

## Powerful causation

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In this paper I shall analyse John Heil's argumentation that leads to the main thesis of his *Ontological point of view* (2003), that is, his identity thesis of dispositional and categorical properties. First, conceptual clarifications are given in order to specify the relevant meanings of the dispositional/categorical distinction. Second, the structure of Heil's argument is evaluated and a hidden premise is identified. In a next step I shall give reasons to doubt the assumption that the properties instantiated in our world are not only categorical, but also dispositional. On the one hand the negative reasons for this thesis, the apparent failure of an appropriate conditional analysis, are not convincing and on the other hand when it comes to causation there is neither epistemological nor ontological support for the claim that causal statements are made true by manifested dispositions.

### 1 Heil's argumentation

The set of properties can be divided in two ways. First, they can be categorical or dispositional (this distinction may not be exclusive, as Heil thinks), or they can be intrinsic or relational (this one in turn is not else conceivable than as an exclusive alternative). To my knowledge there is no reason why we should regard these two ways of classifying properties as dependent on one another. From a neutral point of view all four combinations of them are possible and might label non-empty classes of properties.

There are three central notions to consider when it comes to analysing John Heil's discussion of properties: disposition, power, causal efficacy. These three concepts are connected in the following way: powers are closely related to the notion of causal efficacy. The notion of power entails the notion of causality: there does not exist a non-causal power, such a power would be powerless. A power is always a power of something to bring about a certain effect. Causality in turn can be expressed in power-vocabulary: being a cause means having the power to act. Therefore it is at least true that power-talk is causal talk: to be a power is to be somehow linked to causation or causal relevance. The

difference between categorical and dispositional properties might be expressed by their difference in power bestowing that is a difference in the way causal efficacy is executed. While dispositions have their powers built-in and bestow their powers directly on the object, categorical properties (usually referred to as qualities by Heil) bestow their powers only indirectly to their object-bearers, via the relations they enter into. Thus Heil makes an oversimplification when he identifies powers with dispositions. We should not reserve causal efficacy from the beginning for dispositions only. Heil had rather say that built-in powers are identical with dispositions.

In general, properties are related to powers. In fact, there exists a power criterion for the distinction of properties: properties are distinguished by the distinctive contributions they make to powers or dispositionalities of their possessors (Heil (2003), pp. 76 – 77). This leads to:

(PI) Necessarily, if any *A* and *B* are properties,  $A = B$  just in case *A* and *B* make the same contribution to the causal powers of their (actual or possible) possessors.

(PI) is to say that two properties are identical if and only if they cannot causally behave in any way that permits to distinguish them (supposed that the indistinguishable is identical). If (PI) is combined with Heil's identity thesis (where powers are identical with dispositions) the problem arises, why and how we could conceive the existence of qualities that bestow powers on their possessors only indirectly. If there is a power (dispositional, in his talk) criterion for property identity of existing properties, should there be no qualities? They seem to be excluded by definition, and Heil admits that it "... is hard to find room for them" (Heil (2003), p. 76). But following a long philosophical tradition Heil accepts that a world lacking qualities is unconceivable. Every quality needs a relation to get causal importance. That means that pure isolated qualities have no causal relevance. It follows that there is a brute basic dichotomy between dispositions and qualities.

## 2 The nature of dispositions

John Heil proceeds by specifying the features of dispositions. His strategy is mainly a negative one, since he asks what dispositions are not and identifies the set of dispositions with the remaining substrate. Heil's first step is to accord dispositions an ontological status. Dispositions belong to the ontological

category of properties. Then he applies commonly accepted classifications of properties to delineate the set of dispositions properly:

