

Power Worlds and the Problem of Individuation

MATTHEW TUGBY

When referencing or quoting, please use the published version in *American Philosophical Quarterly*

Abstract.

Is it metaphysically possible for a world to contain power properties but no non-power properties? Recently, much progress has been made by powers theorists to defend the coherence of such a possibility. But unfortunately, it remains unclear how the powers in a power world are individuated. The problem is that the most obvious principle of individuation for properties in a power world is one that is circular. In this paper, it is argued that this circularity is generated by a modal assumption, which is that different families of powers exist in different possible worlds. By rejecting this assumption, a non-circular principle of individuation for power properties can be formulated. Moreover, this solution is not ad hoc because there are independent reasons for rejecting the aforementioned modal assumption.

1. Introduction: Power Worlds and the Problem of Individuation

Is it coherent to suppose that the world could contain power properties but no non-power properties? The powers theory of properties asserts that it is. More precisely, the view asserts two main claims. The first claim is that all natural properties have a dispositional/causal essence, and the second is that such dispositional essences exhaust the natures of those properties.

The powers view of properties has been given various names, such as *causal structuralism* (e.g., Hawthorne 2001). A metaphysical view is structuralist if it says that the entities it concerns are the entities that they are in virtue of the relations in which they stand. The powers view is plausibly a structuralist view because dispositional essences have to be characterized in relational terms. The reason for this is that the identity of a power is fixed by

the type of manifestation(s) that it is a power *for* (together, perhaps, with the type of stimulus that is able to trigger an instance of the manifestation). For instance, to know what the power of fragility is *just is* to know that it disposes its possessors to break when struck with moderate force. So, in order to specify what a power like fragility is, ineliminable reference has to be made to something else, such as the manifestation type of breakage.

On Bird's version of the powers view (2007, chap. 6), power properties are universals,¹ and he calls the essential second-order relations in which they stand "manifestation" and "stimulus" relations. Again, returning to the example of fragility (and assuming for the sake of argument that fragility is a genuine natural property), we would on this view say that the universal of fragility stands in the second-order manifestation relation to the breakage universal and stands in the second-order stimulus relation to the universal of striking. And to repeat, on the powers view, such relations are considered to be of the essence of universals and to be the only essences that they have. In other words, universals in this sense are entirely relationally constituted.

Now, many philosophers have been happy to accept that some natural properties are powers, but have insisted that it is incoherent to suppose a world could contain *only* power properties (e.g., Ellis 2001 and Molnar 2003). One influential reason for preferring this property dualism over causal structuralism is that the latter is thought to be susceptible to a range of regress and circularity problems—problems which can only be overcome with acceptance of some non-power properties. These alleged regress and circularity problems have provoked a range of responses from those who defend the coherence of the powers theory. For example, Coleman (2010) has addressed the worry that a power world would be indistinguishable from an empty world and has argued that such a worry rests on controversial assumptions. And elsewhere, Bird (2007, chap. 6) has attempted to show how the powers in a power world could be distinguished successfully, using his graph-theoretic

model of powers. I think it is fair to say that the powers theorists have made much progress in defending the possibility of a power world. But unfortunately, a number of critics, such as Lowe (2010), Ingthorsson (2015), Oderberg (2012) and Psillos (2012) think there remains an unresolved problem. The problem in question is a problem of *individuation*. These critics worry that, unless there are some non-power properties in addition to power properties, it would be impossible to spell out the individual essence of a power in an informative, non-circular way. If this worry stands, it suggests that we really have no grip whatsoever on what each power *is* in a putative power world. And so, the coherence of such a world is once again brought into question.

My aim in this paper is to bring to light an assumption that underlies the circularity problem and to outline a way in which powers theorists can respond to it. The structure of the paper is as follows. In the next section I outline the powers theory in greater detail, paying particular attention to Bird's graph-theoretic account of powers. In section 3, I introduce the aforementioned problem of individuation, focusing in particular on E. J. Lowe's discussion of the problem. In section 4 I identify the modal assumption underlying the individuation problem, and argue that a non-circular principle of individuation for powers is available if we reject this assumption. The assumption in question is what Bird (2004) calls "weak" necessitarianism. In order to avoid weak necessitarianism, the powers theorists must embrace strong necessitarianism by adopting a Platonic conception of properties. According to Platonism, property universals are transcendent entities which exist necessarily and which do not ontologically depend on their concrete instantiations. In section 5, I then defend the Platonic proposal against two potential objections. In particular, I consider an under-discussed problem for the powers theory which concerns the alleged possibility of isolated power structures. If such structures are possible, this would cast doubt on the idea that powers can be structurally individuated. In response, I offer reasons for thinking that the actual world

does not contain isolated power structures. If Platonism is accepted, it then follows that there are no possible worlds which contain isolated power structures. Overall, then, I conclude that the powers theory remains a live option if understood within a Platonic framework.

