The Powers View of Properties, Fundamental Ontology, and Williams's Arguments for Static Dispositions

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1 Introduction

Dispositions have been receiving renewed interest from metaphysicians, and rightfully so. According to the powers view of properties, properties *just are* dispositions or powers.[1] Perhaps the most obvious advantage of including such properties in one's ontology is their providing a metaphysically robust account of causation, since their very nature embodies the forces central to causal interactions. However, in situating powers within a *fundamental ontology*, they can assist in theorizing about more than simply causation. They also afford resources for systematically engaging a host of metaphysical issues, such as consciousness, intentionality, laws of nature, and modality (Bird 2007; Heil 2003, 2012; Martin 2008; Molnar 2003; Mumford 1998, 2004; Mumford and Anjum 2011). The present paper will examine the powers view of properties in the context of fundamental ontology, with a special emphasis on *static* dispositions.

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[1]Throughout this paper, I will use the terms "disposition" and "power" interchangeably.

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To lend some focus, we will take Neil Williams's (2005) position as our starting point. Williams advocates for a distinction between dynamic dispositions and static dispositions. Dynamic dispositions are dispositions whose manifestations result in some sort of change in the world. The change could involve, for instance, alteration in the properties of objects (e.g., the manifestation of litmus paper's disposition to turn from white to red when placed into contact with an acidic solution), or modifications in the arrangement of objects (e.g., the manifestation of Earth's gravitational disposition to move smaller objects towards it), or bringing about the existence of objects (e.g., the manifestation of the cohesive power of lumps of clay to form a larger lump of clay). In any case, the manifestation of a dynamic disposition will result in a different state of affairs than that which preceded its manifestation. Static dispositions, in contrast, manifest in ways that do not result in change.

To be precise, the static/dynamic distinction (and its ontological importance) ultimately rests on the corresponding kinds of potential *manifestations*. This becomes clear once faced with the question: can a single disposition count as both static and dynamic? It would appear so, were there a disposition capable of engaging in manifestations that result in change as well as those that do not. This suggests, then, that the distinction of primary interest is between static and dynamic *manifestations*. This does not necessarily mean, though, that it is inappropriate to talk about static and dynamic *dispositions*. After all, powers view advocates take dispositions to be essentially tied to their potential manifestations, and therefore it might still make sense to speak of static and dynamic dispositions (especially if one's ontology limits every individual disposition to a single, unique manifestation).

In what follows, I will assess Williams's motivations for adopting static dispositions, from the standpoint of the basic ontology of the powers view of properties. Williams himself, as we will see, is not necessarily concerned with such fundamental ontology. Still, he provides a useful starting point, a springboard for diving into the deeper metaphysical waters of the dispositionalist approach. And in that ontological context, I will contend that Williams's arguments fail to establish static dispositions, or at least any sort not already well appreciated by advocates of the powers view of properties. I will then proceed to suggest an alternative motivation for positing static dispositions, the success of which will turn out to depend greatly on which ontological approach to objects is paired with the powers view.

2   Williams's Advancement of Static Dispositions

Williams proposes three kinds of static dispositions:

1. Static dispositions for internal stability

2. Static dispositions for external stability

3. Static dispositions involved in threshold conditions.

To motivate adopting (1), Williams offers the disposition to continue to exist. Some objects, such as those we typically refer to as combustable (e.g., firecrackers and nitroglycerin), have the *dynamic* disposition to go out of existence when in certain circumstances. In contrast, suggests Williams, there are objects whose existences are more stable. Moving along the continuum towards increased stability, there will be

the most stable of objects, disposed to persist in any given conditions. In order to account for such continued existence, claims Williams, one should attribute to those objects a *static* disposition to persist.

As additional support for (1), Williams offers the disposition for an object to maintain its shape (as well as dispositions to maintain any other intrinsic "primary qualities" an object might have). Again, Williams draws our attention to a continuum from frailty to stability. Some objects are more disposed to change shape (e.g., a balloon) while others are more disposed to keep their shape (e.g., a bowling ball). This latter, static end of the continuum, says Williams, is in need of explanation no less than the former, dynamic end. He insists that static dispositions fill that role—an object's maintaining its shape across a diversity of conditions is neither a miracle nor a mere accident but, rather, due to the object's static disposition to maintain its shape.

Turning to (2), Williams invites us to consider a possible world inhabited by only two electrons, identical in their dispositions. Concerning their dynamic reciprocal dispositions, they have only the following: to repel each other if they were to come within one meter of each other. Now, asks Williams, what should we say about the behavior of the electrons when they are more than a meter apart? The answer, argues Williams, requires positing static dispositions:

> It is not enough merely to say that they will not repel one another—
> that is nothing more than a recognition that the conditions for one of
> their mutual manifestations has failed to obtain. If we assume that the
> two electrons are currently one thousand metres apart, then some other

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dispositions, for some other manifestation, must be at work. These are the static dispositions. (2005, p. 313).

