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Symmetric Dependence

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Metaphysical orthodoxy maintains that the relation of *ontological dependence* is irreflexive, asymmetric, and transitive. The goal of this paper is to challenge that orthodoxy by arguing that ontological dependence should be understood as non-symmetric, rather than asymmetric. If we give up the asymmetry of dependence, interesting things follow for what we can say about metaphysical explanation—particularly for the prospects of *explanatory holism*.

1 Background: Ontological Dependence

The term 'dependence' is employed in different ways across different sub-literatures. So I first need to be clear about what I mean by 'dependence', and what specific literature I'm focusing on. To begin with, I'm concerned with *ontological* dependence. There are no doubt other forms of dependence—causal, conceptual, logical, and so on—but such relations aren't my target here.

What is ontological dependence? That's a vexed question. Moreover, it's not a question I'm going to attempt to answer in full here—not the least because many contemporary metaphysicians take it to be primitive. Rather, I'm going to highlight some key features of the relation, which will hopefully be enough for my purposes.

1.1 Paradigm cases

Talk of ontological dependence is typically introduced via paradigm cases or examples. The whole ontologically depends on its parts. The mental ontologically depends on the physical. Secondary qualities ontologically depend on primary qualities. Esthetic ontology depends on non—esthetic ontology. And so on.

One thing to note about these paradigm cases is that—fitting with the orthodoxy—dependence holds asymmetrically in each of them. The whole depends on the parts, but the parts don't depend on the whole.[1] The mental depends on the physical, but the

[1] Or, at least, there is a dependence relation between part and whole. Most people think wholes depend on parts, but not everyone does—see especially Schaffer (2010b).

physical doesn't depend on the mental. And so on. From this, it is sometimes reasoned that we have justification for thinking that the relation of dependence is asymmetric. For example, Kathrin Koslicki remarks, after introducing a list of paradigm cases of dependence, that if in fact '[these cases] do constitute examples of pairs of entities related by an ontological dependence relation of some sort, the dependence relation in question may plausibly be taken to be asymmetric.'[2] Yet it's a mistake to reason as follows: 'Paradigm cases of F are Φ, therefore all cases of F are Φ.' All the paradigm cases of redness are determinately red. But you can't conclude from that that all cases of redness are determinately red.

1.2 Hyperintensionality

So what do these paradigm cases of dependence—the mental on the physical, a whole on its parts, and so on—have in common with one another? *What is* the relation of dependence? It's been, in recent times, very common to try to appeal to modal concepts to answer this question—to try to give some sort of modal definition or analysis of dependence. The usual thought is that the salient modal notion is 'can't exist without'. The xs depend on the ys just in case the xs can't exist without the ys, or duplicates of the xs can't exist without duplicates of the ys, and so on. Yet these modal analyses look too coarse, for a variety of reasons.[3]

To begin with, there is the problem of necessary co-existents. Kit Fine (1995) gives, as an example, the famous case of Socrates and {Socrates}, which exist in all the same worlds and yet while {Socrates} depends on Socrates, the dependence does not hold in the other direction. A further problem is created by necessary existents. Suppose, for example, that there are, necessarily, numbers. It shouldn't follow from this that everything is dependent on numbers, simply because nothing can exist without numbers. Likewise, the theist believes in a necessary existent (God). Yet, while some theists might be interested in defending the claim that everything depends on God, it doesn't look like this dependence claim should simply follow from the idea that God exists necessarily.

These concerns have led many contemporary metaphysicians to argue that we need a hyperintensional account of dependence. Nothing modal is going to be fine-grained enough to do the work we want dependence to do, for example, to allow us to say that sets are dependent on their members but not vice versa, or that numbers exist necessarily but nothing non-numerical depends on them, and so on.

[2] Koslicki (2013), p. 32.

[3] The counterexamples I give are phrased as counterexamples to the modal analysis of dependence as 'can't exist without'. But given some plausible assumptions, they're also counterexamples to the modal analysis in terms of duplicates. So, for example, if there's a necessary existent, x, that has all of its intrinsic properties essentially (which is plausible in the case of numbers, and perhaps also for the theistic God), then not only can nothing exist without x existing, but nothing can exist without a duplicate of x exists. Likewise, if we assume that the intrinsic nature of sets supervenes on the intrinsic natures of their members, you can't have a duplicate of Socrates without a duplicate of {Socrates}.

Opting for hyperintensionality—and thereby divorcing dependence from modal notions like 'can't exist without'—opens up some interesting options for dependence claims in the presence of contingency. For example, it's common to say that the whole depends on the parts. And yet unless we adopt a strong form of mereological essentialism, we don't want to say that the whole can't exist without its parts—we want to allow that the whole could have been composed of different parts. What does this do to our dependence claim? Those attracted to modal definitions need to do some fancy footwork here—they need to argue, for example, that there's a difference between *de re* and *de dicto* dependence (or between rigid and generic dependence, or the like). The whole depends on having *some parts or other*, but not on the parts it in fact has. But why should we think that the whole is necessarily a complex object, even if it is actually so? Perhaps that there are possible worlds in which this thing which is in fact a complex object is instead an extended simple, for example. And so we can introduce a further complication—talk of duplicates. Yes, the whole could exist without having any parts at all. But a duplicate of the whole can't exist without having some parts or other. And so we continue, the modal definitions getting more and more intricate. But once dependence is divorced from the modal notion of 'can't exist without', it's not clear that any such complication is needed—or, indeed, that we need a distinction between *de re* and *de dicto* dependence at all. Once we give up on modal analyses of dependence, we might consider the option that necessary connections aren't even necessary, let alone sufficient, for dependence. We could then say simply that the whole depends on its parts—on the parts it in fact has in the actual world. Yes, there's a possible world in which the whole has different parts. Yes, there's a possible world in which the whole has no proper parts at all. But none of that precludes us from saying that, in the actual world, the whole depends on the parts it actually has. Not all accounts of dependence will want to embrace this option, certainly—more on this in §4.3—but its availability is an interesting upshot of separating dependence and modality.

