The Unreality of Realization

ABSTRACT: This paper argues against the realization principle, which states that lower-level properties bear the realization relation to higher-level properties. It begins with a review of some principles of naturalistic metaphysics. Then it criticizes popular reasons for embracing the realization principle, and finally it argues against the principle directly. The most popular reasons for embracing the principle depend on the dubious assumption that special science theories cannot be true unless special science predicates designate properties. The realization principle itself turns out to be false because the realization relation fails the naturalistic test for reality; the realization relation makes no causal difference to the world.

1. The Realization Principle

The realization principle says:

There is a relation of realization, which obtains between “lower-level” and “higher-level” properties.

The principle stands behind a great deal of current philosophical work, much of it aimed at clarifying the nature of the realization relation itself.1 There are debates about whether there is a one-to-many mapping of higher-level properties to the lower-level properties that realize them.2 There are debates about which lower-level properties realize which higher-level properties.3 And there are even debates about whether everything that realizes a given higher-level property is a realizer of that property.4

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3 This is a common interpretation of debates about “localization” within the cognitive sciences, as well as the debate over the “extended mind hypothesis.”
4 See Rupert (2007).
At their best, philosophical discussions of realization proceed naturalistically. They aim to answer questions about the realization relation by drawing on, interpreting, and developing our best scientific views of the natural world. This is unsurprising, given what I take to be the main motivation for positing a realization relation at all. The fundamental physical facts of the world determine all the facts there are. Thus the claims of the special sciences face an eliminativist threat. Why suppose our best psychological theories are literally true, when everything that happens is ultimately determined by fundamental physics? Why bother with psychology, when (in principle anyway) physics will do? The realization principle allows physicalists to evade the challenge by conferring a measure of ontological respectability to the subject matter of the special sciences. Those sciences address phenomena realized by fundamental physical phenomena, but the phenomena are no less real, and the theories of them are no less true, for their ontological dependency.

I think the realization principle is false, but I do not have my sights on an all-out refutation of it in this paper. Instead, I aim to show only that the realization principle is inconsistent with certain principles of naturalistic metaphysics that I find compelling. A refutation of the realization principle would require a more extensive defense of those principles than I will undertake here. I take the principles for granted, and I argue that those who embrace them should reject the realization principle.

It is worth commenting on what, exactly, it means for the realization principle to be false, for it could be false in at least three ways. First, higher-level properties could be radically autonomous of lower-level properties, so that higher-level properties could vary without any variation of lower-level properties. Thought experiments about zombies might be aimed at showing that conscious states are radically autonomous of physical states in this way. If
successful, these thought experiments would show that physical states do not realize, and thus do not bear the realization relation to, conscious states.

Another way the principle could be false would be for some form of ontological reductionism or eliminativism to be true. Realization is supposed to be a nonreductive relation, connecting different properties from different strata of reality. If the higher-level properties are really just lower-level properties, or if there aren’t any higher-level properties at all, then it is false that lower-level properties bear the realization relation to higher-level properties.

Though reductionism and eliminativism play a role in this paper, it is the relatively minor role of casting doubt on some arguments for the realization principle, which presuppose nonreductive realism about higher-level properties from the start. My real focus in this paper is a third way in which the realization principle could be (and, in my view, i) false. I think there is no realization relation. Consequently, lower-level properties cannot bear the realization relation to higher-level properties. Maybe higher-level properties exist, and maybe they do not. Maybe they reduce to lower-level properties, and maybe they do not. I am officially neutral on those questions. My claim is just that there is no such relation as “realization” to connect higher and lower-level properties. Or, to put it more carefully, the posit of such a relation is inconsistent with principles of naturalistic metaphysics I find compelling.

The following section sets out those principles, and gives them a cursory and necessarily incomplete defense. Section 3 addresses some common arguments for positing a realization relation. All are unpersuasive, though, for they all turn on the dubious assumption that special science theories cannot be true unless their predicates designate properties. My case against the realization principle occupies Sections 4 and 5. In Section 4, I argue that realization is unreal because it makes no causal difference in the world. In Section 5, I reply
to several likely objections. Section 6 concludes the paper by briefly addressing the question of how to understand the relations among higher and lower-level sciences without positing a realization relation.

2. Naturalistic Metaphysics

There are two fundamental metaphysical questions. One is the question of ontology: What is there? The other is the question of ideology: What sorts of things are there, and what are they like? I take my cue from W. V. Quine in answering each.5 (But I do not claim that Quine would agree with everything I say here.)

