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Powers, Dispositions, and Counterfactual Conditionals

We often say that persons had, have, or will have the power to do certain things. But do we have reasons to ascribe powers to inanimate objects as well? And if we do, is there any difference between ascribing a power and understanding what an object is disposed to do? Are objects' powers dispositions in this sense? In this paper I shall argue that we need to distinguish powers from dispositions for certain theoretical purposes. Most 'disposition terms' in ordinary language do not express causal powers; and many powers cannot be expressed by a conventional disposition term. It is true that when we say that objects are disposed to do this or that, powers are involved. But the converse does not hold because having a power does not entail that objects are disposed to do or to act upon others in certain ways.

The expression 'disposition term' as it is used in contemporary philosophy was introduced by Carnap in the early 20th century. Statements that contain such terms do not describe what is directly observable and hence, according to Carnap, they can have meaning only if they are logically equivalent to other statements which report observable episodes (Carnap 1936, 440). Subsequently, Nelson Goodman went on to argue that, from a logical empiricist point of view, every predicate which refers to enduring properties of objects must be dispositional. Thus all statements that ascribe non-occurrent properties to objects must contain dispositional terms like being fragile, soluble, poisonous, inflammable or soporific. And the meaning of these sentences can be understood only with reference to observable episodes which are the manifestations of these dispositions like breaking, dissolving, poisoning, burning or falling asleep (Goodman 1954, 40).

Most contemporary accounts of powers understand them as dispositions. Otherwise put, they take it that what Carnap and Goodman called disposition terms express what objects are disposed to do; and if objects have powers at all, they are none other than their dispositions. However, I shall argue that the ascription of powers and the ascription of dispositions have distinct theoretical roles. Both dispositions and powers are modal concepts. But whereas the ascription of dis-

positions presupposes some modal truth, the main function of ascribing powers is to ground such truth. Following Hume, many philosophers think that if powers do indeed have this grounding role then we ascribe them in order to ground natural necessities.[1] I shall argue, however, that the main role of properties that are powers is to identify natural possibilities.[2] We ascribe a power in order to identify what a person or an object *can* do; by contrast, we ascribe a disposition in order to express what objects or persons *tend to* do.

Further, I shall also argue that the ascription of powers grounds such possibilities through entailing the truth of certain counterfactuals; for it is with help of such counterfactuals that we can specify powers and hence identify natural possibilities. Propositions that ascribe powers or dispositions to objects are often analyzed with the help of counterfactual conditionals; I shall argue that the main theoretical function of the so-called conditional analysis is different in its application to context in which we aim to understand what objects are disposed to do and in context's in which we ascribe powers.

Traditionally, the conditional analysis is understood as an attempt to provide a semantic analysis of the meaning of disposition terms. And often, the aim of such a semantic analysis is to explain the use of disposition predicates without assuming that objects in fact have non-reducible dispositional properties. As far as the analysis of powers is concerned, however, we rely on counterfactual conditionals in order to explain the link between ascriptions of specific powers and our commitments about what can happen instead of what is going to happen. I shall show that if we understand the aim of the analysis in this way, we can defend a revised, non-reductive, but still relatively simple conditional analysis of powers. Relatedly, I shall also argue that powers are abundant in the sense that objects can have not only intrinsic and generic powers, but also extrinsic and maximally specific ones.

In one respect I propose to follow Carnap's project, even though I do not share his (anti-)metaphysical convictions, and I'm skeptical about his account of the meaning of 'theoretical terms'. When Carnap discusses the problem of disposition terms he does indeed rely on examples borrowed from ordinary language. But it is clear that he is not interested in the semantics of ordinary language. Rather, he wants to explain how we can introduce certain terms into our language in order to provide scientific explanation of certain observable

[1] The subtitle of Harré's and Madden's classic work on causal powers is 'A Theory of Natural Necessity'. Later dispositional essentialists like Ellis 2001 and Bird 2007 also argue that powers can make the occurrence of certain events metaphysically necessary.

[2] Although he does not use the concept of power, Goodman seems to hold a similar view (Goodman 1954, 50–54). Closer to the present paper's claim, Rom Harré writes that 'to say that a thing has a power is to say what is possible for it, for that is what it is talk of its dispositions' (Harré 1970, 101). I shall challenge the second part of this claim while fully grant the first.

phenomena. Analogously, the analysis of powers need not be understood as an exercise in the semantics of ordinary disposition terms. Like Carnap, I believe that we use power terms for theoretical purposes. Since my main interest here is metaphysics and not philosophy of science, I shall argue that the theoretical role of powers as properties is to ground natural possibilities. But metaphysics is complementary, and not contradictory, to science. Powers are needed for science as much as they are important for metaphysics.

1. DISPOSITIONS, POWERS, AND TENDENCIES

In this section I aim to show why ascribing powers and ascribing dispositions might play distinct theoretical roles. I shall argue that what philosophers since Carnap call 'disposition terms' can, but needn't, express objects' powers. Afterwards, I shall also argue that there are far more properties which are powers than what conventional disposition terms can express. The problem of powers has often been discussed by using conventional disposition predicates as examples. This strategy can easily blur the distinction between the role of power-like properties and the role of dispositions in our ontology. For even if some conventional terms can express both dispositions and powers, they do so in different contexts. Thus, as far as the metaphysics of properties is concerned, the distinction between powers and dispositions can become crucial.

According to the now standard approach to the use conventional disposition terms, ascribing a disposition is to say something about what objects having the disposition are disposed to do in certain circumstances. Consequently, as David Lewis suggests (and as most subsequent analyses agree) in order to understand ordinary disposition predicates like being fragile or being poisonous, we first need to specify their meaning by a paraphrase. For instance, to say that arsenic is poisonous is to claim that that it is disposed to poison upon ingestion and when no antidote is taken (Lewis 1997, 153). Let us call these paraphrases of conventional disposition terms explicitly dispositional locutions.[3] An explicitly dispositional locution specifies the meaning of a statement ascribing a conventional disposition term *D* in the sense that an object has *D* iff it is disposed to *M* in response to some stimulus *S*. I shall argue that to the extent that statements containing conventional disposition terms can indeed be so paraphrased, such statements follow a logic distinct from that behind statements that ascribe powers.