Saying that dependence is hyperintensional doesn't preclude trying to give a definition or analysis of dependence—it just precludes giving that analysis in modal terms. Kit Fine (1995), for example, characterizes dependence via essence—x depends on y just in case part of what it is to be x involves y—y is a constituent of some essential property of x. In a similar vein, Benjamin Schnieder (2006) defines dependence via metaphysical explanation—x depends on y just in case there exists some F such that x exists *because* y is F. In recent work, Karen Bennett (2017) defines dependence via her notion of a *building relation*. Something is independent just in case it is unbuilt, otherwise it is dependent.

Others take dependence as primitive. Schaffer (2010b), for example, argues that we can say many informative things about dependence, but that we shouldn't attempt to define or analyze it. Rosen (2010) likewise eschews attempts at defining dependence in favor of giving examples of it and then showing what work it can do.

In what follows, I'll remain neutral on this issue. I don't have any particular definition of dependence in mind, nor am I assuming dependence cannot be defined. My arguments should be applicable no matter which of these competing accounts of dependence you favor.[4] But it *is* important for my purposes—as will be clear—that dependence is understood hyperintensionally.

1.3 Unification

Finally, there is the question of whether there are lots of different varieties of ontological dependence, or whether there is just a single relation of ontological dependence. There's been somewhat of a cottage industry devoted to identifying different types of ontological dependence—distinguishing between, say, rigid existential necessary dependence and generic existential necessary dependence and identity dependence.[5] Discussions of these varying types of dependence, and how we can define and distinguish them, has generated a complex literature with lots of epicycles.

But, perhaps as a backlash to this increasing complexity, it's become prevalent in recent discussions in metaphysics to assume that there is a single, unified relation of ontological dependence. This is the strategy employed in, inter alia, Cameron (2008a), Rosen (2010), Schaffer (2010a), and Schnieder (2006). In what follows, I'll proceed along similar lines and speak of ontological dependence *simpliciter*. But I'll argue in §4.3 that nothing much hangs on this choice.

2 The Orthodoxy

Orthodoxy about dependence includes the claim that dependence is asymmetric. But a striking feature of this orthodoxy is that little in the way of argument is given to support it.[6] The asymmetry of dependence is very often simply assumed without further comment,[7] and is perhaps something we're meant to find intuitive or obvious.

Perhaps the most prevalent argument for the asymmetry of dependence has less to do with dependence itself, and more to do with other relations or concepts that dependence is often assumed to be connected to: in virtue of, grounding, priority, fundamentality, and so on. Dependence is often mentioned in the same breath with

[4] An exception here is Bennett (2017)'s definition of dependence. Bennett defines the independent as the 'unbuilt' (in her terminology). But in cases I'll give below, there are things which are plausibly 'unbuilt' in Bennett's sense, but which I'm arguing are dependent. So if you accept Bennett's definition of independence, you won't find these cases persuasive. But I'm hoping that the cases will give you reason to reconsider Bennett's definition of dependence.

[5] See especially Lowe (2009) for an overview.

[6] See especially Bliss (2012) for a very helpful overview of the relative paucity of argument for many of the key assumptions in discussions of dependence and cognate notions. E.J. Lowe (1994) gives a brief suggestion at an argument for asymmetry (p. 39), saying that our objection to symmetric cases of dependence is analogous to our objection to circular arguments. I'm not exactly sure what to make of this argument, other than to say that there's a difference between circular arguments and holistic explanations.

[7] As in, inter alia, Bennett (2017), Cameron (2008a), Schaffer (2010a), and Rosen (2010).

these other (equally fashionable) notions. More significantly, even, as perhaps the least esoteric of this cluster, dependence is often used as something which can help explain or get traction on the somewhat more slippery notions of priority, grounding, and in virtue of.[8]

So, for example, Karen Bennett (2017) remarks: 'I do not think there is any question that independence is a–the–central aspect of our notion of fundamentality.' Similarly, Schaffer (2010b) takes a rejection of limitless or circular dependence to be a consequence of the claim that some things are fundamental and that 'all being must originate in basic being' (p. 37). And Koslicki (2013) proposes (although acknowledging it to be controversial) the ability to illuminate disputes about fundamentality where there is not a dispute about what exists as a criteria of success for accounts of ontological dependence.