According to Williams (2005, pp. 313-314), a complete causal system will not lack causal "instructions." Such a system will have causal instructions (dispositions) indicating what each object must do in every environment and arrangement in which it might find itself. So, in the two-electron world, there must be dispositions indicating what the electrons should be doing when they are not within a meter of one another. And given the assumption that the only dynamic reciprocal disposition they have is to repel when within a meter of one another, that leads us, claims Williams, to posit static dispositions regarding how they relate to one another: carrying out those causal instructions requires no change but, rather, enables them to "carry on as usual" (2005, p. 314).

Lastly, there is the third kind of static dispositions, those involved in "threshold" conditions. Williams's example is a light bulb that will light up only when it receives 50 or more watts, making 50 watts the threshold point for the bulb's lighting. When the threshold point is reached, the bulb's lighting is a mutual manifestation of the dynamic reciprocal dispositions of the bulb and the electricity. Williams asks: what should we say about the behavior of the bulb when the input of watts is less than 50? He rejects what he takes to be the standard view, which is that nothing is happening: "On the standard view, threshold points mark dramatic changes on the basis of minuscule changes in conditions, and claim that for *any* input less than the threshold, absolutely nothing takes place" (Williams 2005, p. 316). Instead, suggests Williams, we should see the bulb's activity prior to 50 watts of input as

involving static dispositions, which are responding to the input of watts, yet doing so by maintaining the bulb's state of being unlit:

> Without the presence of the static disposition, the threshold point looks rather like a magical point at which something can come from nothing. If instead there are various dispositions corresponding to the various wattages, then the threshold marks the change in the kind of manifestation, and not a magical boundary between a causal event and nothing. (2005, p. 317)

With the worry here of a "magical" boundary, we again see Williams's determination to avoid instructionless regions in the causal network. And, as with the cases considered above, he once again posits static dispositions to fill that causal role.

3   The Powers View of Properties and Fundamental Ontology

Williams is a realist about dispositions in the sense that "dispositional ascriptions capture genuine states of objects in virtue of the properties they possess, and are not just statements about past or possible behavior" (2005, p. 304). This version of realism is rather weak in that it is not committed to those truthmakers (for dispositional claims) being themselves dispositional—the truthmakers simply need to involve some sort of genuine properties. Although Williams attempts to remain neutral on whether or not dispositions are fundamental or identical with those properties

making true our dispositional claims, he evidently favors (at least to some extent) the powers view of properties: "My tendency is to think that properties themselves are at least partly dispositional in nature, and are capable of supporting numerous dispositional states of their bearers, but nothing hangs on this" (2005, p. 304).

As indicated in the introduction of this paper, dispositional accounts of properties (or powers views) have received renewed interest from metaphysicians.[2] Such ontologies, especially in trying to get significant mileage out of dispositions (like providing a fruitful account of causation), cannot afford to be as neutral as Williams regarding the ontological status of dispositions. They must take a more robust view of dispositions, according to which dispositions are among the ultimate truthmakers, in one's basic ontology. This is compatible, of course, with there being non-fundamental dispositions, what Peter Unger (2006) refers to as "derivative" dispositions, and what tend to be the focus of Williams's examples. Still, for those championing the powers view of properties, the ontological weight placed upon dispositions will ultimately rest on the backs of the fundamental dispositions/properties, often leaving derivative dispositions to be dispositions by courtesy (not by serious, ontological anointment).[3]

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[2]It is worth noting a major distinction within the powers view, concerning how to understand the nature of a power. According to the pure powers view (Bird 2007; Mumford 2004; Mumford and Anjum 2011), the powerful nature of a property is in no way qualitative (or categorical). Yet other powers view proponents advocate for the identity thesis (Heil 2012; Jacobs 2011; Martin 2008), according to which the powerful nature of a property is identical with its qualitative nature, making properties *powerful qualities*. For the purposes of the discussion to follow, however, this difference among powers view advocates can be safely set aside.

[3]John Heil (2012), for instance, warns against taking layers of *description* to correspond to *ontological* layers. Granted, those layers of description can all be true (and so one can be a realist about the higher-level entities posited in those true claims), but it does not follow that the truthmakers for those claims are similarly layered. The "linguisticization" of metaphysics, the temptation to read off ontology from the structure of our language, should be resisted.

Now granted, many dispositionalists will use non-fundamental entities in order to elucidate, motivate, and defend their positions. Heil (2003, 2012), for example, is concerned with fundamental ontology and yet appeals to cases apparently involving non-fundamental objects, such as salt dissolving in water, cards leaning against one another, and billiard balls colliding. Does this mean that Heil is committed to adopting salt, water, cards, and billiard balls into his fundamental ontology, or that we must regard his dispositionalism as failing to address fundamental ontology? No. When so working with non-fundamental entities, Heil regularly reminds us that he is *treating* them as ontologically robust, when they are not actually such. The entities we regularly observe in our daily lives have a familiarity that is valuable for conveying concepts employed in characterizing fundamental ontologies (e.g., the concepts of substance, property, and disposition), even if those concepts apply to those entities by courtesy only. Thus, one can use everyday entities to motivate ontologically basic concepts, so long as those entities are *at least* treated as fundamental. And if one is *merely* treating them as fundamental, then one need not thereby allow those entities into one's basic ontology.

