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Modality and Supervenience

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According to the thesis of modal supervenience it is impossible that two objects be alike in their actual properties but differ in their modal properties. Some have argued that the concept of supervenience is inapplicable to the modal-actual case. Some have argued that the thesis of modal supervenience is trivially true. These arguments are refuted; a thesis of the supervenience of the modal on the actual is meaningful and nontrivial. The significance of the thesis is nevertheless limited by the problem of finding a nonmodal specification for the purported subvenient properties.

Introduction

In explaining the fact that something is not just true but has to be true, we seem to be driven out of the realm of the actual and the very idea of something nonactual has often been found unintelligible. The mystery surrounding the modalities can perhaps be compared to the mysteries of mental states, aesthetic properties, relational and moral facts Sometimes a special class of facts raises ontological and epistemological objections, which can only be met by denying its ontological commitments. Still, the problematic facts are too important to be lost. They are objective and perhaps even irreducible. Supervenience promises to resolve the problem. Sentences expressing problematic facts have genuine truth conditions, yet there is some epistemically and ontologically unproblematic basis on which they supervene. When the basis is fixed, everything else, including the realm of the problematic facts, comes as an ontological free lunch.

Despite the general appeal of the Quinean belief that all of the intensional, " . . . that what is said, known, believed, required, forbidden, desirable, necessary, or contingent is, in this metaphysical sense, supervenient on the distribution of earth, air, fire and water,"¹ the idea of explaining modalities as supervenient on actuality has not received much attention. And the attention received did not always help to clear up the issue. In this paper I will try to refute several bad arguments advanced against a thesis of modal supervenience.

John Divers has argued that there is a threat of triviality in the application of the concept of supervenience to the modal-actual case. In the first part of this paper I will examine his reasoning and show that, properly understood, the thesis of modal supervenience is not trivial at all. Alan

¹Kaplan D. (1995), p. 42.

Sidelle has argued that the very idea of modal supervenience is a non-starter. In the second part of the paper, a precise comparison of the arguments that might be advanced against the thesis of mental supervenience, along with those that might be advanced against the thesis of modal supervenience, will show that the thesis of modal supervenience is not less respectable than other theses of supervenience. Nevertheless, a problem of finding the nonmodal basis for modal properties does seem to endanger the ultimate significance of modal supervenience.

Triviality?

The starting idea of modal supervenience is simple. Actual facts determine modal facts, or, in terms of supervenience, agreement in the subvening (actual) considerations requires agreement in the supervening (modal) considerations.² As usual, we have to spell out the subject of the agreement - things, facts, states, possible worlds I will mainly use the most general formulation - there could be no difference in modal facts without a difference in actual facts. When more precision is needed, the "considerations" compared will be properties, which gives us the following standard refinement: entities that are exactly alike in respect of base (actual) properties must be alike in respect of supervenient (modal) properties.

In terms of properties, there are at least three pairs of distinctions to be considered as the sources of modal facts: categorical and hypothetical properties; essential and accidental properties; necessary, contingent and possible properties. Categorical properties are usually understood as those whose analysis should not include any appeal to modality, to might-have-beens, have-to-bes, would-have-beens, etc.³ As such, they are the most natural candidates for the subvenient properties. Necessary, contingent and possible properties (or potentialities) are all hypothetical, since their analysis includes an appeal to modality. Essentiality and accidentality are the ways of possessing a certain property. The modalities can be combined; witness the statement that men have an essential property of possibly being conscious.⁴

Supervenience covers a variety of relations of different strength, so there remains the task of finding the proper formulations which will cover all types of modal facts. But first, the intelligibility of the general idea has to be established. John Divers argues that the thesis of supervenience of the modal on the actual is *trivial*. He discusses a relation of global supervenience where the basis is of a highly general nature, such as the totality of physical or natural properties of a system.⁵ In the case of the modal supervening on the actual, the things that are exactly alike in respect of all of the base (actual) properties must be alike in respect of all of the subvenient (modal) properties. If two entities are exactly alike in the *totality* of their actual (natural) properties, then there is a threat that this base indiscernibility will be sufficient for identity *tout court*. The base description will have a unique satisfaction. But if there is a difference in the possession of the actual (base) properties between *every* pair of entities then, trivially, there is no difference without an actual difference. No two entities can have the same base properties and differ in their modal properties because there just are no *two* entities having the same base properties.