Relations of priority and relative fundamentality are, insofar as I have any grip on them, plausibly asymmetric. And that is because they need to be asymmetric in order to do the work we want them to do. These are relations that are introduced in an attempt to take us from the derivative (the constructed, the grounded, the nonfundamental) down toward the bedrock (the ultimate grounds, the fundamental, the basic). It's not a constraint of such relations that they ultimately bottom out.[9] But it does seem to be a constraint that they're headed in a single direction. Their asymmetry is built into the work we want them to do—it's part of what they are *for*.[10]

The case is somewhat less clear for in virtue of and grounding.[11] But certainly, if you want to treat these as relations that take you from something you should treat with less ontological seriousness (or even, something that is 'less real'; see Fine (2001) or McDaniel (2013)) to something that you should treat with more ontological seriousness, then you need them to be asymmetric. The basic point, then, is this: relations which purport to take us from the derivate to the fundamental are plausibly viewed as asymmetric.

So here is an argument that dependence must be asymmetric. Dependence is intimately connected to (and perhaps even explains or is one and the same thing as) relevant notions of fundamentality, priority, grounding, and so on. Dependence is the kind of relation that explains the connection between the fundamental and

[8] So, for example, Schaffer (2010a), (2010b) and Cameron (2008a) both explain priority partly in terms of dependence (and Schaffer especially often uses dependence-talk and priority-talk interchangeably); Rosen (2010) explains 'in virtue of' in terms of dependence; Bennett (2017) explains relative fundamentality in terms of dependence; and Wilson (2014) identifies the relation of grounding as the target of 'the idioms of dependence'.

[9] See Cameron (2008a) for discussion.

[10] This is evidenced by the way we use them. We say 'prior to' and 'more fundamental than'. I genuinely cannot make sense of what it would mean to say 'x is prior to y and y is prior to x' or 'x is more fundamental than y and y is more fundamental than x', nor do I know what locutions we might replace these with that would render such claims coherent. So, at least as they are commonly used, I simply cannot make sense of symmetrical cases of priority or relative fundamentality.

[11] Wilson (2014) makes a case for the non-symmetry of grounding, for example.

the derivative—it takes us from the derivative (the dependent) to the fundamental (the independent). Any relation that plays this role must be asymmetric. And so dependence must be asymmetric.

I think it's correct that if dependence is to play this role, then dependence must be asymmetric. But what I'm going to argue is that it's far too quick to simply assume that this is the kind of role dependence ought to play. And a big part of the reason it is far too quick is that there's good reason to think that dependence isn't asymmetric.

The idea that dependence and fundamentality come apart is one that we might find plausible regardless of whether we think dependence is asymmetric, and it's an idea that can be put to useful work. For example, in previous work I argue that dependence and fundamentality come apart in both directions—that there can be fundamental dependent entities and derivative independent entities.[12] Distinguishing the two notions lets us make sense of a range of interesting (and independently motivated) positions in metaphysics, including Agustin Rayo's (2013) trivialism about mathematical ontology (according to which numbers are plausibly construed as independent but not fundamental[13]) and ontological emergence, which can be plausibly understood as the idea that there are fundamental dependent entities.[14] In what follows, I'll give a further reason for thinking that dependence and fundamentality come apart: dependence should be understood as a non-symmetric relation.

3 The Case for Non-Symmetry

To make the case that dependence should be understood as non-symmetric, rather than asymmetric, I'm going to make the case that dependence can sometimes hold symmetrically. And to make the case that dependence can sometimes hold symmetrically, I'm going to proceed by a series of examples. Of course, any of the particular cases I offer can be resisted. But when viewed as a whole, the range of cases is striking. Examples of apparently symmetrical dependence are not hard to come by—they can be found across a wide range of metaphysical theories, and in wide variety. The upshot of this, I'll argue, is that we can't maintain that dependence is asymmetric without ruling out wide swathes of the metaphysical landscape. And that quite simply isn't the job of a notion of dependence—which is, after all, meant to be neutral across various ontologies—especially in the absence of independent argument that dependence *must be* asymmetric.

In discussions of ontological dependence, there are at least two (potentially distinct) ways of characterizing dependence: via essence and via explanation. The Finean

[12] See Barnes (2012).

[13] See especially chapter 3.

[14] Indeed, it's for precisely this reason, i.e. that emergence is the idea that there are fundamental things which are also dependent things, that Bennett (2017) argues that emergence is deeply mysterious, and possibly nonsensical. But absent further argument that dependence and fundamentality *must* go together, such skepticism is unmotivated.

account of dependence says that x depends on y just in case *what it is* to be x involves y (y is a constituent of some essential property of x). Whereas an explanatory approach (like the one endorsed by Schnieder) says that x depends on y just in case x exists, or is the way it is, *because* y is F. I'm not endorsing either of these characterizations of dependence. But in what follows, I take these two criteria—the essentialist claim and the explanatory claim—as *indicators* of dependence, and I provide cases that motivate symmetrical dependence for each.[15]

3.1 Immanent universals and essentialism

The first case I'll offer is inspired by neo-Aristotelian metaphysics. Here are two claims that are broadly Aristotelian in spirit: universals are immanent and membership in natural kinds is had essentially. If universals are immanent, then universals require the existence of their instantiations. An uninstatiated universal is impossible, perhaps even incoherent. Universals don't exist in some Platonic heaven and then get stapled on to their instances (or not, if they're uninstantiated). Rather, universals are intimately bound to their instances, and, more generally, to being instantiated.[16] If kinds are had essentially, then for any x that's a member of kind K, part of what it is to be x is to be a member of K.