Quine was aware that, once we distinguish ontology from ideology, the ontological question is easy. What is there? Everything. The things I believe to exist are what the quantifiers of my total theory of the world range over. As a naturalist, my total theory of the world is the best available total scientific view of things. The scientific everything – that is, what the best available scientific view of things means by “everything” – is everything simpliciter.6 Nothing outside the scope of science is real.

This is not yet to say anything about whether our scientific everything includes properties, relations, propositions, numbers, beliefs, quarks, photons, neutrinos, depressions, luminiferous ether, or dark matter. Such questions are almost always questions of ideology, not ontology. They come down to the question whether our best scientific view of things says some things are quarks, neutrinos, depressions, properties, or ether.7 We typically answer ideological questions by doing empirical science, not by purely a priori speculation.

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5 See Quine (1951) and Quine (1983).
6 See Quine (1980).
7 This is an important point that naturalists all too often ignore. In my view, physics never stopped quantifying over the luminiferous ether, because it never started quantifying over the ether. When our physical theories changed from asserting to denying that there is an ether, the change was ideological. Changes in the ontology of a theory are changes in its scope or in its domain of application, not changes in what the theory says. Changes in what the theory says are ideological.
The question of the reality of properties and relations can be posed either ontologically or ideologically. Ontologically, we can ask whether our best theory of the world quantifies into predicate position. In that case, it is a theory with quantifiers ranging over not only individuals, but attributes and relations as well. With Quine, I am dubious that our best theory of the world is “second order” in this sense, because I think we are already ideologically committed to enough set theory to replicate the good parts of second order logic without quantifying over anything but individuals and sets of them.8

Posed ideologically (and assuming a first-order theory of the world), the question of the reality of properties and relations comes down to a question of whether anything in our scientific everything is a property or relation. How could we tell?

One thing we could not do is to assume that every well-formed predicate of our total scientific theory identifies a property. Russell’s Paradox would then show that our total scientific theory is inconsistent.

Nor should we assume that every primitive predicate of our total scientific theory identifies a real property or relation. Primitivity is no less a product of how we choose to formulate our theories than of how the world is. Given a theory with one set of primitives, it is possible to construct a logically equivalent theory with different primitives. So, we should not expect to convert our catalog of primitive predicates into a catalog of genuine properties.

The best naturalistic criterion of reality for properties that I know is given by a form of the Eleatic Principle: Whatever is real has causal powers.9 So stated, of course, the principle is far too strong. It denies the reality of all manner of causally impotent individuals, most notably mathematical abstracta. All the same, we can restrict the principle to concern only properties and relations. Any genuine property or relation must make a causal

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8 See Quine (1970).
9 See Armstrong (1999).
difference in the world, by making a difference to the powers had or manifested by the individuals that bear that property or relation.

The restricted Eleatic Principle provides only a sufficient condition, but it does give us a principled way to deny the reality of a supposed property or relation. If a supposed property bestows no causal powers on its bearers, or if the instantiation of a supposed property makes no causal difference in the world, then that supposed property is unreal. The same goes for relations: If a polyadic predicate is such that its satisfaction makes no causal difference to the world, then that predicate does not identify a genuine relation.10

But why should we accept even the restricted Eleatic Priterion? Is it not still too strong, incorrectly ruling against the reality of such clearly genuine properties and relations as being a prime number and fatherhood?

If there are genuine mathematical and logical properties and relations, then the Eleatic criterion might be too strong as stated. It is notable, however, that mathematics gets along just fine without distinguishing between properties and relations, on the one hand, and their extensions, on the other. Our ideological commitment to the sets that form the extensions of predicates such as ‘prime number’ and ‘less than’ might be all we need, and in that case mathematical and logical properties and relations would not force us to relax the Eleatic criterion. On the other hand, we could always restrict the scope of the Eleatic criterion to specifically exclude mathematics and logic: Genuine non-mathematical and non-logical properties have (or bestow) causal powers.