With this paper's focus on fundamentality, or basic ontology, firmly in hand, we can now get down to ontological business. In the sections that follow, I will assess the prospects for admitting Williams's three kinds of static dispositions to the basic ontology of the powers view.

4   Static Dispositions Involved in Threshold Conditions

Consider first Williams's attempt to motivate static dispositions using threshold conditions. His example, recall, features a light bulb with a threshold point of 50 watts for lighting up, prompting Williams to ask about the behavior of the bulb when the input of watts is less than 50. According to the so-called "standard view," the bulb is entirely unresponsive to the electricity, and there is no causal interaction between the two at all. Now, against this account, Williams's positing of static dispositions responding to the input of watts (by maintaining the bulb's state of being unlit) holds some initial appeal, since it avoids what otherwise looks like "a magical point at which something can come from nothing...a magical boundary between a causal event and nothing" (Williams 2005, p. 317). I am concerned, however, that the "standard view" to which Williams responds is a straw man, a non-starter. Clearly, the bulb does respond in a *dynamic* fashion to the watts that are greater than 0 but less than 50. The bulb, for instance, gets warmer, which is a dynamic mutual manifestation of the powers of the bulb and the powers of the electricity. Granted, the bulb's temperature is not used to characterize the relevant threshold condition. But that should not matter, since we are simply concerned with the bulb "seeing," as Williams (2005, p. 316) anthropomorphically puts it, the input of watts under 50.

There is another, more general concern with Williams's use of threshold conditions in arguing for static dispositions. As we have just seen, an object can very well

react in a dynamic fashion prior to reaching the relevant threshold (although the change will not be the same change involved in meeting the threshold). Therefore, in order to motivate the positing of a static disposition, Williams needs to focus on the fact that, prior to the threshold, the object is not changing in the way it would were the threshold met. This, however, is just the sort of argument made in motivating his other two kinds of static dispositions: those for internal stability and those for external stability. To see this, consider again his examples of the bowling ball and the two electrons. The bowling ball will retain its shape through a certain degree of circumstances, before it reaches a relevant *threshold* (e.g., too much pressure or too high a temperature) and the dynamic disposition to change its shape manifests. The two electrons will maintain their position relative to one another, unless they reach the one meter *threshold* and their dynamic dispositions to repel manifest. According to Williams, these stabilities are due to static dispositions for internal and external stability, respectively. Hence, the argument for static dispositions involved in threshold conditions not only fails to establish a third, distinct type of static disposition but, further, is plausible only to the extent that Williams's arguments for the other two types of static dispositions are plausible.[4] Let us turn, then, to those arguments.

5 Static Dispositions for Internal Stability

As for Williams's bowling-ball case for internal stability, it invites a response proceeding from the following observation: the bowling ball maintains its shape due

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[4]Williams (2005, fn. 3) acknowledges, even if not to the extent indicated here, that there might be overlap between his three kinds of static dispositions.

to powers belonging to the particles that constitute the ball. Those particles have powers that enable them to engage in certain bonding relations, which preserves the shape of the ball across a diversity of conditions. Therefore, the stability of the ball can be explained without appealing to any internal disposition for stability; one need appeal only to dispositions for *external* stability between the ball's constitutive particles. Hence, the bowling-ball case might motivate the adoption of static dispositions, but dispositions for external stability rather than internal stability.

Recall, however, that in using examples of everyday objects to motivate ontologically robust positions, one must at least *treat* those objects as fundamental. The response above, in appealing to the constituents of the ball, is apparently not respecting that requirement regarding the ball. In order to guard against this sort of mistake, we can replace the bowling ball with a fundamental particle (or whatever basic object one's ontology includes), and consider the stable intrinsic properties of that object. Take, for example, a spherical Democritean atom. Its spherical nature is very stable and, consequently, a good candidate for Williams's line of reasoning: the atom's maintaining its shape is in need of explanation just as much as any change the atom might undergo, and a static disposition to keep its shape furnishes the needed explanation.

But Williams's argument, I charge, leads to a vicious infinite regress of static dispositions. Suppose we attribute to the atom a static disposition to maintain its sphericity. If, in one's basic ontology, there is no ontological distinction between properties and powers, then that static disposition of the atom will itself be a property. Moreover, it will be a property of the atom that is no less stable than the sphericity it

is maintaining. Consequently, applying Williams's reasoning, we should also demand an explanation of the atom's stability with respect to this second property (i.e., its disposition to maintain its shape) and, in turn, posit another disposition, namely, a disposition to maintain its disposition to maintain its shape. But, of course, this newly posited disposition will itself be a property no less persistent in the atom than its other two properties, which will prompt Williams's reasoning again, setting us off on a vicious infinite regress of static dispositions.[5]

This infinite regress problem applies as well to Williams's other case motivating static dispositions for internal stability: dispositions for continued existence. An object's disposition to persist will be no less stable than the existence it is maintaining, pushing Williams's reasoning to posit another disposition to maintain the object's disposition to persist, and so on and so forth. Therefore, both of Williams's motivations for static dispositions for internal stability suffer from a regress problem.

