

Introduction

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1. *Introduction*

This focus of *Philosophical Inquiries* is devoted to Barbara Vetter's *Potentiality: From Dispositions to Modality* (Oxford University Press, 2015). In her book, Vetter offers an account of (certain) modalities in terms of the dispositions of certain entities; examples of these dispositions are a glass' fragility, or a rubber band's elasticity. More specifically, Vetter's account aims to explain metaphysical possibility and necessity in terms of a generalized notion of dispositionality. She refers to such notion as *potentiality*. We shall return on the nuances of Vetter's choice in section 3 below; for now, we shall speak more generally of 'dispositions' and 'dispositionality.'

Vetter is not the first to suggest a dispositional treatment of modality, not even in contemporary philosophy;¹ yet, *Potentiality* is surely the most articulated effort in that direction: as such, it has sparked the interest of many, friends and foes of dispositions alike. In addition, the relevance of *Potentiality* is not confined to modal ontology/semantics, or the somewhat narrow subfield of philosophy of science concerning dispositions, conditionals, laws of nature, and causation: on the contrary, the book presents significant ramifications in a vast array of debates, from metaphysics and modal epistemology to philosophy of mind, ethics, aesthetics, and more. Some of these ramifications are explored in the remainder of the present focus, which is intended as a contribution to an emerging debate about the complex interplay between dispositionality and modality.

The goal of our brief introductory remarks is, firstly, to frame the debate and answer some preliminary questions the reader might have (why a dispositional account of modality? and what is special about Vetter's own account?); secondly, we provide a brief overview of the history and contents of

¹ The first explicit discussion about a dispositional treatment of modality in contemporary analytic philosophy can be found in Mondadori&Morton 1976. More recently: Martin&Heil 1999; Pruss 2002; Molnar 2003: ch. 12; Mumford 2004: ch. 10; Borghini&Williams 2008; Contessa 2010; Jacobs 2010.

the focus itself.

2. *A background on dispositional treatments of modality*

The core idea of a dispositional account of modality is very simple. Consider a glass bottle. The bottle can break, and it would break if struck. How can such facts be explained? The answer of those who embrace a dispositional account is that one of such facts (or both, depending on the account) is grounded and explained by the fact that the glass bottle is disposed to break (if struck). More generally, so-called *dispositionalists* maintain that the modal features of the world entirely depend of instances of genuine dispositions by material objects in the physical world.

Some readers may find the dispositionalist project objectionable from the get-go. To say that the glass bottle is disposed to break (if struck) ultimately amounts to say that it *can* break, or that it would break if struck (or some elaboration thereof), thus making any attempt at a dispositional treatment of such modalities hopelessly circular. Then one should keep in mind that dispositional treatments of modality revert the traditional direction of analysis, according to which modal resources are deployed to explain dispositionality away, usually (but not exclusively) along the lines of a “conditional analysis”: something is disposed to M, if S, *if and only if* it would M, if S.² On the contrary, friends of dispositions, capacities, and causal powers take them to have a life on their own, and to be primitive and irreducible items that the physical world and its inhabitants are provided with. Uncompromising claims such as this constitute a relative novelty in a philosophical landscape whose most celebrated influence was Hume’s empiricism, according to which, “[o]f all the ideas that occur in metaphysics, none are more obscure and uncertain than those of power, force, energy or necessary connection”.³ Hume’s opinion was later reinforced along verificationist lines: for how can the ascription of a dispositional predicate be meaningful, let alone true, when the presence of most dispositions, like the fragility of a glass bottle inside a cupboard, eludes standard verification procedures? Hence, the need for a conditional analysis.

The banishment and subsequent rehabilitation of dispositions is a complicated topic with multiple aspects to be considered. But it is indeed the position of many today that dispositions are respectable items that do not need crutches

² Traditionally, Carnap 1936-37; Ryle 1949; Goodman 1954; Quine 1960. Unlike most recent attempts, as in Lewis 1997, original supporters of a conditional analysis, starting with Carnap, limited themselves to extensional logic.

³ From *An Enquiry Concerning Human Understanding*, Section 7, Part I.

of any kind (be they semantic or metaphysical) to stand upright;⁴ and it is this position which makes a dispositional treatment of modality viable.