This is, I shall argue, the consequence of the fact that having a power to *M* is not the same property as being disposed to display behavior *M* in response to stimulus *S* in circumstances *C*. Properties as powers and properties as objects'

[3] Following Choi 2008.

dispositions to do certain things in various circumstances fulfill distinct theoretical roles. Tautologically, if an object or a person is disposed to *M*, it has the disposition to *M*. But it is exactly in this context in which the assumption that powers and dispositions fulfill distinct theoretical roles can become significant. For having a power to *M* does not invariably imply that something or someone is disposed to *M*. There is an important theoretical difference between the ascription of powers and claims about what things are disposed to do.

Consider Amy, who learned how to swim, and then visits the swimming pool regularly. She has also experienced and enjoyed smoking tobacco. But she has never smoked regularly. Her friend, Bob is a different character. Not only has he tried cigarettes, but he has also become a smoker. As a child, he learned how to swim and to this day, he can swim fairly well. But he cannot recall the last time he swam. The two people's behavior is apparently different, and the difference is very well captured by the fact that Amy, being a swimmer, *is disposed* to swim, but not being a smoker, she is *not disposed to* smoke. Bob, on the other hand, being a smoker, is disposed to smoke, but he is not at all disposed to swim. However, both of them have the same powers: both of them *can* swim and *can* smoke; and hence both of them have the power to swim and the power to smoke. The difference between them is that Amy is not disposed to smoke, while Bob is not disposed to swim.

Why is a difference? As Ryle has already observed, we can use dispositional predicates for many different purposes. Sentences containing such predicates can ascribe certain abilities, capacities or liabilities to certain objects or to certain kinds of objects. Thus, we often use such terms in order to ascribe active or 'passive' (i.e. reactive) powers to objects. But disposition terms can also express tendencies, habits or proneness to do certain kind of things (Ryle 1949, 131). There is an important logical relation between the ascription of powers and behavioral tendencies. A behavioral tendency presupposes some relevant power or ability. No one who is averse to cigarettes because, for instance, she is allergic to cigarette smoke can be a smoker. And no one who is unable to swim can be a swimmer. But many people who do not swim regularly can swim, and at least as many who can smoke or are capable of enjoying smoking, do not smoke. Thus, the ascription of powers does not involve any truth about habits, tendencies or behavioral regularities (Huoranszki 2011, 59).

One might object that the difference disappears if we take the proper specification of dispositions into account, according to which 'has the power to *M* at *t*' is to be specified as 'disposed to *M* at *t* in response to *S*'. When we say that Amy is disposed to swim whereas Bob is not, and this is understood as a tendency or habit, we do not mention a particular type of stimulus to which the manifestation is a response. But the dispositional property that we want to express is more specific than what the conventional use of the term suggests. This might be so, but it does not show that such a paraphrase can express the object's power. If being disposed to *M* in response to *S* is a specification of a power of the person

or the object, then it must entail the more generic power of being disposed to *M*. However, it can be true of Bob that he is disposed to swim when he accidentally falls in deep water, but false nevertheless that he is disposed to swim.

Thus, the power to *M* at *t* does not entail being disposed to *M* at *t* even as a response to *S*. Powers might be called dispositions; but if we do so regard them as such, then we must keep in mind that having a disposition, in the sense of having a power to *M* at *t*, does not entail being disposed to *M* at *t*. This can be seen clearly if we consider that even if it seems natural to specify a disposition *D* as being disposed to *M* in response to *S*, it is not true that having a power *P* can also be specified as being disposed to *M* in response to *S*. If an object has the power to *M* in response to *S* then it must also have the power to *M* because the possession of more specific, i.e. more determinate properties entail the less determinate ones. But as we have seen, if an object is disposed to *M* in response to *S*, it is still not necessarily disposed to *M*. Consequently, it is certainly false that having a power to *M* is the same as being disposed to *M*.

More importantly, however, the distinction between being disposed to *M* and having the power to *M* shall not disappear even if we include 'stimulus condition' in the specifications of habits and tendencies. Tendencies and habits can be conditioned just as powers can be. Bob might be disposed to smoke only if he is in a stressful situation, or when he drinks too much, or to whichever specific kind of 'stimulus' he is exposed. Some habitual behavior might be conditionless, but some others might not be. Conversely, Amy can—or has the power to—smoke in the very same sort of circumstances as Bob can, but she does not precisely because she is not disposed to.

My examples above about drawing a distinction between having a power to *M* and being disposed to *M* involved intentional human behavior. However, I used those examples only to make the distinction as vivid as I could in order to show that there is no natural move from 'having the power to *M*', and hence from 'can *M*', to 'being disposed to *M*'. But the problem is more general: if an object has a causal power (or liability) to *M* which is manifested only in exceptional circumstances, it is misleading to claim that it is disposed to *M*. Medications do have the power to kill someone in certain circumstances; for instance, if they are overdosed or if they are taken by someone who is allergic to them. But medications are not 'disposed to kill people as a response to being ingested'; just as some poisonous material that can cure people in certain special circumstances is not 'disposed to heal'. They are medications, or poisons, after all. Thus, as Ryle indicated, conventional disposition terms can be used for different theoretical purposes. For him, it might be only a question of meaning. But for those who take metaphysics seriously this difference in meaning indicates an important theoretical difference. It shows that properties that are powers and properties that can be expressed with the help of explicitly dispositional locutions play different theoretical roles in our ontology.

2. THE SIGNIFICANCE OF SPECIFIC POWERS

Alexander Bird has argued that the explicitly dispositional locutions which Lewis introduces in order to specify the meaning of ordinary power terms are ambiguous. Such specifications must exclude the presence of counteracting factors like antidotes, but it seems that any interpretation of 'disposed to *M* in the absence of antidotes' is either incompatible with what we ordinarily mean by a disposition, or takes dispositions to be extrinsic properties (Bird 1998, 231). According to one interpretation, we should not ascribe, for instance, the property 'being poisonous' to arsenic if it is taken in conjunction with an antidote. This makes the disposition extrinsic since whether or not we can correctly ascribe it depends on features of the environment in which arsenic is taken as well as on arsenic's intrinsic property. According to the other interpretation, arsenic itself is poisonous even when it is taken together with antidotes. But then, the absence of antidotes must be included in the circumstances of manifestation, and this seems to be in conflict with how we ordinarily understand disposition terms. We understand such terms with reference to the typical 'stimulus conditions', like ingesting arsenic, and not as 'ingesting arsenic in the absence of counteracting factors'.

