Yet Another Paper on the Supervenience Argument against Coincident Entities*

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Abstract

Statues and lumps of clay are said by some to coincide—to be numerically distinct despite being made up of the same parts. They are said to be numerically distinct because they differ modally. Coincident objects would be non-modally indiscernible, and thus appear to violate the supervenience of modal properties on nonmodal properties. But coincidence and supervenience are in fact consistent if the most fundamental modal features are not properties, but are rather relations that are symmetric as between coincident entities, relations such as "opposite-possibly surviving being squashed".

1. Coincident entities and modal supervenience

Statues and lumps of clay (to take one example) are said by some to *coincide*—to be numerically distinct despite being made up of the same parts. In order to screen off certain issues about time, let's consider Alan Gibbard's (1975) example of Lumpl and Goliath. Lumpl is a lump of clay that is synthesized in statue form, and is later destroyed instantaneously while still in statue form. Goliath is the statue created in this process. According to the friends of coincidence, Goliath and Lumpl have different modal properties: only Lumpl might have survived being squashed. Thus, by Leibniz's Law, Lumpl is not identical to Goliath. Since Lumpl and Goliath are clearly made up of the same parts, they coincide.

Lumpl and Goliath seem to be *nonmodally indiscernible*: they seem to share all their nonmodal features, both intrinsic and relational.[1] It is this that the influential "supervenience argument" against coincidentalism targets. For modal properties are not "brute" (or so the supervenience argument assumes).

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[1]Although see Fine (2003).

The modal is grounded in the nonmodal; nonmodally indiscernible entities cannot, therefore, differ in their modal properties.[2]

In earlier work (Sider, 1999) I suggested a reply on behalf of coincidentalism. That Lumpl and Goliath differ modally does indeed violate *one* sort of supervenience of modal properties on nonmodal properties: strong global supervenience (roughly: any nonmodal isomorphism from a possible world to a possible world is a modal isomorphism). But there is another sort of supervenience that Lumpl and Goliath do not violate: weak global supervenience (roughly: if there exists at least one nonmodal isomorphism between two possible worlds, then there exists at least one modal isomorphism between those worlds).

Karen Bennett (2004*a*) and Oron Shagrir (2002) then objected to my reply.[3] Weak global supervenience, they argued, is too weak to count as dependence in any intuitive sense. Their arguments were compelling. Consider, for instance, Bennett (2004*a*, §6):[4]

> Because WGS allows the A- preserving and B-preserving isomorphisms to be utterly independent of each other, it is compatible with the complete absence of any interesting connections between the way A- and B-properties are distributed over the domains of worlds.
>
> This is what I call 'the plate problem'. I call it that because I find it helpful to imagine the distribution of A-properties and the distribution of B-properties respectively arranged on two flat surfaces that lie on top of one another. Pick up the top plate, give it a spin, and lay it back down on top of the first one. The relationship that holds between the worlds symbolized by the first and second arrangement of the two plates is perfectly compatible with WGS.

I grant Bennett and Shagrir's criticisms: if there really exist modal properties and relations, and if these are not "brute" (an assumption I will not question[5]), then, I concede, these must strongly globally supervene on nonmodal properties

[2] This argument is defended in many places. See, for instance, Sosa (1987); Burke (1992); Zimmerman (1995).

[3] What I now present is oversimplified, since Bennett introduces another form of global supervenience ("middling") that is consistent with coincident entities but immune to the plate problem. See Bennett (2004*a*) for more details.

[4] Bennett's 'A' and 'B' refer to, respectively, given sets of supervenient and subvenient properties.

[5] Some coincidentalists may wish to flatly deny this assumption. (As Bennett (2004*b*, §4) shows, this denial is naturally coupled with the acceptance of a vast plenitude of coinciding

and relations. (One reason to concede this is reductionist: modal properties and relations are *identical to*—perhaps infinitary, perhaps highly relational—nonmodal properties and relations, from which strong global supervenience of the modal on the nonmodal immediately follows.) Coincidentalists need a new reply to the supervenience argument.