- (I) Dispositions are not relations. This is to say that dispositions are intrinsic. For they are independent of the instantiation of other properties, especially of their manifestations (Heil (2003), pp. 79 – 81). This is an informative claim. Not only does it open the possibility of unmanifested dispositions, but it also excludes the *a priori* possibility of dispositional relations (relations, for example, that have the power to bring about other relations).
- (II) Dispositions are not higher-level properties. For they would succumb to the causal exclusion principle, which would deprive them from the causal relevance they have by definition (Heil (2003), pp. 87 – 89).
- (III) Dispositions are not qualities combined with contingent second-order universals (Armstrong laws). For higher-order universals need both relata to be instantiated in order to be instantiated themselves. Therefore, on a simplified Armstrong account an unperceived tomato is not red (if red is a disposition), because without perception, there is no universal relating the tomato and the perceiver. Hence, there is no disposition. Dispositions are not only non second-order but also non-contingent, that is, necessary. This means properties and their causal powers cannot vary independently (Heil (2003), pp. 90 – 92). The whole of dispositional instantiations fixes necessarily the whole causal make-up of the world.
- (IV) There are qualities and there are dispositions. There is no satisfactory account of combining them while maintaining that they are different kinds of properties (Heil (2003), pp. 117 – 120). They must hence be identical.
  - (IT) “If  $P$  is an intrinsic property of a concrete object,  $P$  is simultaneously dispositional and qualitative...  $P_d = P_q = P$ ” (Heil (2003), p. 111)

### 3 Objections to Heil

From the set of assumptions jointly motivating the formulation of his identity theory, I shall attack the first and most basic one: the assumption that dispositions are properties. In the chronology of his argumentation listed above the power criterion for the distinction of powers is an ontological argument that already presupposes that dispositions are features of objects, that they are entities to be distinguished and classified, and that they are ways things are, i.e.

properties. There are two reasons to justify this assumption. Intuitively, our language is full of dispositional vocabulary. It is therefore plausible that those concepts refer to something in the world. Nevertheless, Heil propagates the rejection of what he calls the Picture Theory of language. This theory expresses the view that to any correctly predicated feature of an object corresponds an ontological counterpart (a property instance) in virtue of which this predication is true and that all those objects that satisfy the predicate possess the same property. Rejecting the Picture Theory of language opens up the possibility of correctly predicated dispositional concepts that are made true by something essentially non-dispositional. However, the burden of proof lies upon those who adopt an eliminativist attitude with respect to dispositions on the ontological level.

Heil's assumption that dispositions are ontological entities is backed by a reasoning Charles B. Martin presents in his 1994 paper. Martin argues as follows: there is reason to postulate dispositional properties, because the most serious and common enterprise to reduce dispositional statements to classes of counterfactual statements can be refuted. Following Martin the task for those who set out to reduce dispositional statements is double: first to show that a counterfactual account is necessary and sufficient for dispositional statements, second to show that it is not dispositional properties that make true counterfactuals. Martin refutes the first point, so he does not have to attack the second.<sup>1</sup> Note that Martin's argument is not logically conclusive, but only a motivation for holding that there are dispositional properties: the main enterprise to show that there are none fails. The main point of criticism Martin and Heil advance against a counterfactual analysis is the case of finkish dispositions. Finkish dispositions are supposed to be counterexamples to the prevailing counterfactual accounts of dispositions. They are supposed to be dispositions that escape counterfactual determination. The most famous example is the following one:

The wineglass is fragile (disposition), but each time fragility is about to manifest itself God intervenes and makes the glass lose its fragility.

This refutes the first direction of implication between fragility (disposition) and its conditional analysans:

(A) Fragility  $\Rightarrow$  breaks when dropped

(A) is false since the glass is fragile, but the counterfactual is false. For the second direction of implication consider the following slightly modified situation:

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<sup>1</sup> For a conditional analysis of dispositional statements combined with a realist position concerning the existence of dispositional properties, see Malzkorn (2000).

Imagine a God that each time a previously non-fragile thing (a tin cup, for example) is dropped he interferes and makes it fragile.

