Dispositions without Conditionals

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Abstract

Dispositions are modal properties. The standard conception of dispositions holds that each disposition is individuated by its stimulus condition(s) and its manifestation(s), and that their modality is best captured by some conditional construction that relates stimulus to manifestation as antecedent to consequent. I propose an alternative conception of dispositions: each disposition is individuated by its manifestation alone, and its modality is closest to that of possibility—a fragile vase, for instance, is one that *can* break easily. The view is expounded in some details and defended against the major objections.

1 Introduction

Dispositions are modal properties. In saying of a vase that it is fragile, of a person that she is irascible, or of a disease that it is transmissible, we are not, or not primarily, saying something about what the vase, the person or the disease is *actually* doing, but rather about what they *would* or *could* do. In this paper, I want to suggest and explore an unorthodox answer to the question of exactly what this modal nature of a disposition amounts to.

In the contemporary literature on the subject, it is almost unanimously assumed that the modal nature of dispositions is best captured by some kind of conditional, most often the counterfactual conditional. Thus, at first pass, a fragile vase is one that would break if it were struck, a transmissible disease is one that would be transmitted if it were to come into contact with a suitable host, and an irascible person is one that would get angry if provoked. Although there has been much debate over the exact nature of the

relation between dispositions and conditionals, there is widespread agreement *that* there is a connection, and that understanding this connection is crucial to understanding the kind of modal properties that dispositions are. Some (such as Martin (1994), Bird (1998) or Molnar (2003), to name but a few) believe that finks, masks and antidotes render the prospect of a reductive analysis of dispositions to conditionals hopeless. Others (such as Lewis (1997), Choi (2006) and Steinberg (2010)) believe that with the right adjustments to the conditionals at issue, a reductive analysis may yet succeed. Some (such as Manley (2008)) believe that disposition ascriptions are indeed equivalent to a host of correlated conditionals, but profess neutrality on the question of whether such an equivalence should be seen as constituting a reductive analysis of dispositions. And yet others (such as Jacobs (2010)) have even argued that the direction of explanation should go the other way, and that the truth conditions for the counterfactual conditional are to be given in terms of dispositional properties.

Despite dominating the current literature, this preoccupation with conditionals is oddly in tension with the linguistic means that we use to ascribe dispositions in ordinary life, adjectives such as the ones I have used: 'fragile', 'transmissible', 'irascible'. Typically, those adjectives are formed from a verb (not always extant in English: 'frag-' is from the Latin *frangere*, 'to break'; 'irasc-' from the Latin *irasci*, to get angry) and various contractions of the suffix '-able' (including '-ible' and '-ile'). These adjectives display two features that are worthy of note in the present context. First, they provide us with only one half of the putative conditional. In the cases I have cited, it is the second half, the disposition's manifestation: breaking, being transmitted, and getting angry. Second, the most natural paraphrase for the suffixes that go into their formation is not a conditional, but 'can' and other expressions of possibility. This is confirmed in lexicography as well as formal linguistics. Witness the entries provided by the *Oxford English Dictionary* for some of our favourite dispositional adjectives:[1]

Fragile: 'liable to break or be broken; ... easily destroyed'.

Transmissible: 'capable of being transmitted'

Irascible: 'easily provoked to anger or resentment'

[1]I have selected only parts of the dictionary definition, but I have not omitted any mention of a conditional. To ensure that my sample is representative, I have relied on Kjellmer's (1986) empirical study, which provides a complete typology of entries for terms in *-ble* in all standard English dictionaries. While there is some variation, the conditional plays no role whatsoever.

Soluble: 'capable of being melted or dissolved'

Elastic: '[t]hat can be stretched without permanent alteration of size or shape'

The phenomenon has a certain stability across languages[2]. Thus linguist Angelika Kratzer writes about the corresponding suffixes in German: 'In general, the suffixes *-lich* and *-bar* express possibility.' (Kratzer 1981, p. 40)

Why is this important? I am certainly not advocating that philosophy be replaced by linguistics or lexicography, but I do take these data to provide some motivation for an alternative approach. If dispositional terms linguistically express a kind of possibility, the default assumption should be that the properties ascribed with them are possibility-like. Linguistic considerations motivate an alternative approach to dispositional properties: one that characterizes their modal nature not in terms of a conditional, but in terms of possibility. On this approach, at first pass, a fragile vase is one that *can* break easily, a transmissible disease is one that is *capable* of being transmitted, and an irascible person is one that *can* easily be made angry. The main task of this paper will be to spell out this suggestion in more detail and defend it against some major criticisms.

The approach that I am proposing has received almost no attention in the contemporary literature on dispositions, though it may well be the more traditional approach applied by Aristotle and his followers to the related notion of *dynamis*. To my knowledge, the only contemporary author who has suggested a similar view is Lowe (2011).[3] I make some suggestions, but provide no details, in Vetter (forthcoming) and (2011), and my proposal has been briefly discussed by Manley and Wasserman (2011), whose criticisms will be addressed below.

However, it has been noted by several authors that there appear to be dispositions that lack a stimulus or triggering condition, and hence an antecedent for the corresponding conditional. Thus Fara (2005) notes that

[2]The English suffix '-ble', being derived from Latin '-bilis', has close equivalents in Romanic languages which, to my knowledge, are all used to express what a thing can do or have done to it. Ancient Greek has a suffix -$\tau o\varsigma$, which functions in much the same way.

[3]Unfortunately, Lowe's paper has come to my attention only as I was preparing the final version of this paper, so I have not been able to remark on the similarities and differences of our views except in a few footnotes. In general, Lowe is less concerned to spell out the positive account in as much details as I do here, and he does not consider objections to the approach. Unlike hte present paper, however, his offers an extended diagnosis of why the conditional conception has held such attraction and where exactly its mistake lies.

> I may be disposed to stutter, my drainpipe disposed to leak, and Mr. Magoo disposed to bump into things. Conditional accounts do not even apply to such cases, since they contain nothing to serve as antecedents to a conditional. (Fara 2005, p. 70)

Similarly, Manley and Wasserman (2008) point out that

> talking in any situation at all can manifest loquaciousness, and anger in any situation at all can manifest irascibility. Perhaps even fragility is just the disposition to break—after all, breaking for no reason at all would be relevant to a thing's degree of fragility. (Manley and Wasserman 2008, p. 72)[4]

The approach that I am suggesting can easily accommodate such counterexamples to a conditional treatment of dispositions. Manley and Wasserman propose, in effect, to treat them as a case of multi-track dispositions: while there is no one conditional true of the loquacious person described in the above-quoted passage, there are a host of very specific counterfactual conditionals, that is, counterfactual conditionals with antecedents that describe all causally relevant factors of the person's surrounding, which *are* true of her. It is well known that most of our ordinary conditions are multi-track: they are typically characterized by more than one stimulus condition and, accordingly, more than one conditional. A fragile glass may manifest its fragility in breaking upon being hit with a spoon, being dropped onto the floor, being sung to by a soprano, or being subjected to pressure over a period of time. Fragile parchments break upon being merely touched, and a fragile old wooden chair may split when transferred into a different temperature. The various conditions that cause fragile objects to break have little in common, apart from their being non-extreme causes of objects' breaking.

