals. First, I mean to indicate the extent to which assumptions philosophers have made about dispositionalism are far from innocent. The assumptions incorporate substantive theses that, by constraining the space of ‘acceptable’ answers to particular philosophical questions, have inhibited the search for answers to those questions. Second, and more positively, I hope to open up the space of possibilities by offering an alternative way of looking at dispositionalism. I should note before getting under way that much of what I have to say here has been defended in one way or another by C. B. Martin.

2. NINE THESES²

The conception of dispositionalism I endorse could be expressed as a series of nine theses.

- (1) Dispositions are actual, not merely possible features of objects.

A ball disposed to roll, a glass disposed to break, a salt crystal disposed to dissolve in water each possess some actual feature in virtue of which it *would* roll, break, or dissolve. A disposition is actual. What need not be actual is the manifestation of a disposition. A ball might never roll, a fragile glass never shatter, a salt crystal never dissolve. In these cases, manifestations, but not dispositions for those manifestations, fail to be actual.

- (2) Dispositions are intrinsic properties of objects possessing them.

Dispositions are neither relations nor ‘relational properties’. A disposition is not a relation to actual or possible manifestations or manifestation partners. A disposition can persist unmanifested and, in the right circumstances, be unmanifestable. *A*-particles are disposed to annihilate *B*-particles; but no *A*-particle exists within the light cone of any *B*-particle. You need not be distracted by fanciful cases, however. A moment’s thought should make it evident that most dispositions will never be manifested. Suppose a red object is one that would look red to an observer under certain conditions. An unobserved – and indeed unobservable – object could be red. I shall say more about the process of manifestation presently. For the

moment, I want only to insist on a conception of dispositions according to which they are intrinsic properties of objects.

- (3) The nature of dispositions is not wholly revealed via a reductive conditional analysis.

The tendency to regard dispositions relationally stems in part from a tendency to imagine that the nature of dispositionality might be revealed by analyzing talk of dispositions into subjunctive conditionals. An object is fragile if it would shatter when struck by something solid. But an object could be fragile when the conditional is false. Consider this delicate Meissen teacup. The teacup could be fragile, although it is false that, were it struck by a hammer it would shatter. It is false because the teacup is watched over by an angel who would see to it that the ceramic would liquefy were it struck. Liquefied, the teacup would cease to be fragile. This granite boulder is not fragile although it is true that, were it struck by a solid object it would shatter: a boulder-watching angel would see to it that its temperature would be lowered dramatically were it struck thereby ensuring that it would shatter.³ Conditionals provide a defeasible, rough and ready way to pick out dispositions, not an analysis.

Even if you could concoct a conditional analysis of dispositionality impervious to counter-examples, it is not clear what you would have accomplished. You would still be faced with the question, What are the truth makers for dispositional claims? Suppose you decide that 'object *o* is fragile' implies and is implied by '*o* would shatter if struck in circumstances *C*'. You are not excused from the task of saying what the truth maker might be for this conditional. Presumably, if the conditional is an analysis, its truth maker will be whatever the truth maker is for the original dispositional assertion. This is *progress*?

- (4) Dispositionality is not a contingent feature of the world.

In a large segment of the English-speaking philosophical world, Hume rules. If an object's possessing a property, *S*, in virtue of which that object is, for instance, disposed to dissolve in water, this could have been otherwise.⁴ There is nothing in the nature of things that necessitates a property's disposing its possessors as it does. Objects behave as they do owing to their properties *together with* the obtaining of certain contingent laws of nature. The laws, which could have been otherwise, empower the properties. Lacking the laws, properties are inert.

I prefer to think of dispositions as intrinsic properties with their powers 'built in'. We might imagine properties with different powers, but these

would be different properties. This makes dispositionality non-contingent in the sense that, if you have the properties, you have the powers (and, incidentally, the laws of nature). What might be contingent is the existence of particular fundamental properties.

- (5) Every intrinsic property of a concrete object is dispositional . . .

The idea here is that properties contribute in a distinctive way to the dispositionalities or causal powers of objects possessing them. A property that made no difference to what its possessors do or would do would be a property that made no difference at all.⁵ Among other things, such properties would be undetectable. This makes it challenging to produce examples of non-fanciful properties altogether lacking in dispositionality. Consider sphericity: the property of being spherical. Being spherical is a paradigm case of what Locke called a primary quality. But it is in virtue of being spherical that an object rolls or would roll; it is in virtue of being spherical that an object makes or would make a concave impression in a lump of clay; it is in virtue of being spherical that an object reflects or would reflect light in a particular way (so as to look spherical).

