

# Four Theories of Pure Dispositions

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**Abstract** The dispositional properties encountered in everyday experience seem to have causal bases in other properties, e.g., the microstructure of a vase is the causal basis of its fragility. In contrast, the Pure Dispositions Thesis maintains that some dispositions require no causal basis. This thesis faces the Problem of Being: without a causal basis, there appears to be no grounds for the existence of pure dispositions. This paper establishes criteria for evaluating the problem, critically examines four theories of the being of pure dispositions, and develops an explanation of how a pure disposition grounds itself via its own power.

## 1 Pure Dispositions and the Problem of Being

According to one theory of dispositions, any dispositional property requires a causal basis consisting of one or more categorical properties (e.g., see Prior, Pargetter, and Jackson 1982). This claim excludes the metaphysical possibility of pure dispositional properties, or dispositions without causal bases in any further properties. However, several philosophers have recently claimed that pure dispositions (or, pure powers) are either actual or at least metaphysically possible.<sup>1</sup> Bird (2007), Ellis (2001), McKittrick (2003b), Molnar (2003), and Mumford (2006) all accept the following thesis or something akin:

**Pure Dispositions Thesis:** It is metaphysically possible that there is some type of dispositional property of which any instance, F, does *not* have a distinct causal basis for its manifestation, where a causal basis consists of some instance of either another dispositional property or property-complex, or a categorical property or property-complex, or combination thereof.<sup>2</sup>

The causal basis is a property or property-complex, either constituted by dispositional or categorical properties, that is causally relevant to the manifestation of a disposition when appropriately triggered in the right circumstances. For example, a vase possesses the dispositional property of fragility. The disposition may be triggered by a hammer striking the vase, where it is some set of micro-

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<sup>1</sup> Moreover, the theory of dispositional essentialism (Bird 2007, Mumford 2004) requires that all of the fundamental properties are pure dispositions, in contrast to the claim that all of the fundamental properties are categorical (Armstrong 1997, 2004).

<sup>2</sup> Two notes: First, the Pure Dispositions Thesis says that F does not have a *distinct* causal basis, since F might be its own causal basis, as McKittrick (2003b) argues. Section 2 addresses this further. Second, if dispositional essentialism is true, then pure dispositions are metaphysically *necessary*, so of course possible; however, attending to the mere metaphysical possibility of pure dispositions is sufficient for the purpose of this paper.

structural properties of the vase that constitutes the causal basis of that particular instance of fragility.<sup>3</sup>

Importantly, besides being causally relevant to the manifestation of a given disposition, the causal basis also plausibly accounts for the disposition's continuous existence or being. So the grounds and causal basis of a disposition are, it appears, identical. When the disposition is not manifesting, the causal basis somehow anchors or grounds the being of the disposition. For example, the continuous existence of fragility is grounded by micro-structural properties of the fragile object. (The grounding relation is further specified in section 2, where I will challenge the assumption that the causal basis is identical to the grounds of a disposition.)

Given that pure dispositions have no causal bases, and that causal bases typically ground the being of dispositions, the Pure Dispositions Thesis raises the question of how pure dispositions continuously exist. This paper aims to investigate and solve this problem. Here is the problem more precisely stated:

**Problem of Being:** For any instance of a pure disposition, F: assuming that F need not manifest continuously, and assuming that there is no property or property-complex distinct from F that constitutes a causal basis that grounds F, there is nothing to ground the continuous existence (or, being) of F.

Another way of putting the problem: In what does the being of a pure disposition consist, apart from its possible manifestations? Or, when a pure disposition at space-time location *l* is not manifesting, *what* is at *l*? Or, as Psillos (2006) asks: What does a pure disposition do when not manifesting? This problem is at the heart of many worries about pure dispositions, and systems of properties built up from them.<sup>4</sup> Extensive arguments have been given for the possibility and actuality of pure dispositions.<sup>5</sup> However, the nature of the continuous existence or being of pure dispositions appears to have received little attention.<sup>6</sup>

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<sup>3</sup> Typical examples of pure dispositions are the properties of fundamental particles, such as mass, charge and spin. I sometimes use these examples, though it may be that some further properties are more fundamental. Moreover, so far as the Pure Dispositions Thesis says, there may be emergent, higher-order pure dispositions.

<sup>4</sup> See especially Heil (2003: 97-110), Mumford (2006), and Psillos (2006). Although he supports the Pure Dispositions Thesis, Mumford (2006: 485) explicitly raises the question of the being of pure dispositions.

<sup>5</sup> See McKittrick (2003b) for an argument for the possibility of pure dispositions based primarily on metaphysical considerations, and Molnar (2003:125-42) and Mumford (2006) for arguments for the actuality of pure dispositions based jointly on metaphysical and empirical considerations.

<sup>6</sup> Two exceptions are Handfield (2008) and Mumford (2006). Mumford (2006: 485) suggests that pure dispositions are self-grounded, and Handfield (2008) suggests that pure dispositions are either self-grounded or globally grounded. Both theories are discussed below. Both Mumford (2006) and Handfield (2008) suppose that McKittrick's idea (2003b) that a disposition may be its own causal basis naturally suggests that a disposition is its own grounds as well. I think this is ultimately right (and I offer an account to support it in section 7), but this assumption is also questioned below (section 2) by giving reasons for thinking that grounds and causal bases are different. This opens up several possible grounding options for pure dispositions that deserve evaluation.

One may think that the being of pure dispositions needs no explanation, especially if one thinks that pure dispositions form the ground floor of reality, as for example dispositional essentialism maintains.<sup>7</sup> Supposing that explanations must stop somewhere, one might simply accept the continuous existence of pure dispositions without explanation, just as one might accept the continuous existence of some other class of fundamental entities posited on some other metaphysic.

However, I have three responses to any 'no explanation' response to the Problem of Being. First, the same puzzling metaphysical questions previously raised about pure dispositions remain, e.g., about what pure dispositions do when they are not manifesting. Second, regardless of whatever considerations in favor of a 'no explanation' view one might offer, we should not consider the Problem of Being alleviated without at least canvassing various possible answers to it. There may be a plausible metaphysical explanation not yet identified or developed in sufficient detail, e.g., a solution that explains the being of pure dispositions by reference to conditions extrinsic to the objects that bear them. Third, given the modal nature of pure dispositions it seems there *must* be some explanation of their being when not manifesting, even if we judge that there are good reasons to posit them absent an explanation of their being; e.g., we may have sufficient reason to posit pure dispositions because of their explanatory power, yet this does not explain the continuous existence of pure dispositions. Moreover, if there is no explanation of the being of pure dispositions, then such entities would just seem to 'hang' ontologically on nothing, akin to how psychological dispositions do on Ryle's (1949) account of mind. Even if pure dispositions do 'hang' in this way, some explanation of what this amounts to is in order. Is it a causal process of some sort? Is it self-grounding, and if so what does this amount to? In light of these considerations, I suggest that taking the 'no explanation' stance is only epistemically permissible once we have reason to reject various theories of the being of pure dispositions. Hence, we should seek such a theory.<sup>8</sup>

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<sup>7</sup> Dispositional essentialists such as Bird (2007) and Mumford (2004) maintain that all the fundamental properties are purely dispositional, but this does not necessarily mean that they think no explanation is required in response to the Problem of Being. Ellis (2001), who accepts the Pure Dispositions Thesis but does not think *all* of the fundamental properties are essentially dispositional (he argues that fundamental spatiotemporal and numerical relations are categorical), argues for the 'no explanation' response to the Problem of Being. Ellis (2001: 114, and especially 139-140, footnote 12) maintains that the existence of higher-level entities plausibly depends on increasingly lower-level causal powers (dispositions), ultimately bottoming out in purely dispositional properties at the fundamental level of reality. Since we must ultimately posit fundamental pure dispositions (barring infinite levels), on this view, their continuous existence needs no explanation. Although it may be true that we must posit them, it is not clear why they must be posited with no explanation as to their continuous existence, for reasons given in the next paragraph. Furthermore, Ellis seems to assume that pure dispositions are intrinsic properties; however, if they are extrinsic they will necessarily have some grounds (though not necessarily causal bases, per my arguments in section 2), and these grounds will figure in an explanation of their being.