²Compare the entry on Supervenience (by Teller P.) in *Handbook of Metaphysics and Ontology*, p. 484.

³Compare Sosa E. (1987), p. 174.

⁴Compare the entry on Essence and Essentialism (by Plantinga A.) in *A Companion to Metaphysics*, p. 138.

⁵Divers J. (1992), p. 107.

A natural solution would be to avoid using the totality of the actual properties in the formulation of the thesis. Divers introduces the Limitation thesis, according to which some actual properties of an object are irrelevant for the possession of its modal properties. But can we really limit the basis in the modal-actual case? Divers observes that all of the actual properties of an entity are relevant for the possession of its modal properties,

for given any actual property, *B1* of *x*, *x*'s having *B1* is relevant (logically sufficient) to its being *possibly B1* and relevant (logically necessary) to its being *necessarily B1*.⁶

If Divers is right, nothing can be excluded from the basis consisting of all of the individual's actual properties. Every actual property is relevant for the possession of some modal property.

We can start with the observation that there are two ways of understanding the Limitation thesis:

AM There is a proper subset of the set of all of the base (actual) properties of an entity such that this subset grounds all of the supervenient (modal) properties of the entity.

MA For each of the modal properties of an entity there is a proper subset of the set of all of its base (actual) properties such that this subset grounds this supervenient (modal) property.

The limitation expressed by (AM) may be plausible in the case of the mental supervening on the physical - arguably there are physical properties which are irrelevant for the possession of any mental property. But it does not make sense to say that all of the modal properties of an entity are grounded on a certain subset of the set of all of the base properties. Only (MA) is plausible in the case of modal supervenience - for each modal property there is a different set of subvenient properties on which this particular modal property supervenes.

Divers might perhaps concede that only (MA) is plausible in the modal-actual case. According to his rather nonstandard line of division, (AM) would express the limitation of the global supervenience in which a maximal actual description of an object is invoked as the basis. He would presumably describe (MA) as a formulation of the local (specific) supervenience which relates specific supervenient properties to specific subvenient properties. And he has an argument against the thesis of local supervenience too. He considers McGinn's formulation of the thesis of modal supervenience:

(M) . . . it is impossible that two objects be alike in their actual properties but differ in the modalities with which they instantiate those properties.⁷

According to Divers, (M) entails the logical truth of the standard theses of modal supervenience. Since origin is McGinn's primary example of the modal (essential) property, Divers takes the

⁶Divers J. (1992), p. 109.

⁷McGinn C. (1981), p. 174.

specification of the origin ("O") as the base property and he designates the modality with which an individual instantiates the property as "Σ". He then obtains the following formulation of the strong supervenience:⁸

$$(10) \quad \Box[(\exists x)(Ox \ \& \ \Sigma(Ox)) \rightarrow \Box(\forall y)(Oy \rightarrow \Sigma(Oy))]$$

Necessarily, if anything has (actually) the origin O and instantiates this origin with the modality Σ, then, necessarily, everything having the same origin O will instantiate the origin with the same type of modality. Which type of modality? Divers gives us the *possibility* operator instance of the scheme (10) in the form of:

$$(11) \quad \Box[(\exists x)(Ox \ \& \ \Diamond(Ox)) \rightarrow \Box(\forall y)(Oy \rightarrow \Diamond(Oy))]$$

Necessarily, if anything has the property O and possibly instantiates this property, then, necessarily, everything having O possibly has O. Since the consequent of (11) is logically true, strong supervenience of the possible on the actual is for Divers logically guaranteed; "the result may even be regarded as trivial."⁹

The result presented in (11) is indeed trivial. But first, one instance of the scheme is not sufficient for the general conclusion. And second, modalities are for McGinn the ways of possessing properties. Essentiality is the way of possessing a certain property (essentially, as opposed to accidentally). Understood in this way (M) says that it is impossible that two objects be alike in their actual properties but differ in the *modal way* with which they instantiate those properties. The operator "Σ" in (10) cannot be automatically substituted with the usual boxes and diamonds.