2. A new approach

Strong global supervenience prohibits the existence of a modal property had by one of Lumpl and Goliath but not the other. Let the coincidentalist grant that there are no such modal properties. In fact, let the coincidentalist say that Lumpl and Goliath do not have any modal properties at all. In fact, let the coincidentalist say that *no* objects have modal properties.

But the coincidentalist does not want to utterly forsake modality. (It was modality, after all, that led the coincidentalist to distinguish Lumpl from Goliath in the first place.) What the coincidentalist should say is that Lumpl and Goliath bear certain modal *relations* to each other. Modality generally consists in the holding of modal relations. (Below, I will show how to reconstruct ordinary modal talk on the foundation of these relations.)

In addition to requiring that nonmodally indiscernible objects have the same modal properties, strong global supervenience also requires that nonmodally indiscernible *pairs* of objects[6] stand in the same modal relations. So the posited modal relations between Lumpl and Goliath must also hold between any pair of objects indiscernible from Lumpl and Goliath. Indeed, since the pair ⟨Lumpl,Goliath⟩ is nonmodally indiscernible from the pair ⟨Goliath,Lumpl⟩, the posited relations must be symmetric as between Lumpl and Goliath.

The modal relations I have in mind may be compared to the relations of **being opposite-handed** and **being same-handed**. Consider a pair of disembodied hands in an otherwise empty world. We ordinarily think of any pair of hands as having one member that is a right hand and one member that is a left hand. But there is no fact of the matter as to which of the disembodied hands is right-handed and which is left-handed. What we call a right hand is a

objects, for arbitrariness is thereby minimized.) Never mind; my interest here is in general issues of supervenience and dependence. For my own critique of coincidentalism, see Sider (2007, §5).

[6] $\langle x,y\rangle$ and $\langle z,w\rangle$ are nonmodally indiscernible (where x and y are worldmates and z and w are worldmates) if some nonmodal isomorphism maps the domain of x and y's world onto the domain of z and w's world, and maps x to z and y to w.

hand that is same-handed as most actual dominant hands; what we call a left hand is a hand that is opposite-handed as most actual dominant hands. But the relations of **same-handed** and **opposite-handed** hold only between objects occupying a common space (those relations are defined in terms of rotations and translations within the common space.) So neither disembodied hand is right-handed. Indeed, there is really no such property as **being right-handed**, for if there were, one of the disembodied hands would have it. Similarly, there is really no such property as **being left-handed**. To describe the disembodied hands we must confine ourselves to the relations of **opposite-handed** and **same-handed**: the hands are opposite-handed from each other; each is same-handed as itself; neither is either opposite-handed or same-handed as any actual hand.

Similarly, my coincidentalist says that Lumpl and Goliath are "opposite-capable of surviving being squashed". To put it roughly: one can survive being squashed and the other cannot, but there is no fact of the matter *which* can survive; indeed, there really is no monadic property of **being capable of surviving being squashed**.

Consider, on the other hand, an amorphous lump of clay that is not statue-shaped, and so is not coincident with anything else. It, my coincidentalist wants to say, is "same-capable of surviving being squashed" as itself; and so (roughly, again), it is definitely true that it can survive being squashed.[7] However, it is not same-capable of surviving being squashed as either Lumpl or Goliath, for it is definitely capable of surviving being squashed, whereas neither Lumpl nor Goliath is definitely capable of this. Nor is it opposite-capable of surviving being squashed as either Lumpl or Goliath, for similar reasons. (Compare the failure of either disembodied hand to be same-handed or opposite-handed as my right hand.) Here is a diagram of our three objects: Lumpl (L), Goliath (G), and the amorphous lump A.

$$\begin{tikzcd} L \arrow[r, <->, dashed] & G & & A \arrow[loop right] \end{tikzcd}$$

The dashed line represents the relation of being opposite-capable of surviving being squashed; the solid line represents the relation of being same-capable of surviving being squashed.