<sup>8</sup> It is worthwhile noting that it does not seem sufficient as an answer to the Problem of Being to offer a characterization or analysis of dispositions (and pure dispositions), such as the directedness theory of dispositions (e.g., Molnar 2003) or some version of the conditional analysis of dispositions. These theories only raise more questions about the being of pure dispositions: e.g., on the directedness theory, what does it mean for F to be in a state of directedness when not manifesting, and what is so directed? And, on the conditional

In this essay, I evaluate four theories that aim to solve the Problem of Being. I will proceed as follows. In section 2, I establish criteria for evaluating the theories, and I argue for two assumptions that will hold throughout the rest of the essay. In sections 3 through 5, I present three theories that I argue do not satisfactorily answer the Problem of Being. I take none of the reasons I give against the three theories to be absolutely conclusive, but only to count against them; certainly each theory could use more extensive development, but I sketch enough of each sufficient for an initial evaluation. In section 6, I argue that the most viable theory, i.e., the one that fully satisfies the two criteria established in section 2 and has the fewest additional problems, maintains that a pure disposition grounds itself: a pure disposition is the grounds of its own being. This basic idea has been advanced by others, for example Mumford (2006) advocates the self-grounding of pure dispositions, but not much has been said about *how* pure dispositions are self-grounded or what exactly self-grounding amounts to. In section 7, I advance and develop an explanation of how pure dispositions are self-grounded, i.e. of what it means for a pure disposition to be self-grounded.

## 2 Criteria and Assumptions

As the Problem of Being indicates, for any pure disposition, F, any satisfactory theory of pure dispositions should satisfy the following criteria:

**Criterion 1:** The theory explains the continuous existence or being of F.

**Criterion 2:** The theory does not invoke additional properties that constitute a causal basis for F's manifestation.

I will reference these criteria in evaluating the four theories, though other considerations will also be discussed regarding each theory. Additionally, two assumptions will hold throughout the evaluation of the theories. For any pure disposition, F:

**Assumption 1:** F may serve as its own causal basis.

**Assumption 2:** There is a metaphysical distinction between the *grounds of F* and the *causal basis of F*.

Assumption 1 is McKittrick's (2003b) proposal: a pure disposition (or, 'bare disposition' in her terminology) has no causal basis either in further dispositions or categorical properties. When a manifestation occurs, it is F itself (and not some subvenient property of F) that is activated by an external stimulus, triggering F to manifest. Hence, F need not have a *distinct* causal basis. This is an important component of the theory of pure dispositions I advocate below (the fourth theory) since some explanation is needed to explain how or what is activated when F manifests.

However, if a pure disposition is its own causal basis that does not necessarily mean that it grounds itself. For purposes of this paper, the grounds of a property, P, consist of another property or property-complex upon which P

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analysis, when not subjected to its manifestation conditions stipulated in the antecedent of the condition, what is the nature of F's being?

ontologically depends for its continuous existence. For example, an instance of a color property, R, is grounded partially in R's object-bearer having the property of extension. Thus, a tennis ball's extension grounds its property of being yellow, but does not *cause* yellow. Moreover, yellow does not necessarily supervene on the shape of the tennis ball; the tennis ball can change shape while retaining the same color. The intuitive idea is that the grounding properties are those that, if eliminated, would result in the immediate (simultaneous) elimination of P as well. (It must be simultaneous otherwise an animal's property of being alive, for example, would be grounded in properties of oxygen, which appears to be a causal, not a grounding, relation.) Also, P can have partial grounds in distinct sets of properties; e.g., P might be grounded partially in properties of its object-bearer, *x*, and also be grounded partially in properties of some object in *x*'s environment, or property of *x*'s environment. (This is the case with relational properties, such as tallness). In the case of color, a color R seems partially grounded in light-reflection properties of the object bearing R and also partially grounded in the object's extension.

Given this understanding of grounding, the distinction in Assumption 2 is that there is a difference between the basis for F's continuous existence (i.e., ontological grounds) and the basis for F's manifesting given an appropriate stimulus (i.e., causal basis). I will argue that the causal basis and grounds of a disposition may come apart in two kinds of cases – extrinsic and intrinsic.<sup>9</sup>

In the intrinsic case, it is possible for F to ontologically depend on and therefore be grounded in intrinsic properties of the object *x* that bears F, but that are *not* part of the causal basis of F. The suggestion is that necessary co-instantiation of two properties, P1 and P2, by *x*, is a kind of ontological grounding or dependence between P1 and P2. For instance, suppose it is necessary for the disposition mass to exist that it bundles with charge and spin, so that the being of mass is grounded in the bundle *charge-spin-mass* (there's no possible world in which you find the disposition mass that you do not also find mass bundled with the dispositions spin and charge, thus forming an electron for example). Yet, it is not obvious that the charge and spin in a particular electron bundle are causally relevant to the manifestation of mass, i.e., that the charge and spin form the causal basis for mass' manifestation. It does not seem as if the charge-spin component of the bundle needs to receive the stimulus in order for mass to manifest. In this example, mass may be its own causal basis yet it is ontologically grounded in – i.e., ontologically dependent on – its bundle partners charge and spin, for it would immediately cease to exist without them. Thus, the grounds of F and causal basis of F are not necessarily identical.

In the extrinsic case, it is possible that F, of object *a*, is partially ontologically grounded in properties of some object *b* that does not bear F, yet *b* is not obviously causally relevant to (by which I mean that it forms part of the causal basis for) the manifestation of F (given an appropriate stimulus). For example, take the extrinsic disposition *vulnerability* – i.e., capable of being damaged if attacked (this is an example of an extrinsic disposition discussed by McKittrick 2003a). For some object *x*, *x*'s being vulnerable depends on whether *x* is an environment that affords protection to *x*. When *x* is *not* in the protective environment, *x* is vulnerable. When *x* is in a protective environment, *x* is not vulnerable. Thus, vulnerability is an extrinsic

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<sup>9</sup> Handfield (2008: 298) distinguishes between the supervenience base of a disposition and the causal basis for the manifestation of a disposition, akin to my distinction between grounds and causal basis. I address this below.

disposition. But it is not obvious that  $x$  being located in a non-protective environment (and so being vulnerable) is part of the causal basis for the manifestation of  $x$ 's becoming damaged (where being damaged is the manifestation of vulnerability); rather it seems like it is solely some properties of  $x$  itself that constitutes the causal basis for  $x$ 's vulnerability, even though  $x$ 's having the disposition of vulnerability requires extrinsic (environmental) factors, i.e., the lack of appropriate protection. Thus, the grounds of vulnerability and the causal basis of vulnerability are distinct.

Given Assumptions 1 and 2, the question I am pursuing is: how can a pure disposition,  $F$ , be ontologically grounded, but nonetheless remain a pure disposition in that it does not have a distinct causal basis? The metaphysical distinction between the grounds and causal basis of a disposition (i.e., Assumption 2) opens up several possible theories of the grounding of a pure disposition. This is because we can look for ways to explain the grounds of  $F$ 's being without necessarily positing a causal basis for  $F$ , thus violating Criterion 2. However, what I will ultimately suggest in the self-grounded theory of pure dispositions (section 6) is that  $F$  is indeed both its own causal basis *and* its own grounds for being. I advance this as a metaphysically necessary claim, yet other theories are at least logically possible, and so must be ruled out before we can infer that  $F$  is self-grounded.

