

DOI: 10.22201/iifs.18704905e.2024.1509

Barbara Vetter, *Potentiality. From Dispositions to Modality*, Oxford University Press, Oxford, 2015, 321pp., ISBN: 978-0-19-871431-6

In our everyday lives we are constantly dealing with things and beings that have potentials: Glass has the potential to break, paper has the potential to burn, and I have the potential to write this review. Potentiality, although a broader concept, includes the following other concepts: On the one hand we can speak of dispositions, which would be those that typically concern inanimate entities, and on the other we can speak of abilities, which would be those that we possess as animals. Thus, the apple has the disposition of being edible, and some people have the ability to climb the fourteen “eight-thousands”. As the author herself puts it, the book *Potentiality. From Dispositions to Modality* “is a plea for the recognition of potentiality as an explanans in the metaphysics of modality” (p. 2), so she develops a theory of potentiality to use it for constructing a potentiality-based theory of modality. She defines possibility as follows:

POSSIBILITY* It is possible that $p =_{df}$ Something has, had, or will have¹ a potentiality for it to be the case that p . (p. 199)

According to Vetter, what we do when we speak about possibility is speaking about potentiality in abstraction from its possessor. Likewise, if metaphysical modality is based on potentialities, our knowledge of the latter would give us much knowledge of the metaphysics of modality, so Vetter’s approach is a major contribution to the integration challenge first posed by Peacocke, which consists in the reconciliation of “what is involved in the truth of statements of a given kind with a credible account of how we can know those statements” (Peacocke 1999, p. 1). But a good theory of metaphysical modality must strive for extensional correctness, i.e., for a correct delineation of what is and what is not metaphysically possible and necessary; it must be formally adequate, i.e., it must be able to account for the fact that possibility is closed under logical consequence, closed under and distributed over disjunction, and implied by actuality; and, finally, it must strive for semantic utility. With these “three constraints”

¹Metaphysical potentiality is not subject to change over time, so the definition must reflect that by including all tenses.

in mind, Vetter will develop her theory of potentiality extensively, exhaustively, and precisely, making her work an indispensable contribution to the philosophy of modality.

The main goal of the book is “to develop a theory of possibility based on the potentialities of individual objects” (p. 33). Potentiality itself is treated in the book as a primitive, since we all seem to have a pre-theoretical grasp on part of its extension. To put it in a slogan “potentialities are possibilities rooted in objects” (p. 3). Potentiality is going to be the notion in terms of which metaphysical possibility is explained: potentiality will have the same role for possibility as essence has for necessity in the Finean (Fine 1994) picture. However, the notion of potentiality is not introduced *ad hoc*, but it is modelled thorough the book.

To understand potentialities, we should first pay attention to dispositions —which are modal properties. “It can be argued that the potentialities which objects have outrun the dispositions that we are willing to ascribe to them” (p. 22). So, having that on mind, she begins by presenting the standard conception of disposition (chapter 2). Dispositional properties have traditionally been characterized in terms of conditionals. This proposal can be traced back at least to Carnap, who in “Logical Foundations of the Unity of Science” (1991) proposes to introduce dispositional terms through reductive propositions. The problem with this proposal, however, is that some objects still need to be determined. According to the standard conception, (1) a disposition is individuated by the pair of its stimulus condition and its manifestation, and (2) its modal nature could be characterized by a counterfactual conditional. In contrast, in chapter 3 of her book, Vetter will defend that (1) dispositions are individuated by their manifestation alone, and (2) their modal nature is characterized by sentences of the form “x can A”.² She wants to propose a realist picture of dispositions, and such a picture must, as Vetter notes, provide a background for the context-sensitivity of ordinary dispositions ascriptions, must individuate dispositions by their manifestation alone (and not by the pair manifestation-stimulus), and must answer the question “how a unified conception of dispositionality might encompass both ordinary dispositions, which we have found to be possibility-like, and nomological dispositions, which figure in laws of nature and seem more akin to necessity than to possibility” (p. 80).

² See also Vetter 2016 on “can-statements”.