[7]Not that there is a property of possibly surviving being squashed; the definite truth is grounded in the fact that the amorphous lump is same-capable of surviving being squashed as itself; see below.

In order to describe these modal relations more rigorously, let us first return to familiar talk of modal properties. According to the usual view, there is a systematic correlation between modal and nonmodal properties: for every nonmodal property P, there is the modal property of **possibly having *P***. Accordingly, the modal predicates that we use to ascribe modal properties are made up of nonmodal predicates and a modal *predicate modifier* 'possibly'. In the modal predicate 'possibly survives being squashed', the predicate modifier 'possibly' converts the nonmodal predicate 'survives being squashed' into a one-place modal predicate.

My modal relations will also be systematically correlated with nonmodal properties. Accordingly, I will use modal predicate modifiers to talk about them. But unlike 'possibly', my modal predicate modifiers are binary: when one attaches to a nonmodal predicate, it creates a two-place modal predicate. I introduce two such modifiers: 'same-possibly' and 'opposite-possibly'. Here is how they may be defined in terms of 'coincident'[8] and the monadic modifier 'possibly':

> x and y are *same-possibly* F iff x and y are identical or coincident,[9] and everything to which either is identical or coincident is possibly F
>
> x and y are *opposite-possibly* F iff x and y are coincident and exactly one is possibly F

Note that Lumpl and Goliath do not violate the strong global supervenience of the relation of **opposite-possibly surviving being squashed** on nonmodal properties and relations. Any pair of objects that are nonmodally similar to Lumpl and Goliath will be a pair of a lump of clay and a statue (in one order or the other), and so will themselves stand in the relation of **opposite-possibly surviving being squashed**.

More generally, according to my coincidentalist, all relations of the form **same-possibly *F*** and **opposite-possibly *F*** supervene strongly globally on nonmodal properties and relations. Modal facts at bottom consist of the holding

[8] x and y are coincident iff $x \neq y$ and for some Xs, x and y are each composed of the Xs. Notice that, while the coincidentalist cites a modal *reason* for thinking that statues and lumps coincide, the relation of coincidence itself is mereological, not modal.

[9] An alternate approach would eliminate the requirement that same-possibly F objects be either identical or coincident. This would not affect the theory of monadic assignments (see below).

of these relations.[10]

Consider first two coincident entities. Where we would ordinarily say that they differ in modal properties, my coincidentalist says that they bear relations of the form **opposite-possibly *F*** to each other (but not to themselves). A loose way of putting the intuitive idea is the way I have been putting it so far: one entity is possibly F and the other entity is not, but there is no fact of the matter which entity is which. A better way to put it is: the two entities have a certain joint modal nature, and this joint nature grounds ordinary assertions like "one of the entities is possibly F and the other is not" without grounding any assertion of the form "*this* one of the entities is possibly F". (I will explain how exactly these assertions are grounded in a moment.)

Where we would ordinarily say that a pair of coincident entities shares a modal property (for instance the property of being possibly self-identical), my coincidentalist says instead that each bears a relation of the form **same-possibly *F*** to the other and to itself. Loosely: there is a fact of the matter that each object is possibly F. Better: each object is same-possibly F as itself (and as the other), which grounds the ordinary assertion that "each is possibly F".

Where a single entity is not coincident with anything else, the object bears relations of the form **same-possibly *F*** to itself (but not to anything else). Loosely: there is a fact of the matter that the object is possibly F; better: the object is same-possibly F as itself, which grounds the ordinary assertion that "the object is possibly F".