Finally, I should note that this is not the first paper to suggest that the powers view is best developed within a Platonic framework of universals. For instance, Bird (2007), Dumsday (2012) and I (2013a, 2016) have all recently argued that the most plausible version of the powers view is a Platonic one. However, neither Bird, Dumsday nor I use the issue of individuation to motivate the Platonists' case.² Given the obvious metaphysical importance of individuation, this paper promises to strengthen significantly the case for a Platonic understanding of powers and for the coherence of worlds containing only power properties.

2. The Graph-Theoretic Account of Powers

Bird developed his graph-theoretic model of powers largely in response to Lowe's 2006 version of the metaphysical regress objection, which was framed in terms of identity (Bird 2007, p. 136). Lowe's worry was based on the insight, explained earlier, that the identity of a power property is fixed by a relation to something else, namely the property which is its manifestation type (and perhaps also the property which is its stimulus type). That in itself may not be problematic, but if *all* properties are to be identified in this relational way, then Lowe thinks:

... no property can get its identity fixed, because each property owes its identity to another, which in turn owes its identity to yet another—and so on and on, in a way that, very plausibly, generates either a vicious infinite regress or a vicious circle. 2006, p. 138

Now, Bird-type powers theorists can hardly deny that the identities of properties are fixed relationally, and so the best way of responding to Lowe's complaint is to argue that any

regresses or circularities are benign rather than vicious. And Bird thought he could show this using his graph-theoretic account of power structures.

I shall not attempt to explain all of the nuances of Bird's graph model here, but the basic idea is that the graph involves nodes (or "vertices") which represent the universals, and connecting arrows (or "arcs") which represent the second-order asymmetric relations in which the universals stand. These arcs serve to connect each node with every other—either immediately, if the nodes stand in manifestation or stimulus relations directly, or indirectly if they are connected via a path of intervening nodes and arcs. In short, a graph structure represents what we might call an interrelated family or network of power types.

Now, how can these graphs help with Lowe's identity regress? Well, Bird argues that as long as a power graph is suitably *asymmetric*, then the identity of each power universal is fully determinate. The reason is that if the graph as a whole contains asymmetries, then "the identity and distinctness of the vertices of a graph can supervene on the structure of the graph" (2007, p. 139). In short, if the graph is suitably asymmetric, then each node will occupy a unique place (relationally speaking) in the graph *as a whole*. Hence, if we consider a graph as an asymmetric whole, we can see that each node (i.e., power) can be distinguished (relationally) from every other.

In short, what Bird has proposed is a *holistic* approach to identifying powers (see also Mumford 2004, chap. 10 and 11, whose work Bird builds upon). As I understand Bird's response, the problem with Lowe's original formulation of the regress problem is that it focused too much on the idea, in Lowe's own words, that "each property owes its identity to another" (2006, p. 138). On Bird's holistic view, this is only partially correct because in fact each property owes its identity to *every* other. In other words, in order to identify a power property we must look at the *whole* graph to which it belongs and then see how that property relationally stands to every other, rather than focusing only on the manifestation or stimulus

types to which it is directly connected. In this way we can see how the power type occupies a unique position within the graph (given its asymmetry), and thereby distinguish it from every other power type on that basis.

So far, so good. However, more recently, Lowe articulates his worries about powers in more detail than he did in his 2006. In his 2010, Lowe argues that despite the work of Bird and others, the powers theory remains unacceptably circular, at least if it is considered as a theory of property *individuation*. Others, such as Ingthorsson (2015), Oderberg (2012) and Psillos (2012) have agreed. After outlining this worry in the next section, we will see in section 4 that the circularity worry can be overcome within a Platonic metaphysical framework.

3. The Circularity Objection

As mentioned above, even if we accept the Bird-type view of powers and the asymmetry constraints it imposes, Lowe thinks there is still the worry that “it simply doesn’t seem intelligible to suppose that different entities of the same kind can be *each other’s sole individuator*” (2010, p. 21). The reason, according to Lowe, is that the individuation of powers is “futile, because viciously circular” (2010, p. 21). In a moment, we shall see why. But first, it is important to note that in these 2010 passages, Lowe moves away from the terminology of *identity*, which was used in the formulation of his 2006 regress objection, to the notion of *individuation*. This is no coincidence because Lowe indicates that he is willing to concede that each of the nodes in an asymmetric structure has a determinate identity (more on this in a moment). However, identity and individuation are not the same thing, according to Lowe. What this suggests, therefore, is that the problem facing the powers view is best put as one of individuation rather than identity.

What, then, is the difference between a criterion of identity and a criterion of individuation? The answer is that the former merely provides a way of telling whether some x and some y (which each belong to some kind ϕ) are either distinct or one and the same. Among other things, such criteria provide us with the resources to count the things of a given kind. Schematically, such a criterion takes the following form: “If x and y are ϕ , then x is identical to y if and only if x and y satisfy $C(\phi)$ ” (Lowe, 2009, p. 16). If x and y satisfy condition $C(\phi)$ then x and y are identical, but if this condition is not satisfied, they are distinct. Considered as a criterion of identity for powers, the powers theory would spell out the right hand side of biconditional as something like ‘ x and y occupy the same relational position in the second-order network’.