Whether we deal with ordinary multi-track dispositions such as fragility, or with Manley and Wasserman's treatment of stimulus-less dispositions as multi-track dispositions, it seems quite clear that one conditional is not generally enough to characterize any one disposition. On the alternative approach that I am suggesting, this kind of complexity disappears: the multitude of putative stimulus conditions is no longer part of a disposition's characterization. We can simply think of fragility as the disposition to break and of loquaciousness as the disposition to talk, and then capture both of these dispositions by a corresponding possibility claim. This provides a unity

[4]Molnar 2003 and Caroll 2008 make a similar point.

to our understanding of dispositional properties which will appeal to those attracted by theoretical simplicity.[5]

In connecting dispositions primarily to 'can' statements, the approach that I am suggesting also aligns them more closely with another kind of modal property: abilities. Agentive abilities are standardly ascribed using the auxiliary 'can', as in 'She can play the piano'. David Lewis (1976) has influentially treated ability ascriptions as expressing a particular type of restricted possibility. Lewis never extended that treatment to disposition ascriptions but instead proposed a version of the conditional analysis for dispositions (Lewis 1997). Others (notably, Vihvelin (2004) and Fara (2008)) have tried instead to understand agentive abilities as a particular type of dispositions: they are dispositions to do X if one chooses to do X. Failures to do what one chooses and is able to do are then explained as cases of finking and masking.

I agree with Fara and Vihvelin that dispositions and abilities should be given uniform treatment. But instead of extending the conditional treatment of dispositions to abilities, I propose that we extend the restricted possibility treatment of abilities to dispositions.

Before I begin, one *caveat* is in order. My proposal is not going to solve the much-discussed problems of finks, masks, antidotes, and so on, and I do not think that the standard view—the view that the modality of dispositions is the counterfactual conditional—fails because of these problems. Finks, masks, antidotes, and so on are a symptom of the fact that dispositions are modal *properties*: they are a matter of how things stand with a particular object, and thus largely independent of how things stand with the world outside that object. In Martin's (1994) classic case of the 'electro-fink', a dead wire is connected to a machine that makes it live whenever touched by a conductor. Hence the conditional 'If the wire were touched by a conductor, then electrical current would flow from the wire to the conductor' is true, although the wire is not live. This is so precisely because the wire's being live or not is a property of the wire itself. It is a matter of how things stand with the wire, not of how things stand in the wire's vicinity where the electro-fink is to be found. Similarly, a vase that has its fragility masked by anti-deformation packaging remains fragile, despite the falsity of the corresponding conditional, precisely because its fragility is a property of the vase. It is a matter of how things stand with the vase, not with the anti-deformation packaging.

[5]For a more detailed argument in favour of the alternative approach, based on the multi-track nature of dispositions, see Vetter forthcoming.

Dispositions, I have said, are modal properties. The two elements of this characterization give rise to two distinct questions: the question *what* is the modality of dispositions, and the question *how* that modality is involved in them—whether there is a reductive analysis to be had of dispositions in terms of that modality, or whether that modality provides only an illuminating but nonreductive model of dispositions, or whether in fact that modality is itself metaphysically grounded in dispositions. The two questions are distinct, and they need to be answered separately. *How* questions arise no matter what we think the modality of dispositions is. But before they can be asked, let alone answered, we must answer the prior question: *which* modality is it that is so related to dispositions? The answer I am about to propose is that it is a species of possibility.

Section 2 will introduce my proposal and explore it in more depth. Section 3 will then address the most obvious objections to the approach. I will not in this paper address the question which conception is to be preferred—the more standard conditional conception, or my alternative possibility conception of dispositionality. For the time being, I am concerned only to argue that the latter is an alternative that merits serious consideration.

2 Dispositions and Possibility

2.1 *The thesis*

We can characterize the standard conception of dispositionality by the following pair of claims:

1. A disposition is individuated by the pair of its stimulus condition and its manifestation (or, if it is a multi-track disposition, by several such pairs): it is a disposition to M when C (or a disposition to M_1 when C_1, to M_2 when C_2, etc., if it is a multi-track disposition).

2. Its modal nature is best characterized (to a first approximation) by a counterfactual conditional 'If x were S, x would M' (or, if it is a multi-track disposition, by several such conditionals).

I will refer to the conjunction of these two claims as the *standard conception*, or sometimes as the *conditional conception* of dispositional properties.

On the *alternative conception* that I am proposing,

1. A disposition is individuated by its manifestation alone: it is a disposition to M, fullstop.

2. Its modal nature is that of possibility, best characterized (to a first approximation) by 'x can M'.

We may refer to this conception as the *possibility conception* of dispositional properties. Of course, the two claims are no more than a template for the view. The remainder of section 2 will be devoted to fleshing out the view.

I have distinguished above between two different questions: first, the question *which* modality is involved in dispositions; and second, the question *how* that modality is involved in dispositions. The template for the possibility conception provides a partial answer to the first question: the modality involved is possibility. Sections 2.2–2.4 will spell this out in more detail and ask what *kind* of possibility is involved. As the dictionary definitions suggest, some dispositions are characterized by *easy* possibility ('easily destroyed'), while others are characterized by possibility *simpliciter* ('capable of being melted').

The possibility conception, as it stands, is entirely neutral on the *how* question. Like the conditional conception, it allows for masked and mimicked dispositions: pack a fragile glass in styrofoam, and there is no easy possibility that it breaks; place a rock in front of a bulldozer, and there is an easy possibility that it breaks. Like the conditional conception, the possibility conception allows for two basic reactions to such counter-examples.

For *anti-reductionists*, the counter-examples render the prospect of a reductive analysis of dispositions to (easy) possibility hopeless. For them, (easy) possibility provides no more but an illuminating yet imperfect approximation to dispositions. Dispositions are a matter of how things stand with a particular object; possibilities take into account how things stand outside that object; so it is hardly surprising that the two fail to provide a simple equivalence. *Reductionists*, on the other hand, will not be so easily discouraged. The literature on dispositions abounds with proposals for how to accommodate cases of masks etc. within the conditional conception. Similarly, the reductionist who subscribes to the possibility conception will seek to manipulate (easy) possibility claims so as to accommodate these cases.