Here we get the refutation of the implication from the conditional to the disposition:

(B) Breaks when dropped  $\Rightarrow$  fragility

(B) is false since the counterfactual is true, but the disposition ascription is false. Hence, counterfactuals are neither necessary nor sufficient to analyse dispositions. Since they are not further analysable in this way they must refer to something “of the kind” in the world, namely dispositional properties. There are several options to answer Martin’s argument:

- (I) David Lewis (1997) and others (Malzkorn (2000), Wasserman & Manley (manuscript), for example) propose conditional analyses that are fink-proof: Lewis excludes the loss of the pertinent property (the dispositional basis) during the counterfactual analysis, but this approach is open to new counterexamples (Bird (1998)). Malzkorn introduces formal normality constraints that seem to exclude finkish cases. Wasserman & Manley introduce a proportionality criterion for manifestations over pertinently varying trigger-situations.
- (II) Finked situations can be considered as bad or invalid counterexamples that, on a proper analysis, turn out to be mostly harmless: Gundersen (2002) and Cross (2005) favour this position, and in what follows I put forward a variant of their insights.

The examples of divine glasses and the like are often difficult to grasp for they demand a lot of flexibility and goodwill from the part of the reader. It is difficult to consider those nomologically highly inaccessible worlds, given that nomological ordering is such a central principle of counterfactual standard semantics. This somehow self-undermines the strength of the argument. Therefore, I propose to consider the following more intuitive situation (intuitive in its most honest sense as it is a scene of Stanley Kubrick’s famous film *A clockwork orange* from 1971 after Anthony Burgess’s 1962 novel with the same title):

The “hero”, Alex, is extremely aggressive and violent. That is his disposition. Example-situations where he manifests his disposition are when someone provokes him, hits him or challenges his group internal leadership. As a most extreme manifestation of his disposition he murders a person and is arrested. The minister of interior affairs wants to make a revolutionary example

in criminal treatment of him. His penalty is abated if he agrees to follow, for a short time, a brand new medical treatment (the Ludovico method) that intends to change him and make him a socially acceptable person. Alex is forced to watch ultra-violent films combined with periodical swallowing of drug cocktails. Then, after the psychosomatacal treatment has come to an end, the public test in front of an illustrious audience, such as the press and the minister, takes place. Alex, on stage, is confronted with an aggressor that provokes and hits him until he gets hopping mad. He is disposed, so to say, to hit back, but every time he tries, he suddenly gets physically sick as a parrot. He lies on the floor, moans and is incapable of doing any harm. This is the result of the Ludovico method. Every time, that is the morale of finkish situations, he is about to manifest his disposition, because the appropriate triggering conditions obtain, he loses the disposition for exactly as long as those conditions obtain.<sup>2</sup>

The Ludovico-fink is responsible for Alex to lose his disposition right at the triggering moment. In this situation the counterfactual “Would Alex be sufficiently provoked by some aggressor, then he would hit back” is wrong because of the Ludovico-fink. More precisely, and presupposing counterfactual possible worlds semantics, there is a very (or sufficiently) similar world where Alex is provoked and does not hit back. Actually such a world would be exactly similar. Nevertheless, the dispositional statement “Alex is extremely violent and aggressive” remains true. So, at least, say Martin and Heil. When the truth values of two different statements diverge, they cannot be identical. Hence, there are dispositional situations that are not accounted for by a conditional analysis. The case of finkish dispositions cashes out the apparent tension between a disposition’s actuality even if unmanifested and its pure counter-to-the-fact analysis through subjunctive conditionals.

How can then the lack of coherence in this alleged counter-example be established? In this special situation it is claimed that finkishness is a metaphysically possible scenario. First let us state the two situations that one needs to compare:

(I) The normal situation

- Alex is violent and aggressive (= has disposition *V*). There is a set of conditions *C* (the trigger conditions) that is typically sufficient for his disposition to manifest itself as *A* (the physical aggression and attack on someone).

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<sup>2</sup> The situation is pertinent as well because it can also be regarded as a masking or antidote example in Bird’s and Gundersen’s sense.

- If  $C$  obtained, then  $V$  would manifest itself as  $A$ .

