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**Jessica M. Wilson.** *Metaphysical Emergence*. Oxford University Press 2021. 336 pp. \$85.00 USD (Hardcover ISBN 9780198823742).

In *Metaphysical Emergence*, Jessica Wilson aims to get clear on metaphysical emergence and to argue that it occurs. Wilson begins by schematically distinguishing between *weak* and *strong* emergence. Weak emergence corresponds to non-reductive physicalism, while strong emergence involves radically non-physical features. The key difference, for Wilson, is that weakly emergent features have a proper subset of the causal powers of their base features, while strongly emergent features have a distinct causal power. She then goes on to argue that complex systems, macroscopic objects, and consciousness are only weakly emergent, while free will is strongly emergent. Throughout her discussion, a subsidiary theme is the usefulness of theorizing in terms of the causal powers of properties.

The book is a wide-ranging and rewarding exploration of metaphysical dependence. Wilson moves seamlessly from abstract discussions of the nature of dependence to specific topics in philosophy of science, mind, ordinary objects, and action theory. In each of these areas, Wilson offers a synoptic vision of the terrain, covering an enormous range of considerations and views. Partly due to this breadth, however, the book is targeted toward an audience already well versed in the relevant topics. When it comes to the philosophy of science, there are many unexplained technical notions and elliptical allusions to specific scientific results. When it comes to rejecting alternative views, there is little by way of explication of them. Such brevity is explained by Wilson's attempt to cover an enormous amount of ground—indeed, I know of no work more diligent in canvassing the work of others. Yet I would warn those stepping their toes into these discussions for the first time that it will be hard going. Though the payoff is worth the effort.

In the remainder of this review, I make some critical remarks about Wilson's conception of weak emergence. To my mind, these cast doubt on the utility of theorizing primarily in terms of the causal powers of properties.

To begin, Wilson holds that each property is associated with a set of causal powers—potentialities to cause and be caused. Moreover, she holds that we can identify causal powers across properties, and so it's possible for the powers of properties to bear set-theoretic relations to one another (45-6). In this way, properties may have a proper subset of the powers of another, or they may have a power not had at all by another. Wilson appeals to such set-theoretic relations in distinguishing strong from weak emergence. Her view of strong emergence is that an instance of *S* strongly emerges from an instance of *P* just when that instance of *S* materially depends on that instance of *P* but where the instance of *S* has a power that the instance of *P* does not (52). Her view of weak emergence is that an instance of *S* weakly emerges from an instance of *P* just when that instance of *S* materially depends on that instance of *P* but all powers of the instance of *S* are also powers of the instance of *P*—where *P* has additional powers beyond those of *S* (72).

No doubt, Wilson's characterization of strong emergence seems plausible—at least when supplemented by her claim that the new causal powers are grounded in new fundamental interactions (133). However, I worry that her characterization of weak emergence is, well, too weak. Consider the property *P* that is associated with some set of causal powers {Power<sub>1</sub>, Power<sub>2</sub>, ..., Power<sub>*n*</sub>}. This set of powers has various proper subsets of powers. Pick one non-empty proper subset {Power<sub>*j*</sub>, ..., Power<sub>*k*</sub>}. Then, there is the property of *being such as to have at least those powers of P not including the powers in {Power<sub>*j*</sub>, ..., Power<sub>*k*</sub>}*—where this doesn't mean an object that has that property *lacks* the powers in {Power<sub>*j*</sub>, ..., Power<sub>*k*</sub>} but simply that it has *at least* the other powers of *P*. Assuming

that  $P$  is a fundamental property, then the property associated with a proper subset of  $P$ 's powers will depend on  $P$ . This is because, since  $P$  is fundamental, it can't depend on this more restricted property, but rather determines it. If the presence of  $P$  comes packaged with causal powers {Power 1, Power 2, ... Power  $n$ }, then the presence of  $P$  also ensures that the object has every proper subset of those powers as well. Yet, since this restricted property depends on  $P$  and has a proper subset of  $P$ 's powers, then it satisfies Wilson's schema for weak emergence. But it doesn't seem to be emergent in any sense. Many hardcore reductivists, for instance, would be happy to admit of such a property, because they would think these properties are simply restrictions on properties they already take to exist. Therefore, Wilson's schematic characterization of weak emergence doesn't distinguish reductive from non-reductive views.