Of course, however, that a philosophical option is viable doesn't mean that it is desirable: why, then, pursue a dispositional treatment of modality? The concerns put forward by dispositionalists in this context are most often than not ontological in character: dispositions are better candidates for an ontology of modality than the far more popular *possible worlds*.

The topic warrants some elaboration. As soon as modal ontology became a respectable topic, the debate has been monopolized by discussions about possible worlds.⁵ The reader should be warned that interest in possible worlds in modal ontology has little to do with Leibniz's theological considerations, or with the so-called many-world interpretation of quantum mechanics: it rather has to do with the theoretical virtues of the modal semantics it is based on. Possible-world modal semantics is, as of now, the best way to understand and extensionalize modal discourse: non-truth-functional modal sentences are understood through a truth-functional semantic metalanguage, and otherwise opaque modal operators are interpreted as well-understood quantifiers; what is more, many features of modal logic can be nicely framed through possible world models (famously, by tinkering the mathematical features of the accessibility relations, modal logics of various strength are validated). So, the thought goes, if modal discourse is at least sometimes true, and true in the same way in which non-modal discourse is at least sometimes true, then the best semantics that can be provided for it ought to correctly describe reality; hence, possible worlds.⁶ The alternative is to take a fictionalist, or non-cognitivist, or otherwise non-realist stance on the status of modal discourse.

Dispositionalists are aware of this difficulty; Jacobs (2010: 240) is quick to recognize that a pressing matter for dispositionalists is to develop an "alternative to the powerful, possible worlds semantics of modality". There are, however, other factors at play. Firstly, one should consider that this allegedly virtuous possible-world formal semantics does not straightforwardly involve possible worlds, at least not without an active interpretative effort.⁷ Kripkean

⁴ Perhaps the first explicit contemporary manifesto in favor of dispositions can be found in Mellor 1974; Martin 1994 and Bird 1998 counterexamples to the conditional analysis also indubitably played a part.

⁵ The most radical and popular version of the position is of course Lewis 1986; see Divers 2002 for a comprehensive overview on the subject.

⁶ See Mondadori & Morton (1976).

⁷ The distinction between pure and applied semantics is relevant here, as in Plantinga (1974: 126ff). Relatedly, Fleischer (1984) described Kripkean modal semantics (somewhat provocatively) as an amalgamation of algebra and poetry. Possible worlds classify as poetry.

triples $\langle W, @, R \rangle$ are merely characterized by set-theoretical features, and it is then philosophers who decide to interpret them through the lenses of a possible world ontology. Possible world talk is surely a useful and comfortable way to frame modal discourse (and one which Vetter herself employs in the book), but one whose ontological commitments are *per se* dubious.

Secondly, it is not clear whether the discussion in modal ontology should be completely stifled by semantic considerations; on the contrary, it could be problematic to read off one's ontology from the formal semantics alone. If an ontology of dispositions can be shown to be preferable to possible worlds for inherently ontological reasons, then a discussion about the semantics may follow it, rather than precede it. This is the kind of methodology put forward in Borghini&Williams (2008), who however do not go as far as so to propose a semantic for their disposition-based modal ontology. Vetter's *Potentiality* does both, ontology and semantics, although the comparison between possible world semantics and her potentiality semantics is deferred to another time.

What are, then, the ontological reasons to prefer dispositions in modal ontology? There's no clear-cut list of uncontroversial virtues enjoyed by dispositions in opposition to possible worlds; there is however, a number of more or less interconnected observations put forward by dispositionalists throughout the literature.

Firstly, actualism is often stated to be a virtue of dispositional treatments of modality, to the extent that they ground modal features in actual instances of dispositions.⁸ That said, there are actualist possible world ontologies as well, so this cannot be the decisive factor to make us decide in favor of dispositions over possible worlds.⁹ Secondly, it is sometimes claimed that possible worlds, whether actual or not, are wholly irrelevant when producing an account of modality: that the glass bottle is represented as broken in an *ersatz* world, or has a broken counterpart in another genuine world, doesn't seem to be the reason why the glass bottle *can* break in the first place; of course, the charge of irrelevance against possible worlds (and counterpart theory) is not a new one,¹⁰ but one which many dispositionalists, Vetter included, take seriously.¹¹ The background idea is that the only reason why the glass bottle can break is because of some perfectly respectable property that it possesses, which can be picked by the predicate "fragile".