10 Eleatists and Quineans are often contrasted with one another, for good reason. Eleatists ordinarily believe in properties and relations but are suspicious of mathematical objects. Quineans ordinarily believe in mathematical objects but are suspicious of properties and relations. But Quineans should be open to the ideological question of whether there are properties, and which ones there are, and they should be open to the Eleatic answers to those questions – provided that the Eleatic answer is the one our best scientific view of the world commits us to.
Relations such as fatherhood fail even a version of the Eleatic criterion that is liberalized to make room for mathematical and logical entities. In my view, this is no great loss. To deny that there is any such relation as fatherhood is not to deny that anyone is or has a father. It is just to say that, between any father and his progeny, there is no third entity, fatherhood also on the scene. Fatherhood does not have causal powers. Nor does it make a difference to the causal powers had or manifested by its relata. Once we see that the reification of fatherhood is unnecessary for it to be true that one person is another’s father, and we see that reified fatherhood would make no causal difference in the world, the reification of fatherhood appears pointless. Likewise, the refusal to reify it looks harmless.

That is my brief defense of the Eleatic criterion against the charge that it is too strong. The motivation for the principle itself comes from two sources, one Quinean in spirit and one decidedly un-Quinean.

The un-Quinean motivation is well expressed by C. B. Martin (1997). We need to posit properties in order to capture the fact that things interact with one another not “bolus bolus” but in virtue of the ways in which they are. When a red brick smashes a window, it is because of the brick’s hardness and the window’s brittleness, not the brick’s redness and the window’s transparency. To understand the shattering of the window, we need to look beyond the brick and the window to some further entities, whose interaction with one another was responsible for the event. Those further entities are properties.

We posit properties to explain the causal interactions of objects. Properties are suitable to fulfill that explanatory function only if they make a difference to the causal powers of their bearers, either by making a difference to the powers their bearers possess (what they can do) or to the powers they manifest (what they do do). But if that is our reason
for positing properties in the first place, it is pointless to posit properties or relations that make no causal difference.

The Quinean motivation begins with the observation that, according to our best scientific understanding of the world, everything that happens involves the redistribution of matter and energy in space and time. To posit causally inert entities is to posit entities whose existence is irrelevant to the distribution of matter and energy in the universe. Such posits are warranted, in Quine’s view, only on the grounds of indispensability to our theories of how the distribution of matter and energy in the world unfolds. Mathematical entities have no causal powers of their own, but (at least on Quine’s view), they are indispensable posits of our best theory of the natural world (Quine 1980). But when it comes to properties and relations, as further entities apart from their bearers and the mathematical menagerie to which we are already committed, we should consider what work their posits do for us. Quine himself envisioned no work for them. I am willing to be slightly more tolerant. I am willing to suppose that there might be some properties and relations among our scientific everything, but only those that make a difference to the distribution of matter and energy in space and time. That is, only those that pass Eleatic muster.

Two features of this view will be important in the arguments to follow. First, we should not simply assume that all the predicates of a theory designate genuine properties and relations, even if we accept the theory. A theory can be true even when there are no properties or relations answering to its predicates. Second, when a relation is genuine, its instantiation makes a causal difference to its relata, either by influencing their causal powers or by making something happen to them.
3. Arguments for the Realization Principle

There are two main ways to argue for the realization principle. One is to point to examples of higher-level properties realized by lower-level properties. The other is to claim that we need to posit the realization relation to account for the structure of science. Neither line of argument is convincing.

First, consider arguments from examples. Sometimes, these are thought experiments, such as the famous ones concerning humans and Martians with nothing physical in common who both suffer pain. Sometimes, they supposedly depend on hard scientific fact: Octopi and humans both have eyes, though their eyes are analogous and not homologous, and they are structurally different from one another. The recent (or ongoing?) real estate bubble in the United States and the Dutch tulip bulb bubble of the 1630s are both economic bubbles, but they have nothing physical in common. Given physicalism, though, the physical world is all there is, so we need an account of how properties such as having an eye or being a bubble relate to fundamental physical reality. The answer, supposedly, is realization. There is a relation of metaphysical determination between lower and higher-levels; the fundamental physical properties realize the properties addressed by special sciences.

Whether the arguments involve Martians, octopi, or tulip bulbs, they always depend on an appeal to intuition. In particular, they depend on the intuition that the predicates of a higher-level theory – predicates such as ‘has an eye’, ‘has pains’, and ‘is a bubble’ – designate genuine properties. The intuition is powerful because we believe the theories employing these predicates, and the easiest way to understand how the theories are made true is to posit properties as semantic values for their predicates.