Objection: given the definition of 'opposite-possibly', if two objects are opposite-possibly F then one of the objects must be possibly F, and so must have a modal property. So it cannot be that the *only* modal features there are are these modal relations; if objects instantiate these modal relations then they must also instantiate some modal properties. Further, since Lumpl and Goliath opposite-possibly survive being squashed, it follows by the definition of 'opposite-possibly' that one of them possibly survives being squashed and

[10]The theory I am presenting assumes a very simple form of coincidentalism. To accommodate more complex forms, one would need to invoke new modal relations, and add corresponding constraints to the monadic assignments discussed below. Such modification would be needed, for example, to allow for: i) more than two mutually coinciding objects; ii) the claim that when a statue coincides with a lump, the lump has one positive modal property and the statue has another positive modal property (as opposed to the lump having one modal property and the statue *lacking* that modal property, as assumed in the text); iii) connections between the modal properties had by coinciding objects, on the one hand, and coinciding composites of those objects, on the other.

the other does not; but that violates strong global supervenience.

Reply: distinguish between a *fundamental* modal language and an *ordinary* modal language. The former is well-suited to describe the underlying reality (a network of modal relations and no modal properties); the latter is metaphysically second rate, but it is the language we ordinarily speak. In the latter, we use monadic modal predicates, thus speaking as if there are in fact modal properties. When I say that there do not (really) exist modal properties, and when I uphold strong global modal supervenience, I am speaking the fundamental language, since on those occasions I am being metaphysically serious. (More on this below.) When, on the other hand, I gave the definitions of the binary predicate modifiers, I was speaking the ordinary language (for in the fundamental language one cannot speak of objects being "possibly F".)

Why did I use the ordinary language to define the binary predicate modifiers? Because the ordinary language is the language we speak; it is our conceptual starting point. Despite this, my coincidentalist maintains, it is metaphysically second-rate. Since objects really have modal relations, not modal properties, the world fits the fundamental language better than it fits the ordinary language. Monadic modal predicates are conceptually prior, but metaphysically posterior, to binary modal predicates.

Compare again the notion of handedness. That a certain pair of hands are *opposite-handed* is the more fundamental fact. That one of them is *right-handed* and the other *left-handed* is less fundamental. Really, there are no monadic properties of right-handedness and left-handedness; for if there were, one disembodied hand would instantiate one property and the other hand would instantiate the other. Nevertheless, it seems clear that the notions of being right-handed and being left-handed are conceptually prior to the notions of being same- and opposite-handed. Likewise, what is fundamental are the modal relations. The pattern in which these relations hold justifies talk of objects' being possibly F, possibly G, and so forth, just as the pattern of holding of **opposite-handedness** and **same-handedness** justifies talk of objects being right-handed and left-handed. Talk of "right hands" and "left hands", and of things that are "possibly F" and "possibly G", is metaphysically misleading, but it is how we talk.

I now want to sketch how the ordinary language of monadic predicate modification may be built on top of the fundamental binary modal language. Above I defined 'opposite-possibly' and 'same-possibly' in terms of 'possibly'; what I am about to do is reverse this procedure. The earlier definition was to introduce my readers to the fundamental language; the following definition is to show how statements in the ordinary language are made true by the fundamental modal facts.

To fix ideas: the fundamental language is a standard first-order language containing nonmodal monadic predicates, plus the binary modal predicate modifiers 'opposite-possibly' and 'same-possibly'. The ordinary language contains, instead of these binary modifiers, the monadic predicate modifier 'possibly'. Now consider various *monadic assignments*. A monadic assignment is an arbitrary, though constrained, choice of how the one-place predicate modifier 'possibly' is to behave. The constraints (which I state using the fundamental language) are these:

> If x and y are opposite-possibly F, then every monadic assignment must count exactly one of x and y as being possibly F
>
> If x and y are same-possibly F, then every monadic assignment must count both x and y as being possibly F

Thus, each monadic assignment arbitrarily assigns extensions to 'possibly F', for each nonmodal F, in a way that "meshes" with the holding of the relations **opposite-possibly F** and **same-possibly F**. Finally, we supervaluate. Call a sentence of the ordinary language supertrue iff it is true on all monadic assignments, and superfalse if it is false on all monadic assignments.[11]

Imagine you lived in a world in which the only modal facts were facts about the binary modal relations. You might nevertheless find it convenient to use the monadic modal language, and utter its sentences when and only when you took them to be supertrue. Your linguistic behavior would then be much like the actual linguistic behavior of English speakers.