As Vetter notes, two first problems are that dispositions ascriptions are gradable and that they are context-sensitive; this means that a disposition cannot be adequately characterized in terms of a single counterfactual conditional. They have been many responses in the literature that try to solve these structural problems. Perhaps the most famous is Manley and Wasserman's (2008) proposal, according to which we should give up the idea of dispositions to be traceable by a single conditional and embrace instead the idea of dispositions being multi-track. Vetter is sympathetic with this idea, but she concludes it considering the fact, as I have noted before, that dispositions ascriptions are gradable and context-sensitive. The context-sensitivity of disposition terms such as "fragile" is a matter of surpassing a contextually determined threshold of a given potentiality. (For instance, to be fragile is to possess the potentiality to break to a certain degree. To be breakable is to possess that potentiality to any degree whatsoever.) On another note, to accommodate nomological dispositions she proposes the notion of maximal degrees, in which nomological dispositions are dispositions that have that maximal degree; she takes possible-world semantics as a heuristic tool, and in this framework, to possess a disposition in a maximal degree is to manifest such a disposition in all relevant possible worlds, that is, roughly, to manifest it necessarily.

In chapter 4, Vetter takes up the notion of potentiality and extends it. According to the author, "potentiality can be recognized as the common genus of dispositions and such related properties as abilities" (p. 102). She speaks of "joint potentialities", i.e., potentialities possessed by several objects in combination. She will note that sometimes the joint potentiality is quite different from the individual potentiality; she recovers the example of catalysis, insofar as adding another substance to a reaction —a catalyst— makes the reaction have a different joint potentiality than the potentiality of the reaction itself:

An interesting range of cases where the degree of the joint potentiality is higher than that of the relevant individual's potentiality concerns catalysts. Hydrogen peroxide (H_2O_2) is disposed to turn into water and oxygen (H_2O and O_2). Adding manganese to the hydrogen peroxide significantly speeds up that process; we may say that hydrogen peroxide and manganese together have a disposition of a greater degree for the hydrogen peroxide to turn into water and oxygen rapidly than hydrogen peroxide does on its own. (p. 110)

She continues the fourth chapter by defining intrinsic and extrinsic potentialities, the former being those which concern nothing other than the object which possesses them, and the latter being those which depend on external circumstances and which arise from joint potentialities. Finally, she defines iterated potentiality —the potentiality of having a potentiality and so on— for which, she claims, there is no limit to the number of iterations. This extension of potentiality allows the author to pave the way for the development of a logic of potentiality and a semantics modal language, as well as to address some of the challenges related to the extensional correctness of possibility as formulated above. All these challenges will be pursued in the next three final chapters.

In chapter 5, Vetter develops the logic of potentiality. She does not forget to mention difficult cases in which potentiality seems “senseless”. For example, tautological potentialities like “ $POT[\lambda x.x = x](a)$ ”³ [the potentiality of being self-identical] is always exercised, so can we say that it is a potentiality at all? According to Vetter, ascriptions of such potentialities are not false, but uninformative: they are potentialities of maximal degree. She will argue for a logic of potentiality that is governed by closure under logical implication, distribution over disjunction, entailment from actuality and non-contradiction; but given that, the following question is fair enough: does not the logic of potentiality collapse into the logic of possibility (which is governed by the same constraints)? Vetter will say: “What is distinctive of the potentiality-based account of possibility is not where it ends: if it is successful, it ends at possibility. (Where else?) It is rather where it starts. Heuristically, it starts with dispositions like fragility” (p. 195). Thus, the logic of potentiality automatically gives rise the logic of possibility.

Finally, chapters 6 and 7 are devoted to explaining how the logic and metaphysics of potentiality developed in the previous chapter satisfies the “three constraints” formulated at the beginning. Chapter 7 also addresses some objections to the extensional correctness of the theory, such as the question of whether there can be *unmanifestable* dispositions or potentiality without possibility,⁴ the question of abstract objects and related problems, or the question of nomic and metaphysical possibility. Vetter gives some arguments against these

³ *POT* is the predicate for expressing potentiality. The lambda operator has two functions: “one is to express logically complex predicates and the other is to turn closed sentences into ‘such that’ predicates” (p. 145).

⁴ See Jenkins and Nolan 2012.

objections based on her innovative theory of modality (for example, extrinsic potentiality helps with the context-sensitivity of modal language, or iterated potentiality gives more remote possibilities) and concludes that her approach, though not definitive, is a good candidate for tackling the metaphysics of modality and its problems.

The potentiality conception of possibility developed by Vetter is not only shown to satisfy the requirements of extensional correctness, formal adequacy, and semantic utility, but is also presented as a strong competitor to more standard conceptions of possibility, such as the possible-world conception and the conceivability conception. Vetter builds up step by step a notion of potentiality that allows her to give account of metaphysical modality in terms of it. Vetter's book is then a substantial contribution to the debate on possibility and should be in the library of all of us who are concerned with the metaphysics and epistemology of modality.

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