If Lewis's 'explicitly dispositional locutions' are indeed unavoidably ambiguous, then I take this as an additional reason for not using them for specifying powers. However, Bird's objection might be interpreted as showing that disposition terms as used in ordinary language can express properties with radically different theoretical roles. So interpreted, the objection shows that by specifying the conditions under which a power is manifested we can identify *different, but not distinct* powers. Further, it also shows that the difference cannot be understood by the paraphrase 'being disposed to *M* as a response to *S*' precisely because the ascription of power-like properties plays a different role in our ontology than the ascription of dispositions does. By specifying the conditions of manifestation, we can capture a more determinate property, which is different, even if not distinct, from the corresponding determinable one.

Powers, like any other properties, can be more or less generic. When we ascribe a *specific* power, we can simply deny that in the presence of counteracting powers the object has *that specific property* to *M*. As I shall argue below, in certain contexts it is natural to ascribe such powers to objects and persons. Our ordinary disposition terms do not express specific powers, and they are probably not fine-grained enough to identify generic ones. But if we are interested in the nature of properties rather than in the semantics of conventional disposition terms, then this fact should not particularly disturb us. We can refer to any of these powers by means of demonstrative expressions. For instance, we can say *this bit* of arsenic material does not have *the specific property* to poison *these* people (because they have taken antidotes). Or, perhaps closer to standard ordinary usage, we

can say that this bit of arsenic has the *generic property* of being poisonous which entails that someone would be poisoned by ingesting it if it were taken *and* antidotes were not taken, *and* several other unmentioned conditions were met.

Thus the problem of the explicit specification of all relevant factors that are necessary for the power to become manifest arises only when we want to identify generic powers. Consider a particular glass that had just fallen and then broke. Since it did break, there must be a sense in which it could break; hence, since it broke it must have had the property being such that it would break if it were stuck by a hard object at that particular time in those particular circumstances.[4] Thus when we ascribe a power that is *maximally specific*, the problem of how to identify every relevant condition of the power's manifestation does not arise. We could say then that in any situation which differs from the one in which the object actually broke when it was dropped only in that it was not dropped, the object must have the specific power that it would break if it were dropped. Hence we can identify a natural possibility, i.e. what can happen in particular circumstances by ascribing a maximally specific power-like property to an object.

Why should we deny that objects have such properties? It seems that some may want to deny this for three reasons. First, it may be said that our ordinary disposition terms never ascribe such powers to objects. Second, such powers are obviously extrinsic: change the environment and you might change the object's power as well. And third, such properties are extremely abundant. But some would say that if powers are properties at all, they should be sparse rather than abundant.

As to the first reason: what it shows (yet again) is only that the study of disposition terms of ordinary language may not be a good guide to understanding the theoretical role of power-ascriptions. Bird mentions the case in which a sneeze, through 'butterfly effect', can cause a glass breaking (Bird 1998, 231). But he says we would not say that we have the disposition to break windows by a sneeze. This is certainly right; but only because the circumstances in which sneezes can cause the breaking of glasses are 'abnormal' or exceptional. The point about 'butterfly effect' is, however, exactly that there *could* be specific circumstances in which one does have the power to break windows by sneezing. That power might be 'strange' because it seems to be no more than a theoretical possibility that such circumstances actually arise. And that's why it is certainly false that we

[4] If we like reasoning with the metaphor of 'closeness of worlds', we can say that, from the perspective of the world in which the glass is not dropped and does not break, (one of) the closest one(s) is ours, i.e. the world in which it is dropped and then breaks. This follows from the fact that even if similarity is not transitive, it is certainly symmetric. Thus if we alter the circumstances *minimally*, so that the only difference between the actual and the counterfactual situation is that in the latter, luckily, the vase does not fall down, then the vase must, in both cases, have the power to break when dropped.

are disposed to break windows in this way if the specific circumstances rarely or never actually arise.

As to the second reason: specific powers are indeed extrinsic, but this does not seem to be a serious problem. Why should we insist that every power is an intrinsic property of the object that has it? Certainly, in some cases whether or not we can correctly ascribe some powers can depend on the *actual* presence or absence of some factors which are, according to some standard account of intrinsicness, extrinsic to objects (McKitrick 2003). But further, it is unclear how these standard accounts are applicable to properties that are powers. Some would say, for instance, that a power is intrinsic if any nomic duplicate of the object has it.[5] But this helps only if we can decide whether or not two objects are nomic duplicates independently of what powers they have. What counts as a nomic property depends on which laws there are. But, as Humeans would have it, what laws there are depends on world-wide regularities that cannot be intrinsic to a particular object. More importantly, it is arguable that nomic relations presuppose powers, and so we cannot characterize powers' features by reference to laws.[6] Hence the notion of extrinsicness as applied to powers is more of a problem than an independent argument for anything.

As to the third reason: one might worry that maximally specific powers cannot be 'real properties' of objects. Real properties are 'sparse'; but maximally specific powers are obviously abundant.[7] But what is exactly the reason to think that properties must be sparse? For the purpose of explanations that aim at unification, the ascription of abundant properties seems idle indeed. But it is one thing to say that for *certain* theoretical purposes it would be wrong to invoke a certain kind of property, and it is quite another to deny that objects can have such a property. The ascription of specific powers can play an important theoretical role in many contexts. Most importantly, if we want to understand natural possibilities as a consequence of objects possessing certain properties, we have good reasons to assume that properties are also abundant. For a certain type of event can occur or cannot occur in one or another specific circumstances, and not just 'in general', without further qualifications.