Here is the structure of the overall argument of this paper:

(1) Rule out these possible grounding theories as solutions to the problem of  $F$ 's continuous existence:

- (i)  $F$  is extrinsically grounded in all properties (i.e., global grounding);
- (ii)  $F$  is extrinsically grounded in properties of the World, taken as a whole that is ontologically prior to the part-objects of the World;
- (iii) Supposing that  $F$ 's object-bearer  $x$  is substantial,  $x$  grounds  $F$ .

(2) If (i), (ii), and (iii) are ruled out, then Assumption 1 implies that  $F$  is self-grounded.

(3) Thus, Assumption 1 implies that  $F$  is self-grounded. [(1), (2)]

(4) If  $F$  is self-grounded, then the intrinsic nature of  $F$  accounts for  $F$ 's continuous existence.

(5) Thus, the intrinsic nature of  $F$  accounts for  $F$ 's continuous existence. [(3), (4)]

This argument relies on the plausibility of ruling out other grounding options, i.e., premise (1), the task to which I now turn in sections 3 through 5. Then, sections 6 and 7 develop premises (2) and (4).

### 3 The Global Theory

Handfield (2008: 298) distinguishes between the 'supervenience base' and the 'causal base' of a disposition, similar to the distinction between grounds and causal basis in Assumption 2. He then suggests that though pure dispositions lack causal bases, they "do have supervenience bases, but that they represent a degenerate case: their base includes every possible property, including extrinsic properties"

(Handfield 2008: 304).<sup>10</sup> If the supervenience base of F is something like the grounds of F, then the theory being suggested (though not necessarily endorsed) by Handfield is this:

**(Global)** The ontological ground of F consists of every possible property, including extrinsic properties.

By “every possible property” Handfield seems to mean (he does not say explicitly) every property in the actual world, not also properties of possible worlds. (Besides, it is a mystery how possible properties would ground actual properties.) So, the ground of F consists of the entire set of actual properties in a given world. In characterizing the supervenience base of a pure disposition as degenerate, I take him to simply mean that the base deviates from the common assumption (e.g., Mumford 2006) that the grounding property (or property-complex) of a disposition must be intrinsic to the disposition’s bearer.

If (Global) is correct, then the set of global properties grounds F while not being a causal basis for F. Perhaps the best example of something approaching the content of (Global) is Mach’s Principle, which maintains that the mass of an object, *x*, is determined by the total distribution of mass and energy in the rest of the system of which *x* is a member. Thus, according to this principle mass is an extrinsic property. This principle is limited as an example of (Global), according to which *every* pure disposition, not just mass, is grounded in all other properties. But Mach’s Principle at least serves as an intuitive analogy.

On (Global), the continuous existence of F is explained by appealing to all other properties, thus invoking the idea of the interconnectedness of all being. We will also see this idea in theories below. Let us assume Criterion 1 is satisfied. What about Criterion 2? If it is true that the global grounds do not play a role in F’s manifestations, then Criterion 2 is satisfied. It is not a causal basis for F, one might argue, because all the properties in the supervenience base are extrinsic relative to the object bearing F. How could they be causally relevant to F’s manifesting? How could the property of the moon looking beautiful to Galileo be causally relevant to some pure disposition’s manifestation event? However, if even *one* is causally relevant, then part of the grounds of F is also a causal basis for F, and so F is not pure. Most of the global properties are going to be extrinsic relative to the object bearing F. But some will not, for some might be intrinsic properties of the object bearing F. But that may not be a problem for (Global) if those properties are simply other pure dispositions (as is plausible for the subatomic particles). Thus, if the global grounding properties are not part of the causal basis of F, yet they do form ontological grounds for F, then we have a solution to the Problem of Being.

Nonetheless, one might argue that the global grounding base *does* also form a causal basis for F somehow. This might be true in two ways: first, perhaps *some* of all the properties of the world may be causally relevant to F’s manifesting; second, perhaps all of the properties form a causal basis for F’s manifesting in some ‘degenerate’ sense, in the same sense that they all form a ‘degenerate’ supervenience base or grounds. (Note that if it really is a supervenience base as Handfield thinks, then some property or property-complex G in the base must co-vary with F, and since G is in the base of the supervenience relation, it looks like it will be

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<sup>10</sup> Terminological note: Handfield (2008: 304) calls this the ‘global hypothesis’, and he uses the term ‘bare dispositions’ instead of pure dispositions (following McKittrick 2003b).

causally relevant.) We might say that F has a 'hidden' or 'subdued' causal basis. It may be that F manifests in some circumstance even though F is not directly stimulated, because some or all of the global properties are stimulated.<sup>11</sup>

Setting aside the question of whether the global base just ontologically grounds F or also serves as a causal basis for F, (Global) is unappealing for two reasons. First, the *truth-maker* for the proposition 'F continuously exists' (or 'F is grounded') is every property of the world.<sup>12</sup> This is problematic on two counts: first, it seems like an unnecessarily large truth-maker, and second, one could reasonably claim that every property's truth-maker is the set of all other properties of the world. It may be true in a weak sense that all other properties make true the proposition 'F continuously exists', or 'the state of all the properties in the entire world is such that F is grounded'. This reflects Armstrong's (2004: 19) observation that the whole world is the "least discerning" (because of its non-specificity) and "most promiscuous" (because it makes every truth true) truth-maker. But this is not very informative; what would be informative is a "minimal" truth-maker (Armstrong 2004: 19) for F.

The second consideration against (Global) is that not *every* other property seems relevant to whether F continuously exists at a specific location. If spin is a pure disposition, then on (Global) the property of earth being the fourth planet from the sun forms part of the grounds for an electron on Venus having spin  $\frac{1}{2}$ . This is wildly counter-intuitive. Perhaps some more precisely defined set of global properties forms the grounds of F, such as all other sparse properties, or perhaps just properties of the world as a whole. But, to entertain that conception of F's grounds is to entertain a different theory than (Global).

In sum, even if (Global) fares decently on Criteria 1 and 2, other considerations lead to a tentative rejection of this theory of the grounding of pure dispositions.

#### 4 The Monistic Theory

In this section I consider two versions of monism to account for the continuous existence of pure dispositions. Monism is the idea that the World (i.e., the entire cosmos or universe) is a genuine object, not just a collection of smaller objects (the World is tantamount to the One discussed in Plato's *Parmenides*). The two versions

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<sup>11</sup> It is worth clarifying that some properties of the world besides F will be causally relevant to F's manifesting if (Global) is true, simply because the stimulus of F will be causally relevant. But typically the triggering or stimulus property is *not* considered part of a causal basis for any disposition. I assumed that was so in advancing the first possibility for what the causal basis might be, to the effect that the entire global grounds could not be the causal basis yet the causal basis could be some sub-set of the global properties not including the stimulus.

<sup>12</sup> This objection should not be confused with the objection that the manifestation conditional associated with F is made true by every property in the world. Although this too may seem counter-intuitive, this objection would assume that all the properties of the world are somehow causally relevant to F's manifesting, and thus form a causal basis for F, which would violate Criterion 2. (The associated manifestation conditional is 'the state of the entire world is such that, were *x* exposed to the characteristic stimulus *S*, it would yield the characteristic manifestation *M*' (Handfield 2008: 304).)

of monism I will consider are priority monism and existence monism, a distinction made by Schaffer (2007, 2010b).