Both these claims are quite naturally understood as dependence claims. Immanent universals depend on their instances. Part of what it is to be a universal, on this picture, is to have instances. And individuals depend on their kinds—part of what it is to be those particular individuals is to instantiate those kinds. If being F is essential to x, then anything that fails to instantiate F isn't x. Part of what it is to be x is to be F. And so, plausibly, we can say that x depends on being F.

But the combination of these two doctrines straightforwardly yields symmetrical cases of dependence. Suppose that being an electron is a universal, the instantiations of which make up a natural kind (the electrons). If universals are immanent, then the universal of being an electron depends on its instances. But, likewise, if natural kinds are essential then its instances depend on the universal—all the things that are electrons wouldn't be the very things they are without the universal of being an electron. And so, on this sort of neo-Aristotelian picture, we get cases where dependence holds symmetrically. For those universals which correspond to natural kinds—and, in general, to essential properties—the universal depends on instances, and the instances depend on the universal.

[15] I am being explicitly neutral about whether modal connections such as 'can't exist without' are a necessary condition for dependence, but I am taking it that Fine's essentialist criterion for dependence is at least an *indicator* of dependence (though perhaps not necessary for dependence). In what follows, I'll assume that Schnieder's explanatory criterion—which I'm assuming doesn't appear to have the same modal consequences as Fine's essentialist criterion (e.g. a complex object, x, could exist or be the way it is because it's parts, the ys, are arranged in a certain way F, even if there are possible worlds where that very thing x is mereologically simple)—is also an indicator of dependence.

[16] See especially Armstrong (1978b) for an overview and defense of immanent universals.

3.2 Armstrongian states of affairs

Consider the states of affairs metaphysic popularized by David Armstrong. There's a deep puzzle in Armstrong's metaphysics regarding the relationship between states of affairs and their constituents (particulars and universals). Consider the state of affairs of Jane being human.[17] That state of affairs binds together two constituents: the particular individual Jane and the universal of being human. But the puzzling question for Armstrong is what the relationship is between states of affairs and their constituents. Do states of affairs depend on their constituents? Or do constituents depend on states of affairs?

The trouble is that embracing either horn of this dilemma is problematic for Armstrong. If we say that states of affairs depend on their (independent) constituents, we get a picture in which the explanatory bedrock is particulars and universals. But if what's ultimately independent are the constituents of states of affairs—rather than the states of affairs themselves—then Armstrong's metaphysics loses its Tractarian ambitions. Armstrong wants an ontology of facts—a 'world of states of affairs'—in which facts are fundamentally explanatory. For Armstrong, what explains the existence of the particular Jane and the universal being human ought to be the existence of the state of affairs—the worldly fact—of Jane's being human. The reason there are particulars and properties, on a Tractarian metaphysics, is because there are things having properties—that is, because there are states of affairs. This picture is undermined, however, if Armstrong takes particulars and universals as independent and understands states of affairs as asymmetrically dependent on—and thus asymmetrically explained by—particulars and universals.

But Armstrong encounters a different problem if he takes states of affairs to be independent, and constituents to be dependent on states of affairs. If this horn of the dilemma is embraced, then the metaphysic becomes explanatorily impoverished. For example, we want to be able to say that the states of affairs of Jane's being human and Tom's being human have something in common. But if the ultimate explanatory bedrock is just the states of affairs, and not their constituents, then it's hard to see how we could explain this commonality. We want to be able to say that the constituents of a state of affairs *explain* why that state of affairs is the way it is. Jane's being human is the state of affairs it is because of the constituents Jane and being human, and it is more similar to Tom's being human than to Rex's being a dog because of the constituents involved in each state of affairs.

The most stable position for Armstrong, I contend, is that states of affairs are a case of symmetrical dependence. States of affairs depend on—and are thus explained by—their constituents. But likewise individual constituents depend on—and thus are

[17] Armstrong wouldn't allow that things like Jane and being human are constituents of fundamental ontology. So replace Jane and humanness with more scientifically respectable terms, if you're worried about that.

explained by—states of affairs. That is, the most stable position for Armstrong is a type of explanatory holism (discussed in more detail in §5.1). But if we separate dependence from fundamentality, this doesn't preclude Armstrong from saying that *both* states of affairs and their constituents are fundamental. They are fundamental, but they each depend on the other. This allows Armstrong to respond to the resemblance problem, and it allows him to have his world of facts. The cost of this picture is, of course, a cost to parsimony—we end up with a fundamental ontology of both states of affairs and their constituents. But the claim here is that this is the most stable way of making sense of the fact-based ontology that Armstrong wants to defend.

3.3 Tropes and the problem of 'bare mass'

According to trope metaphysics, properties are individual 'particular thisnesses'.[18] A traditional property metaphysics says that if the rose and the carnation are both red, then they both have the same property—they both instantiate redness. But the trope theorist says that properties are particulars. The rose's redness and the carnation's redness are two different (non-repeatable) things. What the rose and the carnation have in common is that the rose's redness and the carnation's redness are similar (perhaps exactly similar).

Trope theory is commonly combined with bundle theory—the view that objects are nothing more than collections of properties.[19] According to trope bundle theory, objects just are collections of particular thisnesses (there is not an underlying substance which instantiates or is the bearer of properties). The combination of tropes and bundle theory gives rise to an explanatory puzzle sometimes called the problem of 'bare mass' or 'free mass'.[20] If properties are particulars, and objects are nothing more than collections of properties, could you have an object that was nothing but an individual mass trope? Nothing about trope bundle theory rules this out, and yet it seems incoherent. So much the worse for trope bundle theory.