## (II) The finked situation

- Alex is violent and aggressive (= has disposition  $V$ ). There is no set of conditions  $C'$  that is typically sufficient for his disposition to manifest itself (the trigger conditions), because as soon as any set of conditions  $C'$  becomes sufficient for  $V$  to manifest itself in  $A$ ,  $C'$  entails the loss of  $V$  and therefore of  $A$ .
- It is not the case that if  $C'$  obtained, then  $V$  would manifest itself as  $A$ , because  $C'$  entails that Alex loses  $V$ .

Such is the initial situation. But what does “typically sufficient” mean? In general it means to be often sufficient but not always. There are situations where it is not the case that  $C$  is sufficient for Alex’s  $V$  to manifest itself as  $A$ . Think of the following un-finked (therefore type (I)) situation: Alex is  $V$ , some guy teases him, Alex wants to attack him, but a trapdoor opens and he falls in a hole. Disposition  $V$  is still there but the manifestation  $A$  has become impossible because of not satisfied but necessary physical proximity of, let’s say, an arm length. What this is about could be called circumstances or context (Cross (2005)). Circumstances are also conditions for  $V$  to become manifested as  $A$ , but they are conditions of another kind than  $C$  (or equally  $C'$ ). While the latter ones are properly called trigger conditions (appealing to sufficiency), the former can be qualified as background conditions commonly referred to as normality (basic necessary conditions). The most economic way of describing what we should consider as normal is a negative characterisation: the lack of interference that blocks the entailment connection between  $V$  and  $A$  given some  $C$ . If a situation is not normal, there is some blocking interference. This would qualify a fink as a sufficient feature to render a context abnormal, if added to a set of normal conditions. The context would contain an inconsistency in as much as normality is required for dispositional talk. Abnormality entails the emptiness of  $C'$ . But is it allowed to consider the fink as a part of the background conditions?

Martin and Heil intend to take the fink to be part of the trigger conditions or the overall dispositional make-up  $V$  of Alex. In our formulation of the problem the fink cannot be part of the trigger conditions  $C'$  because  $C'$  is empty. The only way to conceive  $C'$  as non-empty is when one accepts that “typically sufficient” is compatible with the existence of some counter-fink that trumps over the initial fink in making the manifestation possible again. This is no

viable solution, because the pair of fink and counter-fink causally neutralises itself. It would be difficult, or even impossible, to distinguish the result from a normal type (I) situation. It is hard to imagine how finks can be parts of the trigger-conditions if “trigger” is to mean something at all in connection with the respective disposition. What if the fink should be part of Alex’s overall dispositional make-up? What would the result-disposition  $R$  of disposition  $V$  be in presence of a “trumping” disposition  $L$  (the Ludovico-disposition)? I claim that whatever  $R$  might be in detail surely it satisfies the predicate non- $V$ . This is very intuitive in the example case: Alex under the Ludovico influence is no longer violent as there is no metaphysically possible way (remember that the relation is logical entailment) he could act violently towards a person.

The hidden premise of this claim is that in order to ascribe the disposition  $V$  (violence) truly to a subject  $s$  it is necessary that some  $R$ -similar (similar in what regards the having of the finked violence) subject truly manifests  $V$  at least once. If no finked-violent subject ever could manifest violence (because there is no set of conditions jointly sufficient for this) we should not think that it is violent. Or weaker: its violence does not matter anyhow. This means that Alex<sub>1</sub> is not similar to Alex<sub>2</sub> from the point of view of his dispositional make-up. Regarding our initial example (the interacting God-fink) the same applies: God’s finked glass is not fragile anymore. It is possible, however, to combine dispositional eliminativism with an account of “unmanifested disposition”. This is not important in case of fancy counterexamples like ours, but matters when it comes to physically relevant properties. David Lewis’s account of laws of nature, for example, integrates unmanifested laws, but does not license the inference to unmanifested actual dispositions making them true. The truth of such ascriptions might not be determined by actual, but unmanifested, dispositional properties, but rather by the lack of instantiations of the corresponding properties in our world. Unmanifested laws are non-instantiated properties.