Existence monism maintains that the World is the *only* object. Horgan and Potrč (2008) call it the Bobject. On their view, confluences of properties of the Bobject form what we call ‘objects’, e.g., atoms, cells, diamonds, and trees. By contrast, priority monism as defended by Schaffer (2010b) holds that the World – again, the whole cosmos or universe – is ontologically prior to all the smaller objects in the world, but all those smaller parts of the World (the atoms, cells, diamonds, trees, etc.) are legitimate objects in their own right. The World has primary being and its part-objects have derivative being; i.e., the World has ontological priority over the part-objects.

Assume priority monism is true. Priority monism entails that some property or property-complex of the World partially grounds all of its part-objects and by extension also the properties of those part-objects. Thus, any pure disposition F, borne by a fundamental object *a*, is partially grounded in a property or property-complex of the World. So the theory is this:

**(World)** F is grounded in the World, the whole that is ontologically prior to all the part-objects in the cosmos.

This theory has an important implication. Properties, including dispositions, that are ontologically dependent on properties of objects (or environments) *other* than their bearers are extrinsic properties, and thus are grounded extrinsically. Thus, if priority monism is true, then pure dispositions are extrinsic.

(World) and (Global) both invoke the idea that F is grounded in properties external to the object bearing F. On both, F qualifies as extrinsic because F’s being is not solely dependent on properties intrinsic to the object bearing F. But, on (World) the extrinsic grounding base is less robust in the sense that it only invokes properties of (or a single property of) the World as part of the grounds of F, whereas (Global) invokes all other properties beyond F. Compared to the truth-maker problem associated with (Global), (World) yields a more plausible truth-maker for ‘F is grounded’, since only the World (i.e., some property or set of properties of the World) preceding the part-objects is referenced, not *all* properties. So, per Occam’s razor, (World) should be favored over (Global).<sup>13</sup> Furthermore, F does not depend on *non*-fundamental properties as it does on (Global); F only depends on fundamental properties of the World. That is significant if pure dispositions must be fundamental properties, since it is counter-intuitive for fundamental properties to depend ontologically on non-fundamental properties.

Criterion 1 is satisfied since the World grounds everything, including all properties. As may be true with (Global), (World) does not necessarily violate Criterion 2, since the grounding properties of the World that account for F’s being are not necessarily part of the causal basis of F’s manifesting. Note that considerations discussed in section 3, pertaining to Criterion 2 relative to (Global), are also relevant to Criterion 2 relative to (World). However, in addition to those considerations, (World) and (Global) both pose the question of whether extrinsic grounding properties form part of the causal basis of F, thus violating Criterion 2. Some comments on that are in order, and these comments are relevant to (Global) as well, but I will couch my discussion of extrinsicness in terms of (World).

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<sup>13</sup> See Schaffer (2010a) for a ‘one truth-maker’ view.

On (World), F could still be its own causal basis if the grounding properties in virtue of which F is extrinsic are not part of the causal basis for F's manifestations, given that grounds and causal bases may come apart (Assumption 2). But *if* the extrinsic grounds form a causal basis for F, one might respond on behalf of (World) that it is intrinsic purity (i.e., intrinsic 'causal base purity') that matters to whether F is a pure disposition. Thus, even if the extrinsic grounding properties form a causal basis for F, they at least do not form an *intrinsic* causal basis. But why does this matter? If the extrinsic base is causally relevant to F manifesting, then it should not make a difference between the intrinsicness/extrinsicness of the causal basis – a causal basis is a causal basis. Still, it might be urged that if the extrinsic grounds of F form a causal basis, their causal relevance in F's manifestations are only indirect, in a way that the environmental conditions of any dispositional property are causally relevant to what happens in manifestation circumstances. So in this sense, F might have an extrinsic grounds and extrinsic causal base but still be pure intrinsically.

I think there is a good case to be made that the extrinsic grounds of F do not also serve as a causal basis for F, thus making (World) an attractive solution to the Problem of Being. However, a significant problem is that (World) issues from a radically different conception of the nature of the world than most philosophers discussing pure dispositions assume. Although Schaffer (2010b) defends priority monism, the standard assumption is *pluralism*, the view that the world is composed of abundant fundamental objects whereas priority monism says there is only one fundamental object. I will not evaluate these two competing theories of the number of fundamental objects in this essay. But major proponents of pure dispositions, such as Bird (2007) and Mumford (2004), assume pluralism. Provided that a theory of the being of pure dispositions should be consistent with pluralism, at least for dialectical reasons, there is reason to tentatively set aside (World).

Another monistic option to account for the being of pure dispositions invokes existence monism. As discussed above, existence monism says that there is just one metaphysically genuine object, the Bobject. As an answer to the Problem of Being, we get the following:

**(Bobject)** F is ontologically grounded in virtue of being instantiated by the Bobject.

On this view all pure dispositions are grounded in the Bobject directly. If pure dispositions are fundamental properties, then they are the fundamental properties of the Bobject and their continuous existence is explained by the continuing existence of the Bobject. So, Criterion 1 is satisfied. Unlike (Global) and (World), (Bobject) does not invoke extrinsic properties to account for F's being simply because there is nothing extrinsic to the Bobject in virtue of which it has its properties. F is simply instantiated by the Bobject as any typical object instantiates a property (although on this version of monism there is only one genuine object). If there are no mediating properties (categorical or dispositional) between the Bobject and F, then no properties besides F itself constitute a causal basis for F, and Criterion 2 is satisfied.

I have two responses to (Bobject). First, as with (World), given the dominant pluralistic view of objects it is dialectically inadvisable to assume that the Bobject exists. It is merely a possibility to account for the being of pure dispositions and warrants further investigation. Second, and more importantly, (Bobject) raises a question about the nature of the relation between objects and pure dispositions,

assuming that pure dispositions must be borne by objects and cannot 'float free' or potentially exist apart from some object. The question is this: if the instantiation of F by an object ontologically grounds F, and that object has the additional property, G, of *instantiating* F, then how is it that G is not thereby a causal basis for F? The next section will clarify this question, but note that the Bobject shares this potential problem with any ontology that maintains that properties must necessarily be borne or instantiated by objects.<sup>14</sup>

## 5 The Object Theory

Suppose that pure dispositions must be instantiated by objects.<sup>15</sup> Perhaps an object bearing or instantiating F accounts for F's continuous existence without invoking any further properties of the object that would constitute a causal basis for F's manifestation. Thus, for example, an electron's instantiation of a dispositional property token of charge accounts for the continued existence of that charge token during periods of non-manifestation.

In the dialectic concerning pure dispositions, some implicit assumptions are often made concerning the nature of objects, besides the fact that it is often assumed that pure dispositions are necessarily instantiated by objects. Sometimes it is assumed that the objects bearing pure dispositions are just bundles of tropes. And sometimes it is assumed that the objects bearing pure dispositions are substantial objects (i.e., substances distinct from their properties) that instantiate pure dispositions and other properties. On the former view, if some object is just a bundle of pure disposition tropes, then it is not clear how the object could account for the continuous existence of its pure dispositions when they are not manifesting, since there is nothing beyond the pure dispositions in the bundle. But on the latter view, the object could account for F's continuous existence because it is a substantial entity that *has* properties and the properties of the object depend on the object for their existence.

It is the substantial view of objects that I have in mind in evaluating objects as grounds of the being of pure dispositions. I will argue that objects, in this sense, cannot straightforwardly account for the being of pure dispositions without violating their 'purity', and thus if pure dispositions exist, then they are not instantiated by substantial objects. Thus, pure disposition tokens can either 'float free' of objects or are instantiated by objects as bundles of properties, and so some other theory of their ontological grounding is needed.<sup>16</sup> This does not necessarily imply that there are no substantial objects at higher levels of reality, for macro objects may be constituted by smaller objects that are bundles of properties.