- (6) . . . but not *purely* dispositional.

Properties are not ‘pure powers’. More likely, every property is at once dispositional and qualitative (Martin 1997; Martin and Heil 1999; Heil 2003). Certainly this appears to be the case for properties of ordinary material bodies. Locke was right to regard the primary qualities as *qualities*. Readers of Locke have been wrong, however, to imagine that primary qualities are not themselves powers. This is evident in the case of shape. But it is no less evident for the remaining primary qualities: size, position, duration, motility, divisibility, and solidity.⁶ All these qualities make a difference to what their possessors could and could not do and what could and could not be done to their possessors.

- (7) Dispositions are not ‘higher-level’ properties.

Many philosophers nowadays regard dispositions as higher-level properties ‘grounded’ in, or ‘realized’ by, non-dispositional, categorical properties. The idea, familiar to functionalists, is that a dispositional property, *D* is possessed by an object, *o*, in virtue of *o*’s possessing some purely categorical property, *C*.⁷ Note that, on such a conception, *D* is not a higher-order property: *D* is not a property of some property – *C*, for instance. *D* and *C* alike are properties of *o*. *C* is the *realizer* of *D* in *o* (see Figure 1).

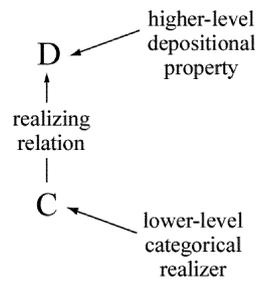


Figure 1.

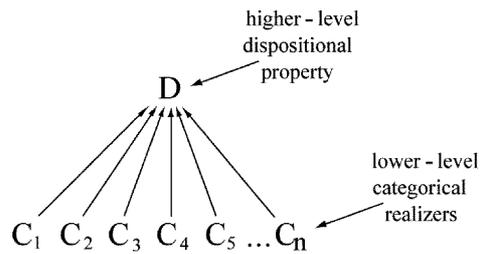


Figure 2.

A view of this kind is partly inspired by the thought that powers bestowed by properties are contingent. Were that so, it might be possible, given different laws of nature, for the very same categorical properties to realize distinct dispositional properties. The chief impetus for such a view, however, is the conviction that dispositions are ‘multiply realizable’. A teacup, a piece of slate, a pocket watch, and a gramophone record are all fragile. Features of these objects in virtue of which they are fragile, however, are very different. A single property, being fragile, is multiply realizable: the property is possessed by objects by virtue of those objects’ possession of some distinct, lower-level realizing property (see Figure 2).

I believe such reasoning is founded on a confusion (Heil 1999). We find it convenient to say that a teacup, a piece of slate, a pocket watch, and a gramophone record all possess the same disposition: being fragile. These items are examples of things that typically shatter when struck or dropped. But do they, on that account, possess the *very same* disposition? That seems unlikely: the objects shatter in different ways. To be sure, the shatterings are similar enough to fall under a single predicate. But the similarity in question is far from precise. I take it as uncontroversial that, if distinct objects possess the very same property, *F*, they must be precisely similar *F*-wise.⁸ To assume that ‘is fragile’ must name a higher-level property is to let the linguistic tale wag the ontological dog.

Turning dispositions into ‘higher-level’ properties threatens to make dispositional properties epiphenomenal. One worry here is the familiar

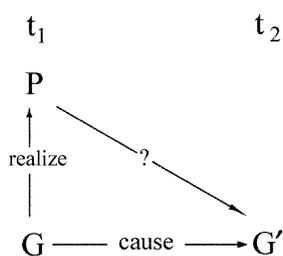


Figure 3.

'causal relevance' worry. Suppose an object, o , possesses a property, P , and suppose P is grounded in/realized by G : o possesses G , and, by virtue of possessing G , o possesses P . Cases of this kind have been discussed at length in the philosophy of mind. Suppose that P is some mental property, being in pain, for instance, and G is P 's neurological realizer in an agent, s on a particular occasion. Now we have an apparent problem. In any case in which you would be inclined to suppose that s 's actions are affected by s 's being in pain, it looks as though this property would be 'screened off' by its realizer. The situation is captured in Figure 3.