I do not wish to endorse either approach here. But I will sketch briefly how the reductionist should proceed, since in so doing we can shed some light on the relation between disposition ascriptions and 'can' statements.

On the possibility conception, disposition ascriptions are akin to 'can' statements. 'Can' statements may be used to express possibilities ('Hydrangeas can grow in this soil'), or to ascribe abilities to individuals ('I can play the piano'). As Lewis (1976) has shown, both uses can be accommo-

dated if we take 'can' to express restricted possibilities and let restrictions vary across contexts. In its ability-ascribing use, 'I can play the piano' expresses the possibility that I play the piano *given*, roughly, my intrinsic make-up. By making the possibility relative to my intrinsic properties, we can home in on the 'propertyhood' of an ability.

The same treatment can be extended to dispositions. 'The vase is fragile' expresses the possibility that the vase breaks *given* its intrinsic make-up. It is true just in case the vase breaks in some relevant possible world; and into the conditions for a world to count as relevant we build, among other things, the condition that the intrinsic constitution of the vase itself, or even only parts of that intrinsic constitution (the disposition's physical base), is held fixed, while contingent circumstances external to the object are not. Thus a glass's molecular constitution and the fact that it has a slight crack will be the same in all the relevant worlds, but the fact that it is packed in styrofoam as opposed to standing near the edge of a table will not.

Disposition ascriptions, on this picture, are akin to possibility statements, but they differ in their degree of flexibility. Take a fragile vase packed in protective packaging. There is no doubt that the vase is still fragile. But can it break? Yes and no, depending on the context. We may say, 'I packed the vase so safely because it can break quite easily', using 'it can break' much like 'it is fragile'. Or else, we may say, 'The vase is fragile, but I packed it so safely that it cannot break', using 'it can(not) break' to express the kind of possibility which, unlike that of a disposition ascription, is sensitive to factors outside the vase itself. Generalizing from this case, it appears that 'can' possesses greater flexibility than disposition terms: in possible-worlds terms, the restrictions on relevant worlds for 'can' may vary more widely than those for the ascription of a disposition. The latter, but not the former, are firmly tied to an object's intrinsic constitution.[6]

[6]This way of putting it is strictly false, though a useful first idealization. It assumes that dispositions are always intrinsic to their bearers. But as McKitrick (2003) has shown, that assumption is mistaken. For instance, whether a city is vulnerable to attack may depend not only on its intrinsic constitution, but also on the defense mechanisms set up outside its borders, on the position of the enemy, and similar factors. Vulnerability, thus, is an extrinsic disposition. The assumption of intrinsicality is a useful first idealisation none the less, and I will continue to make it. To accommodate extrinsic dispositions, we must allow that the facts held constant across close worlds encompass certain facts external to the object in question. Those external facts are, however, selected by relations to that object—in McKitrick's example, they are facts about mechanisms that defend *the city*, about the position of *the city's* enemies, and so forth. Moreover, extrinsic disposition terms appear to be relatively fixed with regard to *which* kinds of external circumstances they are sensitive to, thus again differing from the highly flexible 'can'.

2.2 *Grading possibility*

On the conception that we are now considering, dispositions are characterized by some sort of possibility. But what sort of possibility exactly?

Metaphysical possibility is clearly too weak. But the more ordinary possibility that is expressed in unqualified 'can' claims cannot be quite right either, at least not for the case of fragility. For certainly not everything that *can* break is fragile: bricks and even bridges made of steel *can* break, but they are not therefore fragile. What distinguishes the fragile things from other things that can break? The dictionary definition suggest that the former, but not the latter, can *easily* break or be broken. Similarly, almost everyone *can* be provoked to anger, but an irascible person can be *easily* provoked.

With 'easily', we have introduced an element of gradability into the possibility conception. 'Easily' is the adverb of choice in describing gradations of possibility: to express that p is more of a possibility than q, we say that p can happen *more easily* than q. Accordingly, the positive 'it can easily happen that p' seems to describe a possibility of a sufficient degree, though what counts as sufficient may be for context to determine.[7]

And so it should be, if we are to account for the gradability and the context-sensitivity of 'fragile'.[8] Fragility comes in degrees: champagne glasses are more fragile than ordinary tumblers, which are more fragile than bricks, which in turn are more fragile than steel bridges. These degrees establish an ordering of objects by their fragility, and to count as 'fragile' in a given context is to be above a certain (contextually specified) point in that ordering. The proposal is that the ordering is established by *how easily* an object can break.

The gradability that easy possibility brings, then, is just what we need. But how exactly is that gradability to be understood?

On a standard, possible-worlds based, conception of possibility, there are two basic ways of understanding gradability. First, *closeness*: p is *more possible than* q just in case there is some world in which p holds, and that world is closer (that is, more similar in the relevant respects) to some 'ideal' world than any world in which q holds. The ideal world is often the actual world, though it need not be.[9] Second, *proportion*: p is *more possible than*

[7] I take the adverb 'easily' in the dictionary definitions to modify 'can'. For an alternative approach, on which it modifies the verb that specifies the manifestation, see Lowe(2011).

[8] Both features have been stressed by Manley and Wasserman (2007).

[9] In linguistics, the ideal is often called an 'ordering source'; see the classic work of

q just in case p is true in more worlds than q.

The closeness conception is generally preferred when dealing with graded modals. However, I will now argue that it is inadequate for our purposes. We will then turn to the proportion conception and examine it in more detail.

On the closeness conception, it is easily possible that p just in case p is true in a (that is: at least one) relevant world that is sufficiently close to some contextually supplied ideal world. Easy possibility on this conception is not a stranger in philosophy. It has been used, with actuality as the ideal, by a number of philosophers in various contexts.[10] How does this conception fare in accounting for fragility?

A first point to note is that the ideal world, in relation to which closeness is measured, cannot be the actual world. Any world is at least as close to itself as any other world. If the actual world were our ideal world, therefore, anything that breaks in actuality would have to be maximally fragile, and count as fragile in any context. But from an object's breaking in actuality we cannot infer that it is fragile (steel bridges break sometimes, after all), much less that it is maximally fragile. Better, then, to choose an ideal world that is not the actual world. A plausible candidate would be a maximally normal, boring or 'stereotypical' world.[11] But even so, the closeness conception is inadequate.