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<sup>14</sup> The fact that (Bobject) is just one way to cash out an object-centered theory of the being of pure dispositions is another reason, in addition to it being a variation of monism along with priority monism, why I do not consider (Bobject) as one of four distinct theories of pure dispositions discussed in this essay.

<sup>15</sup> McKittrick (2003b: 254), for example, holds that pure dispositions are dispositions *of* objects, or dispositions that objects *have*.

<sup>16</sup> It may be that any property, and so a pure disposition too, can float freely without inhering in an object and so does not need an object to be instantiated. I do think this is possible; see Schaffer (2003) for a defense of this view. I return to this possibility in section 7.

Suppose that F is grounded by the object of which it is a property, and that the grounding relation between F and its object, O, is simply F's being instantiated by O. The theory under consideration is thus:

**(Object)** F is grounded by O insofar as O is a substantial object that instantiates F.

F is a property instantiated by O (or, exemplified by O) and since O continuously exists, F continuously exists. So an electron's charge disposition continuously exists simply because the electron, as a substantial object that bears that charge token, continuously exists.

Assuming the substantial view of objects and that objects instantiate properties, we can interpret (Object) in two ways. First, properties are *ways* objects are; second, properties *inhere in* objects. The latter idea, as I am using it, is to conceive of objects as discrete substrata onto which properties are 'pinned'. I am primarily concerned with the former view of objects in discussing (Object). This is because on the second view properties would be distinct entities that are separable from their object bearers, and so a problem would be that properties do not necessarily require their object bearers to exist, i.e., property tokens could possibly float free. Thus, in addition to assuming that objects are substantial, in discussing (Object) I will further assume that properties are *ways* objects are, and thereby avoid possible worries about the view that properties inhere in objects. (Perhaps these two views of the relation between properties and substantial objects amount to the same thing; if so, then my critique is not affected.)

As a model for evaluating (Object) I will adopt the view of Lowe (2006), who argues that property tropes or tokens are *ways* objects are; in other words, property tokens are modes of objects. Moreover, Lowe (2006: 27, 75) thinks that property instantiation necessarily depends upon objects: there can be no property-instance that is independent of an object, for property-instances just are properties *of* objects (so no free-floating properties).<sup>17</sup> This implies that objects ontologically ground dispositional properties since one of the ways an object might be is to be disposed to manifest a certain way.<sup>18</sup>

Criterion 1 is satisfied on (Object), since O's continuous existence will ensure F's continuous existence. An event may *cause* O to lose F, as an apple may lose its redness due to decay, yet when O has F it is O that is ontologically responsible for F's continuous existence. To maintain the purity of F on this view, and thus satisfy Criterion 2, it must be that O does not constitute a causal basis for F's manifestation. Therein lurks a potential problem for (Object). O will be involved in interactions with other objects, and I suggest that some further property of O must be stimulated in some way so as to bring about the manifestation of F; what this further property of O is will be addressed below. But if some further property of O plays a causal role

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<sup>17</sup> Although Lowe (2006) does not accept a substratum view of objects, he does include objects as distinct kinds in his Four-Category Ontology. Properties are ways objects are, not things that are pinned on their object-bearers. Heil (2003: 173) also holds that "properties are ways objects are."

<sup>18</sup> On Lowe's Four-Category Ontology (2006), dispositions are not modes or tropes, but universals, and universals characterize *kinds* of objects. So, Lowe does not accept pure disposition tokens and so I think he would deny the Pure Dispositions Thesis. I am just using Lowe's view as a model of how (Object) might be understood.

in F's manifestations, then it looks like F is not its own causal basis, as Criterion 2 requires. So the worry is that the instantiation of F by O cannot constitute a ground for F's continuous existence without some further property of O also constituting a causal basis for F's manifesting.

In support of this, consider that when F is not manifesting, it is natural to say that O is disposed to manifest in such-and-such a way. But what makes it the case that O is so disposed? Here is one answer: O simply has F. But what does it mean to say that O *has* F, if not to say O has the property of being the way of having F, and having the property of being this way, W, is a categorical property. But given the tight connection between W and F, the worry is that W is causally relevant to F's manifesting. So F is not a pure disposition. A second answer: O is the kind of thing that has F. So, O has the categorical property of being an instance of the kind of thing that has F. This seems to repeat the view that F is a way that O is and this takes us back to the response to the first answer. A third answer: O has F in virtue of the instantiation relation between O and F. But O having this instantiation relation is a categorical property of O, and threatens to serve as a causal basis for F. For what is the nature of the instantiation relation? Suppose the instantiation relation is supervenience, then what is the supervenience base? It must be some intrinsic property of O, and this implies that the purity of F is lost. Because supervenience is a covariance relation, it seems that the supervenience base will form a causal basis for F.<sup>19</sup> Thus, by constantly having to invoke some non-F property of O to account for O being the way it is, the non-F property becomes not just a ground for F's being but also part of the causal basis of F, since the non-F property will be causally relevant to F's manifestation.

If F is grounded in its object-bearer by just being a way O is, then when F is not manifesting there remains a question about how O instantiates F, or what it is about O such that it has F, or what F is doing when not manifesting. This issue haunts all of the possible answers mentioned in the previous paragraph. The underlying idea behind the critique being advanced against (Object) is that if properties are ways objects are, then this way will be inextricably tied to this object (if not, then F could float free, and have no causal basis, and thus an object is not the grounds for F). This object will have the property of continuously existing, thus grounding F's being too. But whatever makes O the way that it is, if it is some further property beyond F, as it plausibly must be, then that property will be caught up in the causal process of F being stimulated. Thus, F will have a causal basis and not be pure.

One might retort that on (Object), it is simply a brute fact about O that it has F. If so – if this way O is does not subtly assume some further property that threatens to be a causal basis for F – then the pressing concern seems to be how O *grounds* F, the purpose of (Object) in the first place. If F is grounded by O, and grounding is a relation between properties, then some further property must be involved in the grounding base; then the worry is that this further property is causally relevant to F's manifesting, i.e., that it constitutes a causal basis for F.

This is problematic on *any* non-self-grounding account of pure dispositions, not just (Object), although it seems especially worrying on (Object) because the further grounding property is intrinsic to the very object that possesses F, unlike on

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<sup>19</sup> Suppose the instantiation relation is identity (that is, F is its own instantiating property in O). Then F is pure, but F's being instantiated by an object makes no ontological difference – F grounds itself, exactly the theory to be elaborated below.

other theories discussed above that invoke extrinsic grounding properties. It is true that I argued in section 2 that grounds and causal bases can come apart in intrinsic cases as well as extrinsic cases. But the kind of case I envisioned there was a case where each property of a bundle object was grounded in the other properties of the bundle, and where each property had a distinct existence apart from the bundle. But in evaluating (Object), I have explicitly assumed a non-bundle theory of objects where the properties of objects are ways of the object, and not separable from them.

In sum, I tentatively conclude that (Object) is not a satisfactory account of the being of pure dispositions. If properties of objects are *ways* objects are, then if F is stimulated, so must be some further property of O; thus F has a causal basis. Note that my critique of (Object) applies straightforwardly to (Bobject) as well, to the extent that the Bobject is a substantial object and not a bundle object.