Admittedly, it is arguable that finks are (always) components of the dispositional make-up, but if they are not, they enter at least in the background conditions that are presupposed in any case of dispositional talk. In whatever way the preferences lie, it follows from the above discussion that it is impossible that (a) a fink is truly ascribed to an object (in the general meaning that includes subjects) and that (b) the disposition it finks does not behave correctly under counterfactual analysis. Thus the amended situation (II) is either:



(II') The pseudo-finked situation 1:

- Alex is violent and aggressive (= has disposition  $V$ ).
- If the situation were normal, there would be a non-empty set of conditions  $C'$  typically sufficient for  $V$ 's manifestation as  $A$ . If  $C'$  were a non-empty set of conditions  $C'$  typically sufficient for  $V$ 's manifestation as  $A$ , then  $V$  would manifest itself as  $A$ . This counterfactual is vacuously true, since a non-empty  $C'$  is metaphysically impossible.

or:

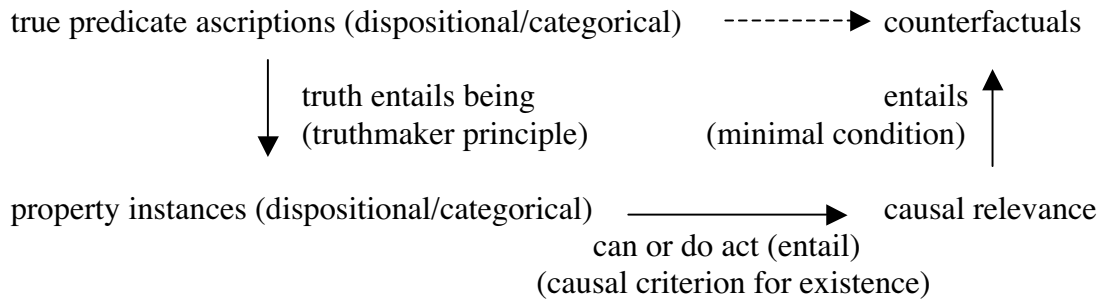
(II'') The pseudo-finked situation 2:

- Alex is not violent and aggressive (= has disposition non- $V$ ). His having  $V$  is trumped over by the presence of the intervening Ludovico-fink, which makes it impossible for him to aggress someone.
- It is not the case that if some triggering conditions for violence  $C$  (typically the ones from case (I)) obtained, then  $V$  would manifest itself as  $A$ , because Alex does not have  $V$ .

Note that no step of the argument depends on the supposition that dispositions could not be lost or gained in time (as postulated by Martin and Heil, although for properties and not explicitly for predicates). Rather this view is adopted and constitutes a part of the premises. Even the example fits the argument in that Alex finally turns into a “normally” violent and aggressive guy again at the end of the film. In a more general context Gundersen (2002) shows that finks and more recently antidotes are no engaging counter-examples to a conditional analyses, because they either disrespect a serious principle of object composition ( $s$  having  $V$  does not imply that  $s + x$  has  $V$ ), or abuse to a certain point the counterfactual semantics. For valid counterexamples “... a scenario is called for in which the masker [fink or antidote] prevents the characteristic manifestation from appearing, not merely on some particular occasion, but in a systematic and non-accidental manner” (Gundersen (2002), p. 393)).

Besides this point there is a second objection to the claim that dispositional statements are typically analysed as counterfactual dependence statements advanced by Mellor (1974). His claim is inconsistent with Martin and Heil's objection because it says that strictly anything that is a true factual statement, be it dispositional or categorical, can be appropriately analysed in terms of counterfactuals. The objection to counterfactuals is then (unlike in Martin and Heil's case) that counterfactuals cover too many statements, especially not only

dispositional ones. Mellor's claim provides an overall scheme to refute finkish cases:



Heil is right in denouncing the analysis of the truthmaker relation as entailment, for this would be an impermissible category mix between the ontological and the linguistic domain. Entailment in the schema above therefore only stands for a general dependence relation. Note that Martin and Heil's claim for the inadequacy of counterfactual analyses of dispositional statements is turned into a challenge for them to show which true predicate ascriptions do not satisfy the inference of counterfactual truths (their finkish examples do not settle the matter). Even worse, assuming the acceptance of the truthmaker principle and the causal criterion for existence they face the problem to give intuitive examples of causal relevance that do not satisfy counterfactuals. God's intervention in making the glass unbreakable is counterfactual-proof, for example.