Now, as mentioned earlier, some philosophers (including Lowe, 2010 pp. 21-22) are happy to concede that the Bird-type holistic account of powers may be able to distinguish powers successfully and thereby provide a criterion of identity for powers.³ For example, in a critical paper on Bird’s theory, Ingthorsson accepts that the holistic approach can provide an account of the “numeric distinctness” of powers (2015, p. 535).

Unfortunately, however, it is not clear that the powers theory can provide an adequate principle of *individuation* for powers. A principle of individuation is one that specifies the *individual essence* of the entity in question, or to use John Locke’s words, “the very being of a thing, whereby it is, what it is” (Locke 1690/1975, III, III, 15). This metaphysical notion of individuation is to be distinguished from individuation in the cognitive sense, the latter of which consists in successfully singling out an entity in thought. This second notion of individuation involves a mind-dependent activity, whereas entities have *metaphysical* individuator(s) even if there are no minds to think about those entities. Metaphysical individuation, to be precise, is a relation of determination between an entity and its individuator(s); in Lowe’s words, “the relation that obtains between entities x and y when x

determines or ‘fixes’ (or at least *helps* to determine or ‘fix’) *which* entity of its kind *y* is” (2010, p. 9). Common examples of individuation criteria include those for sets and material objects (Lowe 2007, p. 521). The members of a set, for instance, determine *which set it is*. In other words, the members of a set constitute the individual essence of that set. Similarly, it seems plausible to think that at least some material objects are individuated by their material parts. It is worth noting, though, that we should not insist that all entities have individuator in this sense, for otherwise there would be a regress of individuation (Lowe 2007, p. 522). Lowe is therefore happy to accept that some entities may be *self*-individuating. But as we shall see later, the powers theorists cannot accept that powers fall into this latter category.

Now, clearly a principle of individuation entails a criterion of identity because once we know the individual essence of a thing, we can thereby distinguish it from all other things. But on the other hand, according to Lowe, a criterion of identity need not entail a principle of individuation because it seems there could be criteria of identity which provide a way of distinguishing and counting the things in question, but do so in a way which tells us nothing about how those things are individuated. An example used by Lowe is as follows. Suppose we agree with Locke that two concrete objects of the same kind can never occupy the same space at the same time. This would enable us to distinguish and therefore count material objects on the basis of their having different space-time trajectories. But importantly, it would not follow from this that an object’s space-time trajectory is essential to it (Lowe 2010, p. 13).

Why, then, is the Bird-type account of powers thought to be inadequate as a theory of individuation? Lowe’s answer, as we anticipated above, is that it is viciously circular. Note that there are two obvious desiderata for a principle of individuation. The first is that it must provide *transworld* criteria because an entity’s essential nature is one that it must have in any world in which it exists. Let us call this the *transworld condition*. Second, a principle of

individuation must not be circular, which is to say that the entity being individuated should not appear (either explicitly or implicitly) in its own individuation conditions. The reason for this second condition is that the notion of metaphysical individuation is plausibly an *explanatory* one (Lowe 2003, pp. 92-93). In other words, a principle of individuation, which picks out an entity's individual essence, serves to *explain* why an entity is the very entity that it is. This is because, as we saw above, metaphysical individuation involves a relation of determination. And according to most realist approaches to explanation, X explains why Y if X determines Y in some sense (see e.g., Audi 2012, p. 688). Given this explanatory role of individual essence, we can see why a principle of individuation ought not to be circular. This follows from the fact that circular explanations are *uninformative* and therefore do not count as genuine explanations at all. The orthodox view of explanation is that if X explains Y, it cannot be that Y also explains X. According to Lowe, the unacceptability of circular explanations is closely tied to the unacceptability of circular arguments. If an argument is to be persuasive, we must make an exclusive choice as to which proposition is the premise and which is the conclusion. As Lowe puts it, "we cannot have it both ways" (1994, p. 39). Unfortunately, it is on this non-circularity desideratum that, according to Lowe and others, the powers theory falls down.

The worry is that in order to satisfy the transworld condition, the theory of individuation for a power universal p has to specify not only that p occupies such and such a relational position within a second-order structure, but also that the power "belongs to *the same power structure* in any possible world that it exists" (Lowe, 2010, p. 22). But unfortunately circularity has now crept in because in stating 'belongs to the same power structure', the theory is already presupposing a principle of individuation for powers. To be precise, on the powers view 'the same power structure' must mean something like "the same set of powers structured in the same way" (Lowe, 2010, p. 22-3). Indeed, given the powers theory, it

trivially follows that sameness of structure implies sameness of power. So, in that sense, the ‘the same set of powers’ clause is redundant. Nonetheless, Lowe inserts the ‘the same set of powers’ clause in order to clearly distinguish this interpretation from an alternative reading which would be unacceptable for powers theorists. The alternative reading of ‘same power structure’ would be “*a set of powers structured in the same way*” (2010, p. 23). This alternative reading seems to imply the possibility of the same power standing in the same relations to *different* powers. Such a reading would contradict the powers theory, which says that powers have the same manifestation types in all possible worlds.