This sort of restricted property also reveals that Wilson's conception of weak emergence accommodates multiple realizability in a way that's acceptable to a reductivist. To see this, take multiple fundamental properties  $P_1, P_2, \dots P_n$ , where the set of all their powers has a non-empty intersection that is distinct from any set of powers that one of them has individually. Let  $S$  be the property of having the causal powers shared by all and only  $P_1, P_2, \dots P_n$ . According to Wilson, realization involves the realized property having a proper subset of the causal powers of the realized property (59). But then  $S$  is multiply realizable by each of  $P_1, P_2, \dots P_n$ . Having any of the properties in  $P_1, P_2, \dots P_n$  will endow a superset of the set powers of  $S$ . Hence, by Wilson's lights  $S$  is weakly emergent any one of the  $P_1, P_2, \dots P_n$ . Yet  $S$  seems completely acceptable to a reductivist – at least insofar as they accept the association of properties with causal powers.  $S$  is simply the property of having a restricted number of powers had by fundamental properties  $P_1, P_2, \dots P_n$ . Therefore, Wilson's schematic construal of weak emergence doesn't leverage multiple realizability to distinguish reductive from non-reductive views. Yet multiple realizability is supposed to be a hallmark of non-reductivism, and so appealing to set-theoretic relations between causal powers is not enough to distinguish reductivism from non-reductivism. Hence, Wilson's schematic characterization of weak emergence is too weak.

The same sort of problem arises for Wilson's more particular implementation of the distinction when it comes to mental properties. Wilson holds that mental features are weakly emergent in that they are determinable properties with physical properties as their determinates (241-50). Since determinables have fewer causal powers than their determinates, and instances of determinables depend on instances of their determinates, then this secures weak emergence for mental properties given her characterization of weak emergence. The immediate objection to this view is that mental determinables only have mental – not physical – determinates. Wilson responds to this worry by analyzing the determinable-determinate relation in terms of causal powers:  $P$  is a determinate of  $Q$  if and only if  $Q$  has a proper subset of powers of  $P$  and the powers had by  $P$  but not  $Q$  are not associated with any property (247). Hence, a mental property can have a physical determinate so long as it has a proper subset of powers of that physical property, which will happen when the mental is realized in the physical.

However, a similar kind of construction as before raises problems for this specific proposal. The properties had by  $P$  but not  $Q$  are always associated with some property, namely the property of *being such as to have at least the powers of  $P$  not including those also had by  $Q$* . Because this property is well-defined in all cases, there is no case where there isn't some property associated with the powers of  $P$  but not  $Q$ . Yet, if so, then on Wilson's definition of the determinable-determinate relation there are never any determinates. Thus, her take on the determinable-determinate relation does not work, and hence she can't use it to avoid the objection to her view that mental properties don't have physical determinates.

The general point is that set-theoretic relations between causal powers aren't enough by themselves to guarantee any sort of emergence. When it comes to strong emergence, Wilson appeals not just to causal powers but to the notion of fundamentality in appealing to those new powers involving new fundamental interactions. And when it comes to weak emergence, a host of other properties associated with proper subsets of causal powers come along as well. Thus, we must appeal to something else beyond causal powers to distinguish weakly emergent properties from such reductionism-friendly restricted properties.

Of course, Wilson may try to deny that these sorts of restricted properties exist. But it's hard to see why not. They are well-defined from her ideology of causal powers and set theory. Moreover, they characterize objects. If  $P$  endows objects with a set of powers, then it certainly endows every proper subset of powers as well. Hence, it also endows the proper subset of powers that include the powers not shared by  $Q$ . Thus, I think we would do better to appeal to some additional metaphysical widget beyond causal powers, like 'carving at the joints'. Perhaps restricted properties don't count as weakly emergent because they don't carve at the joints. Yet making this move involves bringing in heavy metaphysical cannons beyond the mere appeal to causal powers.

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