To see why, consider the case that Manley and Wasserman (2008) call 'Achilles' heel':

> consider a sturdy concrete block that, like Achilles, is almost entirely immune to harm. ... But, like Achilles, the block has a weak spot. If it is dropped onto a *particular* corner at *just* the right angle with *exactly* the right amount of force, an amazing chain reaction will cause it to break. (Manley and Wasserman 2008, p. 67)

We can easily imagine that the block being dropped in this particular way is an entirely normal type of event—just as normal as dropping it onto any other corner, at any other angle, and with any other force. In fact, it may be *more* normal than any of the many ways in which a delicate champagne glass can be broken. On the closeness conception just canvassed, that block would then have to count as fragile, and more fragile than the champagne

Kratzer (1981) and (1991).

[10] Cf. Williamson 2000, Williamson 1994, Sainsbury 1997 and Peacocke 1999.

[11] See Kratzer 1991 for 'stereotypical' ordering sources.

glass. After all, the world in which it breaks may be stipulated to be as normal, boring and stereotypical as can be. Indeed, for any elaboration of the ideal in relation to which closeness is measured, we have a recipe for a counter-example: stipulate a block with an Achilles' heel such that the block breaks in just such a world, and in no (or hardly any) other. There will then always be one close possibility in which the block breaks, and one is enough. But it seems clear that the imagined block is not fragile, let alone more fragile than other objects which break in many worlds that are slightly less close (such as the champagne glass).

This is an objection not only to the reductionist version of the closeness view. The anti-reductionist takes easy possibility to be only a rough and not fully adequate model; but this is not to say that she can count anything, including Achilles' heels, as one of the many inadequacies of that model. The motivation for the anti-reductionist view is the idea that a disposition is a matter of how things stand with the object (the block) itself, while (easy) possibility concerns how things stand with the object and the world outside it. The block's weak spot, however, *is* how things stand with the block itself; it is not an interference of its surroundings.

The problem with the closeness conception is that, however the ideal for closeness is spelled out, *one* world that comes sufficiently close is enough. We need not look to the block's behaviour in other worlds once we have established its breaking in one sufficiently close world. But it is precisely its behaviour in other worlds that prevents the block from counting as fragile. No matter what the ideal for closeness is, one close breaking-world is not enough for fragility; for an object to be fragile there need to be more ways of breaking it.

One world is not enough; but a few worlds might be. This leads us directly to the second conception of graded modality: the proportion conception.

On that conception, x is more fragile than y just in case x breaks in more of the relevant worlds than y. x is fragile *simpliciter* just in case it breaks in a sufficiently large proportion of the relevant possible worlds, where context may determine what counts as sufficiently large. Two points need to be made immediately.

First, the sufficient proportion of worlds will still be a rather small proportion. Even a very fragile champagne glass remains unbroken in most worlds, simply because it is safely standing on a table or packed away at the back of a shelf. On the quantificational spectrum ranging from 'at least one' to 'all', the proportion of worlds where an object has to break in order to count as fragile will be close to, but not quite at, the 'at least one' end,

bearing witness to the fact that fragility is akin to possibility, not necessity. The right proportion is best captured as 'a few'.

Second, however, we must not mistake this capturing of the right proportion to be a full statement of the account. Even a sturdy brick will break in a few possible worlds; this is not what sets the fragile things apart from the non-fragile ones. Rather, it is that (all of) the former break in *more* possible worlds than (any of) the latter. This is based on two ideas, both introduced earlier in this section: first, that the comparative 'is more fragile than' establishes an ordering among objects, such that to count as fragile *simpliciter* (in a given context) is to be above some (contextually determined) point within that ordering; and second, that to be more fragile than something else is to break in more possible worlds than it.

2.3 *Grading possibility further*

For the reasons given, I believe that the proportion-based conception of grading possibility is the right conception to capture dispositions such as fragility. But it needs to be qualified in two crucial ways.[12]

(1) From worlds to cases. To get the proportions right, we should quantify not over worlds but over *cases* or centered worlds: triples of a world, a time, and an object. An irascible person will typically get angry any number of times within one world, and a transmissible disease will typically be transmitted more than once. What should determine the proportion that makes a person count as irascible, or a disease as transmissible, is not the number of worlds in which the person becomes angry at least once or the disease transmitted at least once, but rather the number of individual instances of anger or transmission: in other words, of cases.

As with worlds, so with cases, it is crucial to provide maximal variation in the external circumstances. The proportion of cases in which a vase breaks, a person gets angry, or a disease is transmitted, should not depend on factors that are external to the vase, the person, or the disease. Otherwise we will be faced with the familiar problems of finking and masking: a dead wire that has an electro-fink attached to it will conduct electricity in the same proportion of cases as a live wire, if external circumstances such as

[12] Both qualifications are inspired by Manley and Wasserman (2008), who have rightly emphasized the proportional nature of dispositions. Unlike the present proposal, theirs is a variation of the conditional conception. As a result, their understanding of the relevant proportions differs from mine: Manley and Wasserman's sufficient proportions are, in many cases, a majority, and hence akin to necessity rather than possibility. For a contrast between the two views, see also Vetter 2011.

the presence or absence of electro-finks are allowed to be held fixed over the cases that count towards the wire's being live or dead. A fragile vase that is packed in anti-deformation packaging will break in fewer cases than its intrinsic duplicate which is precariously standing at the edge of a table, if packaging and position are allowed to be held fixed over the cases that count towards the vases' fragility.

(2) Measuring proportions.[13] The set of possible worlds, and a fortiori of cases, is non-denumerably infinite: and so, in all likelihood, are its subsets whose proportions to one another determine fragility. If the proportion of breaking-cases among the relevant cases is to be determined by comparing the cardinality of the respective sets of cases, we are faced with grave and notorious mathematical worries. Proper subsets of non-denumerably infinite sets may have the same cardinality as their supersets; and so no non-trivial comparison of cardinalities may be possible. How, then, are the proportions of cases to be determined?

One response to this problem, suggested by Manley and Wasserman (2008), is to hope for a *measure* on the sets of worlds that does not rely on comparisons of cardinality. As Manley and Wasserman point out,

> Sometimes there is a natural substitute for comparison of cardinality. For example, take the intuition that on a real line from 1 to 100 metres, there are in some sense fewer points between 1 and 2 metres than there are between 2 and 100 metres; and that a point selected at random from the line is far more likely to be selected from the second interval. (Manley and Wasserman 2008, p.79)

They suggest that in the case of dispositions, the Liouville measure on physical phase space, or else an appeal to the objective probabilities of the proposition that corresponds to the sets to be measured, might do the job, but they remain doubtful (see Manley and Wasserman 2008, p. 80f., fn. 24).

Rather than be hostage to mathematical or physical fortune here, I prefer an alternative response: to substitute for each non-denumerably infinite set a better behaved finite subset which can unproblematically provide the relevant proportions. But how might such a set be determined?