However, the problem is that even once we assume the first reading of the principle, it is difficult to see how we can individuate the relevant power structure without at the same time individuating the powers that make up that structure. And so, it seems the individuation of power universals is *presupposed* by such a principle, thereby violating the non-circularity condition. Worse still, among those powers which help to individuate the structure in question will be *the very power universal* that we are trying to individuate in the first place. In short, then, on this interpretation of the powers view (*qua* a theory of individuation), the power universal being individuated figures in its own individuation conditions, thereby violating the second desideratum of non-circularity.

I agree that such circularity is unacceptable. Troy Cross does too, but concludes that the best thing for the powers theorist to do is to concede that power universals have no individuator by Lowe’s lights (Cross 2012). However, if one is otherwise attracted to the Bird-type view of powers, then I think one ought to be reluctant to give up on a principle of individuation quite so easily. It is important to note, for instance, that the powers theorists cannot accept that properties are self-individuating, for that would mean that properties have a primitive, self-contained essence. Such a view sounds more like the categoricist or quidditist view of properties, which is precisely what the powers theory opposes.

Another possible response would be that, in the light of the circularity problem, we should simply say that a power type is individuated by everything else except itself.⁴ This solution is simple, but the problem is that such a principle is so coarse grained that it would not allow us to distinguish different power types. This means that it would not meet Lowe's requirement of being sufficiently informative and explanatory. Individual essences, to recall, are supposed to play the explanatory role outlined above. As such, we need principles that tell us *which* specific entities play the individuating role for different power types. Only then would we have principles fine grained enough to count as genuine explanations. With all of this in mind, I shall now propose a more promising way of answering this circularity problem.

4. A Solution to the Problem of Power Individuation

We may summarize the circularity described thus far as follows. It seems the most obvious principle of individuation for a power universal is something like the following:

Principle of Individuation for Powers* (PIP*): Power p is individuated as that which occupies such and such a position (relationally speaking) in the second-order structure to which p always belongs.

This principle provides the right transworld specification, but clearly there is circularity.⁵ Because this principle contains the 'second-order structure to which p always belongs' clause, p now figures in its own individuation conditions.

In order to deal with this circularity problem, it is important to identify the assumption which generates the apparent need, when individuating a power universal, to insert a clause like 'the second-order structure to which p always belongs'. The assumption in question is that *different worlds contain different second-order structures of powers*. This assumption gives rise to the need for the aforementioned clause because if there are different power

families in different possible worlds, then the principle of individuation for a power universal needs a way of specifying the structure that is relevant for that power's individuation. The 'second-order structure to which p always belongs' clause does precisely this job, but as we shall see, the need for this clause drops away if we resist the assumption that some worlds contain second-order structures to which p does *not* belong.

The view that different worlds contain different families of power universals is the view, mentioned earlier, that Bird (2004) calls "weak" necessitarianism. A weak necessitarian accepts that worlds containing the same power properties must be nomically the same (because power properties have their modal profiles essentially). However, weak necessitarians do not accept the "strong" necessitarian claim that *all* worlds are nomically the same because they do not accept that all worlds contain the same properties. It is natural for someone like Lowe to rule out the strong necessitarian powers view because he favours an Aristotelian view of properties on which universals are ontologically dependent on their concrete instantiations. If concrete property instantiations are contingent, as seems plausible, then the existence of universals must be contingent on the Aristotelian conception.

The argument I shall now propose, then, is that if this contingency assumption is rejected, and we insist upon the strong necessitarian claim that the same family of power types exists in all possible worlds, then a clause like 'the second-order structure to which p always belongs' becomes redundant. To repeat once again, the reason for including this sort of clause in the principle of individuation is the belief that different worlds contain different second-order structures and so different powers. However, if the same power structure exists in all possible worlds, then for any power p that is to be individuated, *there is simply no question of having to pick out, from the set of different possible power families, the one to which p always and essentially belongs.*

In a moment we shall see where this leaves the principle of individuation for powers. But note, first, that jettisoning the contingency assumption is not as radical as it might seem. This is because the necessary existence of power universals falls naturally out of the Platonic version of the powers theory, which a number of powers theorists already favour (see e.g., Fales 1990, Bird 2007, Dumsday 2012 and Tugby 2013a). The reason for this necessity is that if properties are transcendent and thereby exist outside of space and time, then they are plausibly necessary existents (see e.g., Bird 2007, p. 55 and Tugby 2013b for discussion). And as we saw, if those universals are powers, then they must necessarily stand in the same relational structure in all possible worlds, given that the relational features of power universals are essential to them. Moreover, such a view does not entail the implausible claim that there is only one possible world. For even if the structure of powers types exists necessarily, different worlds can still vary on which powers are instantiated and how those instantiations are distributed.