Counterfactuals, on a traditional Humean account, supervene on contingent laws and a distribution of qualities. It therefore depends on the conception of laws, which is independent of dispositions (like Lewis's conception as systematically privileged regularities), whether or not the truthmakers of dispositional ascriptions are dispositional properties. Given the structure of Heil's negative argumentation it is important to see that non-dispositional accounts of laws are not all equivalent to Armstrong-laws (as second-order universals). Therefore, the successful criticism of the latter does not show in any way that there are no non-dispositional laws: there might be first-order relations of structural realists or privileged regularities or simply Lewis's distribution of intrinsic properties over the whole of space-time on which the laws supervene (modulo simplicity and empirical content). So far, there is nothing that sets the friend of intrinsic properties apart from the friend of relations. They are allies against the dispositionalists.

One reason for Martin and Heil's dispositionalism, the alleged inadequacy of counterfactual analyses, is not well conceived. In any case does the con-

struction of finkish dispositions load heavy metaphysical burden on such fancy counterexamples as enchanted glasses, namely the burden of deciding whether there are dispositions in the world or not. This fundamental question, however, had better be discussed in a broader ontological perspective (like the role of dispositions in physics and the other sciences, their philosophical prospects when it comes to reduction, and so on). Another reason in favour of dispositions is the epistemological one that pure qualities are unknowable. Their being intrinsic seems to make them impossible to grasp for the basically relational human knowledge. Even if granted, qualities are parts of regularities and relations that make it possible for a thinking subject to get in touch with them. As such unmanifested dispositions are just as unknowable as intrinsic properties deprived of their relational network. It is intrinsicity that is sufficient for succumbing to the epistemological argument: qualities and dispositions are therefore on a par. The third reason in favour of dispositional properties is that once they are manifested they instantiate single-case necessary relations. On the fundamental level of properties those can be regarded as necessary law-of-nature-instances. However, the necessity that links dispositions and manifestations is first of all conceptual, not metaphysical or nomological. This point will be discussed later.

#### 4 An outline of an alternative positive account for dispositions

The aim of this section is to sketch the framework of a positive account for dispositions through a counterfactual analysis. The idea is to indicate an *a priori* semantic reduction from dispositional to categorical vocabulary. Propositions consisting exclusively of the latter have in turn only categorical (intrinsic or relational) truthmakers. This is sufficient to make the project eliminativist. In the case of the reduction of higher-level kinds, by contrast, no semantic analysis is provided, but only extensional bridge-principles can be identified *a posteriori*. The following is an outline of an eliminativist account in the above sense:

Dispositions are names for classes of counterfactuals. Counterfactual analyses are therefore adequate and exhaustive to account for the meaning of those names. Such a reduction can be accomplished, according to a seventy years old tradition, via reduction sentences featuring a simple conditional analysis (Carnap (1936 and 1937)), Ramsey sentences composed of counterfactual relations (Mellor (2000)), or more complex variants of the simple conditional analysis (Lewis (1997), Malzkorn (2000), Gundersen (2002)). Counterfactuals are important as an expression of nomological status. Thus, laws and causal

relations are typically more than simple actual truths and one needs more than material implications to fully acknowledge their status. Hence, dispositions can label laws and causal relations or even property instances that might (but did not yet) causally matter, because they fall under laws. They might label laws to the extent that the support of counterfactuals is an important feature of laws (van Fraassen (1989), chapter 2.4). They might label causal relations to the extent that to support counterfactuals is widely accepted to be a necessary condition for causation. Common examples of dispositions are:

- Fragility is the name for the law that in appropriate circumstances things of a certain molecular structure break when sufficiently struck, where sufficiency is thus specified that it does not render the statement circular.
- Alcoholism is the name for the causal relation that humans are in such a condition that they cannot resist to drink alcohol, as soon as they have the opportunity, that they feel nervous, sick, etc. when they lack the opportunity.
- Mass conceived dispositionally (intended is rest mass, not relativistic mass) is the name for the law that describes the behaviour of things as regards their resistance to acceleration. “Mass” names counterfactuals of the following kind: had the mass of thing *o* been a little smaller, it would have showed less resistance to acceleration (where the quantity of “less” is of course determinable).