This does not mean that specific powers cannot play any role in the explanation of what has actually happened. They are often presupposed, for instance, in contrastive explanations of singular events. Such explanations mark out an event *C* in the causal history of *explanandum* event *E*, the absence of which would be

[5] Choi 2008.

[6] See also McKitrick 2009, though McKitrick's main concern is causation and not laws.

[7] About the concept and issue of sparseness and abundance of properties see Lewis 1983. As I understand him, Lewis does not deny the existence of abundant properties; he only says that they are not 'natural'. In my view, however, naturalness itself has little to do with parsimony. For an argument that dispositional properties are not sparse (one that is different from mine), see McKitrick 2003a.

sufficient for *E*'s failing to occur. But such explanations work only if we assume that the presence or absence of *C* does not change the powers of objects that participate in the causal interaction within those particular circumstances. The contrast between the two cases is brought out precisely by the fact that the powers in the specific situations are the same so that the only distinction relevant to the occurrence of *E* is the presence or absence of *C*.

We also ascribe powers in order to identify what *things can do* and, pragmatically, what *we can do with them*. Thus, maximally specific powers find a natural place in practical reasoning. When we need to decide what to do, first we want to know what our real options are, i.e. what we can do or *what is in our power* to do *in the specific circumstances* in which we must make a choice. To use the old Lockean example, when I sit in a firmly locked room without keys and other exit etc., I cannot, i.e. I'm not able to, leave it. This means that I do not have the specific power to leave *that room at that time* even if I do have some generic power to leave rooms in the sense that I can move my limbs, see the exit etc. Thus when the question is whether or not I can do something in a particular situation, and I think that I can—I have the power to—do this or that, what I am assuming is that *at that moment and in those circumstances* no intervening factor is active. Even if I cannot explicitly specify all the conditions, I assume that, for all I know, in the specific situation, I have the power to act in the way I choose.[8] And if I'm lucky, I do indeed have that property there and then.

Consequently, some of the powers are objects' or persons' specific properties that ground certain possibilities even if the possibilities are never actualized. And objects can have determinate powers in specific situations even if we do not actually use them with the purpose to make their powers manifest. That objects, or rather certain kinds of objects, may not be disposed to *M*, not even in response to some type of stimulus *S*, unless they do display *M* with some statistically relevant regularity, does not show that they cannot have the power to *M* in certain specific circumstances.

3. POWERS AND REDUCTIVE ANALYSES

As I have mentioned at the beginning, according to the Humean tradition, the ascription of powers entails modalities in the sense that if objects could have powers, having such powers would entail necessary connections between distinct events. Traditionally, it is the rejection of necessary connections which is the main reason why Humeans have denied that power concepts can refer to genuine properties of objects. However, if I'm right, the theoretical role of

[8] I say more on this and on its implications for the ascription of responsibility in Huoranszki 2011.

ascribing powers is that they ground natural possibilities, not necessities. Thus, someone who holds that many properties are powers can—though needn't—agree with Hume that no event is such that its occurrence can make the occurrence of another distinct event necessary.[9]

Above I argued that we often ascribe a power to persons or objects in order to identify what they can do or what we can do with them. Thus the ascription of powers entails some potentialities or possibilities. This does not mean, as some have complained, that the ascription of powers is *only* talk about objects' relation to possible events. Powers are not 'occult relations to possible events'; they are actual properties of objects that explain why there are certain possibilities. Even if there might be unrealized powers, many powers are more or less specific properties that objects *actually* have.

But Hume's followers insist that power concepts do not refer to properties, or they refer to properties only because they can be reductively analyzed.[10] Reduction usually requires that the instantiation of one (sort of) property depend asymmetrically on the instantiation of some other (sort of) property. In the case of powers, reductive analyses usually assume that statements that ascribe powers express nomologically grounded actual and possible causal connections. The first step of the reductive analyses is to paraphrase statements ascribing powers in terms of what objects are disposed to do. Then it is claimed that such statements are conceptually equivalent to some counterfactuals that express contingent connections between distinct events. And finally, the truth-conditions of counterfactuals should be given purely in non-dispositional terms relying explicitly or implicitly on the concept of laws.

Critics of the Humean approach deny the possibility of such reduction. Interestingly, they do not seem to object to the very first step of the analysis, which I challenged in the earlier section; perhaps because they do not distinguish properties that are powers from those of dispositions. But even setting the issue of explicitly dispositional locutions aside, the possibility of reduction can be denied in two different ways. One way is to deny that the truth-conditions of the counterfactual conditional entailed by the ascription of a power can or should be understood purely in terms of causation, laws and non-dispositional properties. The other is to reject the earlier step of the reductive project, by arguing that the ascription of powers is not logically connected to the truth of any counterfactual conditionals. Many realists about powers, i.e. philosophers who reject reduction and take powers to be genuine properties of objects, believe that there is no

[9] In fact, so formulated, the claim is trivial. The question is whether causally connected events are ontologically distinct.

[10] This view has been endorsed in different forms, for instance, by Armstrong 1997, Mackie 1973 and 1977, and Lewis 1997.

interesting logical connection between the ascription of powers and the truth of certain counterfactual conditionals.[11]

Some of them suggest that to individuate a power it is enough to single out the type of events that is its typical manifestation.[12] George Molnar, for instance, argues that having some powers is like being in an intentional state in the sense that powers are directed at their manifestations even when the manifestation does not occur (2003).[13] But even if the parallel with intentional states is adequate, this does not prove that identifying a type of manifestation is sufficient for identifying powers. For intentional states can differ from each other even if they are directed at the same type of intentional object.[14] In fact, the attempt to understand causal powers without using conditionals must face a similar difficulty. The types of manifestations are not fine grained enough to identify distinct powers, unless we already understand them as manifestations of those powers.