With the above observations in mind, we can now see that the clause responsible for the circularity problem could in principle be dropped. This would leave us with a criterion along the following lines:

Principle of Individuation for Powers (PIP): Power p is individuated as that which occupies such and such a position (relationally speaking) in the second-order structure.

The last part of the principle, which describes ‘the second-order structure’, implies that the Platonic powers form a single, interrelated network. As we shall see in the next section, this is a reasonable assumption. For the time being, though, let us simply grant it. If we do so, and accept a Platonic framework, then our desiderata for power individuation are met. First, PIP provides an acceptable transworld, non-circular criterion because on the Platonic view, different possible worlds will not contain different power structures. This

means that there is simply no need for the individuation principle to select, from among different metaphysically possible structures of universals, the one that is relevant for p 's individuation (which is what the 'structure to which p always belongs' clause was designed to do). This is simply because there is only one possible second-order structure on the Platonic view we are considering, and so if p is a power universal, then it must automatically belong to that structure. It is also for this last reason that PIP is non-circular. Given that the principle does not have to select in the aforementioned way, it does not have to presuppose anything about the individuation of the second-order structure it refers to.

There is, however, one final circularity worry that a critic might try to raise for PIP. At the end of his 2010 paper (p. 23), Lowe briefly raises a circularity objection which is more general than the one we have addressed thus far. The worry is that even if the principle of individuation does not presuppose the individuation of a power's *specific* structure (which is what Platonism allows us to avoid), we may still ask what it is that entitles us to think the structure referred to in PIP is a type of power structure at all rather than some other type of structure. If it is not clear that the structure referred to is a power structure, then it is not clear that we have succeeded in individuating a power at all (as opposed to some other kind of entity). And perhaps we cannot simply stipulate that the structure is a power structure for that would be to presuppose that we already have a grip on the notion of a power (if only in the generic sense).

The most plausible response to this concern, which Lowe does not consider, is that different generic types of structure are distinguished in terms of the kinds of relations involved. An entity such as a person can, for instance, be involved in many different structures (often at the same time) such as geometric structures, institutional structures, family structures, and so on. And plausibly, what distinguishes these general types of

structure is the fact that they involve different kinds of relations. In the case of the world's second-order power structure, Bird is clear that it is characterized by the involvement of two different kinds of second-order relation: manifestation and stimulus relations (2007, chap. 6). Thus, if reference to the 'second-order structure' in PIP is interpreted as 'stimulus-manifestation structure', then there seems no doubt that the structure in question is the relevant one. Of course, there remains the interesting question of what second-order stimulus and manifestation relations are like and how they are themselves to be individuated. But that is a further question for powers theorists to debate. According to one view, for instance, such relations are best viewed as having a primitive identity (see e.g., Barker 2009). This would mean that stimulus and manifestation relations are not themselves powers, but this would not be surprising given that such relations are *second-order* (internal) relations, rather than concrete, first order relations of particulars. Moreover, if stimulus and manifestation relations were themselves relationally defined, Bradley-type regresses would be likely to ensue (see Barker 2009 for details).

5. Objections and Their Replies

The first worry is that the Platonic solution is ad hoc. The idea that the same power universals exist in all possible worlds may be counterintuitive to many, and if such a view is being accepted purely to avoid the problem of individuating powers, then perhaps it is a cure worse than the disease. Fortunately, however, we may emphasize that the Platonic conception of powers is one that is gaining in popularity for a variety of independent metaphysical reasons. This paper merely provides one reason among many for a powers theorist to favour Platonic realism about properties. To give a few examples: It has been argued that the Aristotelian principle of instantiation loses its plausibility within the powers theory because the principle rests on contingentist views about laws and properties (Bird 2004); it has been argued that

strong necessitarianism, which the Platonic powers view entails, halts various explanatory regresses (Bird, 2004); it has been argued that Platonism avoids the unpalatable possibility of taking every power out of existence by simply destroying the instances of a single property (Oderberg, 2011); it has been argued that considerations relating to *ceteris paribus* laws favour a Platonic understanding of powers (Dumsday 2012); it has been argued that Platonism provides a natural way of understanding the holistic solution to the powers theory's "problem of fit" (Williams 2010); Platonism has been offered as a way of shedding light on the directedness of unmanifested powers (Tugby 2013a); and it has been argued that the Aristotelian powers theory faces explanatory problems that a Platonic powers theory can avoid (Tugby 2016). In short, then, this paper ought not to be viewed as providing an ad hoc solution to the problem of individuation, but rather should be viewed as one which makes a contribution to the wider ongoing debate between Aristotelian and Platonic theories of powers.