I want to return briefly to the bundle theory of objects as a possible account of F's being. The idea is that elementary particles are just bundles of compresent pure disposition tropes; e.g., electrons on this view would just be bundles of mass, charge, and spin. The other dispositions of a bundle-object ground a given F; e.g., mass-charge grounds spin, spin-charge grounds mass, etc. Do these other dispositions form a causal basis for F's manifestation, thus violating Criterion 2? I argued in section 2 that this is not the case, in arguing that grounds and causal basis may come apart (Assumption 2), using the bundle theory as a possible case of this (a *mass-charge-spin* bundle object). But even if I am right about this, I am reluctant to invoke the bundle theory because of other problems. First, there is the possibility of having 'free' mass, charge or spin; i.e., these properties may be able to exist alone or float free, apart from the bundle objects that bear them. Second, if there are other options to account for the being of F that do not assume a particular view of objects, then it is dialectically advisable to pursue those options.

Other accounts have also rejected objects as grounds for the being of pure dispositions. Molnar (2003: 151-2) thinks that the properties of elementary particles are pure dispositions, but he holds that the objects that bear these pure dispositions are point-size elementary particles. So there is no *object*, properly speaking, if objects require extension. Mumford (2006) thinks that since fundamental particles have no parts (they are simple), and since fundamental particles have no other properties beyond their dispositions, this means that the fundamental dispositions do not supervene on either parts or properties of elementary particles. It seems that the elementary particles are just bundles of dispositions on this view. But whatever the object is, it is not something that grounds the being of pure dispositions.<sup>20</sup>

The upshot is that pure dispositions seem to be ontologically independent of objects; if they are instantiated by objects it is a contingent instantiation. I have argued that (Global), (World), (Object), and (Bobject) as a sub-theory of (World) and (Object), do not satisfactorily solve the Problem of Being. The theory that I think best answers the Problem of Being maintains that pure dispositions are self-grounded.

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<sup>20</sup> Williams (2009), arguing against Mumford (2006), suggests that particular elementary particles must *be some way* at all times, and this is nothing less than having a categorical property. If this way an object is, is categorical and grounds a 'pure disposition', then that disposition would not be pure.

## 6 The Self-grounding Theory

The theories evaluated thus far appear to satisfy Criterion 1, while Criterion 2 and other considerations put pressure on the theories. If we interpret the Problem of Being as a question of what a pure disposition, F, is doing when it is not manifesting, then it is plausible that none of the theories satisfy Criterion 1. Moreover, it seems that coming to grips with the Problem of Being consists in explaining how F continues to exist when un-manifested *regardless* of what is happening outside the spatiotemporal boundaries of F itself and regardless of the status of other entities. One might think this is so because it seems there could be a world in which there is only one entity, a solo pure disposition; this is consistent with the self-grounding theory, but not the other theories which look beyond F itself.<sup>21</sup> If a solution can be given to the Problem of Being that satisfies Criteria 1 and 2, without the problems of the other theories, then that account holds favor.

As the Problem of Being indicates, for any pure disposition, F, a satisfactory theory should explain F's continued existence (i.e., the ontological grounding of F) without invoking additional categorical or dispositional properties that constitute a distinct causal basis for F's manifestation, lest F not retain its purity.

Crucial to the self-grounding theory is the assumption that F can be its own causal basis, as defended by McKittrick (2003a) and introduced as Assumption 1 (in section 2).<sup>22</sup> When a manifestation occurs, it is F itself (and not some additional property that F supervenes on, or is realized by, etc.) that is stimulated, triggering F to manifest. Hence, F does not have a *distinct* causal basis. This is important to the self-grounding theory since some explanation is needed concerning what is causally relevant to F's manifesting.

So how is it that a pure disposition, F, is ontologically grounded, but nonetheless F does not have a distinct causal basis? The correct answer, I propose, is that (i) F is its own causal basis (so the causal basis is not distinct from F) and (ii) F is its own grounds for being. So the self-grounding theory is simply:

**(Self-grounded)** Any pure disposition, F, grounds itself and is thus solely responsible for its continuous existence.

The theory of self-grounding holds that F accounts for its own continuous existence, without invoking any properties that would constitute a distinct causal basis for F; so, F remains pure as required by the Pure Dispositions Thesis. Mumford (2006: 485) similarly answers the Problem of Being, arguing that a pure disposition is grounded in "Nothing other than itself. It grounds its own manifestations." However, in giving this answer he affirms McKittrick's idea (that F can be its own causal basis) and then seems to assume that this implies that F is self-grounded, without giving any further explanation of the phenomenon of self-grounding as it pertains to dispositions. Similarly, Handfield (2008: 306) suggests that a pure disposition is

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<sup>21</sup> However, a solo pure disposition is consistent with the priority monistic version of F's grounding too. But, in that case the World=F, so F is simply self-grounded.

<sup>22</sup> So, a pure disposition (or 'bare disposition' in McKittrick's terminology) has no causal basis either in further dispositions or categorical properties, but it is its own causal basis.

identical to its causal basis in the context of trying to account for its grounds for being.<sup>23</sup>

However, if F is its own causal basis that does not necessarily mean that F is its own grounds for continuously existing. This is because the causal basis of a disposition and the grounds of a disposition may be different, as argued in section 2. Importantly, this may be true of pure dispositions too: e.g., although a pure disposition might be its own causal basis, it may be ontologically grounded extrinsically (where the grounds are not part of the causal basis), or in other ways evaluated in sections 3, 4, and 5. Thus, F's self-grounding does not necessarily follow from the fact that F is its own causal basis, as Mumford and Handfield suggest. To convincingly argue for the self-grounding theory – thus yielding a triple identification between the causal basis of F, the grounds of F, and F itself – one needs to rule out other grounding options. Thus, supposing the evaluation conducted in previous sections has effectively ruled out other grounding options, we can tentatively infer that (Self-grounded) is correct. Additionally, considerations of ontological simplicity seem to favor the self-grounding of F, at least as compared to options that invoke an additional ontological category of substantive objects (understood as substances instantiating properties). Regardless, whether or not I have effectively ruled out other grounding options, (Self-grounded) remains a legitimate contender worthy of examination.

Suppose that F is self-grounded. It is not clear how this accounts for F's continuous existence. That is, *how* is F self-grounded? How does F account for its own continuous existence through periods of non-manifestation? I will next develop a principle concerning how pure dispositions are self-grounded. Though having a viable explanation of F's self-grounding does not completely rule out other grounding options, it at least enhances the plausibility of (Self-grounded).

## 7 The Principle of Minimally Sufficient Occurrence

How does F ground itself? What does it mean for F to be self-grounded? I suggest the following principle in support of (Self-grounded):

**Minimally Sufficient Occurrence:** A pure disposition, F, is self-grounded if and only if F undergoes a minimally sufficient occurrence of F's own power when F is not engaged in one of its more characteristic manifestations.

This principle is a supposition to explain F's continuous existence or being when F is not manifesting one of its other possible, and generally characteristic, manifestations. The characteristic manifestations are those manifestations comprising F's causal role in a system of dispositions (more on this below).

One motivation for this principle is the idea that we should look to the nature of F itself for an explanation of F's continuous existence, already implicit in the idea of self-grounding. In looking to the nature of F, we are drawn to the powerhood of F. The core idea is then that F's persistence or continuous existence lies in

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<sup>23</sup> Handfield (2008) does not necessarily affirm that this is the best solution to what I call the Problem of Being. In fact, he proposes two competing theories: what I call (Global) and (Self-grounding) in sections 3 and 6 respectively.

manifesting a minimally sufficient range of its power.<sup>24</sup> By ‘range’ I mean the total set of possible manifestations F can undergo. So, this proposal assumes the following:

**Assumption 3:** Any token disposition, F, is multi-track, such that F can manifest in multiple ways depending on the manifestation circumstances.<sup>25</sup>

This means that a token disposition may receive multiple kinds of stimuli and thus may manifest in multiple ways. In other words, dispositions possess *the power* to manifest in many ways. As such, an instance of a pure disposition has a set of many powers (Mumford 2004: 171). Assuming pure dispositions are multi-track, a minimally sufficient occurrence is just *one* of the possible ways F can manifest, so F’s total dispositional nature is much more than its capacity for minimal manifestation. Thus, while F does not nearly manifest all it is capable of at any given time, F does manifest some of its power thereby continuously existing and staying ready for future characteristic manifestations.