Thus I'm going to argue for a third possibility. I accept, along with Humeans, that there must be a conceptual connection between the ascription of powers and the truth of certain counterfactual conditionals. However, the conditional analysis of dispositions can serve different purposes. It may be the case that originally it was introduced as a step towards reduction. The idea was that propositions that ascribe powers, if true at all, can be replaced by talk about actual or potential causal relations between events. But an analysis, even a conceptual analysis, can serve purposes other than conceptual reduction. In fact, very few analyses, if any, have ever provided conceptual reduction of one kind of entity to some other. The conceptual link between powers and counterfactuals can elucidate the relation between properties and natural possibilities without 'reducing' powers or denying that they are genuine properties. So understood, the conditional analysis of powers can play a significant role in our ontology: it is through such an analysis that we can specify powers and hence explain, with reference to objects' properties, which natural possibilities exist.

The non-reductivists' rejection of the conceptual connection between the ascriptions of powers and the truth of certain counterfactuals is based on counterexamples to what is called the 'simple conditional analysis of powers'. According to such an analysis, the ascription of powers entails the truth of some counterfactual conditional. Now, I agree that the instantiation of a property cannot depend on whether or not we happen to hold a counterfactual true. But the

[11] See Martin 1994, Molnar 2003, and Bird 2007, Chapter 2.

[12] See for instance Lowe 2010. Interestingly, most realists say surprisingly little about the way we should individuate powers.

[13] In fact, Molnar—assuming that there are further similarities between powers and intentional states—argues that to have a power is to be in an intentional state. This is a more contentious claim, which has been severely criticized by other realists. See for instance Bird 2007, 114–129.

[14] Thus, in order to identify an intentional state, we also need to identify the intentional mode. See Crane 2001, 32.

power that may or may not be instantiated by an object is nevertheless identifiable only by linking its ascription to the truth of some such counterfactual conditionals. For it is with the help of such counterfactuals that we can individuate the relevant possibilities.

4. FINKS, REDUCTION, AND CONDITIONALS

Alvin Goldman considers—though immediately rejects—an objection to the conditional analysis in one of the footnotes to his book on intentional action. According to the conditional analysis something is soluble iff it would dissolve if it were immersed in water. But imagine that someone has a magical power to make an object soluble whenever it is about to be immersed in water. Then it is true that it would dissolve if it were immersed in water. Nevertheless, the object is insoluble (Goldman 1970, 199–200). Many philosophers thought—perhaps Goldman included—that such examples speak more against the possibility of magic than against the conditional analysis of dispositions. Later, however, in a highly influential article, Charles Martin argued that there are cases logically analogous to the one described by Goldman that do not involve the use of supernatural capacities (Martin 1994).

Martin presents a scenario in which an electro-fink is attached to a wire. An electro-fink is a device that can make a wire live when it is touched by a conductor. Suppose we hold that a wire is live at *t* iff an electric current would flow through it, if it were touched by a conductor at *t*. But in the presence of an electro-fink, the conditional is true even if the wire is dead. Finks can work in the opposite way as well. It is possible that a wire is live, but, thanks to the presence of a 'reverse-fink', no electric current would run through it if it were touched by a conductor. In this case, we can correctly ascribe a power to an object even if the conditional is false. Thus, the possibility of finks and 'reverse-finks' raises an obvious difficulty for the simple conditional analysis.

As I noted earlier, in view of such counterexamples, some philosophers want to conclude that there is no interesting conceptual connection between the ascription of powers and the truth of the corresponding counterfactual conditional. Martin himself concludes that counterfactual conditionals in general are 'only clumsy and inexact linguistic gestures to dispositions' (Martin 1994, 8). Perhaps we can use such conditionals to characterize vaguely some causal powers; but the ascription of powers is logically independent of the truth of any counterfactual conditionals.

What Martin and many other realists about powers are supposing is that the simple conditional analysis' failure to accommodate the possibility of finks proves certain metaphysical consequences. They assume that if our ordinary disposition terms cannot be analyzed by means of counterfactual conditionals,

then powers cannot be reduced to non-powers, and hence they cannot be eliminated from our ontology.[15] In fact, I doubt that any such consequence follows. More importantly, however, one can draw such conclusions only if one assumes that the purpose of the conditional analysis *must* be reduction. Accordingly, if the analysis fails, reduction is rejected. But I shall argue for the contrary view: if reduction is rejected, the analysis can be saved and can play an important role in our understanding of powers.

Having said this, it remains true that many philosophers who aim at some reductive account of powers do rely on the conditional analysis. And it is generally agreed that for the purpose of reduction, propositions which ascribe powers must be logically or conceptually equivalent to certain counterfactual conditionals. The possibility of finks does indeed raise a difficulty for the reductive project. Therefore the reductionist needs a more complicated conditional analysis which is immune to such counterexamples.

David Lewis's reformed conditional analysis—perhaps the most influential attempt to amend the original analysis—was conceived exactly in this spirit (Lewis 1997). As Lewis observes, the examples of finks and reverse finks are based on the possibility that the bearer of a power can change during the process of manifestation, and that such change can result in the acquisition or loss of the power to be analyzed. Thus in order to answer the difficulty raised by the possibility of finks, we need to include among the conditions of manifestation that *some property* is retained until the power's manifestation occurs. But what is that property exactly?

Since Lewis rejects what he—following Martin—calls 'irreducible dispositionality', his purpose is to offer a reductive analysis of powers (Lewis 1997, 148). Thus, taking his cue from earlier reductive analyses, he assumes that every disposition must have a *causal basis*—'some intrinsic property *B*'—the presence of which together with the stimulus event would be causally sufficient for the occurrence of the manifestation event.[16] He then suggests completing the antecedent of the conditional with the condition that in the circumstances of manifestation, the object's relevant intrinsic property *B* would be retained.

However, the postulation of such intrinsic property gives rise to a number of difficulties. Reduction seems to require that the relevant intrinsic property be non-dispositional; and that it be distinct from the power itself. But it is unclear why every power needs to have a distinct ground or causal base. It has been argued persuasively that many fundamental physical powers do not have such ground (Ellis and Lierse 1994; McKitrick 2003b; Molnar 2003). Further, even

[15] This is, for instance, Molnar's view; see Molnar 2003, 82–98. This view is often identified with realism about powers. For important exceptions see Mellor 1974, Mumford 1998 and Mellor 2000.