⁸ Eagle 2009; Contessa 2010; and Vetter 2011.

⁹ Contessa (2010) differentiates traditional actualism (e.g., the one present in actualist possible world ontologies) from "hardcore actualism" which rejects the idea that the so-called "Leibnizian biconditionals" employed in possible world semantics ought to be taken ontologically seriously.

¹⁰ For an overview on this topic, see Divers (2002: 124-133).

¹¹ See Jacobs 2010 and *Potentiality*: 6.

This leads us to our third point concerning dispositions *qua* modal ontology: that they allow for a thoroughly *naturalistic* ontology, at least in the Armstrongian sense of naturalism as “the doctrine that reality consists of nothing but a single all-embracing spatio-temporal system”.¹² To ground modal features of the world one only needs perfectly respectable instances of properties within the space-time continuum, without the need to explain them away through far-removed possible worlds which are only postulated by virtue of the corresponding formal semantics.

Fourthly, and finally, there’s an epistemological advantage. Peacocke (1999: 1) called “integration challenge” the general task of providing “for a given area, a simultaneously acceptable metaphysics and epistemology”. This has been a notoriously problematic aspect of possible world accounts of modality, the most glaring issue being that there is no epistemic access to possible worlds, direct or indirect as it might be, since, as Kripke’s adagio goes, we can’t see them with a telescope. But there *is* a fairly straightforward access to manifestations of dispositions (for most of them, we don’t need telescopes either!); which means that a dispositional treatment of modality offers the prospect of a fruitful integration between modal ontology and modal epistemology.

3. Vetter’s approach in Potentiality

As before, Vetter’s variant of dispositionalism is not the only one on the market. What is specific, then, to her approach in *Potentiality*, and which motivations are offered in its favor?¹³

Firstly, we must understand Vetter’s distinctive shift from dispositions to *potentialities*. Dispositions, such as a sugarcube’s water solubility, are not the only features associated with what entities can or would do in certain circumstances. Entities might also possess certain powers, capacities, or potentials, e.g. water’s power to dissolve sugar;¹⁴ in addition, some entities have abilities, such as Jane Austen’s ability to write in English. Vetter intends “potentialities” (a term of art which she hopes to be conceptually blank) to be the most general category in which they all fit; potentiality is thus intended to be the “common genus” (102) of dispositions and other modal features.

¹² Armstrong 1981: 149.

¹³ Numbers in brackets, unless otherwise specified, refer to *Potentiality*.

¹⁴ The distinction in many natural languages between “dispositions” and “powers” may be linked to the pre-theoretical asymmetry (of ultimately Aristotelian descent) between an agent and a patient in a causal process, such as the dissolution of a sugarcube in water. Many friends of dispositions today believe this asymmetry to cut no ontological ice.

The one just described is not the only respect in which dispositions and potentialities differ. Dispositional ascriptions are notably a messy affair, subject to both vagueness and context-sensitivity: e.g., a XVII century Ming vase probably counts as fragile, and has to be bubble-wrapped wherever it goes, whereas a steel rod appears to be pretty sturdy, thus not fragile; but what about a pencil? I can break it with one hand, but I do not need to be excessively careful handling it in my everyday life, since it can probably survive a fall from my desk without breaking: is that enough to make it fragile? As for context-sensitivity, it is not even uncontroversial that a steel rod is *not* fragile: a certain steel rod may be considered to be too fragile by engineers on a construction site, and thus not used for a skyscraper's foundation. However, according to Vetter, "both vagueness and context-sensitivity are features of language, not the world" (20); thus potentialities are introduced as a context-neutral metaphysical background for dispositional ascriptions. Potentialities come in degrees: both the Ming vase and the steel rod have a potentiality to break, but with a different degree, thus, warranting, in different contexts, different dispositional ascriptions. In many ordinary contexts the degree of the Ming vase's potentiality passes a threshold for the vase being called "fragile", while this is not the case for the steel rod; but in other contexts, different dispositional ascriptions might be warranted.