Of course, one might grant these regresses follow from Williams's argument, yet deny they are *vicious.* But even if, as certain replies to the cosmological argument for God's existence suggest, there is room to make such a case, it remains a highly controversial matter.[6] Thus, it would be nice for a powers view advocate to have an argument for static dispositions which did not require that, for *every* static disposition, there is an *infinite* number of further dispositions supporting it. It is one

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[5]Note that this regress problem is importantly different from the sort raised by E. J. Lowe (2006, p. 138). There, the concern is with fixing the *identity* of a disposition. Here, the regress is *causal* in nature, as one is not trying to explain the identity of a disposition but, rather, trying to explain every instance of internal stability by positing a static disposition.

[6]The controversy concerns not only the ability of an infinite regress of causes to be explanatorily satisfactory, but also the very possibility of an actual infinite in the spatiotemporal world. For a detailed summary of these debates, with extensive citations, see Bruce Reichenbach (2013).

thing to open your ontology to static dispositions, and quite another to embrace an infinite number of them!

Perhaps, though, an attempt to stop the regress from ensuing can be extracted from Unger's work (2006, ch. 5, sec. 19). Not only does Unger employ reasoning similar to Williams's in arguing for static dispositions, but he comes close to setting himself upon the infinite regress that I have raised. Yet Unger eventually stops at a comprehensive static disposition, where that disposition maintains all of the static dispositions of the object to which it belongs, *including itself*. While Unger, as far as I know, never explicitly considers the infinite regress problem I have raised here, there is a potential reply to be had using his introduction of a comprehensive static disposition: once the regress of Williams's style of reasoning reaches such a disposition, there is no need to posit a further static disposition, since the self-maintaining disposition accounts for its own stability—regress stopped.

Furthermore, if being self-supporting can be built into a disposition, then there is no principled reason for not stopping the regress sooner. Returning to our spherical atom, one might take the initial static disposition to maintain not only the atom's shape, but itself as well. This would then prevent Williams's style of reasoning from forcing one beyond the initial static disposition posited—regress stopped, before it even gets going.

Indeed, for those who take a "multi-track" view of dispositions, an even tidier solution becomes available. On such a view, a single disposition is capable of multiple kinds of manifestations, depending on the conditions or other dispositions with which it is paired. Consider the atom's sphericity once more. On a multi-track

powers view, that property of sphericity is a disposition that can manifest itself in a variety of ways. One manifestation of the atom's sphericity might be the atom rolling, were it appropriately paired with a much larger, rectangular atom. Another manifestation might be a certain indenting, were it appropriately paired with a "pillow" consisting of many, much smaller, spherical atoms. Furthermore, if dispositions can be self-supporting, then maintaining itself might be yet another track belonging to the atom's sphericity. In which case, the atom's sphericity could itself fully satisfy William's demand to explain the stability of the atom's sphericity, again stopping the regress before it gets going—one need not even venture beyond the initial sphericity/disposition at all![7]

Now, with this tidy solution, one would not get *purely* static dispositions, i.e., dispositions that manifest themselves statically, and *only* statically. But this would be no great loss as far as the argument for static dispositions for internal stability is concerned. As indicated earlier, the ontological significance of static dispositions is primarily in their ability to engage in static *manifestations*, which the multi-track appeal to self-supporting dispositions would preserve.

There is, though, a much more significant problem that arises for these appeals to self-supporting dispositions. Such self-supporting must be understood as involving either a synchronic or a diachronic account of causation. Yet both options, I will presently argue, are problematic: on the synchronic approach, one faces an implau-

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[7]William A. Bauer (2012), for example, advocates for this sort of multi-track approach to self-supporting dispositions. His motivation for adopting self-supporting dispositions, however, is not to avoid an infinite regress of supporting dispositions but, rather, to address the "Problem of Being" (i.e., the problem of explaining what a disposition is doing when it is not engaged in its characteristic manifestations.)

sible self-causation, while on the diachronic approach, it is difficult to see how the self-supporting involves a disposition for internal stability.

Among dispositionalist approaches to causation, the synchronic approach enjoys a good deal of currency.[8] This makes sense for those who construe causation as the *mutual* manifestation of disposition *partners*; such a cooperative affair naturally suggests a picture in which dispositions work together simultaneously (as apposed to a cause bringing about a passive effect that occurs at a later time). In fact, appreciation of the synchronic nature of causation is especially pronounced in cases of just the sort relevant to static dispositions.

One such popular case is that of two cards leaning against each other (forming a $\wedge$) upon a table. Heil, for instance, has emphasized that this is a standard case of causation, yet one not easily captured on what he calls the "received view," according to which causation is an *asymmetrical* relation between distinct events. The cards remaining upright is not easily captured in terms of one event, the cause, asymmetrically bringing about another event, the effect. Yet it is readily captured on a dispositionalist approach, according to which causation is a *mutual* manifestation of *reciprocal* powers: "The cards' remaining upright is a continuous mutual manifestation of reciprocal powers possessed by the cards and the table" (Heil 2012, p. 119). And, as Heil (2012, p. 120) makes evident, this (static) manifestation of the cards' positioning upon the table is *simultaneous* with the activity of the relevant disposition partners. Speaking to stability more generally, Heil writes:

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[8]See, for instance, Heil (2012), Martin (2008), Mumford and Anjum (2011), and Tugby (2010). It deserves emphasizing here that, as all of these authors remind us, *simultaneous* does not mean *instantaneous*. Disposition partners can simultaneously exercise their reciprocal roles in processes that unfold over time, such as in the case of salt dissolving in water.