Mumford (2006: 485) raises the Problem of Being when he asks: “in what, actual, does an unmanifested, elementary casual power [i.e., pure disposition] consist?” Similarly, Psillos (2006) asks what pure dispositions do when they are not manifesting. The answer I am proposing is: Pure dispositions are not ever in a non-manifesting state – yet they *are* dispositions. Thus, my proposal rejects the condition assumed in the Problem of Being that any pure disposition may be in a completely latent state.<sup>26</sup>

I will now develop my proposal by answering five questions about it, including whether a minimally sufficient occurrence implies that pure dispositions are categorical properties.

The first question is: *What kind of manifestation is a minimally sufficient occurrence of F?* Perhaps it is best to cast the answer negatively: The minimally sufficient occurrence of F is *not* a characteristic manifestation of F. The characteristic manifestations of F are those possible manifestations related to the causal role F typically occupies in a system of dispositions that includes some of F’s disposition partners, i.e., dispositions that may trigger F and that F may trigger (Heil 2003: 11). This can be differently understood from an epistemological perspective: the characteristic manifestations of F are typically those by which we, observationally or theoretically, identify and define F, based on the variety of possible stimuli that in fact, or might, trigger F. But we don’t identify or define F by its minimally sufficient occurrence, so it’s not a characteristic manifestation in the sense given. Suppose mass is a pure disposition; mass is identified and defined in terms of its causal role with other instances of mass and other relevant dispositions,

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<sup>24</sup> On this view, persistence is dispositional, not categorical; cf. Williams’ (2005) concept of static dispositions.

<sup>25</sup> Ryle (1949) introduced multi-track dispositions, and others have posited them, e.g., Martin (2008) and Mumford (2004). Such dispositions are capable of manifesting in different ways given the variety of stimuli they are subjected to; e.g., a token of fragility might manifest as shattering, cracking, or chipping. The minimally sufficient occurrence of a pure disposition is just one track of its power.

<sup>26</sup> Maybe the proposed theory of self-grounding only answers a narrow interpretation of the Problem of Being, concerning what F is doing when not manifesting. In that case, the proposal at least presents a narrowly defined solution worthy of examination.

such that these resultant manifestations, but *not* a minimally sufficient occurrence of mass, constitute its characteristic manifestations.<sup>27</sup>

However, this account of F's characteristic manifestations does not imply that the minimally sufficient occurrence of F is not subsumed by the complete *causal profile* of F, for a minimally sufficient occurrence does have causal significance – specifically, in grounding F. Two points, however, differentiate the causal roles related to all of the characteristic manifestations of F, and the causal role F has in maintaining its being via a minimally sufficient occurrence. First, the latter is not the kind of causal role typically used in identifying and defining F since *all* pure dispositions, if this theory is correct, will have such a power to occur minimally sufficiently to ground their being, and second, F's minimally sufficient occurrence is not the result of the interaction of F with a disposition partner as F's characteristic manifestations are.<sup>28</sup>

Given these details, here is a more precise statement of the relation between the minimally sufficient occurrence of F and F's characteristic manifestations: Given that F is multi-track, and has the power for both characteristic manifestations and a minimally sufficient occurrence, then F manifests its minimally sufficient occurrence during any segment of time, so long as during that segment of time, F is not activated by a stimulus, S, that triggers F to undergo a characteristic manifestation; and if S does trigger F into a characteristic manifestation, then when the characteristic manifestation stops, F reverts to its minimally sufficient occurrent state. So, F need not minimally sufficiently occur at all times, but only when F is not manifesting characteristically. Indeed, F need not *ever* manifest in a minimally sufficient way, supposing F is constantly involved in characteristic manifestations, as may be true of the dispositions of fundamental particles, for example (often cited by proponents as examples of pure dispositions).

So, a minimally sufficient occurrence is not an occurrence or manifestation of a kind that is characteristic for F, but it is consistent with the kind of disposition that F is, for it falls within the total cluster of possible manifestations of F. If F is mass, for instance, then the minimally sufficient occurrence necessary for mass' being is, indeed, a manifestation of mass. F's minimally sufficient occurrence means that F is undergoing the process of manifesting some of what it can do and it is this fact that accounts for F's continual existence when not engaged in its characteristic manifestations.

As an analogy, suppose the familiar disposition fragility is a pure disposition. A characteristic manifestation of fragility would be cracking, for instance. But a minimal manifestation of fragility would be a case of the ever-so-slightest cracking or a prolonged (over days or longer) cracking, perhaps undetectable to unaided human observers. The suggestion is that fragility continuously manifests itself thus maintaining its being, yet it is continually capable of manifesting in many more

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<sup>27</sup> Given the distinction between 'characteristic manifestations' and the 'minimally sufficient occurrence' or manifestation, one might just call the latter "non-characteristic manifestation"; however, the former phrase captures the idea that the kind of manifestation picked out is *sufficient* for the continuous existence of F.

<sup>28</sup> A minimally sufficient occurrence of F *may* be insufficient for detecting F, unlike F's characteristic manifestations. That is, our best possible observational techniques may indicate no manifestation of F even when F is undergoing a minimally sufficient occurrence.

ways.<sup>29</sup> It is important to note that because fragility has a distinct causal basis, the minimally sufficient occurrence of fragility requires that its causal basis be triggered by a stimulus typically associated with fragility's characteristic manifestations. This is unlike pure dispositions, on the theory being offered. This is because – assuming characteristic manifestations are generally associated with what we might call characteristic stimuli – the minimally sufficient occurrence of F does not require a characteristic stimulus.

With the core of the theory now in place, one might object that any property X needs to exist (be instantiated) in order to do something, whereas my claim implies that X's doing something gives X existence; so F's existing in virtue of its minimally sufficient occurrence (a type of functioning) seems to incorrectly reverse the order of existence and functioning. Temporally, existence comes before functioning, whereas my account implies that functioning comes first. However, this is not what my theory claims. Rather, my theory is that F's continuous existence just *consists in* its functioning (i.e., displaying its power): existence and functioning are packaged together in pure dispositions. The series of manifestations F undergoes, including its minimally sufficient occurrences, is a dynamic process of continual dispositional self-generation.

The second question is: *If the minimally sufficient occurrence is an event (a manifestation event), how does an event ground a property?* In other words, given that properties generally ground properties, how is it that an event (i.e., a minimally sufficient occurrence) accounts for the grounding of F?

The manifestation event does *not* ground F; rather, the grounding of F's being just *is* a manifestation event. To explain this answer, following Kim (1998) I will suppose that events are property-exemplifications: an event,  $E$ , =<sub>df</sub>  $(x, P, t)$ , an object  $x$  exemplifying a property  $P$  at a time slice  $t$  or temporal interval  $t_1...t_n$ . (If F is not borne by an object, then  $x$  drops out of the definition, or perhaps spacetime exemplifies F). Assuming that this theory of events is right, F's manifestations are property-exemplifications. Thus, the event of F exemplifying one track of its power at any given time  $t$  or from  $t_1$  to  $t_n$ , i.e., undergoing its minimally sufficient occurrence, is the basis of F's being or continuous existence over time.