The second and more important objection to the Platonic theory proposed is that even if we accept that all power universals exist in all possible worlds, perhaps there is still no guarantee that each and every power type will belong to *one and the same family*, as we have so far assumed. Opponents might insist it is possible that the world contains multiple families of powers, which are completely isolated from each other and bear no relations in either direction. Yet, if this were the case, then the principle of individuation would once again have to specify which of the power families it is to which p belongs (which introduces circularity once again). This requirement would be especially strong if, for instance, there were two distinct but structurally indiscernible families of power types.⁶

A referee has pointed out that this seems to be the strongest challenge facing the Platonic solution, and I agree. Nonetheless, I believe that if we reflect on what science shows us, from a Platonic perspective, then the solution outlined earlier appears *plausible*, which I think is

the best one can hope for in metaphysics. It is plausible because there are good reasons for thinking the actual world does not contain completely isolated power structures. And given the Platonic necessitarian view proposed, this would mean that no possible worlds contain isolated power structures. In that case, PIP would be an adequate principle of individuation for the Platonic powers theorist.

The main reason for thinking that the actual world (and hence all worlds, assuming Platonism) contains an interconnected family of powers is that the various branches of science are clearly not completely isolated from each other. In order to elaborate this point, and to avoid a potential confusion, it should be emphasized what a strong supposition it really is to think there are multiple power families which are isolated from each other. It is important to note that even if it turns out that each special science investigates its own novel properties and laws, as non-reductionist or emergentist philosophers of science believe, this still would not provide a good reason for thinking that there are isolated power structures. I know of no emergentists who claim there are properties which bear no relations to properties in other domains. For instance, no emergentists about chemistry or psychology deny that chemical or psychological states stand in interesting causal or nomic relations to states in physics. Indeed, a core thesis of emergentism about the mental is that not only do mental states supervene causally or nomically on the physical, but also that mental properties exert a *downward* causal influence on physical states.

As soon as we bear these points in mind, we can see the implausibility of the suggestion that the world contains distinct families of powers. Yet, to re-emphasize, if Platonism (i.e., strong necessitarianism) is accepted, then isolated power structures would only be metaphysically possible if the actual world contains such structures. If such isolated powers were instantiated in our world, then science would fragment into isolated special sciences, with each investigating realms of the world which fail to interact in any ways with any others.

But as highlighted above, we know that, so far, special sciences have not developed in that way. Thinking that psychology investigates an isolated structure of powers involves thinking that, for example, changes in the physical properties of the brain can have no effect on psychological states. It is clear that this is not the case.

With the foregoing points in mind, are there any other ways to rescue the thought that there are isolated power structures in this world (and hence all worlds, assuming Platonism)? It seems the best way to do this would be to insist that although there are isolated power structures, science fails to reveal this because, as it happens, only powers which belong to the same structure are *instantiated* in our world. This seems an ad hoc move, however. For if there are many other powers which belong to different isolated structures, surely it would be very unlikely (and fortunate) that our world instantiates only powers that belong to the same structure. If there are many isolated powers that could be instantiated, it would seem surprising that none of them happen to be instantiated. Rather than believe in this happy coincidence, it is more rational to believe there are no isolated power structures.⁷

Perhaps there is a final option for the opponent, however. Perhaps it could be proposed that the world does in fact instantiate powers from isolated structures, but we do not notice this because these distinct structures are isomorphic with one another. Hence, from our epistemic perspective it looks as though the world contains only powers that belong to the same structure, even though this is not the case. In response, I agree it is *epistemically* possible that our world could be like this, but to suppose that this possibility is realized seems, again, rather ad hoc. My claim, to recall, is just that the existence of a single network of powers is *plausible*. The epistemic possibility just outlined is essentially a sceptical scenario, since it implies we are systematically mistaken about which properties are which. Although most people admit that sceptical scenarios are epistemically possible, few accept that we can rationally give such possibilities serious credence. Perhaps there is no certainty

here, but again my claim is merely that it is *plausible* to think there exists a single interrelated power structure in our world (and hence all worlds, given Platonism). If the case against the Platonic solution proposed rests entirely on the obtaining of a sceptical scenario, then Platonism is on fairly safe ground.