Stability requires massive cooperation, the mutual manifestation of count-

less reciprocal powers to hold things together, to preserve the status quo.

Their holding together is an outcome, but one that *temporally coincides*

with their manifesting themselves as they do" (Heil 2012, p. 119, empha-

sis added).

Furthermore, regarding *self-supporting* dispositions specifically, Bauer (2012) ex-

plicitly takes the self-causing involved to be synchronic, with a disposition's existence

at a time being a manifestation of that disposition at that time.[9] But such self-

causation is highly problematic. To begin with, notice that attributing synchronic

self-causing to a stable disposition does not explain what it is supposed to explain.

To say that a disposition exists at a time, t, because it is manifesting itself at t

appeals to the very thing that we are trying to explain, namely, the existence of that

disposition at t. In which case, there is a vicious explanatory circularity involved in

synchronic self-causing.[10]

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[9]Again, Bauer appeals to self-supporting dispositions not in order to answer a regress problem
but, rather, in order to answer the Problem of Being. While there is not the space here to adequately
evaluate Bauer's motivations for positing self-supporting dispositions, it is clear that the problem
of synchronic self-causing that I am about to raise applies to Bauer's account.

[10]Note that this is not simply an instance of the *virtus dormitiva* objection, which is often raised
against dispositional explanation, and to which a number of replies have been offered (see e.g.,
Mumford 1998, pp. 136-141, and Mumford and Anjum 2011, p. 133). The charge there is that
since the phenomena being explained is built into the very characterization of the dispositions,
dispositional explanations are entirely vacuous and uninformative: e.g., the pill made one tired
because it has the power to make one tired. The problem being raised here goes further. In self-
causing dispositions, the problem is that the *occurrence* of the effect is appealed to in explaining
the disposition's ability to bring about the effect. It is analogous to saying that the pill had the
power to make one tired because one was tired—appealing to *the fact that* you are tired to explain
that very fact! This is not the case in the *virtus dormitiva* objection, since it does not assume that
the pill's power to make one tired is grounded in one's being tired.

There is an ontological difficulty as well. Stephen Mumford and Rani Lill Anjum's (2011) synchronic account of causation, for example, still takes seriously the notions of cause and effect. On their view, when a disposition manifests itself, the exercising of the disposition is the cause, and its manifestation the effect. Now, even if a cause is not *temporally* prior to its effect, it is still *ontologically* prior to its effect—the effect is *due to*, or *produced by*, the cause. But such ontological priority is incoherent in cases of synchronic self-causation, as nothing can be ontologically prior to itself![11]

If causation is a diachronic affair, however, with causes coming *before* their effects, then perhaps there is room for a disposition to preserve its own continued existence. In fact, Williams notes how, on a four-dimensionalist account of persistence, an object's persistence might be accounted for in terms of a sequential causal chain of object-stages: "present object-stages are themselves the cause of subsequent object-stages, and ... the very existence of the subsequent object-stages is the product of the powers of the present object-stages" (Williams 2005, fn. 13).[12] This account might be extended to all concrete particulars, applying to not only objects, but also par-

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[11]Mumford and Anjum (2011, pp. 118-119) do allow for reciprocal, symmetrical cases of causation, in which *a* causes *b* and, simultaneously, *b* causes *a*. They would count the case involving the cards on the table as just such a case, with the one card causing the other card to remain upright, and vice versa. However, as far as I understand their account, the symmetry is built from two instances of the (asymmetrical) cause-effect relation. In which case, generating such cases still requires treating a cause and its *immediate* effect as distinct, if Mumford and Anjum are to avoid making a disposition ontologically prior to itself.

[12]In the literature, "four-dimensionalism" is put to different uses. Some philosophers use it to refer to a theory of time (i.e. eternalism), while others use it to refer to a theory of persistence (i.e. the one according to which an entity's persistence depends on it having temporal parts). In this paper, I will be adopting the latter use. Within four-dimensionalism, so understood, there is a distinction between stage theory (e.g., Hawley 2001; Sider 1996, 2001) and perdurantism (e.g., Lewis 1971, 1976, 1986; Quine 1950, 1960). Perdurantists take our everyday subject terms, such as "rock," "boat," and "person," to refer to *collections* of temporal parts. Stage theorists, however, take our talk about ordinary objects to be about *singular* temporal parts or "stages." Hence, the difference concerns semantics, with the two views both assuming a four-dimensionalist ontology.

ticular property instances and dispositions. Instead of just sequential causal chains of object-stages, one might also appeal to sequential causal chains of property-stages or disposition-stages. In which case, this four-dimensionalist account of persistence might be better characterized more generally in terms of *entity-* or *thing*-stages. At any rate, there is apparently room here to appeal to a *diachronic* notion of causation to thereby avoid the problematic sort of self-causing raised above.