The possibility of unmanifested basic dispositions is controversial. An eliminativist view is committed to the claim that dispositional statements about basic properties are made true by the respective, actual property instances (and the regularities they are part of). Higher-level law-like statements by contrast (like statements about genes for white blossoms, being true in winter as well) including *ceteris paribus* or normality clauses might have truthmakers that are only instantiated in the specified arrangements referred to by the clause. Heil seems to think that something merely possible in our world (the potential of producing white-blossom expressed by a gene-ascription in winter) has to have an actual truthmaker directly corresponding to the predicate. The linguistically possible is made true by the corresponding ontologically actual. Humean regularities, he thinks, do not suffice to account for the truth of such statements. This is a close tie of correspondence between the linguistic and the ontological level. Why should uninstantiated laws, for example, correspond to unmanifested dispositions? The Humean, it seems, has problems when it comes to justifying

the inferences he makes from known to unknown facts. However, even if the evaluation of counter-to-the-fact statements involves vagueness and partly subjectivity, not anything is possible, given the distribution of particular matters of fact that is our world. The practical difficulties to delineate the space-time region instantiating the properties that make true such inferences are uncontroversial. Every evaluation of a causal statement on a classical Humean account involves basic regularities and big world-regions. Dispositionalists take this as a reason to plead for unmanifested dispositions each time they ask what the truthmaker for a potential behaviour ascription might be. The inference from the behaviour of one particle to the behaviour of a similar particle outside the light-cone of the former is licensed on a Humean account by means of their qualitative similarity and the degree of importance of the regularities they might therefore be part of. On a dispositionalist account this inference is licensed by means of their similarity only. In both cases similarity is primitive and not further explainable. Apart from the advantage for the dispositionalist when it comes to localise the truthmakers of disposition-ascriptions, his use of primitive similarity to license inferences is not more justified than the use the Humean makes of the same feature.

The mass case exemplifies well why many philosophers think of the basic physical properties as dispositional instead of taking them as properties governed by laws and dispositions to name those laws. To the extent that properties fall under laws the latter can be called or classified by concepts that facilitate their usage in common and scientific language. Dispositions are supposed to be necessary by those who believe in their real existence. This necessity is not nomological but conceptual. Fragility conceptually implies its counterfactual analysis, which in turn might well express relations or features of the world that are modally prioritised by being nomologically necessary. But to talk of dispositional properties would be a category mistake (Mellor (2000), p. 767).

The question of whether dispositions are identical with their basis vanishes (the higher-level question) as well as the question of whether they are intrinsic or relational: somehow dispositions are relational, because they name the nomologically possible causal network of a property instance; dispositions are neither identical nor distinct from their basis, as the disposition and the cause belong to a different category. If we take the predicate “*B*” that applies to the basis, they are related in the following way:  $D = \{R \mid xRy \text{ for } R \text{ a true counterfactual of a certain kind, for } x \text{ satisfying “} B \text{” and } y \text{ property instances}\}$ . The primitive directedness (the pointing) of dispositions expresses the need for something to remain when property instances are considered independently of