The first point should be obvious. If the performance is actually boring, then it is possibly boring. If I am actually a cat and you are actually a cat, then we are both possibly cats. Since under any interesting notion of metaphysical modality actuality implies possibility, it will always be true that all the things that are indiscernible in being actually F are indiscernible in their being possibly F. These trivia do not endanger the thesis that the modal supervenes on the actual. When philosophers argue for the essentiality of the origin, they typically have in mind the *necessity* instance of the scheme (10) - actual origin is possessed necessarily:

$$(11') \quad \Box[(\exists x)(Ox \ \& \ \Box(Ox)) \rightarrow \Box(\forall y)(Oy \rightarrow \Box(Oy))]$$

⁸I use Divers' numbering. For comparison, here is the standard formulation of the strong supervenience: *A strongly supervenes on B* iff for any *x* and any *y* and any possible world *w_i* and *w_j* if *x* has in *w_i* the same *B*-properties that *y* has in *w_j* then *x* has in *w_i* the same *A*-properties that *y* has in *w_j*. Compare the entry on Supervenience (by J. Kim) in *Handbook of Metaphysics and Ontology*, pp. 877-879.

⁹Divers J. (1992), p. 112.

The result is no longer trivial. But even (11') is just an approximation to the thesis of supervenience for essential properties. Essentiality of a property "F" for an entity *o* sometimes supervenes on a certain subset of the actual properties of *o* and not just on the actual possession of "F". Otherwise it would be just too easy to construct counterexamples to the thesis of modal supervenience. Number five is non-yellow and essentially so, but my blue pen is also non-yellow, yet only accidentally so.¹⁰ The ice cube in the fridge is solid and essentially so, but a tomato on my plate is only accidentally solid. Number five and my pen do not share the relevant subset of actual properties. The basis for the essentiality of being non-yellow for number five will include non-spaciality of number five, but this property is lacking in the case of my pen. Similarly, the basis will include being a cube for an ice cube, the property which is lacking in the case of the tomato.

A more serious disadvantage of (11') as a formulation of modal supervenience is that it invites the reading of essentiality as necessity and accidentality as possibility. It has been recently argued that the notion of essential property is not to be understood in the terms of the notion of necessity at all.¹¹ And it is straightforwardly false to equate, as Divers does, accidentality with possibility. The accidentality instance of (M) could only be something like: necessarily, if anything actually has the property *O* and the relevant base properties *B** and is such that it might not instantiate *O*, then, necessarily, everything having *O* and the relevant base properties *B** is also such that it might not instantiate *O*. Of course, this way we are still trying to explain accidentality in terms of possibility. And nothing has been said about the notion of the relevant base properties. Still, even if the task of finding the exact formulation of modal supervenience is postponed, enough has been said to refute the verdict of triviality. In fact, far from being trivially true, the thesis might even be false!

Can two entities be alike in their actual properties and yet differ with respect to the modal way of possessing those properties? If so, then the difference in essential properties is grounded on how the thing would or could have been, and the thesis of modal supervenience is false. Consider the following examples:¹²

The bust of Aristotle is essentially a bust of Aristotle, but the hunk of wax from which the bust is made, while sharing with the bust all of the nonmodal properties, is only accidentally a bust of Aristotle.

Jones drives home at high speed; her speeding home is essentially done at high speed, but her driving home, while sharing with her speeding home all of the nonmodal properties, only happens to be done at high speed.

The defender of modal supervenience might say that if two entities are exactly alike in the

¹⁰Compare Sosa E. (1987), p. 175 and Brody B. (1980), p. 132.

¹¹Fine K. (1994).