Suppose, though, that opponents accept that our world plausibly contains a single, interrelated network of powers. Could they not simply dig in their heels, and insist that because isolated power structures are conceivable it must therefore be a metaphysically contingent fact that they do not obtain?⁸ This would, in effect, amount to a rejection of the strong necessitarian assumption that Platonism entails. A Platonist is simply not in a position to accept that the world's nomic structure is contingent and some may find this objectionable. One problem with this kind of objection, though, is that it has a tendency to lead to a stand-off, since the Platonists will think such intuitions beg the question against their position. And again, the Platonist will plea that their position is not ad hoc, given the array of independent reasons for favouring their version of the powers view. However, I believe more than this can be said on behalf of the Platonic powers theorists. I agree with Bird (2004, p. 273-4) that necessitarians should try to accommodate any contingency intuitions in cases which they claim exist necessarily. A familiar move, which can be utilized in the current context, is to distinguish different notions of contingency, in particular the distinction between, say, epistemic, metaphysical and logical contingency (indeed, we already made use of the notion of epistemic contingency in the discussion of the sceptical scenario above). All that the proposed Platonic view requires is that there is no *metaphysical* possibility of distinct, isolated power structures. Importantly, such a view is consistent with the claim that from our pre-theoretical *epistemic* perspective, isolated power structures are possible, or that distinct power structures are *logically* possible. For example, the Platonist can happily accept that there is no logical contradiction in the claim that there could be isolated power structures. In

short, then, there is scope for a powers theorist to allow that distinct power structures are possible *in some sense*. The idea is just that there may be no metaphysical contingency here, for reasons given above. Indeed, this sort of response to contingency intuitions is common in recent literature on the powers theory. For instance, Bird (2004, p. 273) explains the apparent contingency of laws in terms of epistemic contingency, while in a recent discussion of the Principle of Least Action, Smart and Thébault (2015, p. 390) have defended necessitarianism by explaining the apparent contingency of the principle in terms of *logical* contingency.

6. Summary

Despite attempts to individuate power universals holistically, some critics have remained unsatisfied and think that the powers theory's principle of individuation for properties is unavoidably circular. After outlining this circularity problem, a solution was proposed. We saw how the circularity complaint is based (implicitly) on the assumption that different families of power universals exist in different possible worlds. It was then explained how powers theorists can reject this assumption by adopting a Platonic conception of universals. In section 5 of the paper, I focused on an under-discussed issue concerning the alleged possibility of distinct, isolated power structures. If isolated power structures were metaphysically possible, this would cast doubt on the powers theorists' claim that structure alone individuates powers. However, we discussed reasons for thinking that the actual world does not contain isolated power structures, and if Platonism is accepted, it follows that no possible world contains such structures. I conclude, therefore, that the powers theory remains a live option if understood within a Platonic framework.

Durham University

NOTES

Acknowledgments: This paper benefitted hugely from discussions I had with E. J. Lowe. The final version of this paper was prepared during my 2015-2016 Mind Fellowship, and I am grateful to the Mind Association for their support. Finally, I would like to thank the anonymous journal referees for their helpful comments.

¹ Some philosophers such as Molnar (2003) view powers as tropes rather than universals. However, because there can be unmanifested powers, it is not entirely clear that power tropes can be viewed as having a relational essence. Elsewhere I have argued that this aspect of the trope powers theory is problematic (see my 2013a, section 2). In any case, the individuation problem that we are discussing comes out most clearly on the relational universals version of the powers view, and so for the purposes of this paper we shall focus on that version.

² For instance, Bird (2004, pp. 271-272) points out that the necessary existence of properties would halt explanatory regresses. He also argues that the motivations which lie behind the Aristotelian principle of instantiation are lost if we reject the categoricalist view of properties, as the powers theorists do. However, as mentioned above, my aim is to provide a different and new reason for powers theorists to favour strong necessitarianism over weak necessitarianism, one which concerns the issue of individuation. This is not an issue that Bird considers. Indeed, as far as I know, no powers theorists have yet addressed the recent circularity worries raised by Lowe and others in connection with the issue of individuation.

³ Strictly speaking, Lowe directs this remark towards what he calls CIP, which is a criterion for *token* powers. CIP says that “If P and Q are token powers, then $P = Q$ iff P and Q have the same manifestation-type, M , possessor, O , and time of possession, t ” (2010, p. 12). However, because both CIP and Bird’s criterion for power types involve relations to other manifestation types, Lowe’s concession on CIP carries naturally over to Bird’s account of power types. It is also worth noting that Lowe is perfectly happy to apply the notion of *individuation* to power types (i.e., universals). In one place, he agrees that “a *type* of power” would have to be “completely individuated by its manifestation-type” (2010, p. 12).

⁴ I am grateful to an anonymous referee for raising this possibility.

⁵ It should be noted, however, that this revised principle is not trivial. A natural response to PIP* might be that if an entity is related to some others, then surely it will not fail to belong to the structure made up of those relations. This last point is correct, but note that it would only leave us with triviality if the PIP*condition were merely an *intra-world* condition. Recall that an individuation condition must specify the individual essence of p

and so provide a transworld condition. This is why the use of the term ‘always’ in PIP* is important (and non-trivial) because it implies that the structure of powers to which p belongs at a world is the structure to which p belongs at all worlds.

⁶ E. J. Lowe raised this possibility in conversation. Bird also seems to take seriously the thought that there could be distinct sets of powers or laws which are “causally isolated from one another” (2004, p. 270). As is clear in section 5, I think there are reasons for a strong necessitarian to reject such a possibility, at least if what we are talking about is metaphysical possibility.