The trouble, as we know, is that we cannot just posit properties for our predicates willy-nilly. We must always be open to the discovery that some of our cherished predications
are true even though their predicates do not designate properties. Arguments from examples of higher and lower-level properties ignore that possibility. They assume the reality of the higher-level properties in question, simply on the strength of the false intuition that the theories we accept couldn’t be true without them. Perhaps different physical properties in seventeenth century Holland and in twenty-first century America bear the realization relation to being a bubble, but that is possible only if there is such a property – an entity in our scientific everything – as being a bubble to begin with.

Moreover, there are legitimate reasons to doubt the reality of higher-level properties altogether. For example, Jaegwon Kim’s exclusion argument purports to show that such properties as being an eye, being in pain, or being a bubble fail to pass Eleatic muster. The trouble is that, so long as we suppose these properties are not identical with their supposed lower-level realizers, there is not enough causal work to go around, and the higher-level properties appear to be epiphenomenal. But the Eleatic Principle counsels us to deny the reality of what is epiphenomenal.

Of course, philosophers have tried to find ways to allow for the reality of higher-level properties despite Kim’s worries, and their efforts are instructive. The best approach I know of is that of Sydney Shoemaker and others, who conceive of realization as the inclusion of causal powers. On this account, higher-level properties do have causal powers, and the causal powers of a higher-level property are a proper subset of its realizers’ causal powers. The view is clearest if we suppose that determinate properties realize determinables, so consider the determinable property red and its determinates, crimson and scarlet. The latter two properties differ in their causal powers, and they are different from one another. But each

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11 Most recently refined in Kim (2005, Ch. 2).
12 Kim’s argument is familiar and space is short, so I will not discuss its details here.
realizes red, because each bestows the distinctive causal powers of redness on its bearers. The causal powers of red are among the causal powers of crimson and scarlet, and that is what it means to say that they realize redness.

If fundamental physical properties realize the property of being a bubble (or another higher-level property), on this view, the causal powers of being a bubble (or whatever) are among the causal powers of the physical properties that realize it.

Though it is technically neat, the inclusion account of realization does more to undermine the realization principle than to motivate it. Given naturalism, we should think of properties as entities that bestow causal powers. But there is no need to suppose that crimson things have the causal powers of redness bestowed on them twice, once by their crimsonness and once by their redness. In fact, we need not suppose there is any such property as redness at all. On the alternative view, we find it useful abstract away from the differences among things with properties that are not identical but, by virtue of conferring some of the same causal powers, are similar to one another. Our predicate, ‘is red’, gives us a means for doing that. Once we see that the causal powers distinctive of redness are among the causal powers of crimson and scarlet, we no longer need to suppose that redness is a genuine property.14

The inclusion account of realization does not bolster the assumption that special sciences deal with higher-level properties, and so it does not strengthen the arguments from examples for the realization principle. But the inclusion account’s troubles also point to a weakness in arguments from the structure of science.

What I have in mind are arguments that begin from the observation that our sciences seem to fall into a hierarchy with certain interesting features. “Higher-level” sciences tend to

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be autonomous of “lower-level” sciences, insofar as we cannot infer anything about how a lower-level science will describe or explain a phenomenon from higher-level descriptions or explanations of it. Higher-level sciences often deal with entities that are readily construed as made of entities lower-level sciences deal with. Finally, sciences produce ceteris paribus laws that are subject to disruption only “from below” or “at the same level,” not “from above.” For example, a psychological law might fail to hold in a particular case because it is preempted by a neurobiological factor or by another psychological factor, but psychological laws aren’t disrupted by macroeconomic factors. The notion of realization, and especially the notion of multiple realization, promises to explain why science has this structure.

But the explanation would be predicated on the idea that higher-level sciences concern higher-level properties, and it neglects the alternative view described above. We might see the predicates of higher-level sciences as accounting devices, which help us to track families of properties that are similar (insofar as they confer some of the same causal powers) but do not designate genuine properties themselves. The sort of higher-level science we would expect in that case would be one that gives us a useful but noisy picture of what is going on the world. It would be a science whose “laws” are approximately true, subject to disruption in indefinitely many ways, and such that their disruption is generally explicable when we revert to a means of describing the world that is more fine-grained and less noisy. It is, in short, the sort of science that we have.

The availability of this alternative explanation significantly weakens the argument from the structure of science. The alternative is simpler, in that it does not posit higher-level

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15 Whether or not we are in a depression is a macroeconomic matter. Whether or not Jones thinks we are in a depression is a psychological factor. The depressed state of the economy cannot cause psychological laws ordinarily true of Jones to fail, but Jones’s thinking the economy is depressed might.


properties, and it seems to explain the structure of science at least as well as the realizationist account. Reflection on the structure of science should not lead us to embrace the realization principle immediately.