We have seen already (under (1)) that variety plays a role in forming the set of relevant cases. Now we must extend that observation. Plausibly, an object which breaks in a greater variety of circumstances is more fragile

[13]Thanks to Wolfgang Schwarz and Mathias Böhm for helpful discussions on this.

than one which breaks only in one very precisely circumscribed set of circumstances, and likewise for other dispositions. Suppose that Ann consistently gets angry in cases in which she is shouted at, even if only slightly. In any other circumstance, however, she keeps her temper perfectly. Betty, on the other hand, gets angry in some cases where she is shouted at, some where she is stared at, politely told to wait, or where she simply did not get the dessert that she wanted. Given Ann's consistent anger across the shouting-cases and Betty's erratic pattern of anger across the variety of cases, they might even get angry in a roughly similar proportion (intuitively speaking) of cases altogether. But we would classify Betty as more irascible than Ann, because there are so many more different circumstances in which she gets angry. (If disposition ascriptions can serve as a warning sign, the warning for Betty is more significant. Situations in which she gets angry are not so easily avoided as those in which Ann gets angry.)

This observation suggests the following strategy. To measure the degree of a disposition, take that finite subset of the set of relevant cases which provides the greatest variation in external circumstances, or in those external circumstances that are causally relevant to the disposition's manifestation[14]. Then we can (figuratively) count the manifesting-cases among them, and compare their cardinality to that of the subset as a whole.

There may, of course, be no one finite subset that provides the greatest variation. But to quote Manley and Wasserman again, 'a certain degree of vagueness in dispositional ascriptions is surely acceptable, so we would hardly need a single canonical measure' (Manley and Wasserman 2008, p. 80f.)—nor do we need one canonical subset, as long as the different candidate subsets provide roughly the same results in those cases where we have firm intuitions.

2.4 *Beyond graded possibility*

I have argued that the modality of dispositions such as fragility and irascibility is not ordinary possibility, but a graded possibility best captured in terms of the *proportion* of worlds where the disposition is manifested.

Does the case of fragility generalize? It is instructive here to contrast 'breakable' with 'fragile'. The introduction of a graded possibility, marked by 'easily', was motivated by the observation that not everything which *can* break is thereby fragile: after all, bricks and steel bridges can break, but they are not fragile. Are they none the less breakable? It seems to me

[14]This qualification does *not* re-introduce stimuli through the back door. Among the causally relevant circumstances for breaking is *standing on the back of a shelf*.

that they are. Moreover, consider the inference from actual manifestation to disposition that I rejected earlier: from the fact that a thing breaks in actuality, we cannot infer that it is fragile; but we can, it seems, infer that it is breakable. This inference is typical of the modal force of possibility proper: an object's Φing in actuality does not prove that it Φs in a sufficient proportion of cases, but it does prove that it Φs in at least one case. Hence the graded possibility that we have found to characterize fragility is ruled out for breakability.

Nor is 'breakable' an isolated case. A disease's being transmitted once in actuality is sufficient for its being transmissible; it shows that the disease *can* be transmitted. Walking a path proves that it is walkable, smashing a pot that it is smashable, winning a game that it is winnable, and (my) reading a text in fine print proves that it is readable (for me). The natural paraphrase in each of these cases does without 'easily': a transmissible disease is one that *can* be transmitted, a walkable path one that can be walked, and so on. Even some of the philosopher's favourite examples seem to fall into this category. Of the dictionary definitions I have quoted in section 1, only those for 'fragile' and 'irascible' contained 'easily'. Solubility, for instance, was defined in terms of plain possibility, as 'capable of being melted or dissolved'. And it seems right that from a substance's dissolving once in actuality we can infer its being soluble.[15]

The modality inherent in these dispositions therefore seems to be possibility *simpliciter*, as expressed in ordinary 'can' statements. Although the dispositions themselves may be gradable—a champagne glass is, after all, more breakable than a brick stone—any degree above zero is sufficient for their possession. For an object to be breakable, it is enough that it break in one possible world. Even the block with an Achilles' heel should count as breakable.

There is, then, some variation to be expected in the modal strength of different dispositions, between ordinary possibility and the graded possibility that requires manifestation in a sufficient proportion of worlds.[16] The variation is not *ad hoc*, and it is not very wide-ranging. It is motivated by the different inferential behaviour of the terms we use to ascribe the dispositions in question. It is, further, a variation over only a limited part of the quantificational spectrum: it takes place between 'at least one' and 'a few'. It does not, or so I have suggested, ever go near the opposite end of

[15] For more on solubility, see Sect. 3.3.

[16] Kjellmer (1986) observed this variation in an empirical study on adjectives in *-ble*, and notes that the more frequent an adjective is, the more likely it is to have the stronger (easy possibility) meaning.

the quantificational spectrum, on which we find the universal quantifier that characterizes necessity. It is is situated firmly within the area of possibility.[17]

The picture, then, is this. Dispositions come in degrees. Those degrees can be modelled–reductively or, for the anti-reductionist, only approximately—by the proportion of relevant cases, that is, centered worlds, in which the disposition is manifested, to those in which it is not. Some disposition terms—paradigmatically 'fragile'—impose a threshold: a minimal degree to which the disposition must be possessed, or a minimal proportion of cases in which it must be manifested. Only objects which lie above the threshold count as having the disposition. Others—paradigmatically 'breakable'—impose no such restriction. In those cases, the required degree or proportion can be any positive degree or proportion whatsoever.

So far I have been concerned merely to introduce the possibility conception of dispositions, and to show that it is *prima facie* a feasible and fruitful research programme. It is time now to face some challenges.

3 Facing challenges

3.1 *The disposition to M if C*

As I noted earlier, my thesis comes in two parts. The first is that a disposition is individuated, not by one or more pairs of stimulus and manifestation as has standardly been assumed, but by its manifestation alone. The second part is that the modal nature of a disposition is, accordingly, not that of a conditional with the stimulus as its antecedent and the manifestation as its consequent, but that of a possibility, with the disposition's manifestation as its actualization. The counter-examples that I am about to consider challenge the first part of my thesis: that no two-part schema of stimulus and manifestation is needed to characterize any disposition. Counter-examples are easiest to come by when we simply take a disposition term that explicitly requires the two-part characterization: the disposition to sneeze when

[17]Note that this does not entail that dispositions are incompatible with necessity. For all I have said, an object may be disposed to Φ and be necessarily Φ, or very nearly necessarily Φ. The point is merely that the possession of a disposition does not *require* any more than (easy) possibility.
If you think that dispositions *are* incompatible with necessity, then this may be added on to the account: x is disposed to Φ just in case x can easily Φ and x is not necessarily Φ. Alternatively, a restriction may be imposed on which verbs can replace Φ in 'disposed to Φ': if dispositions are linked to changes, Φ may be required to denote a process of change. Note that similar restrictions apply to the conditional conception: not any conditional, however adjusted to finks and masks, corresponds to a disposition.

near flowers, for instance[18]. Or what of the disposition to break if struck? Whether or not that is what we ascribe with 'fragile', it seems to be a disposition in its own right.