Aside from the fact that (as indicated above) the synchronic notion of causation enjoys significant currency among dispositionalist approaches, this diachronic approach to self-supporting dispositions faces the following concern: a causal chain of thing-stages is arguably not causation *within a fundamental entity*, since the thing-stages are *distinct* entities. As Sydney Shoemaker (1979) observes, it is natural to take thing-stages to be distinct entities and, consequently, the persisting entity they constitute to be not ontologically robust but, rather, a "logical construction" (or, as one might say, a derivative entity, or an entity by courtesy only).[13] This is not to say that there are not perhaps moves that could be made to resist this plausible perspective, as Shoemaker himself makes clear. Examining such matters in depth, however, is beyond the scope of this paper. Here, I will have to remain content with simply pointing out an initially plausible concern: while the diachronic, four-dimensionalist account of an entity's persistence might avoid the worrisome prospect of synchronic,

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[13]No matter which phrase one uses here to downplay the ontological role of persisting entities, one is not necessarily committed to eliminativism or antirealism regarding such entities. There can still be persisting entities, in that one can make true claims positing them. It will just be that the deep story about persisting entities, the ultimate truthmakers for those claims, are chains of non-persisting entities. To think that the mere acknowledgment of true claims positing persisting entities commits one's basic ontology to such entities is to fail to heed Heil's warning against the linguisticization of metaphysics.

self-causation mentioned, it would (at least initially) seem to do so at the cost of the internal stability we are looking for, namely, the persistence of a *fundamental entity* being due to powers *within that entity*; we would lose dispositions for *internal* stability. Again, this is due to the account appealing to one concrete particular (a thing-stage) causing a *distinct* concrete particular (a later thing-stage).[14]

One might be tempted, here, to look to endurantism. After all, on endurantism, numerical identity is what grounds the persistence of an entity over time, which would enable one to avoid our worry generated by the distinct, temporal parts (or thing-stages) of four-dimensionalism. However, with an identity relation so employed, it is less clear where diachronic causation within an entity is supposed to help account for the persistence of that entity. Indeed, I suspect this is why Williams proposes the four-dimensionalist example that he does.[15]

To summarize, Williams's argument for static dispositions for internal stability, I have argued, leads to a vicious infinite regress. I considered appealing to self-supporting dispositions to avoid the regress. However, that move would, for many powers view advocates (i.e., those who take causation to be a synchronic affair), push them into another problem, namely, an implausible notion of a self-causing disposition. And for those powers view advocates who take a diachronic approach to causation, the self-supporting they end up with is no longer clearly one involving static dispositions for *internal* stability. Therefore, concerning their basic ontology,

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[14]The present point is driven by the distinct, temporal parts posited by four-dimensionalism and, therefore, remains neutral between stage theory and perdurantism (which differ semantically).

[15]Note as well that adding causation to the endurantist story invites concerns of self-causation similar to those raised for the synchronic approach to self-supporting dispositions. Granted, the self-supporting disposition would be considered at different times, but it would nonetheless be *one and the same* entity on endurantism.

powers view advocates have good incentive to resist adopting Williams's argument for static dispositions for internal stability.[16]

6   Static Dispositions for External Stability

Fortunately for our discussion, which is focused on the *basic ontology* of the powers view, Williams's case for static dispositions for external stability is arguably already at that fundamental level. His case, recall, involves two electrons—which are fundamental particles on the Standard Model—that never come close enough (within one meter of each other) for the mutual manifestation of their dynamic dispositions to repel each other. Williams is concerned with avoiding "instructionless" regions in the causal network and, so, requires of the electrons causal instructions (dispositions) indicating what they should be doing when they are more than a meter apart. Furthermore, such reciprocal dispositions must be static, for the only dynamic reciprocal disposition they have is to repel each other when within one meter of each other. And since Williams is after static dispositions for *external* stability, he is presumably attributing to the electrons static dispositions to maintain their spatial location or distance from one another. In fact, that would make sense, given his claim that these static dispositions "give us the basis for determining which objects have actually moved" (Williams 2005, p. 314).

With Williams again looking to avoiding instructionless regions in the causal network, one might initially suspect that this argument faces a regress problem similar

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[16]To be fair to Williams, he is not necessarily concerned with such fundamental ontology, as suggested by the weak version of dispositional realism with which he operates. For us, though, basic ontology is precisely the context of concern.

to the one raised in the previous section. This suspicion would be misguided, however. Importantly, the positing of reciprocal dispositions maintaining the electrons' distance from one another does not involve positing an additional spatial relation between those electrons. As such, the initial posit of static dispositions satisfies Williams's demand to causally account for the external stability of the two-electron world. Granted, any static dispositions for internal stability associated with external stability might still invite their own regresses (as already argued). But that is not a concern specific to matters of external stability. Therefore, I need not pursue here any charge of a vicious infinite regress of static dispositions for external stability.

I will, though, take up a different concern with Williams's argument, namely, that it cannot (even if successful) significantly further the powers view ontology. Powers view advocates have already embraced such dispositions for external stability. Indeed, they tend to occupy central cases motivating the powers approach to causation in the first place. One such popular case has already been considered, namely, that of two cards leaning against each other upon a table. And while I cited Heil's (2012) recent use of the example, it dates back significantly further to his longtime collaborator, C. B. Martin (1993, p. 185). Both Martin and Heil fully appreciate how, in that example, powers can preserve external spatial relations in a static fashion. Even if they do not use the term "static," the manifestation of interest is obviously so according to Williams's terminology, since it does not involve change but, rather, the cards *remaining upright*. Furthermore, Martin and Heil embrace such static manifestations as a benefit of understanding causation in terms of the *reciprocity* of dispositions engaging in *mutual* manifestations.