But allowing that dependence can hold symmetrically gives the trope bundle theorist an easy line of response to this objection. The problem for the bundle theorist is that she cannot appeal to an underlying object on which properties depend—objects just are collections of properties. But if dependence can hold symmetrically, what she can say instead is that there are tropes which mutually depend upon each other.[21] You cannot have a mass trope without a size trope and a shape trope, for example. And so on, *mutatis mutandis*, for shape tropes and size tropes. The picture here is one of 'dependence clusters'—mass depends on shape and size, size depends on mass and shape, and so on. Part of what it is to have mass is to have shape and

[18] The contemporary discussion of tropes goes back to at least Williams (1953). See Maurin (2013) for an excellent overview and discussion.

[19] See Paul (2013) for a good introduction and overview.

[20] See, inter alia, Armstrong (1997) and Schaffer (2003) for discussion.

[21] This sort of interdependence between tropes is posited as a solution to the free mass problem in both Denkel (1996, 1997) and Simons (1994).

to have size, for example. And part of what it is to have shape is to have mass and to have size. And so on. These properties are all interdependent. And so the resulting ontology that trope bundle theory can offer includes clusters of interdependence—properties are particular 'thisnesses', but that doesn't mean that 'particular thisnesses' are independent. Trope bundle theory needn't encounter the problem of bare mass if dependence can hold symmetrically between tropes.

3.4 Mathematical ontology

Thinking that there are numbers might also give you good reason to accept symmetrical cases of dependence. This is particularly evident if your mathematical ontology is that of non-eliminativist structuralism. That is, you think there are numbers, and you think that what numbers are are nodes or positions in a mathematical structure.[22] Non-eliminativist structuralists often say that each node of the structure depends on all the others nodes—and perhaps even on the *structure itself* as well. And, as Linnebo (2008) persuasively argues, it's easy to see why such dependence claims are needed. *What it is* to be a particular node in the structure is bound up in the other nodes being what they are. Consider the number six.[23] The non-eliminativist structuralist is a realist about mathematical ontology. She thinks that the number six exists. Moreover, she thinks that what the number six is is a particular node in a complex mathematical structure. But that particular node is the number six in virtue of the relations it stands in to the other nodes in the structure. Likewise, the fact that the particular node is the number six is explained by the relations it stands in to the other nodes in the structure. And so for the non-eliminativist structuralist, the number six is dependent on the other numbers (which are, *mutatis mutandis*, themselves dependent on the other numbers). The non-eliminativist structuralist is (plausibly) committed to symmetrical cases of dependence in order to explain her ontology.[24]

While the case for symmetrical dependence is most vivid for the structuralist, other versions of realism about mathematical ontology might have similar explanatory need for such inter-dependencies. On a Finean conception of dependence, for example, x depends on y if what it is to be x involves y—that is, if y is a constituent of some essential property of x. On such an understanding of dependence, numbers are plausibly interdependent—that is, they depend on each other. The mere fact of their necessary co-existence doesn't entail interdependence, but the explanatory

[22] See especially Shapiro (1997) for explication and discussion of this view.

[23] Linnebo argues that the structural realist shouldn't think this about *all* mathematical ontology—it is implausible for sets, for example—but maintains that it's a central part of the structuralist picture in many cases. My use of natural numbers here is no doubt not the most compelling instance of symmetry—Linnebo (2008) provides much more sophisticated examples in his paper.

[24] It's worth noting that *structuralisms* in general—whether mathematical or not—are likely to give rise to symmetric dependencies, simply because of the holistic style of explanation they favor. Structural realism about the ontology of physics might similarly be interpreted as involving claims of symmetric dependence between individuals and structures, for example. See e.g. French (2014).

connections will. What it is to be the number six is bound up in what it is to be the number five and the number seven, and so on. The number six would not be the thing it is were it not the successor of five, but it also would not be the thing it is were seven not its successor, so the number six is dependent on the numbers five and seven; but seven would not be the thing it is were it not the successor of six, and so seven is dependent on six; and so on.

3.5 Events

Many people who endorse an inflationary metaphysics of events are attracted to both the idea that at least some events contain/are constituted by smaller events and to the idea that at least some events have some of the smaller events they contain/are constituted by essentially.[25] The event WWII contains many smaller events—some insignificant (such as a particular lighting of a cigar by Winston Churchill) some much more significant (such as the evacuation of Dunkirk). And while WWII might have been the same event without that particular lighting of Churchill's cigar,[26] it's plausible that WWII just wouldn't have been the same event without the evacuation at Dunkirk. Without the evacuation at Dunkirk, it literally would have been a different war—the evacuation is an essential part of the war.

But, similarly, we might think that being a part of WWII is essential to the evacuation of Dunkirk. Sure, you could have a duplicate of that event that doesn't take place in the wider context of WWII. But that duplicate isn't the evacuation at Dunkirk—part of *what it is* to be the evacuation at Dunkirk is to be a part of WWII. It's part of the character of the event that it had the goals it had, that it was part of a wider mission, that it took place within the particular geopolitical context that it did, and so on.