4. Against the Realization Principle

My criticisms of the arguments for the realization principle have turned on doubts about the reality of higher-level properties. Those doubts suffice to cast doubt on the adequacy of the arguments. If there really are no higher-level properties, the falsity of the realization principle follows immediately. Realization would be a relation without relata.

I do not intend to argue against the realization principle in that way, however. The point of the preceding discussion has been only to show that the arguments for the realization principle are not conclusive. In what follows, I will assume that there are higher-level properties, and I will argue that the realization principle is false anyway.

Realization is supposed to be a relation of metaphysical determination. So far as I can tell, that means it is the inverse of a metaphysical supervenience relation: If a given lower-level property complex realizes a given higher-level property, it is metaphysically impossible for something to have the lower-level property complex without having the higher-level property.\(^{18}\)

This could work out in either of two ways. First, the complex of lower-level properties might realize the higher-level property in every world where the lower-level properties are instantiated. Alternatively, there might be some worlds where the lower-level properties do not realize the higher-level properties, but the lower and higher-level properties

\(^{18}\) On some views, it is metaphysically possible for something to have a lower-level realizer of a higher-level property without having the higher-level property because the “contextual” or “background” conditions are not right. But it is necessary, on these views, that the higher-level property be on the scene whenever the conditions are right and the lower-level property complex is there. So, this complication will be irrelevant to most of what I say here. We can take the “background” conditions to be part of the lower-level property complex itself.
are nevertheless always coinstantiated. Because realization is the inverse of supervenience, there is no case in which the complex of lower-level properties is instantiated but the higher-level property is not. This is an important point. If a lower-level property complex realizes a given higher-level property in any world, then the higher-level property comes along with the lower-level complex\textsuperscript{19} in every world, even if the realization relation does not link them in every world. This is a consequence of the fact that realization is an inverse form of supervenience.

Suppose that some lower-level properties always (i.e., necessarily) realize some higher-level property. Then there is no such thing as the case in which the lower-level properties do not realize the higher-level property, and so there is no such thing as the causal difference the realization relation makes, for there can be no difference without differents. Realization makes no difference beyond the difference already made by the instantiation of the lower-level properties.\textsuperscript{20}

Now suppose that the lower-level properties do not always (i.e., not necessarily) realize the higher-level properties. Still, they are always coinstantiated, and there is evidently no causal difference between worlds where the lower-level properties realize the higher-level property and those where they do not. The causal powers bestowed by all the properties are the same in either case, and the obtaining (or not) of the realization relation does not change that. Imagine two worlds whose only difference is that, in one world, property $F$ realizes $G$, while in the other world, it does not. The properties would be distributed through each

\textsuperscript{19} If higher-level properties supervene not on their lower-level realizers, but on their lower-level realizers plus contextual factors, this point must be reformulated: If a lower-level property complex realizes a higher-level property in any world, then the higher-level property comes along with the lower-level property and the relevant contextual factors in every world, even the ones where the lower-level property does not realize the higher-level property.

\textsuperscript{20} Or, realization never makes a causal difference beyond that already made by the instantiation of the lower-level properties and the obtaining of suitable background conditions, if we do not consider those conditions to be part of the lower-level property complex.
world identically, and there would be no causal difference between the two worlds. There
would be no difference in the distribution of matter and energy in the two worlds, and their
histories would unfold in exactly the same way. Realization, evidently, makes no difference
to these worlds.

In either case, we can see that the realization relation makes no causal difference; it
has not causal powers, and it has no affect on the causal powers its relata manifest.
Therefore, it fails our naturalistic reality test. There being no such thing as the realization
relation, the realization principle is false. More cautiously: The realization principle is
inconsistent with the plausible naturalistic metaphysics outlined in Section 2.

5. Objections

Three lines of potential objection to my argument are worth considering. The first
two are attempts to show that the realization relation does make a causal difference after all.
The third is an attempt to exempt metaphysical relations, such as realization, from the
Eleatic Principle. None of these objections succeed.

Objection 1: Existential Differences 21

The very existence of a higher-level property instance depends on its being realized. So, the
realization relation makes an enormous difference to the causal powers of instances of
higher-level properties. When the realization relation obtains, the higher-level properties
exist and have causal powers. When it doesn’t, they don’t.