In this case, P 's figuring in a 'lower-level' effect would apparently require a kind of 'downward causation'. But downward causation of the kind depicted in Figure 3 is hard to swallow. Either G by itself is not sufficient for the production of G' ; or G' is causally over-determined; or one of its apparent causes is not really a cause at all. The first possibility appears to be at odds with our conception of the physical realm as 'causally autonomous'. This could be put in terms of laws of nature. Laws governing higher-level phenomena, the kinds of law you might associate with the special sciences, are subject to exception. Any higher-level process is susceptible to 'outside' intervention. Rational agents as a rule try to do what they judge best all things considered. This homely observation might be elevated to the status of a 'psychological law':

- (L) If an agent, s , judges an action, s 's A -ing, best all things considered, s forms an intention to A , *ceteris paribus*.

On a particular occasion, however, you might believe that A -ing is best all things considered, and resolve to A , yet not form an intention to A . You fail to form the intention because you are struck by an errant frisbee and knocked silly. In such a case, psychological laws (if indeed there are any such laws) 'break down'. When we get to the fundamental physical constituents, in contrast, there is no prospect of breakdown, no possible 'outside' intervention because there is no 'outside'.

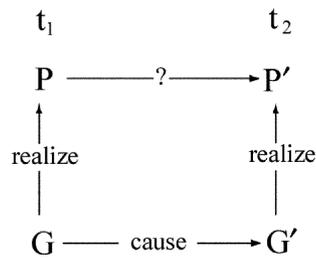


Figure 4.

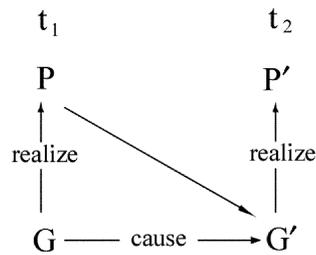


Figure 5.

One option is to envision higher-level items as affecting only other higher-level items. Your settling on *A*-ing as the best course of action results in your forming an intention to *A*. Each of these episodes has a lower-level realizer, however. It is not easy to see how a given higher-level item could affect another higher-level item except by affecting that item's realizer. Were that so, the situation depicted in Figure 4 would collapse into that represented in Figure 5. Now, however, we are back to the situation depicted in Figure 3.

Worries of this kind have stirred the passions of philosophers of mind. What are the implications, if any, for dispositionality? Frank Jackson, one of the original defenders of the thesis that dispositions are higher-level properties, is dismissive of the idea that dispositions could be operative in causal relations in which their realizers figure. This would, he says, involve 'a curious and ontologically extravagant kind of overdetermination' (1998, 202). The over-determination in question is evident in Figures 3 and 5: *P* and *G* over-determine *G'*.

This is most odd. In an effort to make sense of causal powers – dispositionality – Jackson and his colleagues posit dispositions as higher-level properties. Having introduced these properties, they then express

amazement that anyone could imagine that such properties might *do* anything. This is the kind of maneuver that gives philosophy a bad name.

- (8) The manifestation of a disposition is a manifestation of reciprocal disposition partners.

Philosophical lore has it that a disposition is ‘triggered’ by a ‘stimulus’, and the result is a manifestation of the disposition. The asymmetry implicit in this picture is reflected in Locke’s talk of ‘active’ and ‘passive’ powers – and, more recently, in Shoemaker’s invocation of ‘backward-’ and ‘forward-looking’ powers.⁹ A salt crystal manifests its disposition to dissolve in water by dissolving in water. But this manifestation is a manifestation of both the salt crystal’s disposition to dissolve in water *and* the water’s reciprocal disposition to dissolve salt. A match bursts into flame when it is scratched across the abrasive surface of a matchbox. The match’s bursting into flame is a manifestation of dispositions possessed by the match, the surface of the matchbox, and the surrounding air.

I do not deny that some dispositions could manifest themselves spontaneously. This is evidently how it is with the emission of particles by atoms undergoing radioactive decay. For the most part, however, dispositions manifest themselves in concert with reciprocal disposition partners. The model here is not a chain, but a net, or perhaps two playing cards supporting one another upright.

- (9) One and the same disposition can manifest itself differently with different reciprocal disposition partners.

Principle (9) is a corollary of (8). Consider a simple case, the sphericity of a particular ball. The ball’s sphericity, in concert with incoming light radiation, structures outgoing radiation in a definite way. The very same property of the ball disposes it to produce a concave depression in a lump of clay or to roll. Each of these manifestations depends on the presence of appropriate reciprocal disposition partners: one disposition, many different kinds of manifestation with many different kinds of reciprocal partner.