¹²Compare Yablo S. (1987), p. 295.

totality of their categorical properties, then we do not have *two* entities required by the proper formulation of the thesis. Yablo claims that in this case the entities in question are contingently identical. Other philosophers would say that one entity (the hunk of wax) stands in the relation of ontological constitution with another (the bust of Aristotle). In any case, the issue is complex and connected with the problematic notion of contingent identity. The thesis of modal supervenience will have to be restricted to entities which are not contingently identical.

Inapplicability?

Another challenge to the very idea of modal supervenience has been presented by Alan Sidelle in his attack on real necessity. Sidelle realizes that the strategy of his arguments for conventionalism might endanger realism in general, particularly in ethics. He does not want to support moral antirealism, so he is forced to draw a distinction: moral facts and properties can fit into a naturalistic worldview but modal facts and properties cannot. Supervenience makes the difference. Moral facts supervene on natural facts because they are *nothing over and above* their naturalistic basis. A certain pattern of natural properties (say torture) *realizes* a moral property (badness); badness *consists* in frustrating the flourishing of a sentient being. Not so for modal properties; they are something over and above the actual:

Necessity and contingency, essence and accident, outstrip the actual. Nothing actual could suffice, in the way base properties must suffice for supervenient properties, for these modal features.¹³

Take, for instance, the usual candidate for an essential property, the property of being a deepest explanatory feature, and compare this property with the usual candidates for subvenient properties in other areas:

We can say that torture realizes badness because, say, it frustrates the flourishing of a person (sentient being), and personal (sentient) flourishing is what goodness is. We can say that neural structure N realizes anger because it plays a certain functional role and that role defines anger. But there seems to be no feature of H₂O that we can similarly say makes it realize essentiality. Necessity isn't the property of being a deepest explanatory feature in the way in which anger is the property of filling a certain functional role. And this seems plain, among other reasons, because the property of being a deepest explanatory feature is a nonmodal property: it's an actual property.¹⁴

Sidelle seems to be arguing that it is impossible, in principle, for modal facts to supervene on actual facts. But surely, something must be wrong with this impossibility; otherwise, it would be all too easy to eliminate some respectful naturalistic programs in the area. The facts of modality include also powers, dispositions, potentialities, capacities, tendencies Dispositions, for

¹³Sidelle A. (1989), p. 125.

¹⁴Sidelle A. (1989), p. 126.

instance, are usually described as hypothetical properties (*o* is fragile, iff, if *o* were knocked, then *o* would break). Consider the following claim:

- D Fragility of an object cannot supervene on its categorical properties because categorical properties are nonmodal properties: they are actual properties.

Naturalistically oriented philosophers are typically engaged in the project of finding actual grounding for dispositions. It does not seem plausible to proclaim the thesis that entities which are indiscernible in their categorical basis are indiscernible in their dispositions a non-starter. So let us try to reconstruct the empiricist's reasoning against the thesis of modal supervenience. I will discuss two possible arguments for the thesis that the actual facts cannot ground modal facts.

- A1 Modal facts are nonactual.
- A2 If actual facts ground modal facts, then something actual grounds something nonactual.
- A3 It is impossible for something actual to ground something nonactual.
- A4 Actual facts cannot ground modal facts.

Sidelle is convinced that the considerations particular to the content of modality prevent the realist about necessity from using the thesis of supervenience. So let us try the same type of argument against the supervenience of the mental on the physical.

- B1 Mental facts are nonphysical.
- B2 If physical facts ground mental facts, then something physical grounds something nonphysical.
- B3 It is impossible for something physical to ground something nonphysical.
- B4 Physical facts cannot ground mental facts.

In this version it is easy to see that (B1) is the weakest premise. If supervenience makes sense for the moral facts because they are *nothing over and above* their naturalistic basis, then supervenience makes sense for the mental facts if they are *nothing over and above* their physical basis. The story indicated by Sidelle suggests that (B1) is to be denied. If functionalism is accepted, then mental properties are functional properties. Functional properties are usually understood as second-order properties, properties of having some properties or other that have some causal relations to one another and to inputs and outputs. Mental properties can perhaps be characterized as ways of possessing the relevant first-order physical properties. Anger, to take Sidelle's example, is a way of possessing a certain neural structure N. It is then unacceptable to claim that mental facts are something nonphysical. And if (B1) is false, then the argument for the thesis that the physical facts cannot ground mental facts is unsound.