This objection fails for two reasons. First, recall that realization is supposed to be a
form of metaphysical determination. The presence of a lower-level property instances (or
their presence in the right context) necessitates the presence of a higher-level property
instance. That means that there is no such thing as the case in which the lower-level property

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21 This objection is based on one suggested to me by Carl Gillett, who is not responsible for the way it is
formulated here.
instance exists (in the right context) but the higher-level property does not. So, it does not make sense to say that an instance of realization, along with the lower-level properties (and background conditions, if necessary) brings the higher-level property into existence. If anything brings the higher-level property into being, it is the lower-level property instances (along with the background conditions, if necessary). But if we can’t say that the instance of realization brings the higher-level property into being, we can’t attribute the causal difference the higher-level property makes to the obtaining of the realization relation. If we attribute it to anything, we should attribute it to the instantiation of the lower-level properties (and, possibly, the background conditions), which do not need the help of a reified realization relation to bring the higher-level property onto the scene.

Second, it is just a mistake to infer the realization is a real relation from the fact that higher-level property instances would not exist if they weren’t realized. That inference invites precisely the same kind regress that leads metaphysicians to deny that “instantiation” is a genuine relation between properties and objects.

The inference depends on a principle to the effect that a putative relation exists whenever the existence of at least one of its relata depends on the obtaining of the relation. So, since the existence of higher-level property instances depends on their being realized by lower-level properties, the realization relation is real. It is a third entity on the scene, along with the higher-level property and its lower-level realizer.

In the case of instantiation, this sort of reasoning is disastrous. The existence of property instances depends on their being instantiated by objects. So, by the above principle, there are three entities on the scene whenever an object has a property: the object, the property, and the instantiation relation connecting them. Of course, that instance of the instantiation relation would not exist if it did not connect the object and the property. So,
there are not three but four entities: the object, the property, the instantiation relation, and the triadic “connecting” relation borne by the other three. But the instance of triadic connecting would not exist but for its connecting the object, the property, and the instantiation relation, so there is also a fourth entity on the scene, a quadratic connecting relation. This regress goes on infinitely, multiplying entities without every explaining anything.

In the case of realization, the problem is exactly parallel. The objection presupposes that there is a real thing, an instance of the realization relation, on the scene because higher-level property instances cannot exist unrealized. But the instance of realization would not exist if it did not connect the higher-level property to its realizer, and parity of reasoning would then require that a fourth entity, an instance of triadic connection, also be on the scene. Continuing the reasoning would require positing infinitely many such relations, with ever more relata, all without ever getting any real explanatory work done.

The right response is to reject the “dependence principle,” according to which a relation exists whenever the existence of something depends on its being related to something else in some way. When we reject that principle, this objection loses all its force. Realization does not make a causal difference by bringing higher-level properties into existence.

Object 2: Manipulation and Causation

When a higher-level property is realized by a certain lower-level property, alterations to the lower-level property can produce alterations in the higher-level property. That is how realization makes a causal difference. In worlds where lower-level property L realizes higher-level property H, you can confer or take away H-ness by conferring or taking away

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22 This objection was suggested to me by Jason Ford, who is not responsible for the way it is formulated here.
L-ness. In worlds where L does not realize H, that cannot be done. So, the causal powers of L depend on whether it bears the realization relation to H.

This objection purports to identify the causal difference realization makes. Realization confers on lower-level properties the power to influence what higher-level properties something has.

Though I admit this objection is plausible on its face, I do not think it stands up to closer scrutiny. This is because, as I have already mentioned, realization is a metaphysical determination relation, and so it is the inverse of a form of metaphysical supervenience. If L realizes H, then either it is metaphysically impossible for something to have L while lacking H, or it is impossible for something to have L but not H given the background conditions.

Imagine two worlds, identical with respect to which things are L and H and with respect to the relevant background conditions. In one world, suppose L realizes H, but supposed it does not in the second world. Nevertheless, making something L in either world would suffice to make that thing H, because L is metaphysically sufficient for H (given the background conditions). So, the realization relation doesn’t confer the power on L to produce H-ness; if L realizes H in any world, then it is possible to make something H by making it L in a particular world regardless of whether L realizes H in that world.

But what about taking away the H-ness of something? In worlds where L realizes H, you might be able to undo the H-ness of something by undoing its L-ness, while in other worlds, undoing the L-ness of something might have no effect on its H-ness whatsoever.