The standard conception has at its disposal a two-place operator 'disposed to ... if/when ...', while the alternative conception that I am proposing is committed to using a one-place operator 'disposed to ...'. In fitting the two parts of the opponent's examples—striking and breaking, or being near flowers and sneezing—into the alternative conception's picture, there are two options.

One option is to agree with the standard conception that only one part—breaking in one case, sneezing in the other—is the manifestation of the disposition in question. The second part then becomes external to the disposition ascription, and the proper parsing of such ascriptions is '[x is disposed to break] [if struck]' and '[x is disposed to sneeze] [when near flowers]'. Clearly this is wrong—the sentences are not conditional ascriptions of dispositions. 'John is disposed to sneeze when near flowers' is not used to conditionally ascribe to John a disposition—John does not acquire the disposition to sneeze whenever he is near flowers.[19]

A second option is to agree with the standard conception that both parts of the disposition ascription belong within the scope of the 'disposed to ...' operator, but conclude from this that both are part of the manifestation, yielding disposition ascriptions of the form '[x is disposed to [break if struck]]' or '[x is disposed to [sneeze when near flowers]]'. The disposition to break-if-struck is characterized (reductively or nonreductively) by the possibility of an object's breaking-if-struck, that is, the possibility that the object be such that, if it were struck, it would break. Similarly, *mutatis mutandis*, for the disposition to sneeze near flowers. But clearly this is not right even for the possibility conception of dispositions. An object disposed to break if struck has that conditional true of it in actuality, not merely in some other possible world. Someone who is disposed to sneeze when near flowers is probably allergic to flowers. Someone who is possibly such that they sneeze when near flowers may merely be disposed to become allergic to flowers. In general, with a construction of the form 'is disposed to M when/if C', we do not seem to have a conditional embedded in a possibility context—but such an embedded conditional is exactly what my proposed view seems to predict.

[18]Thanks to David Manley for the example.

[19]The defender of the possibility conception might go with the first option but explain the 'if'-clause as an Austinian 'biscuit conditional', not an ordinary conditional (see Austin 1961, Honoré 1964 and Horgan 1979). I will not pursue this strategy here.

An objection along these lines is raised explicitly by Manley and Wasserman (2011), who conclude that while the present proposal 'is appealing in its simplicity, it is not flexible enough to account for the full range of data involving disposition ascriptions'. (Manley and Wasserman 2011, p. 1224) The 'data' that are being alluded to are of the kind that I have just sketched. My strategy in answering the objection will be to discredit the status of the relevant linguistic intuitions as data of the kind that need to be accommodated, by focussing on some actual empirical data concerning the use of 'disposed'.

In discussing properties such as fragility, solubility, and irascibility, philosophers have often found it convenient to switch from these terms to the apparently more transparent 'disposed to ... if ...' locution, and to examine their linguistic intuitions regarding those constructions rather than the terms that the debate was initially concerned with, such as 'fragile'. In this context, it is easy to forget that the locution, used in this way, is almost entirely an artifact of philosophy, a theoretical term introduced as a placeholder to capture whatever it is that fragility, solubility and so on have in common *qua* dispositional properties. Note that 'disposed to', if I am correct, contrasts sharply with dispositional adjectives such as 'fragile' and 'soluble': it is precisely our pretheoretical grasp of those dispositional predicates that philosophers have been trying to capture with the theoretical term 'disposed to'.

That 'disposed to' and 'disposition', as used by philosophers, *are* theoretical terms is confirmed by a look at empirical data. I report the results of a simple statistical survey based on the *Corpus of Contemporary American English* (COCA), the largest existing corpus for the English language (comprising 425 million words from a variety of different sources).[20] COCA had 341 occurrences of 'disposed to', of which 115 could be discarded as irrelevant, mostly because they were followed by a noun phrase instead of a verb. In the present context, the following results are of interest.

To begin with, the survey did not confirm any special connection between 'disposed to' and the conditional, counterfactual or otherwise. There were only five instances where 'disposed' interacts with 'if', and one for 'when'. In each case, the scope of the conditional can be read as inside or outside that of 'disposed to'.

More importantly, the results do not support any significant link between the expression 'disposed to' and what philosophers think of as dis-

[20]Thanks to John Maier for introducing me to COCA, to Anke Lüdeling for advice on corpus linguistics, and to Romy Jaster for help in producing the statistics.

positional properties. The sentence's subjects were typically agents, human or otherwise (221 of 226 cases), and in the remaining five cases they were (personified?) abstracta, such as theories or policies. The verb which followed 'disposed to' was typically a verb of action (190 of 226 cases), or else a verb of sensation or otherwise tied to sentience (35 out of 226). The survey confirmed that, on the most natural reading, a sentence of the form 'N is disposed to Φ' is often best paraphrased as 'N is willing to Φ'. Where the sentence's subject is plural, 'N are disposed to Φ' can be used to express statistical correlations. This is also the most natural reading of the only occurrence of 'disposed to' that was not followed by a verb of action or sensation.[21]

In the entire corpus, there is not a single example of 'disposed to' being used to ascribe to a concrete, inanimate subject a relatively permanent and intrinsic tendency to behave in certain ways—a disposition in the philosophers' sense. To ascribe a paradigmatic philosophers' disposition such as fragility or solubility with the 'disposed to' locution is either to anthropomorphize the inanimate, or to use a theoretical term.

If 'disposed to ...' is a theoretical term, a placeholder for whatever it is that characterizes dispositional properties such as fragility and solubility, then the question of whether is to be construed as a one-place operator akin to possibility, or as a two-place operator akin to a conditional, becomes a question of how best to characterize fragility, solubility, and other such properties. In discussing that latter question, it is perfectly legitimate to appeal to linguistic intuitions concerning 'fragile', 'soluble' etc. But to appeal to one's linguistic intuitions concerning the 'disposed to' locution, and to use those intuitions in judging the adequacy of either the standard or the alternative conception, gets things backwards for two reasons. First, the use of a technical term ought to be informed, ideally, by true theory, not vice versa: the use of technical terminology is not a guide to truth, though it often encodes what is held to be true. Second, and relatedly, the use of a technical term may be expected to encode features of the prevalent theories in which it occurs. In our case, it is not surprising that philosophers' linguistic intuitions concerning the technical term 'disposed to' go with the standard theoretical assumptions, in particular with the conditional conception. But that is a (causal) consequence of, not an (epistemic) reason for, belief in that conception. If philosophers' linguistic intuitions about these expressions are used as 'data' (as Manley and Wasserman's formulation above suggests),

[21] To wit, 'People with autism, or its milder variant, Asperger's syndrome, are biologically disposed to have extreme S-brains.'

they are flawed: the data are already informed by the theory that they are used to support.