Here's a different way to make sense of the vagueness and context-sensitivity of dispositional ascriptions: viz., to specify a different stimulating condition. After all, the Ming vase is more fragile than the steel rod to the extent that it takes a far lesser force to shatter it. Thus, the Ming vase has a disposition to break when struck with (at least) n , whereas the steel rod has a disposition to break when struck with (at least) m , such that $n < m$. This brings us closer to the so-called Standard Account of dispositions, in which dispositions are characterized and individuated by virtue of a stimulus S and manifestation M , and usually paired with the correspondent conditional "if S then M ".

Vetter takes this option to be deeply problematic. She argues (39-49) that no disposition, unless maximally specific ones (e.g., disposed to break if struck with *exactly* 8.5 N), can successfully be paired to a single stimulus and manifestation, thus to a single conditional (so-called "single-track" dispositions, as opposed to the "multi-track" ones). Thus, a general disposition such as fragility would have to be understood as a massively multi-track, or as complex disjunction of maximally specific dispositions; intuitively, that general disposition would then be less fundamental than the maximally specific dispositions (in the same way a complex disjunction is less fundamental than its disjuncts);¹⁵

¹⁵ See Bird 2007: 22.

however, Vetter also has an argument to the contrary conclusion that general dispositions are more fundamental than maximally specific ones (56-58).

The culprit, for Vetter, is the Standard Account itself, which characterizes the nature of a disposition in terms of both stimulus and manifestation; her idea (63 ff) is to characterize it by its manifestation alone, and take the resultant potentiality to come in degrees, rather than the stimulus.¹⁶ This solves the difficulty: the Ming vase and the steel rod both possess the general potentiality to break, but to different degrees. Potentialities, so understood, are a modal primitive of the account, and are thus to be taken as fundamental (or, at least, no less fundamental than anything else, 24-25).

This kind of internal restructuring of dispositionality has a crucial consequence on Vetter's account of modality; if the Standard Account naturally pairs dispositions with conditionals (from "object *a* is disposed to M if S" to "object *a* would M if S"), Vetter's potentialities are naturally paired with possibility (from "object *a* has a potentiality to break" to "object *a* can break"); thus, *Potentiality* offers a *possibility-first*, rather than *conditional-first* account of modality.¹⁷ An immediate advantage is that Vetter is spared from having to deal with the notoriously troublesome link between dispositional ascriptions and conditionals.

In order to produce a formal semantics, Vetter introduces her potentiality operator POT (144-145), which functions as a predicate modifier; this is in line with the natural language grammar of dispositionality (e.g., disposed to break), but in order to bridge the difference in logical form between POT and possibility, *qua* sentential operator, Vetter allows predicate abstraction to turn sentences of any given logical complexity into predicates to plug in the POT operator; this is, by Vetter's own admission "the path of least formal resistance" (141). Vetter introduces multiple kinds of potentiality to ensure that all such applications of the POT operator make sense from an ontological point of view; from the simplest intrinsic potentialities to *joint potentialities*, viz. potentialities jointly possessed by two or more items (e.g., Lorenzo's and Andrea's joint potentiality to play a game of chess), to *extrinsic potentialities* (e.g., Lorenzo's potentiality to play a game of chess with Andrea, or maybe even Lorenzo's potentiality for Andrea to play a game of chess). Finally, building from Borghini&Williams (2008) there are *iterated potentialities*, viz., potentialities whose manifestations are, or involve, the possession of

¹⁶ Reasons for her alternative account also come from linguistic considerations concerning dispositionality in natural languages; for according to Vetter "our modal metaphysics should provide the materials for a semantics of at least a significant part of natural-language modality" (16).

¹⁷ See Jacobs 2010 for a conditional-first account of modality. Even without potentialities in Vetter's sense, Borghini&Williams 2008 also argue for a possibility-first account.

other potentialities (e.g., Lorenzo's potentiality to learn to play chess). Vetter claims extrinsic potentialities to be grounded in joint potentialities: as long as one can produce a reasonable grounding chain ending in the simplest intrinsic potentialities, every potentiality is acceptable.