But if the events-ontologist accepts both these claims, she accepts a symmetric case of dependence. The event of the evacuation depends on the event of WWII. A qualitatively similar event that isn't a part of WWII isn't the same event. But likewise the event of WWII depends on the event of the evacuation. An event that doesn't contain the evacuation at Dunkirk isn't WWII. The two events—WWII and Dunkirk—each depend on each other to be what they are.

3.6 Summing up

I have presented a range of cases—across a variety of topics and debates in metaphysics—which might motivate the claim that dependence can hold symmetrically. None of these cases are, by themselves, knock-down reasons to reject

[25] See Hornsby (1997), chapter 3, for an excellent articulation of the former claim. Hornsby also seems in many places to endorse the latter, although this is less explicit.

[26] Although see Lombard (1986) for an argument that we should embrace a radical form of essentialism about events.

asymmetric dependence. But their dialectical force when taken together is, I'll argue, greater than the sum of their parts.

Orthodoxy assumes that dependence is asymmetric. But, as already noted, there's very little in the way of argument to support this tenet of orthodoxy. It is, more often than not, assumed rather than argued for. And it's against this backdrop that I give this range of cases in which dependence is better understood as non-symmetric, rather than asymmetric. These cases are, taken collectively, quite striking. Cases where dependence holds symmetrically were not hard to find—there are plenty of them, including some very popular and well-known theories in metaphysics (and if the goal of this paper had simply been to list potential examples then the list could have continued for some pages). Nor is it a single niche area or type of view that's giving rise to such cases—rather, the examples come from across a wide range of theories in metaphysics, and from a variety of different traditions. This makes a default, undefended assumption of asymmetry in dependence look odd—to say the least.

Suppose we take on board the default assumption that dependence is asymmetric. If I'm right that the above cases should plausibly read as ones in which dependence holds symmetrically, then to take this assumption on board is to rule out these cases. That is, to assume that dependence is asymmetric is to rule out vast swaths of interesting, historically grounded metaphysics—or at least to force on them unpalatable interpretations. That—I contend—isn't dialectically appropriate. Absent some compelling argument that dependence *must* be understood as asymmetric, it isn't the role of a notion of dependence to simply rule out (or even severely constrain) diverse and promising metaphysics. That's not what a notion of dependence is for—if we can rule out all such views simply by pointing out that they run afoul of the asymmetry criteria of metaphysical dependence (which, again, there isn't much argument for) then dependence is doing too much work.

4 Objections

4.1 These cases are all impossible

I've presented the above examples as more or less argument by cases. But a clear objection is simply this. Most metaphysicians don't think the views described in the cases above are true. Most metaphysicians think that whatever ultimate metaphysical theory is true is necessarily true. Therefore most metaphysicians will think that the views I've described are necessarily false. Why think you can convince people that dependence can sometimes hold symmetrically by giving a bunch of impossible cases?

In reply, let me clarify an important point. I'm *not* arguing that there are in fact cases of symmetrical dependence. Here's what I'm arguing, in a nutshell:

- People assume that dependence is asymmetric. They shouldn't.
- People assume that asymmetry is built into the concept of dependence. It isn't.

- Insofar as we want a relation of dependence that is neutral across varying ontologies (as it's often assumed to be in the literature on dependence), dependence needs to be non-symmetric, not asymmetric.
- Insofar as we're warranted in talking about a relation of dependence, a non-symmetric relation seems to fit our purposes better than an asymmetric relation.
- We shouldn't rule out ontologies just because they allow for symmetric cases of dependence.

All of that is compatible with it being the case that dependence only ever *in fact* holds asymmetrically. Suppose Jonathan Schaffer (2010b) is right, and monism is the true theory of fundamental metaphysics. If monism is true, then everything asymmetrically depends on the world. Does that mean that Schaffer should think dependence is in fact asymmetric? Well, it depends on what role dependence is playing in the dialectic. If dependence is something that's supposed to be neutral across different ontologies—something that we can use to explain common structures between ontologies, or some kind of generic explanatory principle—then the fact that it only ever occurs asymmetrically doesn't mean the relation itself is asymmetric.

Schaffer seems to use dependence in this specific-ontology-neutral sense. (As do Bennett, Koslicki, Fine, Rosen, etc.) Indeed, Schaffer (2010b) starts out with general reflections about dependence (not tied to any particular ontology) that include the claim that dependence is asymmetric, and then uses these reflections about dependence as part of his motivation for monism. It would be an odd sort of bootstrapping, to say the least, to then point to the asymmetry of dependence in monism as an argument for the general claim that dependence is asymmetric.

Dependence might, prior to commitment to a particular ontology, turn out to be non-symmetric, and so we shouldn't simply assume that it's asymmetric, and shouldn't use the assumption that it's asymmetric to rule out particular ontologies.

4.2 These cases aren't symmetric dependence, they're joint dependence

Another way of objecting to what I've said above is that in the cases I describe, the reason it looks like you get two things which depend on each other is that they each depend on the same further thing. These are cases of *joint* dependence, not symmetric dependence.

But this move doesn't look like it's available for all the cases given above. If we combine Aristotelian universals with essentialism, it doesn't look like there's anything further we can point to that both universals and their instances depend on. (Aristotle himself may have thought that everything ultimately depends on the Aristotelian god, but I doubt this move will be particularly popular.) Likewise, for trope bundle theory, it doesn't seem plausible that there's any one supertrope on which all the other tropes in the bundle depend. So as an across-the-board response, appeal to joint dependence doesn't work.