[16] For earlier analyses relying on the same assumption, see Armstrong 1973, Mackie 1977, Prior et al. 1982.

if we assume that they do, we must explain how dispositions, understood as objects' properties, are related to their ground. If the ground is some non-dispositional property or property-complex, dispositions cannot be identical with it. But if they are distinct, why is the causal basis not sufficient for the occurrence of the manifestation events? Why do we need dispositional properties at all?

Lewis himself, seeing the difficulties with cashing out the nature of the relationship between dispositional properties and the non-dispositional base, tries to be as non-committal as possible about this question (Lewis 1997, 151–152). He insists only that the relevant property must be intrinsic. But even this is contentious. According to Lewis, the ground or basis of dispositions must be intrinsic because dispositions themselves are always intrinsic to their objects. However, our earlier considerations have shown that we have good reason to ascribe specific powers to objects that are extrinsic. And it would be hard to make sense of the claim that such power's ground is intrinsic. Further, some finks may be intrinsic to the object.[17] And if such finks can be removed only together with the intrinsic causal base, Lewis's analysis fails. Hence a large number of philosophers are in no position to agree with Lewis's analysis: on the one hand, philosophers who think that objects can have powers without having distinct non-powers as their grounds; on the other hand, philosophers who think that objects' powers can change without a change in their intrinsic non-dispositional properties (because, they hold, for instance, that some powers are not intrinsic).

Lewis's analysis assumes, of course, that there is no difference between the ascription of a power and the ascription of a disposition. Both are claims about what objects are disposed to do. But if I am right that powers as properties fulfill a different theoretical role than dispositions do, then we can avoid the difficulties and complications induced by the introduction of a non-dispositional causal base. As far as powers are concerned, we can propose a relatively simple non-reductive analysis. And as far as dispositions are concerned, we can rely on some statistical interpretation of the relevant counterfactual that can make the analysis immune to the problem of finks.

5. A NON-REDUCTIVE CONDITIONAL ANALYSIS OF POWERS

When Martin introduced the example of a fink, he meant it as a criticism of reductive analyses of dispositions. But Martin has not shown why, if we reject reduction, some version of the conditional analysis cannot be correct. In fact, before he draws his conclusion (cited in the previous section) about the useless-

[17] About the first possibility, see McKitrick 2003; about the second, Smith 1977. About intrinsic finks, see Clark 2008, Clark 2010 and Choi 2012.

ness of counterfactuals in the analysis of powers, he suggests that 'there can be no conditional which is both logically equivalent to a categorical ascription *and* such as to support the elimination of power or dispositional predicates' (Martin 1994, 6, emphasis in the original). But this is not the same as to claim that counterfactual conditionals are only 'clumsy gestures' towards powers.

Since realists about powers do not aim at a reductive analysis of powers, they can include in the circumstances of manifestation that *the object does not change with respect to the power* to be analyzed until the manifestation event occurs. Of course, in case of powers that can be manifested only once by a particular object, the power must be lost by the end of its manifestation, often together with its bearer. No vase can remain fragile after it has been broken; and no sugar cube is soluble after it has been dissolved. But objects can retain a power until its manifestation occurs.

Thus the problem of finks can be avoided if we use a slightly reformed conditional analysis suggested by Hugh Mellor as an improvement on Carnap's account of reduction sentences (Mellor 2000, 7–8). This requires the following minimally revised version of the original formulation of the counterfactual conditional:

> For any object o and times t, $t+\delta t$, o has the power P to M at t iff the manifestation event of type M would occur no later than $t+\delta t$, if o were in circumstances of type C as characterized by conditions $\{c_1 \ldots c_n\}$ at t and it retained P at t– $t+\delta t$.

For instance, a sugar cube is (water-)soluble if and only if it would dissolve within a certain period of time if it were immersed in some not already saturated, not very cold etc. water *and* it retained its solubility until it dissolves.

This version of the conditional analysis has several advantages relative to Lewis's. First, it is much simpler. Truth, of course, should not be compromised because of our desire for simplicity, but simplicity without compromise might count as a virtue of an analysis nonetheless. Second, the analysis is compatible with powers being extrinsic. For some, this is perhaps more of a vice than a virtue. However, as I have argued earlier, if we ascribe powers to objects in order to ground natural possibilities, we had better make room for extrinsic powers. And third, this version of the conditional analysis does not assume that every power must have an intrinsic base that would make it nomologically impossible for the object to change its power while it does not change intrinsically; meanwhile, there is nothing in the analysis that would make it incompatible with the assumption that some powers do have intrinsic ground.

Despite such virtues, one might object that the analysis is circular and hence less informative than Lewis's analysis. However, we need to be careful about what we mean by circularity here. If it means that we refer to the yet unanalyzed property in the *analysans*, then the proposed analysis is certainly 'ontologically'

circular. But that circularity is unavoidable since the analysis can be correct only if it involves reference to the same property in the *analysandum* and in the *analysans*.[18] If, however, circularity means that the analysis does not provide any semantic information that can elucidate the content of the *analysandum* because of the reference to the power to be analyzed, then the analysis does not seem circular to me. At the very least, it is unclear why reference to the power in the *analyzans* would make the analysis uninformative.

Certainly, the analysis is not reductive, and this contradicts Lewis's assumption that we do not need properties that are irreducibly powers in our ontology. However, such convictions about whether every genuine property must be purely 'qualitative', or whether the ascription of properties must entail what objects possessing them can do, are independent of the question which counterfactual conditionals are entailed by their correct ascription. But more importantly, if the reference to the power to be analyzed in the *anlysans* is an objection to this version of the conditional analysis, then Lewis's analysis is not in better shape since that analysis also contains tacit reference to the power to be analyzed.

According to Lewis's analysis, one of the conditions of manifestation is that the object retain 'some intrinsic property *B*' until the manifestation occurs. What is that property? Obviously, it must be the property that grounds the power. Now ordinary objects have many powers at the same time. A knife made of stainless steel, for example, can have the power to conduct electricity, to resist rusting, as well as the power to cut bread (or the more generic power to cut or scratch objects made of material less hard than steel). These are obviously not the same powers, since certain kinds of objects can have one of them without having the other. Soft objects can be good conductors, and hard objects can be very bad ones.