On the proposed solution to the Problem of Being, F's self-grounding via a minimally sufficient occurrence is an event that keeps F remaining ready for further exemplifications of its power. If a given minimally sufficient occurrence of F is temporally extended, then it is a temporally extended event, or process – i.e., a powerful or dispositional process. An interesting implication of this event-theory of F's self-grounding, is that if pure dispositions are fundamental properties then the fundamental entities or constituents of the world are events.

The third question is: *What happens when F manifests in a characteristic way?* Then, the minimally sufficient occurrence stops.<sup>30</sup> Thus, there are (near-by)

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<sup>29</sup> It is not so implausible that fragility is continuously manifesting some of its power, if one considers that a fragile glass is constantly bombarded with particles, dirt, etc. So despite appearances it is not obviously false that the glass is minimally manifesting its fragility by slowly breaking over an extended time. Of course, this does not mean that fragility needs to manifest minimally in this way, whereas on my theory pure dispositions do need to manifest minimally sufficiently to continuously exist.

<sup>30</sup> We might call the minimally sufficient manifestation state of a pure disposition its 'static-side' as opposed to its more 'dynamic-side', to differently employ the distinction between static and dynamic dispositions introduced by Williams (2005). (He employs the distinction

possible worlds in which F is not manifesting a minimally sufficient range of its power, i.e., worlds in which F manifests in one of its characteristic ways. Thus, F is not continuously manifesting *all* it is capable of in all possible worlds (if it were, this would seem to make it a categorical property). When F displays one of its characteristic manifestations, then it is not minimally sufficiently occurring. Thus, the fact that F undergoes a minimally sufficient occurrence when not undergoing a characteristic manifestation does not make F categorical because it need not always undergo a minimally sufficient occurrence, just as the other possible manifestations of F are occurrences of F and do not make F categorical.<sup>31</sup>

Still, one might press that because F is continually manifesting *some* of its disposition – or something of which it is capable – this makes it categorical. But why is this so? A categorical property, strictly speaking, is not capable of manifestations as dispositions are. A categorical property is what it is at any given time, whereas a disposition is full of possibilities, even while manifesting some power (although there are some dispositions like fragility that release all of their power, so to speak, on some of their manifestations).

The fourth question is: *What is the activating condition (or stimulus) for F's minimally sufficient occurrence?* Assuming that characteristic manifestations of F are generally associated with characteristic stimuli, the minimally sufficient occurrence of F does not require a characteristic stimulus.

However, it may not even require a non-characteristic stimulus, for perhaps F's minimally sufficient occurrence is spontaneous or self-generated (akin to radioactive decay). On that view, then F is its own stimulus for its minimally sufficient occurrence. But if a stimulus is required, perhaps it is constituted by negative conditions: F being in the absence of stimuli appropriate for F's characteristic manifestations. Yet another possibility is that F being situated in spacetime stimulates it to undergo its minimally sufficient occurrence (implying that F could not exist sans spacetime, which seems true for all concrete entities). For example, if mass is a pure disposition then perhaps its minimally sufficient occurrence is the bending of spacetime.<sup>32</sup>

The fifth question is: *Does a minimally sufficient occurrence of F make F categorical?* This is important because it questions the power-hood of pure dispositions. On the theory I am defending, pure dispositions continually manifest their power. In contrast to Psillos (2006: 141), I am claiming that continually manifesting dispositions may still be dispositions, not categorical properties. Once we accept that pure dispositions need not manifest everything they are capable of at any given time, we can allow that they undergo a minimally sufficient occurrence during stretches of time when they are not manifesting in more characteristic ways.

However, suppose that F undergoing minimal occurrence indeed implies that F is not a disposition but a categorical property. Then, if the proposed theory is the best available response to the Problem of Being, then the overall argument of this essay should be construed as a *reductio* of the Pure Dispositions Thesis. This would be a significant conclusion in its own right. On the other hand, if a minimally

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for instances of different kinds of disposition, whereas I am suggesting it be used for different tracks of power of a token disposition.)

<sup>31</sup> Some pure dispositions may be gone forever once they undergo a certain type of manifestation, while others may retract back to a minimally sufficient occurrence state after any of their other possible manifestations occur.

<sup>32</sup> Thanks to Luke Elwonger for this example.

sufficient occurrence of a pure disposition does not imply that pure dispositions are categorical properties, then we have a viable theory of the being of pure dispositions.

I maintain that we can avoid the problem – that F's continuous manifestation of any sort along F's possible lines of manifestations implies that F is categorical – by attending to the distinction between 'occurrent' and 'categorical'. Sometimes these terms are used interchangeably. However, by an 'occurrent' property I mean a disposition in a state of manifesting – a disposition is *occurring* (or, manifesting). This is a dynamic process. As with all manifestations F may undergo, the minimally sufficient occurrence of F does not necessarily make it categorical. A categorical property like having shape is supposed to be static, possessing a quality of 'just-there-ness' (Armstrong 2004: 141). A categorical property may be a leftover of some causal process involving dispositions in the past – a glass' microstructure, for example. But an *occurrence* of a pure disposition, or any disposition, is the process of the disposition actively manifesting.

Categorical properties are complete in the sense that they fully 'manifest' all they are capable of at any given time. By contrast, dispositional properties are not fully manifest. Each manifestation of a disposition, including a pure disposition, just taps the surface of potentiality built into it. This is why they are modal properties. Hence, F continuously manifesting some of its power (whether a minimally sufficient occurrence or a characteristic manifestation) does not imply that F is categorical. F's total multi-track power remains intact even while manifesting some of its power. Thus, since pure dispositions do not display all they are capable of at any given time, to say they are categorical like traditional categorical properties is misleading. F is not categorical because it is always full of threats: even as it is manifesting in one way, it is capable of manifesting in another way. At the most, some limited range of F's power is displayed at any given time, which is to say that the disposition is undergoing a process of manifesting, not that it is categorical.<sup>33</sup>

The opponent of the Pure Dispositions Thesis might respond that a minimally sufficient occurrence of any pure disposition implies that it has a categorical aspect, as according to the dual-aspect theory found in Martin (2008), or that it implies that any pure disposition is identical to a categorical property (Heil 2003); if either view is true, then the Pure Dispositions Thesis is false. It is worth noting that on both of these views properties have dispositional natures and are identified in terms of their causal roles. A prime motivation for adding a categorical dimension, to what are otherwise fully dispositional properties, is to account for their continuous existence (the idea is that to say a property X is 'categorical' is to say that X is always there). Despite this, restricting discussion to the fundamental properties on the dual-aspect view or identity thesis, it is plausible that it is the dispositional nature of these properties, *not* the added categorical dimension, in virtue of which they continually exist. This is because continuous existence appears to be a causal process.

Rather than invoking a categorical aspect or an identical categorical property to explain the continuous existence of what would otherwise be pure dispositions, my account offers an explanation of the being of pure dispositions that

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<sup>33</sup> Still, one might maintain along with Mumford (2006: 485), who accepts the Pure Dispositions Thesis, that pure dispositions are just as 'categorical' as traditional categorical properties. That is, pure dispositions have a categorical existence just as categorical properties do, yet throughout their existence they are potent.

invokes the powerful nature of such properties. On my view, pure dispositions are purely powerful and continuously manifesting some of that power. Perhaps this is similar to the sense of categoricalness sought by the dual-aspect or identity theorist. But my account differs from these views in that F's being is explained by reference to F's power, i.e., by reference to F's dispositionality.

## 8 Conclusion

In sum, this paper proposes that pure dispositions are self-grounded in virtue of continually manifesting a minimally sufficient range of their total multi-track power. Thus, pure dispositions continuously exist because of their own power and thereby remain ready for all of their other possible manifestations.

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