In other cases, there might be candidates for joint dependence. Maybe what we ought to say about structuralist realism in mathematics is that all the nodes depend on the structure itself, but that the structure doesn't depend on the nodes. But this option looks ad hoc and forced. Why would the structure be independent of the nodes? How could it be? The ontology we're forced into if we want something we can say is a source of joint dependence begins to look mysterious and bizarre. Why go in for such an ontology, rather than just allowing that this is a case where dependence holds symmetrically? The answer had better not be an assertion that dependence just *has to be* asymmetric.

4.3 *These cases only arise because you failed to distinguish different kinds of dependence*

As outlined in §1, I'm following the tradition in the literature that treats dependence as a single, unified relation. But it could be objected that it's precisely the refusal to distinguish between different varieties of dependence that's leading to apparent cases of symmetric dependence. After all, it's *prima facie* cases of symmetry like the dependence of universals on their instances and instances on universals that, for example, motivates Jonathan Lowe (1994) to distinguish between generic existential necessary dependence and rigid existential necessary dependence, and between existential and identity dependence.[27] And similar worries have motivated the distinction between *de re* and *de dicto* dependence. So we don't, if we're careful, really have a case where we've got a single relation that's holding symmetrically—we've just got two (or more) different forms of dependence.

The key thing to say about this objection, once again, is that it doesn't look like a response that can be leveled at all the cases I give above. Even if we allow for different forms of dependence, whatever sense in which a trope bundle's shape trope depends on its size trope is the same sense in which its size trope depends on its shape trope. And likewise for individual nodes in a mathematical structure, and for Dunkirk and WWII. So even if we granted that there are different kinds of dependence—a view which, as discussed in §1.2, has its problems—that wouldn't eliminate all apparent cases of symmetrical dependence.

But let's consider the case of *de re* and *de dicto* dependence. Someone might object that *de re* and *de dicto* dependence are very different things—in the case given in §3.1, for example, the particulars depend on *that very universal*, but the universal merely depends on having *some particulars or other* that instantiate it. This, it might be protested, is not the same relation of dependence in both cases. And so the case is not, in fact, a case of symmetric dependence.

[27] Interestingly, though, some of Lowe's arguments for accepting multiple kinds of dependence seem to rest on the assumption that there cannot be symmetrical cases of (strong) ontological dependence. The above discussion can be taken as a reason to apply modus tollens where Lowe applies modus ponens.

As discussed in §1.2, divorcing dependence from modality might give us reason to push back against this thought. The motivation for a deep distinction between *de re* and *de dicto* dependence seems like an after-effect of modal accounts of dependence. The universal could exist without any of the things that in fact instantiate it—it just has to be instantiated by something, not by the particular things that in fact instantiate it. Whereas the particular things that instantiate it couldn't exist without the universal. But if 'couldn't exist without' doesn't give us a grip on dependence, why think this is relevant to the question of whether the universal depends on the things that in fact instantiate it, just as the things that in fact instantiate it depend on the universal?[28]

Not all accounts of dependence can accept this. Someone attracted to Fine (1995)'s essentialist account of dependence, for example, will want to maintain something like the *de re/de dicto* distinction for this case—part of what it is to be the particulars is that they instantiate that very universal, but it's not part of what it is to be that universal that it is instantiated by those particulars (part of what it is to be that universal is simply that it's instantiated by some particular or other). For these accounts of dependence, there are two points to make. The first is again simply that the cases given in §3.3, §3.4, and §3.5 (and perhaps §3.2 as well) look to be cases of symmetrical *de re* dependence.[29] The second is that even if you think that, in a case like §3.1, it's not the same relation of dependence going in both directions, the resulting picture—where both particulars and universals are *dependent*, even if they are dependent in different ways—yields an interesting explanatory structure that further undercuts that idea that fundamentality and independence always go together.

A more complicated case is that of the distinction between full and partial dependence. For those inclined to think this distinction is important, the cases given above might seem like they only give support to the idea that *partial* dependence can sometimes hold symmetrically. The Aristotelian universal is partially dependent on each of its instances, but not wholly dependent on any of them. The mass trope is partially dependent on the size trope and the shape trope, but not wholly dependent on either. And so on. Perhaps *full* dependence is asymmetric, regardless of whether partial dependence might be non-symmetric. And perhaps full dependence is the more important, bedrock notion.

[28] This point is particularly salient if we separate dependence from relations like priority—which, once the prospect of the non-symmetry of dependence is raised, I think we should. It's plausible to think that certain kinds of necessitation claims go along with priority. If the xs are prior to y, then necessarily if you have the xs you have y. That's one way of interpreting the idea that, if the xs are prior to the y, then in some sense having the xs gets you y 'for free'.

[29] And it's also possible to motivate symmetric cases of *de dicto* dependence. In some of the medieval discussion of 'substantial form', the relationship between matter and form seems to suggest such dependence. The account of substantial form given by Suarez, for example, seems to suggest a reading in which matter depends on having some form or other (but not on having any particular form), and likewise form depends on being realized in some matter or other (but not on any particular matter). See Pasnau (2011), pp. 561–3.