This ample variety of potentialities greatly expands the reach of potentiality, and gives ontological significance to all applications of the POT operator. The criterion that POT must respect in this endeavor is some degree of "extensional correctness" (15ff.), it must respect enough of our pre-theoretical intuitions about what is possible, and what is not possible.

Finally, in page 197, Vetter presents the POSSIBILITY principle:

POSSIBILITY It is possible that p =df Something has an iterated potentiality for it to be the case that p .

Necessity is standardly introduced as the dual of possibility: thus, it is necessary that p if and only if nothing has the potentiality to not- p (203). As Vetter quickly points out, POSSIBILITY as a proper definition could be used to replace and eliminate all possibility-talk, but it shouldn't. The account doesn't offer a reduction of modality in the sense that modal features of the world are reconducted to non-modal features: it rather consists in a *localization* of modality to the specific aspects of the physical world which are responsible for it (viz., instances of potentialities). In POSSIBILITY such a localization is signaled by the existential quantification in the right-hand side. On the other hand, as Vetter claims (197-198), possibility-talk involves some kind of abstraction, as we are required to think about some potentiality in abstraction from its bearer.

4. *About this focus*

The idea of this focus presented itself quite naturally following two events centered on *Potentiality*. A reading group on Vetter's book met for an extensive seminar at the University of Padua, on July 7, 2017. The meeting was organized by Massimiliano Carrara, Giorgio Lando, and Vittorio Morato and saw the participation of Lorenzo Azzano, Massimiliano Carrara, Donatella Donati, Ciro De Florio, Simone Gozzano, Giorgio Lando, Vittorio Morato, Alessio Santelli, Alfredo Tomasetta, and Giacomo Turbanti. The reading group was later followed by the workshop *Potentiality & Possibility*, organized by Giorgio Lando at the University of L' Aquila on September 14, 2017, with talks from Barbara Vetter, Andrea Borghini, Lorenzo Azzano, and Donatella Donati.

The focus hosts six contributions from seven philosophers, engaging with different aspects of Vetter's book, in an attempt to advance the discussion on

potentialities, and, more generally, on dispositional treatments of modality. In the last part, Vetter offers her reply to the contributors.

The first paper is *Possibility and the Analysis of Dispositions* by Alexander Bird, which studies the possibility-first aspect of Vetter's treatment of modality. Linking potentialities directly with possibility *prima facie* spares Vetter from a problem of conditional-first approaches: that of non-conditional possibilities. According to this problem (which is fairly new to the literature), when dispositions are provided with both stimulus and manifestation, and thus paired with subjunctive conditionals, the non-conditional possibility of the consequent can only be ensured through the non-conditional possibility of the antecedent, which no disposition can provide. It would seem that Vetter has the upper hand here; unfortunately, she allows for *conditional manifestations* in order to deal with those dispositions that would normally be distinguished by their stimulus (e.g., gravitational mass and electric charge). Although technically stimulus-less, potentialities with conditional manifestations can be shown to be subject to the problem of non-conditional possibilities.

David Yates, in *A Strange Kind of Power*, questions the formal adequacy of Vetter's account. Yates had previously argued (Yates 2015) that, given Vetter's account, for certain propositions p (e.g., $2+2=4$), it is both the case that p is necessary and not possible; given minimal requirements for the formal adequacy of the account, (axiom T) that yields a contradiction.¹⁸ Vetter has later argued for a plenitude of potentiality, according to which there can be a non-causal potentiality for it to be the case that, e.g., $2+2=4$ (Vetter 2018). Yates criticizes Vetter's strategy for plenitude, which crucially revolves around the claim that if an object necessarily has an intrinsic property P , then it also is maximally disposed to P . An alternative is offered: by treating truthmaking as a form of metaphysical causation, that something makes $2+2=4$ true suggests that it may also possess a causal potentiality to do so: pros and cons for that "strange kind of powers" are then evaluated.