3.2 *Dispositions, stimuli, and causation*

I have argued that disposition ascriptions which are explicitly phrased so as to provide a stimulus and a manifestation condition, and to conform with a conditional model of dispositionality, are by no means decisive against the possibility conception of dispositions. I have also argued that we should not rely on linguistic intuitions concerning the expression 'disposed to', since those are most likely to be already heavily influenced by theory. Switching from ordinary dispositional idioms such as 'fragile' and 'soluble' to the 'disposed to' locution is not, as many have believed, a good way to sharpen our intuitions and clarify the debate.

But this is not the end of potential counter-examples to the possibility conception. For are there not dispositions that we can ascribe without any use of the 'disposed to' locution, and which clearly provide us with a stimulus condition? Water-solubility is manifested by dissolving *when immersed in water*, hay fever is or includes a disposition which is manifested by sneezing *when near flowers*. Claustrophobia is a disposition to feel anxiety in enclosed rooms, while acrophobia is a disposition to feel anxiety in response to heights. Both, it would appear, have the same manifestation: anxiety. But they are not the same disposition.[22] In fact, it has been suggested to me[23] that some apparent disposition terms specify not the manifestation of the disposition, but only its stimulus: an edible substance is one, perhaps, which nourishes (or does not do harm) when eaten, a washable object is one, perhaps, that is not harmed when washed.

It seems to me that there is a picture in the background of these considerations which goes, roughly, as follows. When something, x, manifests a disposition, there are two things going on. First, x has something done to it, or happen to it. Second, this happening triggers in x a reaction. A disposition's manifestation is something that the object does (though, of course, mostly in a non-agentive sense of 'does'). It relates to the stimulus much as an effect does to its cause, or a machine's output to its input.

The possibility conception offers a different picture. On this picture, a disposition relates to its manifestation much as a possibility relates to the state that would hold were the possibility to become actuality. Such a state

[22] Thanks to an anonymous referee for the example.

[23] In particular, by Alastair Wilson and an anonymous referee for an earlier version of this paper.

may be of various types: it may or may not be something that is done by an object, and it may or not be complex. Similarly, the manifestation of a disposition—the property that the object would possess were it to manifest the disposition—may be of various types. It may or may not be something that is done by the object, and it may or may not be complex. In particular, it may be the property of being *dissolved by water* (in the process sense or the end state sense), it may be the property of *being caused by flowers to sneeze*, of *being caused by an enclosed room to feel anxiety* or of *being caused by height to feel anxiety*. It may even be the property of *being washed* or of *being eaten*. In fact, there is good reason to believe that often the manifestation processes are of such a complex nature. Let us look again at the linguistics of disposition ascriptions.

I have pointed out earlier that the typical dispositional terms, ending in the suffix *-able* (or variations on it), appear to express possibility, rather than an implicit conditional. It is worth having a closer look at the suffix. As the OED entry for *-able* states, it is a suffix

> [f]orming adjectives denoting the capacity for or capability of being subjected to or (in some compounds) performing the action denoted or implied by the first element of the compound.

An adjective of the form 'Φ-able' typically, though not universally, expresses the disposition to be Φ-ed, or in a plausible paraphrase, to be caused to Φ. Thus solubility is the disposition to be (dis)solved or to be caused to dissolve, flexibility is the disposition to be bent or to be caused to bend (from the Latin *flectere*, to bend), to be ignitable is to be capable of being ignited or to be caused to ignite, and so on. For many of these manifestation processes, we have knowledge of the typical causes—ignition, for instance, is generally caused by proximity to a source of extreme heat. Other processes may reasonably be thought to be so complex as to already include the nature of the cause: to be bent is not merely to assume a 'bent' shape but to do so in reaction to someone's (or something's) bending. In some cases, the nature of a disposition's manifestation trivially provides one specification of its manifestation's causes: thus water-solubility, or the disposition to dissolve in water, will have as its manifestation a process that cannot be caused without the substance's being immersed in water. Often it is useful to distinguish between individuals that are caused to do something by different causes—for instance, between those who can easily be caused to feel anxiety by enclosed rooms, and those who can easily be caused to feel anxiety by heights, or between those who can (easily) be caused by rye to sneeze and those who can (easily) be caused by flowers to sneeze.

In short, where the conditional conception sees a stimulus/cause and a manifestation/effect, the possibility conception sees either a causally complex manifestation (as in the cases of claustrophobia and acrophobia), or else a manifestation plus a further fact about typical causes of that type of process (as in the case of ignitability).[24]

The conditional conception provides more structure for dispositions, the possibility conception provides more flexibility. The first thus links dispositionality closely with causation, the second takes causation to be a separate ingredient that may or may not be part of a disposition's manifestation. Its greater flexibility makes it easier for the second picture to accommodate examples, such as the disposition to decay spontaneously, which appear not to have a causal element, let alone a clearly circumscribed 'stimulus condition'. It remains to be seen whether this advantage outweighs the theoretical benefits of closely associating dispositions with causation. For the time being, I only wish to point out that this is an open question.

3.3 *Beyond possibility?*

I turn, finally, to a different kind of objection. The possibility conception of dispositionality was introduced as the conjunction of two claims, one about the individuation of dispositions, the other about the kind of modality inherent in them. The objections that I have discussed so far were aimed primarily against the first of these conjuncts. I now turn to the second. Thus Manley and Wasserman (2011) object that possibility may not be strong enough to account for all dispositions:

> For example, there will be contexts in which an atom does not count as disposed to remain stable even though it would remain stable in some much-higher-than-negligible proportion of nomologically possible situations. (Manley and Wasserman 2011, p. 1223)

I have argued at length that the appeal to a natural-language 'disposed to' formulation is of little use in debating the nature of dispositional properties such as fragility. But perhaps the point can be made without the

[24]Lowe (2011) adduces similar considerations, especially regarding the grammatically passive form of a disposition's manifestation. He denies, however, that the putative stimulus can be understood as a causal factor at all: being immersed in water is a logical consequence of being in water (p. 25). Whatever we say about the particular case of water-solubility, I doubt that his observation generalizes to the other cases that I discuss in the main text.

formulation. Is stability not itself a disposition, and likewise robustness or sturdiness? And do these dispositions not require more than the (even easy) possibility of their manifestation—which, we may assume, consists in an object's remaining intact?