Return to Lumpl and Goliath. My coincidentalist says that we have here two objects that opposite-possibly survive being squashed. How to describe them in the ordinary language? Thus: "There are two objects in this scenario; one of them possibly survives being squashed, and the other does not possibly survive being squashed". For this sentence is supertrue: since the objects opposite-possibly survive being squashed, every monadic assignment counts exactly one of them as possibly surviving being squashed. But you cannot point to one of them and say: "*it* possibly survives being squashed", for this sentence is not supertrue (nor is it superfalse). Neither object is such that each monadic

[11]I use the supervaluational model because it is familiar, not because I accept its application to vagueness (Braun and Sider, 2007).

assignment counts it as possibly surviving being squashed—there are insufficient binary modal facts to constrain the monadic assignments this closely. (Compare how supervaluationists about vagueness accept true disjunctions without a true disjunct.)

Turn now to the names 'Lumpl' and 'Goliath'. 'Lumpl' is a name for the *lump*—the thing that can survive being squashed. But neither of the objects in our example is such that we can say of it: it possibly survives being squashed. So which is named 'Lumpl'? And which is named 'Goliath'?

First, let monadic assignments assign referents to names. Second, when names are "penumbrally connected"[12] to monadic modal predicates (as 'Lumpl' and 'Goliath' are connected to 'possibly survives being squashed'), require assignments to coordinate what they assign to names with what they assign to monadic modal predicates. Thus, a monadic assignment must assign to 'Lumpl' whichever of our two objects it assigns as the thing that possibly survives being squashed, and it must assign the other of the two objects as the referent of 'Goliath'. As a result, sentences like 'Lumpl possibly survives being squashed' and 'Goliath does not possibly survive being squashed' turn out supertrue, despite the fact that neither 'Lumpl' nor 'Goliath' has "determinate" reference; each denotes different things in different monadic assignments.

Let us return, finally, to the supervenience argument. Strong global supervenience of the modal on the nonmodal forbids modal differences between nonmodally indiscernible entities. But consider the following sentence of the ordinary modal language:

> Lumpl and Goliath are nonmodally indiscernible, and yet, Lumpl possibly survives being squashed whereas it is not the case that Goliath possibly survives being squashed

The sentence is supertrue (if we expand each language to provide for talk of nonmodal indiscernibility), and so one is licensed to utter it. And the sentence is, on its face, inconsistent with the strong global supervenience of the modal on the nonmodal. But we began with an underlying metaphysics that is consistent with modal supervenience (the metaphysics of the binary modal relations) and merely added on a way of talking about that underlying metaphysics (the ordinary modal language) without changing the metaphysics itself. What is going on?

[12] Fine (1975).

Strong global supervenience, when uttered in the ordinary language, is indeed false. But it is important to uphold that principle only when one is speaking the fundamental language. Its falsity in the ordinary language is harmless, given that language's supervaluational semantics.[13]

Whether a sentence is appropriate to utter depends on its semantics. For instance, a sentence of the form 'ϕ or not-ϕ' might be appropriate to put forward given a supervaluational semantics, but not given a semantics employing truth value gaps (if, given such a semantics, the entire sentence lacks a truth value and is therefore untrue). More to the point, the theoretical import of a metaphysical thesis—for instance, the thesis of modal supervenience—also depends on its semantics. We are drawn to modal supervenience by the thought that, at bottom, the world is fundamentally nonmodal; modal features are not "brute". The principle of strong global supervenience of the modal on the nonmodal does not capture this thought if that principle is interpreted via the devious supervaluational semantics. For consider sentences to the effect that objects "differ modally", for instance: 'there are two coinciding objects, one of which possibly survives being squashed, the other of which does not possibly survive being squashed'. Interpreted supervaluationally, such sentences do not imply what they seem to imply, namely that there is a modal property (in the fundamental sense of 'there is a property', a sense that one could express only in the fundamental language) had by one of a certain pair of objects but not by the other.