So how can we single out the 'intrinsic property B' the retention of which is necessary in order for the power to become manifest? The only way I see is to say that *whatever property is the ground of the power* must be retained. Of course, if we assume that that property is distinct from the power itself, then there might be ways to detect it independently of the power. But the relevant question is whether or not we can identify it *as* the ground of the power without some implicit reference to the power itself. If our metaphysical conviction is that no property is irreducibly a power, and hence objects' powers must have some non-dispositional ground, then reference to the intrinsic non-dispositional property seems natural, quite independently of the issue of finks or any other objection to the simple conditional analysis. But this is not an issue about how powers are

[18] As Michael Jubien says 'if the concept under analysis has a certain characteristic feature, […] then one would think that feature must also somehow be present in the analysans, or else the analysis could not be correct. From this perspective [seeking a 'reductive' analysis] looks like the pursuit of magic.' (Jubien 2009, 95).

connected to conditionals. And certainly, it is hard to see why an analysis that includes the condition 'the power to *M* is retained' is less informative than the one with the condition 'whatever property is the ground of the power to *M*, it is retained'. If there is a difference between the two in terms of their informativeness, it is certainly the second, with its reference to a further unknown property, which is the less informative.

6. DISPOSITIONS, GENERIC POWERS, AND STATISTICAL REGULARITIES

When Lewis introduced explicitly dispositional locutions he meant to specify the meaning of conventional disposition terms so that they fit his reformed conditional analysis. But the introduction of the explicitly dispositional locution can also be interpreted as the first step in a statistical interpretation of the truth-conditions of the corresponding counterfactual conditionals. According to the statistical interpretation, the ascription of dispositions entails counterfactual conditionals that can tolerate exceptions. This means, roughly, that [1] a (kind of) object has the disposition *D* iff it is disposed to *M* in circumstances *C*; and [2] it is disposed to *M* in circumstances *C* iff in the statistically relevant reference class of cases, it would *M* more often than not, were it placed in a circumstance of the same type as *C*.[19] For instance, an object is fragile iff it would break more often than not in the counterfactual circumstances in which it is dropped from an appropriate distance on a hard surface.

It has been argued that the statistical interpretation of the counterfactuals can answer the challenge from finks as well as several other possible counterexamples to the conditional analysis of dispositions.[20] Indeed, this analysis can provide an intuitively adequate account of the connection between the ascription of dispositions and the sort of conditionals that are entailed by their ascription. But the statistical analysis explains this connection so well precisely because dispositions are understood here as behavioral tendencies. It is for this reason that the ascription of dispositions can be shown to entail certain counterfactuals the truth conditions of which can be interpreted in statistical terms. If it is true of an object that it is disposed to behave in certain ways in response to some stimulus, then it must be true as well that in the counterfactual circumstances in which the stimulus event occurs, the difference between the object's displaying and not displaying the behavior would be statistically relevant.

Dispositions the ascription of which involves such statistical regularities play an important explanatory role both in science and in ordinary discourse. But it plays a fundamentally different theoretical role than the ascription of powers.

[19] This is a variation of the theory proposed by Manley and Wasserman 2008, 75–76.
[20] See Manley and Wasserman 2008, 76–81.

To recall my earlier example, even if Bob *has the power to*, i.e. *can* swim, or can steal, can hurt other people's feelings etc., this needn't explain what he actually does, and it does not help predict what he is ever going to do. His having those powers is presupposed when we explain his behavior by his being a smoker, a thief, by his being callous, etc.; but ascribing them does not entail any such behavior. In contrast, when we say that Amy is a swimmer it does tell us something about her actual behavior because it explains what she occasionally does, even if the explanation is not particularly interesting or informative.

Of course, we can ascribe a disposition to a particular object even if the object does not actually display the relevant sort of behavioral tendency; if not for other reasons, just because many dispositions are such that particular objects can manifest them only once. For instance, no fragile object can break regularly. However, in most such cases, what grounds the truth of the statistical counterfactual is some actual regularity which is characteristic of the natural kind the particular object instantiates. Things made of a kind of glass are fragile because things made of that kind of glass break more often than not when dropped from a particular distance and when they fall on a hard surface etc. It is this actual regularity which can ground our belief that any particular object made of that kind of glass would break more often than not in the counterfactual circumstances in which it is dropped.

But even if the statistical interpretation of the counterfactuals explains well what it means for an object to be disposed to do certain things, it is ill-suited for the analysis of statements that ascribe powers to objects. For, as we have seen from Bird's sneezing–window-breaking example, if the circumstances in which an object would *M* more often than not are, statistically speaking, uncharacteristic, then the object is not disposed to *M*. Similarly, a poisonous material can cure someone in certain special circumstances and a medication can kill. But a poisonous material is not disposed to cure, and a medication is not disposed to kill. Thus, if powers fulfill the theoretical role in our ontology which they do according to my proposal, then the statistical interpretation of the counterfactuals should be understood as an account of objects' dispositions rather than that of their powers.

Despite this, there is an important metaphysical and an important epistemic connection between objects' having powers and their being disposed to behave in certain ways. As mentioned earlier, it is unlikely that every power has a distinct ground. However, it seems extremely plausible that dispositions as behavioral tendencies must have some ground. And their ground is exactly the object's generic power which specifies in which kind of interactions the object *can* participate in which kind of circumstances. Thus, metaphysically, the possession of generic powers grounds objects' dispositions. Epistemically, however, it is on the basis of observed regularities that we ascribe a disposition to certain objects or, more frequently, to certain kinds of objects. And it is through ascribing such

dispositions that we can infer the possession of generic powers. So understood, the ascription of dispositions provides a link between statistical regularities and the ascription of generic powers.

7. CONCLUSION

As I mentioned at the beginning, the concept of a disposition as it is used in contemporary philosophy was introduced as a technical term. As such, any theory of dispositions should be evaluated with reference to the theoretical role that the properties represented by such concepts play in science and philosophy. I tried to show that many analyses of disposition terms hide an important difference between two fundamentally different roles which such terms can play in metaphysics. One of these roles can be well captured by understanding statements of dispositions as expressing what objects are disposed to do in response to certain stimuli. But dispositions understood in this way should be distinguished from powers as properties of objects. For even if dispositions presuppose powers, the ascription of a power does not entail that objects are disposed to behave or interact in certain ways. The ascription of powers has a distinct role in metaphysics. And that role will not be adequately captured by a semantic analysis of the meaning of conventional disposition terms.