Consider as well Mumford (2009 p. 105), who not only continues employment of the card (or book) example, but extends it with a string of cases involving powers preserving relations between distinct objects:

> Taking this [one billiard ball striking another, causing the second billiard ball to move] as the paradigm case favours, I think, an account of contingent event causation. But the powers theory would point to some other cases of causation and claim that they are equally paradigmatic. Two books may lean against each other, for example, creating a 60° angle, each propping up the other. A planet may maintain a regular orbit around a star, neither increasing nor decaying in extent but being in a state of equilibrium. A fridge magnet may sit motionless on a fridge, kept in place by its magnetic attraction and resisting the gravitational attraction of the Earth. These are cases of causation if anything is, yet they all seem to be cases in which essentially nothing is happening at what I will call the factive level, the level of macroscopically discernable events. They are also all cases where cause and effect seem simultaneous. (2009 p. 105)

Not only does Mumford appreciate cases of causation involving external stability, but he even contrasts them with the (dynamic) billiard-ball case in order to promote his dispositionalist account of causation over a competitor. This is evidence of the continuation of a dispositionalist theme tracing back (at least) to the much earlier

work of Martin, namely, appreciating how external stability can both involve genuine causation and illustrate the plausibility of a powers approach.[17]

So, while Williams's proposal of static dispositions for external stability is plausible, it is difficult to see how such dispositions can directly extend the powers view ontology in a substantive way. Powers view proponents have already advocated for such dispositions. Nevertheless, perhaps an ontological advancement can still be salvaged, albeit indirectly. In the next section, I will propose a way of exploiting the plausibility of static dispositions for external stability to further motivate static dispositions for internal stability.

7 Revisiting Static Dispositions for Internal Stability

Recall that the stability of a bowling ball's shape could be seen as a case of external stability between the basic particles making up the ball. Although this appeared to involve treating the ball as a non-fundamental object, it still suggests a way

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[17]This should not be taken to imply that Martin, Heil, and Mumford are in complete agreement about the ontology underlying such cases of external stability. One important difference, for instance, is that Mumford takes each disposition to have its own, private manifestation that it alone works to secure, while Martin and Heil take each disposition to aim at working with a reciprocal disposition so as to secure a mutual manifestation that the disposition partners would equally own. So, on Mumford's approach, the present cases would be understood as involving powers working in opposite directions towards their own, private manifestations, but with equal force so that they balance out and result in a static manifestation. But on Martin and Heil's approach, those cases would instead be seen as involving powers intimately working together to support the relevant spatial relations, yielding a static mutual manifestation in which powers cooperate with each other rather than battle. Such ontological differences would also entail different interpretations of Williams's proposed (and admittedly science-fictional) case involving the two electrons' static dispositions to maintain their position from one another.

of employing the plausibility of static dispositions for external stability to further motivate static dispositions for stability within a fundamental object. The thought is this: find disposition partners within a single (fundamental) object working together in a manner analogous to how dispositions in different objects work together to statically support various properties and relations. In doing so, one could capitalize on the plausibility of static dispositions for external stability to further motivate static dispositions for internal stability, where one might similarly find disposition partners engaging in static manifestations. In short, if disposition partners belonging to distinct objects can engage in static manifestations, then why can they not also do so when belonging to the same object? As we will soon see, however, the prospects for such internal stability depend greatly on one's view of objects. In what follows, I will consider three views of objects that a powers view advocate might adopt: the reductive approaches of bundle theory and bare substratum theory, as well as non-reductive substance theory.

Let us begin with the reductive approaches. The prospects for disposition partners for internal stability are not good on bundle theory. If one reduces objects to collections or bundles of properties, then there are no objects in one's basic ontology but, rather, simply properties (and perhaps some sort of binding relation, often referred to as compresence).[18] Any such property/disposition, being fundamental, cannot have internal stability due to disposition partners, for there are no proper-part dispositions composing it. Now, perhaps there is room for some of the prop-

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[18]The bundle theorist need not thereby be an eliminativist about objects. One can still truly posit tables, trees, and the like, it will just be that the ultimate truthmakers for those claims do not involve tables or trees or any objects at all but, instead, properties.

erties/dispositions within a bundle to work together to statically support another, distinct property/disposition belonging to the same bundle. But we would still be without dispositions for *internal* stability within a *fundamental* entity. Those disposition partners would not be internal to the property/disposition they are supporting. Rather, they would all remain distinct constituents of the object they constitute. And while the disposition partners' support of their fellow constituent would provide a static manifestation within an object, objects are not fundamental entities on bundle theory.[19]

At this point, I can imagine an advocate of "higher-order" properties charging that my considerations have been limited by the assumption that the disposition partners and the property they support are of the same order. But suppose instead, the suggestion might go, that the bundled properties causally interact so as to support a further, higher-order property—a property of the bundle (rather than simply another, first-order property within the bundle).[20] The problem remains, however, that such a property would not fall within the bundle theorist's basic ontology, since the property characterizes a non-fundamental entity, i.e., an object/bundle. One might attempt a return to the fundamental by focusing on how a *single* property can have second-order properties (e.g., the property of being negatively charged having the property of being a charge property, or the property of being red having the prop-

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[19]Appealing to compresence would not help matters here. If that relation is supported by other properties within the bundle, then we would again get a static manifestation, but one not within a fundamental entity. Alternatively, if the compresence relation is a special, self-supporting property within the bundle, then we would run into the problems raised in section 5 regarding self-supporting dispositions.