Even if L did realize H, though, you could undo a thing’s H-ness by undoing its L-ness only if it had no other properties that realize H. So, to see the causal difference realization makes, we should look not at what happens not when we just take away the L-ness of something H, but when we take away the L-ness of something H that has no other properties that
realize $H$, and we should look at that case in two worlds that are identical in all respects except for whether $L$ realizes $H$ or not.

In a world where $L$ realizes $H$, undoing the $L$-ness of an $H$ thing with no other $H$-realizing properties will undo its $H$-ness. In a world where $L$ does not realize $H$, though, something with $L$, $H$, and no realizers of $H$ other than $L$, will be something that has $H$ without $H$'s being realized at all. As a higher-level property, though, $H$ is supposed to be metaphysically dependent on its realizers. It is not supposed to be possible for an instance of $H$ to exist without being realized. But if that is so, there is no such thing as the case in which something has $L$, $H$, and no other realizers of $H$, yet $L$ does not realize $H$. And if there is no such thing as that case, there is no such thing as the difference between it and the case in which $L$ does realize $H$.

There is one further possibility. Suppose that $L_1$ realizes $H$ in world A, but $L_2$ realizes $H$ in world B, and suppose that worlds A and B are alike with respect to all relevant background considerations. The only difference between A and B is whether $L_1$ or $L_2$ realizes $H$. Imagine some object, $x$, that has all three properties, and no other properties that realize $H$ in any world. In world A, perhaps it would be possible to undo $x$'s $H$-ness by taking away $L_1$, but not by taking away $L_2$. In world B, perhaps it would be possible to undo $x$'s $H$-ness by taking away $L_2$, but not by taking away $L_1$. Maybe this is the causal difference realization makes.

It is not, and for a familiar reason. To be realizers of $H$ in any world, $L_1$ and $L_2$ must be metaphysically sufficient for $H$. So, the only way to undo the $H$-ness of something with $L_1$ and $L_2$ would be to take away both those lower-level properties. So, in each world, “taking away $x$'s $H$-ness” is accomplished in the same way – by taking away $x$'s $L_1$-ness and its
There is no difference between the worlds, and so there is no difference made by realization.

The realization relation does not make a causal difference by altering the ways in which we can manipulate higher-level properties by manipulating lower-level properties. This objection does not succeed.

*Objection 3: Metaphysical Relations*

A final objection to my argument grants that realization makes no causal difference, but it claims that realization is a *metaphysical* relation, and so it can be real without making a causal difference. I suspect this view is popular.

What is wrong with the view depends on what is meant by ‘metaphysical’. Maybe metaphysical relations are just logical relations. Then at least one of their relata must be something representational, like a proposition, a sentence, or a theory. If realization is a metaphysical relation in this sense, then it either relates our theories to the world or it relates some of our theories to one another. Either way, it is not a relation between higher-level *properties* and lower-level properties. At best, it is a relation between higher-level *predicates* and lower-level properties. But in that case, the realization principle is still false. The realization principle says that realization is a relation between lower-level and higher-level properties.

On the other hand, metaphysical relations might be non-logical (so they can be relations among properties) while also being non-natural (so they need not have causal powers to be real). If realization were such a relation, it would be immune to my criticisms. But thinking of realization in that way is pointless.

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23 Only representations have logical properties, and at least one relatum of a logical relation must have logical properties. If there were such a property as *being either square or non-square*, it would not be a logical property, but a property whose ascriptions to entities are logically true. Logical truth, if there is such a property, *would* be a logical property.
The point of positing a realization relation was to show how special science properties could be part of the natural world after all. If we treat realization as a non-logical, non-natural property, then special science properties qualify as natural because they bear a supernatural relation to physical properties. If the goal is to show that the natural world is the only world there is, that our scientific everything is everything, then this is not progress. Moreover, if we are willing to treat realization as a supernatural relation, we have already admitted that there are supernatural relations and properties. We might as well then allow that special-science properties are likewise supernatural (or superphysical, anyway), in which case we find ourselves no longer in need of positing a realization relation. Making the realization relation non-logical and non-natural saves the relation at the expense of its motivation.

6. Special Sciences without Realization

I have not argued that claims such as these are false in every reasonable sense:

(A) Psychological properties are realized by neurological properties.

(B) Psychological properties are multiply realizable.