I will try to show that the same type of reasoning which disproves the argument against the thesis of mental supervenience can be extended to the original argument against the thesis of modal supervenience. The moral from the mental-physical case would be that (A1) has to be inspected. Is it really true that modal facts are something nonactual? Does the premise have any support? Sidelle refers to his previous arguments against real necessity, but they are not easy to find:

Here I do not really have any arguments besides: What could real necessity be?¹⁵ . . . This is not an argument but a puzzlement: what, in what is actual, could make it the case that something could not be differently?¹⁶

The rest of the justification for (A1) was quoted above. Necessity and contingency, essence and accident, outstrip the actual. Empiricists usually say that actuality only separates true from false, but essential predications could only be made true by possibilities and they are not real in the way actualities are.

I will try to show that the empiricist's support for (A1) can be disputed. And if (A1) is false, the argument against the thesis of modal supervenience is unsound. I will take the thesis of modal supervenience as a part of the actualistic explanation of modality. Actualism promises modality without possibilia but not actuality without modality. The phrase "modal facts" is ambiguous: understood in one way these are facts about nonactuals and nonexistents; understood in another way these are facts whose analysis includes an appeal to might-have-beens, have-to-bes, would-have-beens, etc. Actualism is a program of analysing facts of modality understood in the second way without an appeal to nonactual possibilia. To use again the earlier analogy: "mental facts" are ambiguous, too. Understood in one way these are facts about a special mental realm, understood in another way these are facts whose analysis includes an appeal to mental properties. Somebody who accepts functionalism and supervenience of the mental on the physical will be opposed to mentality in the first sense, but not in the second. He will propose to analyse the facts of mentality understood in the second way without an appeal to a special nonphysical realm.

Now, Sidelle will remind us that there is a story to be told about how the physical determines the mental and the natural the moral, but no such story can substantiate the supervenience of the modal (essential) on the actual. So the analogy between the mental and the modal breaks down.

But there will always be a story about the actual grounding of modal properties. And the mechanism of modal supervenience does not seem to be something which is, in principle, different from the mechanism of mental supervenience. Consider Tom and his friend Jim. Their parents are dead, Tom is the only child, but Jim has a teenage brother. It is possible for Jim to be an uncle but not so for Tom. Is this true in virtue of something nonactual? In a sense, yes - Jim is possibly an uncle in virtue of his brother's nonexistent child. But there is also a perfectly good sense in which the difference between Tom's and Jim's modal properties is explained in terms of modal supervenience, as a difference in their actual properties. The actual pattern of extrinsic and

¹⁵Sidelle A. (1989), p. 115.

¹⁶Sidelle A. (1989), p. 116.

intrinsic properties and causal processes up to a certain point determines that Jim has a potentiality to be an uncle and Tom does not.¹⁷ A potentiality is a property of having some properties or other, related in a suitable causal pattern.

The grounding for essential properties is provided by their usual definition: a property is essential for an object if the object must have the property to exist and be the kind of thing it is. So consider the following explanation:

Being H₂O is the deepest explanatory feature of water. This property is causally responsible for other properties of water. If water ceases to be H₂O, then it ceases to be the same kind of thing. Since water must possess its deepest explanatory feature in order to exist, the actual possession of H₂O realizes the essentiality of H₂O.

Note also that essentiality is a second-order property, a way of possessing a certain property (essentially, as opposed to accidentally). Dispositional properties are another well known example of second-order properties - fragility is the possession of some property or other which is causally relevant for breaking glass. It has even been suggested that modalities in general should be conceived as higher order conditions on properties; for instance, the properties expressed in a law of nature are related by nomic necessity and an analytic sentence has the property of truth necessarily.¹⁸ The idea of modalities as properties satisfying a certain condition can be extended to the familiar actualistic program of construing possible individuals as uninstantiated properties (essences) and possible worlds as uninstantiated total ways the things might have been. But then the analogy between modality and mentality can be supported. Just as we can say that neural structure N realizes anger because it plays a certain functional role, and that role is a second-order property which defines anger, we can also say that a certain pattern of first-order actual properties realizes a certain modal property.