the relata they enter in relation to (be it of a law-like or causal kind). This is exactly Armstrong's default. Counterfactuals intimately fit the picture of property instances pointing towards a manifestation (that is a causal relation). The truthmakers of such counterfactuals have to combine the idea of stable behavioural patterns with the possibility that those patterns are sometimes or often not instantiated because the conditions to do so lack. The truthmakers need to be regularities of property instantiations in the world: regular arrangements of qualities only, an arrangement of qualities plus basic law-like relations, or only regular structure. But what makes it true that a flower has a gene to produce white blossoms, but does not execute this potentiality because it is, say, wintertime? The definition of the function of a gene incorporates the idea of its conditions of functioning (that the flower is not dead, that sunlight intensity and duration, as well as temperature are appropriate). Those conditions form a context that can be called the possibility context of normal vegetal life. Gene ascriptions for white blossoms in spring are made true by the specific DNA string, the plant having it, and the regularities (*qua* co-instantiations) of the gene with other properties of the environment or of the plant itself. To all this adds up a *ceteris paribus* clause, made true by a nomologically accessible and similar state of the world. Together, this makes true the statement held during winter, that a specific plant has a gene to produce white blossoms in spring. To the extent that the co-instantiations composing regularities are instances of categorical properties, no need for dispositional properties remains.

## 5 What is powerful causation?

Powerful causation for dispositionalists is the manifestation of a dispositional property instance  $d$  as  $m$ . For sure  $m$  is the effect, but what is the cause? Heil's powerful causation is an internal relation between context  $C$ , disposition  $D$  and effect  $M$ . What does  $D$  have to be in order to satisfy some minimal causation condition (e.g. simple counterfactual dependence or Lewis's influence account (Lewis (2004)))? Most recently David Lewis identifies causal statements with there being a chain of influence between the cause and the effect. There is influence if and only if sometimes, small variations of the cause ( $C$ ) are followed by small variations of the effect ( $M$ ) and if  $C$ 's and  $M$ 's are counterfactually dependent. Causal responsibility comes from the object  $o$  having a certain property  $B$  often called the basis and of  $o$  standing in relations  $C$ .  $D$  then merely names  $\{C\} \& \{B\} \square \rightarrow \{M\}$ . Gundersen rightly claims that this counterfactual relation is not implied by  $\{B\} \square \rightarrow \{M\}$ , nor by  $\{C\} \square \rightarrow \{M\}$  and says more than

the latter two (see Gundersen (2002), pp. 391 – 393). It is rather preferable to fully account for all the active elements in a causal relation (context, cause and effect) than to choose for example the  $\{C\} \square \rightarrow \{M\}$  analysis for the price of leaving aside the central causally effective event. The idea to take equivalence classes for trigger-situations is given additional motivation in Wasserman & Manley (manuscript). *D* is sometimes saved as a cause by being identified with *B*, but *B* is not being fragile: it is rather being of molecular structure *X*.

This scheme might seem odd for event-ontologists. Indeed on such an account a *C* and a *B* would combine into an event *E*. To the extent that the truthmakers of causal counterfactuals are not properties of *C*, *B* and *M* only, a causal relation is an external relation: the instantiation of *C*, *B* and *M* is not sufficient for the instantiation of the causal relation. What might be internal, or characteristic for *C*, *B* and *M* is only its name. Names are given to groups of counterfactuals in virtue of so-called typifying manifestations (i.e. the typical effects). Being fragile is the name of some structure that breaks when dropped. Fragility does not mean only being of a certain molecular structure: the counterfactual is made true by laws and the events drop and break. The disposition itself does not act as a cause, and it is hardly conceivable how it could then provide explanation for *M*. The only explanatory function of dispositions could be that they incorporate some natural law-like necessity. This is hard to accept for anyone who believes that explanation has something to do with the causal history of things or events. It might be that law-like necessity just is systematic priority of regularities (like in Lewis (1994a), p. 478).

Therefore the feature of the glass referred to by the antecedent of the counterfactual called fragility should be the relevant cause: the molecular structure of the glass. Dispositions are only linguistic entities. As they refer to nothing dispositional in the world, there are no such entities that have their powers built-in. The trigger-manifestation-relation as the realisation of a power does not really exist. It is only a way to talk about regular causal relations. Those relations in turn are only Humean arrangements of particular matters of facts. All there is to powerful causation is a powerful name.