The ascription of powers is not constrained in any way by the use of dispositional predicates. It has been observed already in early discussions of dispositions that English has certain grammatical devices with which we can easily generate new disposition terms.[21] Some philosophers have worried that this makes it too easy to introduce new powers into our ontology.[22] This may be a justified worry as far as generic powers are concerned. But the role of specific powers cannot be understood through an analysis of conventional disposition terms for a different reason. Not because we can generate terms for powers too easily; rather, because some powers are so specific that it would be impossible to introduce separate terms for each. This does not mean that we cannot express specific powers, since it is possible to identify them with the help of demonstratives. But the main purpose of the conditional analysis of powers is not to provide an account of the use of conventional disposition terms, but rather to identify powers of varying specificity.

Ascribing such powers to objects serves a special theoretical purpose. Such specific powers are properties that ground natural possibilities. According to many contemporary accounts, properties should be understood in terms of possibilities. My account agrees with this to the extent that properties are not in-

[21] See Goodman 1954, 40.
[22] Molnar expresses this worry, which he shares with Quine. See Molnar 2003, 27–28.

dependent of possibilities. However, if I'm right, the order of ontological dependence should be the reverse. Since many properties are powers, it is these properties that ground natural possibilities.[23]

REFERENCES

Armstrong, D.M., 1973. *Belief, Truth and Knowledge*, Cambridge: Cambridge University Press.
——, 1997. *A World of States of Affairs*, Cambridge: Cambridge University Press.
Bird, A., 1998. 'Dispositions and Antidotes', *The Philosophical Quarterly* 48: 227–234.
——, 2007. *Nature's Metaphysics: Laws and Properties*, Oxford: Oxford University Press.
Carnap, R., 1936–7. 'Testability and Meaning', *Philosophy of Science* 3: 419–471 and 4: 1–40.
Choi, S. 2008. 'Dispositional Properties and Counterfactual Conditionals', *Mind* 117: 795–841.
——, 2012. 'Intrinsic Finks and Dispostional/Categorical Distinction', *Noûs* 46: 289–325.
Clarke, R., 2008. 'Intrinsic Finks', *The Philosophical Quarterly* 58: 512–518.
——, 2010. 'Opposing Powers', *Philosophical Studies* 149: 153–160.
Crane, T. 2001. *The Elements of Mind*, Oxford: Oxford University Press.
Ellis, B. and Lierse, C. 1994. 'Dispositional Essentialism', *Australasian Journal of Philosophy* 72: 27–45.
Ellis, B. 2001. *Scientific Essentialism*, Cambridge: Cambridge University Press.
Fara, M., 2005. 'Dispositions and Habituals', *Noûs* 39: 43–82.
Goodman, N., 1954. *Fact, Fiction and Forecast*, Cambridge, Mass.: Harvard University Press.
Goldman, A. 1970. *A Theory of Human Action*, Englewood Cliffs, NY: Prentice Hall.
Harré, R., 1970. 'Powers', *British Journal for the Philosophy of Science* 21: 81–101.
Harré, R. and Madden, E.H. 1975. *Causal Powers: A Theory of Natural Necessity*, Oxford: Basil Blackwell.
Heil, J., 2003. *From an Ontological Point of View*, Oxford: Clarendon Press.
Huoranszki, F. 2011. *Freedom of the Will: A Conditional Analysis*, New York: Routledge.
Lewis, D. K., 1983. 'New Work for a Theory of Universals', *Australasian Journal of Philosophy* 61: 343–77.
——, 1997. 'Finkish Dispositions', *The Philosophical Quarterly* 47: 143–158.
Lowe, J. 2010. 'The Individuation of Powers', in A. Marmodoro, A. (ed.) *The Metaphysics of Powers: Their Grounding and Their Manifestations*, 8–27.
Mackie, J.L., 1973. *Truth, Probability and Paradox*, Oxford: Oxford University Press.
——, 1977. 'Dispositions, Grounds and Causes', *Synthese* 34: 361–370.
McKitrick, J., 2003a. 'A Case for Extrinsic Dispositions', *Australasian Journal of Philosophy* 81: 155–174.
——, 2003b. 'The Bare Metaphysical Possibility of Bare Dispositions', *Philosophy and Phenomenological Research* 66: 349–369.
——, 2009. 'Dispositions, Causes, and Reduction', in Handfield, T. (ed.), *Dispositions and Causes*: 31–64, Oxford: Oxford University Press.

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Manley, D. & Wasserman, R., 2008. 'On Linking Dispositions and Conditionals', *Mind* 117: 59–84.
Marmodoro, A. (ed.), 2010. *The Metaphysics of Powers: Their Grounding and Their Manifestations*, London: Routledge.
Martin, C.B., 1994. 'Dispositions and Conditionals', *The Philosophical Quarterly* 44: 1–8.
Mellor, D.H., 1974. 'In Defence of Dispositions', *The Philosophical Review* 83: 157–181.
——, 2000. 'The Semantics and Ontology of Dispositions', *Mind* 109: 757–780.
Molnar, G., 2003. *Powers: A Study in Metaphysics*, Oxford: Oxford University Press.
Mumford, S., 1998. *Dispositions*, Oxford: Oxford University Press.
Prior, E., 1985. *Dispositions*, Aberdeen: Aberdeen University Press.
Prior, E., Pargetter, R. & Jackson, F., 1982. 'Three Theses about Dispositions', *American Philosophical Quarterly* 19: 251–257.
Quine, W.V., 1960. *Word and Object*, Cambridge, Mass.: MIT Press.
Ryle, G., 1961. *The Concept of Mind*, 3rd edition, New York: Barnes and Nobles.
Smith, A.D., 1977. 'Dispositional Properties', *Mind* 86: 439–445.