If, as many believe, the world is rich enough to fix the facts of mentality and morality, why could actuality not be rich enough to fix the facts of essentiality? Perhaps the empiricist has another argument against modal supervenience in his mind. If nothing actual could suffice to ground modal features this might mean, not that modalities are nonactual, but that actuality is nonmodal, and so instead of (A1) - (A4) we get:

- C1 Actual facts are something nonmodal.
- C2 If actual facts ground modal facts, then something nonmodal grounds something modal.
- C3 It is impossible for something nonmodal to ground something modal.
- C4 Actual facts cannot ground modal facts.

¹⁷A similar grounding of modal properties is proposed by Mondadori F. and Morton A. (1979).

¹⁸McGinn C. (1981), pp. 163-64.

It will again prove instructive to examine a parallel argument against the supervenience of the mental on the physical.

- D1 Physical facts are something nonmental.
- D2 If physical facts ground mental facts, then something nonmental grounds something mental.
- D3 It is impossible for something nonmental to ground something mental.
- D4 Physical facts cannot ground mental facts.

In this version we can take (D1) to be true, but if (D1) - (D4) is an argument against the supervenience of the mental on the physical, then it begs the question on (D3). Is it really impossible for something nonmental to ground something mental? This impossibility is granted by dualists (there is a special realm of mental facts) and eliminativists (there are no mental facts). But can you assume this impossibility in the very argument which is supposed to show that the mental cannot supervene on the physical? Surely, this move is unacceptable.

Again, I think that the same type of reasoning can be extended to the modal-actual case. Is it really impossible for something nonmodal to ground something modal? This impossibility will be granted by possibilists (there is a special realm of possibilities) and Humean reductionists (there are no modal facts). But can we assume this impossibility in the very argument which is supposed to show that modal facts cannot supervene on the actual facts? Surely, this move is again unacceptable because it begs the question on (C3).

A careful inspection of (C1) will reveal, however, the possibility of another, more damaging argument against the thesis of modal supervenience. True, it might be possible for something nonmodal to ground something modal, but is there anything nonmodal to do the job? Can we specify the relevant subvenient properties without an appeal to modalities? Some have argued that there are no categorical (nonhypothetical) properties at all, that all the properties are dispositional, and reality is modal all the way down.¹⁹ It might turn out to be impossible to find any property such that a thing's having it is independent of what could or would have happened. This worry will certainly provide no comfort for a modal conventionalist, but the thesis of modal supervenience will be undermined nevertheless. Here we do have a disanalogy with the case of mental-physical. It seems plausible to accept that the physical facts grounding the mental facts are something nonmental, but we are much less sure about the parallel claim that the actual facts grounding the modal facts are something nonmodal.

The charge is not that the actual facts can ground the modal facts only if the actual subvenient properties are nonmodal. The thesis of modal supervenience is intelligible and nontrivial, even if

¹⁹Compare the entry on Dispositions (by Mellor H.) in *Handbook of Metaphysics and Ontology*, p. 484.

the grounding properties cannot be specified without an appeal to modal notions. It is just that the original purpose and the importance of the thesis will be diminished. A thesis of supervenience is usually proposed in the hope of extracting something problematic from something unproblematic and it may turn out to be impossible to extract modalities from something which is ultimately nonmodal.

Modal supervenience is best understood in the frame of the actualistic explanation of modalities. Within actualism it is conceded that some modality will remain primitive. How could this be avoided when according to the usual formulations supervenience itself is a modal notion? Things that are exactly alike in respect of base properties *must be* alike in respect of subvenient properties. The ultimate significance of the thesis depends on the general success of a nonreductive analysis of modality. I have tried to show only that a thesis of the supervenience of the modal on the actual is meaningful and nontrivial. The thesis that it is impossible that two objects be alike in their actual properties but differ in the *modal way* with which they instantiate those properties is still a substantial philosophical claim.

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