Earlier, I noted that conditional perspectives on dispositions can lead us to count distinct dispositions as the same. Now it is clear that over-reliance on conditional characterizations of dispositions can result in our counting instances of one and the same disposition as different.

Consider an imaginary case:

D_1 a disposition to fracture when struck.

D_2 a disposition to reflect light of wavelength L.

D_1 and D_2 seem obviously different. If you accept the idea that a manifestation is a reciprocal affair, however, this is less clear. It could well be that, it is in virtue of possessing a certain structure that an object shatters (when struck) and in virtue of possessing that very same structure it reflects light as it does: $D_1 = D_2$.

3. POWERS AND QUALITIES

Let me revisit items (5) and (6). Suppose I am right in thinking that properties of concrete objects are both dispositional and qualitative: properties are powerful qualities. In this I see myself (perhaps optimistically) as a philosophical descendent of Locke (through Charlie Martin). A view of this kind, in spite of possessing what strike me as impeccable philosophical credentials, is generally greeted with incredulous stares. I lack the time to spell out considerations that might elevate the view in your eyes, but I might be able to show how it could be seen as a more or less natural consequence of two wholly different, but widely popular ‘mainstream’ views.

Consider, first, the idea that properties are (or perhaps are bestowers of) powers. The idea is one I happily endorse, although of course I reject any rider to the effect that this is all there is to a property. Properties that make no difference to what their bearers do or would do are aberrations. But the idea that the nature of an object is exhausted by what it does or would do is even harder to swallow. One tradition (originating perhaps with Galileo) depicts the material world as a world of objects possessing powers to affect other objects and relegates qualities to the minds of conscious observers. This is all well and good if you are a physicist concerned with how matters stand in the material world, but it places a severe burden on anyone who seeks a unified understanding of mind and world. If minds have qualities but no material thing has qualities, then minds are not material things. When you combine this conclusion, as Berkeley does, with the idea that a world consisting wholly of powers is indistinguishable from an empty world, the result is a virulent idealism.¹⁰

So we have the idea that properties are powers and an associated worry that if properties turned out to be nothing more than powers, we could lose our grip on the material world. Now consider the ‘default’ (Prior, Pargetter, and Jackson) conception of dispositionality: a disposition is a higher-level property possessed by an object by virtue of that object’s possession of some lower-level ‘grounding’ or ‘realizing’ property. In the simplest case, this lower-level realizer will be a ‘categorical’ or purely qualitative property. This conception has the unwelcome consequence that

powers themselves are powerless! More cautiously: if powers are higher-level properties, they are either ‘screened off’ by their lower-level realizers or they ‘over-determine’ their effects.

I believe that each of these approaches – properties as pure powers and dispositions as higher-level properties – serves up more problems than it resolves. A world of pure powers, like a wholly relational world, is difficult to credit. If you are impressed by arguments advanced by Shoemaker (and others; see note 5) to the conclusion that properties are powers, you will not look with favor on the thought that properties can be either dispositional or qualitative. Purely qualitative properties appear epiphenomenal. A world containing purely qualitative alongside (or as realizers of) purely dispositional properties looks like a combination of two bad ideas: a world of pure powers and a world of inert, undetectable qualities.

Imagine now that the higher-level, causally challenged properties of Prior, Pargetter, and Jackson, were ‘collapsed’ into their lower-level qualitative ‘realizers’. In that case, qualitative properties would serve, not as lower-level grounds, but as *vehicles* of, dispositionality. The possession of a property would be the possession of a *powerful quality*. Properties (intrinsic properties of concrete objects) would be both qualitative and dispositional: every such property *is* a quality and *is* a power. By my lights, this ‘identity theory’ of properties involves only a minimal extension of a pair of ‘mainstream’ views otherwise deeply at odds.

4. APPENDIX: PRIMARY AND SECONDARY QUALITIES

Locke was by no means alone in marking a distinction between primary and secondary qualities.¹¹ What exactly is the force of such a distinction? More generally, what makes a quality a secondary quality, and how do secondary qualities differ from primary qualities?

Locke describes secondary qualities as powers to produce certain kinds of idea in us. Colors, for instance, are powers to produce experiences of certain sorts in conscious agents. This kind of view has been widely discussed and, I believe, widely misconstrued. I make no claim to being a Locke scholar, but I think that the position often associated with Locke flies in the face of Locke’s considered view.

Reflect on the question whether secondary qualities are pure powers. Is the nature of a secondary quality exhausted by the contribution it makes to the dispositionality or powers of its possessors? I see no reason to think this is so. Reflect again on the primary qualities, being spherical, for instance. In virtue of its possession of this quality an object has the power

to roll, to reflect light in a particular way, and so on. Primary qualities must be dispositional as well as qualitative.