Stability, sturdiness or robustness are much like the 'dispositions' of insolubility, inflexibility, or invulnerability. Rather than endowing an object with a susceptibility to certain kinds of change, they seem to consist in the absence of such a susceptibility. Robustness differs from, say, unbreakability in much the same way in which fragility differs from breakability. An object need break in only one possible scenario to count as breakable, but in a few such scenarios to count as fragile; an object must remain unbroken in all possible scenarios to count as unbreakable, but only in most of them to count as robust. While 'x is breakable' expresses a restricted possibility (of x's breaking), 'x is unbreakable' expresses a restricted impossibility (of x's breaking), or a restricted necessity (of x's not breaking). That should not surprise us: after all, 'unbreakable' is the negated form of 'breakable'. If the latter expresses a possibility, the former may be expected to express an impossibility. Similarly, we may think of 'robust' (or 'sturdy') as, approximately, being the negative of 'fragile'. While 'x is fragile' expresses a little more than a plain possibility, 'x is robust' expresses what we may call a 'graded necessity'—a little, but not much, less than an impossibility (of x's breaking) or necessity (of x's remaining intact, that is, not breaking).

To pose a real threat to the possibility conception, an opponent would need to adduce a disposition which (i) is not plausibly construed as just the negative of some disposition, as (I have argued) stability or robustness is, and (ii) comes with a modality that is clearly stronger than a (mere or graded) possibility, and closer to a necessity, of its manifesting. I will discuss one attempt to produce such an example, and finish by sketching some implications of the present view.

Take a water-soluble lump of sugar. Surely, the opponent may say, the lump's solubility is more than just the *possibility* of its dissolving in water? The lump exhibits a precisely specifiable lawful behaviour. To say that it *can* dissolve in water is true but clearly an understatement: it *will* dissolve in water every time it is put into water. The possibility conception of dispositions has nothing to offer that captures this kind of lawful behaviour.

In response, we need to draw some distinctions. It is, of course, true that *as a matter of fact* soluble substances not only can, but (in some suitable sense) must dissolve in water. But is this fact part of what it takes for a substance to be soluble? Suppose, counterfactually, that there was a substance S samples of which dissolved only in some possible scenarios, as

unsystematically connected as, say, the scenarios in which various irascible people get angry. Would we count that substance as soluble? I submit that we would. And as far as the English word 'soluble' is concerned, the Oxford English Dictionary agrees: as we have seen, it defines 'soluble' as 'capable of being melted or dissolved'. The definiens clearly applies to my hypothetical substance S.

But perhaps there is something wrong with the supposition that there be a substance such as S. Would a process that is so irregular as not to be governed by the kinds of laws that we know still count as 'dissolving' in a sense useful to, say, chemistry? Perhaps it would not. But the crucial thing to note is that the problem with my supposition is a problem about dissolving, not one about dispositionality. There are two aspects to a disposition, on the possibility conception. One is its dispositionality; this it shares with any other disposition. The second aspect is its manifestation; this is what sets it apart from all other dispositions. The trouble with imagining my hypothetical substance S, if there is any, has its source not in the dispositionality of being soluble, but in the manifestation. Dissolving is a law-governed process. If a substance appears to dissolve or fail to dissolve at random, we may doubt that the process which it is undergoing really is the process we know as dissolving, and consequently whether the disposition that it manifests in undergoing that process really is solubility, the disposition to dissolve. But these considerations, if they are along the right lines, concern only the nature of dissolving. They have no bearing on the nature of dispositionality.

In linking dispositional properties, as we know them from ordinary life and language, to possibility, I have divorced them from counterfactuals, causation, and lawful behaviour. It may be asked what remains for them to do. In particular, the possibility conception of dispositions seems badly aligned with the view, increasingly popular in the metaphysics of science, that the natural properties which our best scientific theories study are dispositional. Negative charge, for instance, is said to be the disposition to attract positively charged particles and repel negatively charged ones. But surely to say that a negatively charged object *can* so attract and repel other particles is, again, an understatement and not an apt characterization of charge on any account. More specifically, some have recently argued that it is the essentially dispositional nature of natural properties such as charge in which the laws of nature are grounded. (See especially Bird 2007.) For these dispositional essentialists, it is a law that two negatively charged objects repel each other *because* that is the dispositional nature of negative charge. But, again, such laws do not describe (even easy) possibilities. They state (nomological)

necessities: they tell us what objects must do, not what they can do.

Does the possibility conception, then, clash with the idea that the natural properties are dispositional, and with dispositional essentialism more specifically?

I believe that the clash is merely nominal, and that the possibility conception, if correct, spells trouble only for a popular way of formulating dispositional essentialism, not for the claim itself. Dispositional essentialists often begin by discussing ordinary dispositions such as fragility, and then introduce their thesis by saying that the natural properties, such as charge, are just like those ordinary dispositions in certain respects: in particular, that both are linked to certain counterfactual conditionals in interesting ways. If the possibility conception is correct, that way of introducing the claim is mistaken. The natural properties are not *just like* the ordinary dispositions we know from everyday life; if they are to encode the laws of nature, they must be characterized by a modality stronger than possibility. They are like those ordinary dispositions in a more general way: both have a *modal* character, even if their modality is not the same.[25]

What remains for the dispositional essentialist to say is that the natural properties, like our ordinary dispositions, are *modal* properties. Perhaps there is more than one variety of modal properties. The kind that we capture with our ordinary disposition terms is a simple and flexible one; the kind that we study in scientific theories is more fixed and predictable. The claims of this paper concern the former, not the latter.

4 Conclusion

I have proposed and defended an alternative conception of dispositions, one that holds them to be individuated by their manifestation alone, and that holds their modality to be that of possibility, not of any kind of conditional. Serious consideration of typical disposition terms points in this direction, as does the desire for a unified conception of dispositions. I have argued that the view can answer the most obvious challenges, and that in doing so it may teach us a valuable lesson about the status of linguistic intuitions in the debate about dispositions.

I have not in this paper compared the possibility conception to any of the various versions of the conditional conception to argue that the former

[25] It is at least an open question whether the counterfactual conditional is better suited for the dispositional essentialist's purposes than for everyday dispositions. See Vetter 2012 for an argument that it is not.

is superior to the latter. The reader may suspect by now that I do believe it is superior. Such suspicion would not be at all mistaken. But I leave the argument for another day.[26] What I hope to have shown is that it is not at all obvious that the conditional conception is the only feasible starting point, or even that it should be the default starting point, in understanding dispositional properties. The ball is now in the opponent's field.[27]

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[26] Or rather, another paper: see Vetter forthcoming.

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