[20]One might take compresence to be such a property, insofar as it characterizes the structure of a bundle.

erty of being a color property). Even if one allows such second-order properties to be ontologically anointed into the fundamental, their being properties of a *single* property runs counter to what we are looking for, namely, a case of disposition *partners* working together to yield internal stability. Worse still, the relation between the sort of first-order and second-order properties under consideration does not appear to be causal at all but, instead, conceptual or logical. For instance, if the property of being red were to have the property of being a color-property, it would do so as a matter of conceptual entailment, not causal production. Bundle theory therefore remains unfriendly to the strategy of appealing to disposition partners within a fundamental entity in order to establish static dispositions for internal stability.

The prospects for establishing such dispositions do not improve by adding a bare substratum to one's reductive account of objects. Granted, a substratum will support, or statically maintain, an object's properties/dispositions. However, as part of a reductive account of objects, the substratum must be *bare*, and therefore not internally characterized by any property/disposition. If the substratum were not bare in this way, then it would look more like an object rather than a reductive constituent of an object—the supposed reduction of objects to more basic constituents would be smuggling in objects through the (allegedly more basic) ontological category of substratum. In fact, bare substrata now appear to threaten the need for static dispositions for internal stability, as they perform the role of supporting an object's features, while occupying an ontological category entirely distinct from that of properties/dispositions.

While reductive accounts of objects have proven inadequate to the task at hand, the non-reductive approach of substance theory shows a great deal more promise. On this view of objects, substance and property are a group package. One cannot have a free floating property, since properties are *ways a substance is*, or *modes of a substance.* Nor can one have a featureless substance, a substance that is no way at all; non-reductive substance theory is incompatible with bare substratum theory. This sort of view does appear to allow for a fundamental object to have intrinsic disposition partners engaging in a static manifestation. A basic substance, it would seem, can have multiple properties/dispositions working together to support other properties/dispositions of that very same (fundamental) substance.[21] Moreover, such an approach is not vulnerable to the threat of an infinite regress of static dispositions, since we are here simply appealing to how disposition partners can work together to engage in static manifestations.[22] Therefore, at least one path remains open for developing a powers view ontology with static dispositions for internal stability.

To summarize, in our search to locate static manifestations of disposition partners within a fundamental entity, reductive approaches to objects have proven to be dead ends. You will not find such partners working together within either the bundle theorist's fundamental properties/dispositions or the substratum theorist's

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[21]There is the view (e.g., Heil 2012, p. 132; Campbell 1990, pp. 124-125) that a single substance cannot yield the kind of *discrete* relata required for causal *interaction*. I address this sort of position in Baltimore (2015), where I argue that a substance's having distinct dispositions can yield sufficiently discrete relata for causation to occur within that substance.

[22]As indicated in the previous section, Williams's argument for disposition partners for external stability can resist the threat of an infinite regress. Furthermore, advocates of static dispositions for external stability evidently need not even appeal to a *general* demand to causally explain external stability, since the cases traditionally cited in support of such dispositions are arguably paradigm instances of causation (e.g., two cards leaning against each other upon a table).

bare substratum. Non-reductive substance theory, on the other hand, looks far more promising. A basic substance, even as a fundamental entity, appears to have room for disposition partners to support other dispositions/properties of that same substance. As such, substance theory can exploit the plausibility of static dispositions for external stability to motivate static dispositions for internal stability as well, thereby providing an alternative to Williams's problematic argument.

8 Conclusion

Time now to bring our assessment of Williams's case for static dispositions to a close, which we have conducted within the context of the basic ontology of the powers view of properties. The use of threshold cases to motivate static dispositions turns out to be parasitic on the ability to establish two other types of static dispositions: dispositions for internal stability and dispositions for external stability. Williams's argument for static dispositions for internal stability, however, faces the threat of a vicious infinite regress of static dispositions. And trying to stop the regress with self-supporting dispositions, we have seen, is not an effective strategy, as the move raised a variety of other problems. Williams's case for static dispositions for external stability is far more plausible, but offers no significant improvement upon the ontology of the powers view. Powers view advocates have not only already appreciated such dispositions but have emphasized them in motivating their powers approach to causation. However, as I also argued, the plausibility of static dispositions for external stability can motivate a new case for static dispositions for internal stability—one

that hinges on the nature of objects. It is fitting, then, that our assessing the case for including static dispositions within the powers view comes down, in part, to other fundamental ontological commitments.

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