Secondary qualities are powers an object possesses in virtue of its possession of certain primary qualities. Secondary qualities are not distinct from primary qualities: an object's possession of a given secondary quality is a matter of its possession of a certain complex primary quality. In virtue of possessing this complex quality, the object would – is disposed to – look, feel, taste, smell, sound a certain way to an observer. (How it would look, feel, taste, smell, sound depends on the observer's makeup.)

This anthropocentric way of picking out dispositions does not turn those dispositions into something subjective.¹² The dispositions are there, mind independently, in the objects. They are qualities of the objects picked out by reference to certain of their characteristic manifestations. What then is the point of the primary–secondary distinction for Locke? Suppose you ask why an object looks spherical. The answer: because it *is* spherical. Now, suppose you ask why an object looks red. The answer is going to be a complicated dispositional story: the surface of the object has a particular character; the surface structures light radiation in a particular way; light radiation so structured, in combination with our visual system, yields an experience of something red. Characteristics of objects responsible for structuring the light radiation are perfectly respectable qualities. A taxonomy in which these qualities feature would be of little interest to physics, however.

In sum, secondary qualities are not properties objects possess alongside, or in addition to, their primary qualities. This is why, in giving an inventory of the fundamental properties, physics need do no more than list the primary qualities. These, suitably combined and picked out via their effects on us, make up the secondary qualities.

Could primary qualities exist apart from secondary qualities? Berkeley denied it, concluding that all qualities must be mind-dependent. But if secondary qualities are arrangements of primary qualities, we can accept the idea that no object – or, at any rate, no middle-sized object – could fail to possess secondary qualities if it possesses any qualities, without joining Berkeley and going anti-realist about the material world.

NOTES

¹ The phrase is from Harré and Madden (1974); see also Boscovich (1763), Priestley (1777), Harré (1970), Cartwright (1989, 1999), Shoemaker (1980, 1984, 1998, 2001), and Swoyer (1982).

² The original version of this paper listed eight theses. Troy Cross reminded me of what I now bill as thesis (1).

³ So-called finkish cases of this kind are discussed in Martin (1994). See Lewis (1997) for a rejoinder, and Bird (1998, 2000) for a discussion of cases in which antidotes block the manifestation of a disposition.

⁴ Here I am taking the Humean view to be, not that there is no necessitation, but that necessitation, if it obtains, is contingent ('merely nomological').

⁵ This is close to Graham Oddie's (1982) 'Eleatic Principle' and what Kim (1993, 202) calls 'Alexander's Dictum'. It is implicit in Shoemaker (1980) and in Swoyer (1982).

⁶ Locke includes number among the primary qualities, a seemingly odd choice. One possibility is that all Locke has in mind is that there is always a mind-independent answer to the question, How many? asked of a particular kind of object.

⁷ The canonical statement of this view can be found in Prior et al. (1982). The *in virtue* of relation here is standardly explicated by reference to contingent natural laws.

⁸ Here I remain neutral on the question whether properties are universals. If properties are universals, then exact similarity is explicable in terms of identity; if properties are modes (tropes, individual accidents), similarity, or at least similarity among the basic properties, is not further explicable.

⁹ See Locke (1689, II, xxi, 2), and Shoemaker (1998, 64).

¹⁰ Versions of the argument, not all of which are meant to yield idealism, can be found in Armstrong (1961, Chap. 15) and in Armstrong (1999), Blackburn (1990), Campbell (1976, 93–94), Foster (1982, 67–72), Martin (1997, 213–217), and Swinburne (1980). The argument is discussed in Heil (2003, Chap. 10).

¹¹ The distinction can be found in Descartes (*Principles of Philosophy*, IV, §§188–203), Boyle (in *The Origin of Forms and Qualities*), and Galileo (in *The Assayer*), for instance.

¹² Here I am disagreeing with Campbell (1993, 257) who describes secondary qualities as 'qualities of the ideas that perception produces in the mind', with Jackson and Pargetter (1987), and with many others who read Locke as a 'subjectivist' about secondary qualities.

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Department of Philosophy
Davidson College
Box 6954
Davidson, NC 28035-6954
U.S.A.
E-mail: joheil@davidson.edu

School of Philosophy and Bioethics
Monash University
Clayton, VIC 3800
Australia
E-mail: john.heil@arts.monash.edu.au