Compare talk of fictional entities. Suppose a certain story, S, says that there exists a person who weighs over two thousand pounds. One might introduce a language in which one can say "There exist fictional characters. One of them, discussed in story S, weighs over two thousand pounds." Now, if 'some fictional character weighs over two thousand pounds' is true in this language, does it follow that there must be some particular weight, w, greater than two thousand

[13]Notice that the principle of *weak* global supervenience holds even when interpreted in the ordinary language. This, I suspect, is the source of its intuitive appeal, such as it is. The truth conditions for whole sentences of a supervenient language L (even if its semantics is deviant, e.g., supervaluational) will be expressible by sentences of the subvenient language L^*; so weak global supervenience will hold in L.

Note that Leibniz's Law, the principle that if x is F and y is not F then $x \neq y$, continues to hold in the ordinary language, even given the supervaluational semantics. Thus my coincidentalist can still regard the original Leibniz's law argument in favor of coincidentalism as sound. Still, one might worry that the force of this argument is undermined by the observation that the ordinary language is metaphysically second-rate. (Might its force even be undermined by reductionism about modality?).

pounds, such that 'some fictional character has weight w' is true? We may well want to answer: *no*. The semantics for quantification over fictional characters is bound to be devious and quite unlike the semantics of a more fundamental quantificational language; sentences of the fictional language should not be assumed to behave logically the way similar-sounding sentences in a nonfictional language behave.[14] Nor should we expect the same metaphysical import from sentences in the fictional language as we would expect from sentences in a nonfictional language. Consider the distribution of truth values just envisaged: 'someone weighs more than two thousand pounds' is true; but every sentence of the form 'someone weighs w pounds', where w is greater than two thousand, is untrue. This distribution of truth values in a *nonfictional* language would be metaphysically remarkable indeed (setting aside vagueness); but in the fictional language it is utterly unremarkable; it signifies only that a certain fiction speaks of a character weighing over two thousand pounds without specifying exactly how much that character weighs.

The analogy here is actually closer than it may first appear. For in a sense, the ordinary modal language is a fiction of monadic modal properties. The fiction yields verdicts of determinate (super-) truth values for sentences attributing the fictional modal properties provided those verdicts may be grounded in the underlying reality of modal relations. When there are insufficient underlying facts then the fiction is silent, and there are (super-) truth value gaps. And as with the language of fictional characters, we should expect neither the same logical behavior nor the same metaphysical import from sentences in the ordinary language as we would expect from sentences in the fundamental language.

What is interesting about coincidentalism is that the fictionalism is of an intermediate variety. Given modal supervenience, the world contains no correlates for ordinary monadic modal predicates (since we attempt to use those predicates to distinguish pairs of objects that are in fact indistinguishable). But the world does contain near-correlates for these predicates and the sentences in which they occur: modal relations, and propositions that may be expressed in terms of them. There really is a relation of **being opposite-possibly *F***, and there really is a true proposition **that there exist two objects that are opposite-possibly *F***. The fictionalism is merely to allow this proposition to be expressed by a sentence of the form 'there exist two coinciding objects, one

[14]Here is one simplistic semantics with this result (assuming a Lewisian (1973) rather than Stalnakerian (1981) account of counterfactuals): a fictional sentence, ϕ, is true iff the content of its fiction is such that, if it were true then ϕ would be true.

of which is possibly F, one of which is not', rather than the more metaphysically perspicuous: 'there exist two coinciding objects that are opposite-possibly F'.

To sum up: the defender of coincident entities can consistently maintain the supervenience of the modal on the nonmodal by holding that there really exist no monadic modal properties at all. At bottom, the realm of the modal consists of supervenient modal relations, whose holding justifies ordinary attributions of monadic modal properties. My use here of 'really' ('at bottom', 'fundamentally') is of course essential; drop these words and the result is garbage. This is no surprise; without 'really' there is no metaphysics.[15]

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[15] See in this vein Fine (2001).

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