Rather, I have been arguing against interpreting them in their most metaphysically committing ways:

(A1) There are psychological properties and there are neurological properties and there is a relation of realization, such that instances of that relation connect instances of neurological properties to instances of psychological properties.

(B1) There are psychological properties and there is a realization relation, such that instances of many further properties can bear instances of the realization relation to instances of the psychological properties.
It would be useful, though, to have some idea of what it could mean for (A) and (B) to be true, given that our scientific everything encompasses no realization relation. The approach I prefer has the benefit of neutrality on the question whether properties are real. It employs a semantic ascent to treat (A) and (B) as describing what makes our theories (in particular, our psychological theories) true, rather than as making object-level claims about the existence of certain properties and relations. This semantic ascent could be worked out in either of two ways.

The first way is simply to assimilate realization to truthmaking. To say that psychological properties are realized by neurological properties is just to say that certain psychological claims are made true by neurological properties, or else that their truthmakers are the same as the truthmakers for certain neurological claims. The asymmetry of realization24 could be preserved by maintaining that the truth of neurological claims necessitates the truth of the psychological claims, but not vice versa, or by maintaining that our neurological theories explain the truth of our psychological theories, but not vice versa.

The moves we might make to preserve the asymmetry of realization also help us make sense of multiple realization. If psychological properties are “multiply realized” by neurological properties, this just means that, even though every true psychological claim is made true by the truthmaker of some (complex!) neurological claim or other, there is a range of possible neurological truths that could do the job.

This is all very close to John Heil’s preferred way of accounting for multiple realization, without positing higher-level properties. Like me, Heil is impressed by the fact that should not assume all the predicates of all our theories pick out properties. The

24 We need no substantial realization relation to say that realization is asymmetric. The claim just means that whenever a claim of the form $\left[ \phi \right.$ realizes $\psi \left. \right]$ is true, the corresponding claim of the form $\left[ \psi \right.$ realizes $\phi \left. \right]$ is not true.
predicates of higher-level sciences class things together not on the basis of shared properties, but on the basis of similarities among the properties they have. Those similarities could amount to the sharing of some of their causal powers. A claim such as (B), on this view, just says that psychological predicates gloss over certain differences among diverse “lower-level” properties, treating them as if they were identical when in fact they are not. Such glossing over is justifiable, in my view, whenever the differences among those properties are irrelevant to the purposes we mean our psychological properties to serve.

The second way to deal with (A) and (B) is similar in flavor, but more radical. It takes seriously the idea that our theories are not mere records of the objects and properties to be found in the world, aiming to be perfectly isomorphic to The One True Way the World Is. Rather, our theories are tools we use to get by in the world. As such, they are crafted not only to fit the world, but also to fit our minds and our needs.

Accepting such a pragmatic account of science does not require antirealism or relativism. Instead, one might adopt a stance similar Daniel Dennett’s view in his classic paper, “Real Patterns.” One could see our theories as offering representations of the world with varying levels of signal and noise. For some purposes, detailed, relatively noiseless representations are needed. For other purposes, such representations are inappropriate because they omit certain patterns that emerge only noisily in nature or because using them would render our problems intractable. We cannot use noisier theories to do the work of less noisy ones, and we cannot use less noisy theories to do the work of noisy ones.

Claims such as (A) and (B), on this view, are just claims about the relative signal and noise of our theories. Psychological properties are “realized by” neurological properties insofar as psychology gives us a coarser grained, noisier representation of the same states of

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affairs of which neuroscience gives us a finer grained, less noisy representation. That does not mean that neuroscience gets us closer to “the real truth,” though, for the patterns psychology discovers are often invisible from the neuroscientific point of view, and the problems psychology addresses are often intractable from there as well.

I am attracted to both the Dennettian and the Heilian views, and I suspect that they are ultimately compatible with one another. But my point here has not been to convince anyone that either view is correct or immune to criticism. My only point is that rejecting the realization principle does not suddenly undermine our understanding of the special sciences and their relationship to fundamental sciences or to the world. It does not require treating the special sciences as convenient falsehoods, and it does not require any form of relativism. It does not even require us to deny (A) and (B), which are ostensibly about realization but can be given glosses that do not commit us to the realization principle.

That is a good thing, because the realization is false. At least, it is inconsistent with certain compelling principles of naturalistic metaphysics, particularly the Eleatic criterion of reality for properties and relations. The arguments in favor of the realization principle are not compelling, and a supposed realization relation makes no causal difference to the world. We should not posit one.

References