⁷ Here I am assuming a broadly Bayesian conception of rationality. On such an approach, the most confirmed hypothesis is the one which most increases the probability of the relevant observable outcomes.

⁸ I am grateful to an anonymous referee for pressing this worry.

REFERENCES

- Audi, Paul. 2012. “Grounding: Toward a Theory of the *In-Virtue-of Relation*,” *Journal of Philosophy*, vol. 109, pp. 685-711.
- Barker, Stephen. 2009. “Dispositional Monism, Relational Constitution and Quiddities,” *Analysis*, vol. 69, pp. 242-250.
- Bird, Alexander. 2004. “Strong Necessitarianism: The Nomological Identity of Possible Worlds,” *Ratio*, vol. 17, pp. 256-276.
- 2007. *Nature’s Metaphysics: Laws and Properties* (Oxford, UK: Oxford University Press).
- Coleman, Mary C. 2010. “Could There Be a Power World?” *American Philosophical Quarterly*, vol. 47, pp. 161-170.
- Cross, Troy. 2012. “Review of ‘The Metaphysics of Powers: Their Grounding and Their Manifestation’, ed. Anna Marmodoro,” *Notre Dame Philosophical Reviews*, July 7.
<http://ndpr.nd.edu/news/31889-the-metaphysics-of-powers-their-grounding-and-their-manifestations-2/>.
- Dummsday, Travis. 2012. “Laws of Nature Don’t Have Ceteris Paribus Clauses, They Are Ceteris Paribus Clauses,” *Ratio*, vol. 26, pp. 134-147.
- Ellis, Brian. 2001. *Scientific Essentialism* (Cambridge, UK: Cambridge University Press).
- Fales, Evan. 1990. *Causation and Universals* (Abingdon, UK: Routledge).
- Hawthorne, John. 2001. “Causal Structuralism,” *Philosophical Perspectives*, vol. 15, pp. 361-378.

-
- Inghorsson, Rögnvaldur D. 2015. "The Regress of Pure Powers Revisited," *European Journal of Philosophy*, vol. 23, pp. 529-541.
- Locke, John. 1690. *An Essay Concerning Human Understanding*, ed. P.H. Nidditch (Repr., Oxford, UK: Oxford University Press, 1975).
- Lowe, E. J. 1994. "Ontological Dependency," *Philosophical Papers*, vol. 23, pp. 31-48.
- 2003. "Individuation," in *Oxford Handbook of Metaphysics*, eds. Michael J. Loux and Dean W. Zimmerman (Oxford, UK: Oxford University Press), pp. 75-95.
- 2006. *The Four-Category Ontology: A Metaphysical Foundation for Natural Science* (Oxford, UK: Oxford University Press).
- 2007. "Sortals and the Individuation of Objects," *Mind & Language*, vol. 22, pp. 514-533.
- 2009. *More Kinds of Being: A Further Study of Individuation, Identity, and the Logic of Sortal Terms* (Oxford, UK: Wiley-Blackwell).
- 2010. "On the Individuation of Powers," in *The Metaphysics of Powers: Their Grounding and Their Manifestations*, ed. Anna Marmodoro (Abingdon, UK: Routledge), pp. 8-26.
- Molnar, George. 2003. *Powers: A Study in Metaphysics*, ed. Stephen Mumford (Oxford, UK: Oxford University Press).
- Mumford, Stephen. 2004. *Laws in Nature* (Abingdon, UK: Routledge).
- Oderberg, David. 2011. The World Is Not an Asymmetric Graph. *Analysis*, vol. 71, pp. 3-10.
- 2012. "No Potency without Actuality: The Case of Graph Theory," in *Contemporary Aristotelian Metaphysics*, ed. Tuomas E. Tahko (Cambridge, UK: Cambridge University Press), pp. 207-228.
- Psillos, Stathis. 2012. "Adding Modality to Ontic Structural Realism: An Exploration and Critique," in *Structural Realism: Structure, Object, and Causality*, eds. Elaine Landry and Dean Rickles (Netherlands: Springer), pp. 169-185.
- Smart, Benjamin T. H., and Thébault, Karim P. Y. 2015. "Dispositions and the Principle of Least Action Revisited," *Analysis*, vol. 75, pp. 386-395.
- Tugby, Matthew. 2013a. "Platonic Dispositionalism," *Mind*, vol. 122, pp. 451-480.
- 2013b. "Nomic Necessity for Platonists," *Thought*, vol. 2, pp. 324-331.
- 2016. "Universals, Laws, and Governance," *Philosophical Studies*, vol. 173, pp. 1147-1163.
- Williams, Neil. 2010. "Puzzling Powers: The Problem of Fit," in *The Metaphysics of Powers: Their Grounding and Their Manifestations*, ed. Anna Marmodoro (Abingdon, UK: Routledge), pp. 84-105.