The two following papers deal with an important issue in the metaphysics of potentialities: assuming that potentialities are indeed properties, as Vetter does throughout her book, what kind of properties are they? Between various brands of nominalism, trope theory, and universalism, which account of properties, if any, best fits *Potentiality*? The two papers both find Vetter's current stance on the matter somewhat unstable, but advocate for a different solution: Platonist the first, Aristotelian the second.

In *Potentiality: Actualism minus Naturalism equals Platonism*, Giacomo Giannini and Matthew Tugby suggest that Vetter's potentiality account would

¹⁸ For these formal requirements, and T in particular, in *Potentiality*, see 15-16.

be better served by a Platonist framework. Vetter takes the ontology of potentialities to be appealing insofar as it is both actualist and naturalist (as defined above); this leads her to an Aristotelian account of properties as immanent universals, which depend on their instances and thus cannot exist uninstantiated. Yet this dependence notoriously narrows the range of possibilities that can be accounted for. Vetter is aware of this difficulty¹⁹, and in *Potentiality* she formulates a weakening of her position (271-272); but for Giannini and Tugby, in this weakening the naturalist component of Vetter's ontology is already compromised. It is thus a small step to abandon the dependence claim and embrace Platonism, according to which properties can exist uninstantiated. The advantage is that there are certain aspects of scientific reasoning that are better understood through a Platonic framework.

Potentialities as Properties by Jennifer McKittrick has a wider scope, arguing that no existent theory of properties is compatible with Vetter's account: all accounts are problematic, including Platonism. So rather than following Giannini and Tugby in an explicit rejection of naturalism, McKittrick focuses on a different aspect of Vetter's framework to solve this difficulty: viz., the claim that determinable potentialities are more fundamental than their determinates, to which Vetter may be committed, according to McKittrick, by virtue of her claim that general potentialities are more fundamental than the specific ones. However, according to McKittrick, *Potentiality* may also offer the solution: building from Vetter's tentative suggestion that so-called nomological dispositions, which "encode laws of nature" (*Potentiality*, 50), e.g. electric charge, are always possessed to the maximal degree, she claims fundamental potentialities to be such determinate nomological potentialities. This alternative proposal is consistent with many options about the status of properties (Aristotelianism, and perhaps trope theory as well).

Nathan Wildman also offers three *Potential Problems?* relating to potentialities. Firstly, regarding talk of degrees of potentiality, for Vetter to be cashed out with the help of a proportionality principle formulated in terms of possible worlds. Such a principle should of course not be taken ontologically too seriously, but merely as a "formal model and rough approximation" of degrees of potentiality" (*Potentiality*, 78); thus, at least, materially adequate. Wildman offers a counterexample; Vetter can of course abandon the problematic principle entirely, but that would leave talk of degrees as entirely primitive. Secondly, there's a difficulty concerning the individuation of potentialities; given that Vetter rejects stimuli, all the individuating work has to be done by manifesta-

¹⁹ Limitations of an Aristotelian (and trope theorist) account of dispositions are forcefully pressed in Tugby 2013.

tions alone; but Wildman objects that there might be different potentialities with the same manifestations, which apply to different kinds of entities (e.g., perishable and destructible). Thirdly, Wildman wonders how Vetter could treat potentialities whose manifestation involve the bearer's ceasing to exist (e.g., again, perishability and destructibility).

In the last contributed paper *Potentiality, Modality, and Time*, Jennifer Wang introduces a distinction between “*de re* first” treatments of modality, which start from modal properties of objects, and “*de dicto* first” treatments, which start from general possibilities and necessities. Vetter's account, as exemplified by the POT predicate modifier, is of the former kind, while possible world ontologies (at least in the paradigmatic Lewisian variant) clearly belong to the latter. Vetter's intended treatment for *de dicto* modalizations, e.g., possibly the US president is a woman, requires backtracking in time in search for bearers of potentialities whose manifestation might have brought about that, say, the US president is a woman. Wang objects that, in the case of some specific *de dicto* modal claims, Vetter's account loses its attractiveness and intuitiveness. Yet *de dicto* first treatments do not necessarily need possible worlds to function: an alternative *de dicto* first account is also discussed, with primitive modal relations of compatibility and incompatibility between properting; eventually, Wang suggests that a mixed account might serve Vetter better.

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