But I'm skeptical that there's an important difference between full and partial dependence—or at least I'm skeptical that if there is an important difference, the cases I've given only address the latter. Full dependence seems simply like the limit case of partial dependence, rather than something different in kind. Consider again the case of Aristotelian universals. Universals depend on their instances, but they don't wholly depend on any particular instance—they partially depend on each instance, and collectively depend on all their instances. But if universals depend on their instances, it looks like it's possible for a universal to depend on a single instance. Suppose that all natural kinds correspond to universals, and suppose further that the elements of the periodic table each represent natural kinds. Many of the elements of the periodic table are plentiful and naturally occurring, but some can only be made in specialized laboratory conditions, and have only ever been made a few times. An element like Einsteinium, for example, has only had a few instances. Now consider the possible world in which Einsteinium is only made once. That's a world in which Einsteinium only has one instance. In that world, the universal Einsteinium wholly depends on the single instance, and the single instance wholly depends on the universal Einsteinium.

5 Morals of the Story

5.1 Holistic explanation

If dependence is non-symmteric, why does it matter? Another objection to symmetric cases of dependence that will doubtless crop up is that symmetric cases of dependence license unacceptable circular explanations. Dependence—whatever else it may be—is inextricably linked to metaphysical explanation. If x depends on y, then x is at least in some sense explained by y. But suppose that we have a case of symmetric dependence—x depends on y and y depends on x. In that case, the explanation suggested is that x explains y and y explains x. Surely that's unacceptable circularity.

However, I think that allowing such forms of explanation is a feature, not a bug, of understanding dependence as non-symmetric. What non-symmetric dependence allows is a certain kind of *explanatory holism*. The existence of the state of affairs explains the existence of its constituents. The existence of the constituents explains the existence of states of affairs. The existence of the mass trope explains the existence of the shape and size tropes. The existence of the shape and size tropes explains the existence of the mass trope. And so on. The most common models of explanation in metaphysics are analogous to foundationalism in epistemology. Chains of explanation ultimately ground out in primitive, unexplained explainers. But that needn't be the only way that explanation in metaphysics can work. We could have alternative pictures that are more like coherentism: the overall explanatory structure can be holistic, and there are no unexplained explainers.

Certainly, the availability of this kind of explanation is one reason why people have in fact objected to non-symmetric dependence. E.J. Lowe (1994) and (2009), for

example, remarks that our objection to symmetric cases of dependence is analogous to our objection to circular arguments. But it's hard to know what to make of this claim. Circular arguments are valid. The reason that they're bad arguments is an epistemic reason—they don't provide any new information, or any further warrant, for thinking that the conclusion is true. And so they don't play the justificatory role we want arguments to play. But *metaphysical* explanation is explicitly non-epistemic. When we say that x explains y and y explains x, we're not saying that the way we come to have knowledge of x is via y, and the way we come to have knowledge of y is via x, or something along those lines. So it's not clear what the analogous objection to circular arguments would be in the case of metaphysical explanation.[30]

Another way of motivating a circularity objection can be found in Fraser MacBride (2006). MacBride objects to the symmetry of dependence in mathematical structuralism (or at least explores the following objection without fully endorsing it). In order for a relation to obtain between two objects, MacBride argues, those objects need to be:

> independently constituted as numerically diverse. Speaking figuratively, they must be numerically diverse 'before' the relation can obtain; if they are not constituted independently of the obtaining of ...[the] relation then there are simply no items available for the relation to obtain between. (p. 67)

But symmetric cases of dependence seem to be cheating in this regard—it's the very obtaining of the relation that allows for the existence of the objects (because they depend on each other). On MacBride's picture—at least as I understand it—objects are like pins in a bulletin board and relations are like bits of string that you can hang between pins. You've got to have the pins there before you can hang the string. It can't be the hanging of the string that somehow magically gives you the pins. But on this very flat-footed reading, MacBride's objection carries just as much weight against dependence-as-grounding or dependence-as-priority as it does against symmetric cases of dependence (like the mathematical structuralist). On such understandings of dependence, if x depends on y, then x isn't 'independently constituted as numerically diverse' in a way that's explanatorily prior to the obtaining of the dependence relation. It's precisely because x depends on y—that is, precisely because the relation of dependence obtains between x and y—that x exists. Symmetric cases of dependence aren't asking us to countenance anything radically different. They're just positing a case in which both relata—rather than one relatum—require the obtaining of the dependence relation for their existence.

[30] Lowe (2009) further asserts that metaphysical explanation is asymmetric, and therefore dependence—because it tracks or is intimately bound up with metaphysical explanation—must likewise be asymmetric. But he gives no argument for the claim that metaphysical explanation must be asymmetric. Schaffer (2010b) appears to endorse this claim of Lowe's, but likewise does not say why. Schnieder (2006) makes a similar claim, but again does not argue for the asymmetry of explanation.

But a MacBride-esque worry that cuts directly against symmetric cases of dependence would be this: we need to have the existence of *at least some of the relata* of a relation independently of the obtaining of that relation. We need, as MacBride puts it, a relatum 'before' (figuratively speaking) we can have a relation. In symmetric cases of dependence, though, the very existence of the relata requires the obtaining of the relation—the relata depend *on each other*. But put this way, the objection just sounds like a denial of (rather than an argument against) the sort of explanatory holism that non-symmetric dependence allows. It's important not to be misled here by the temporal metaphor. The objection is not whether we need objects temporally before the obtaining of relations between those objects. Rather, the point—at least as I understand it—is that we need at least some objects to be explanatorily prior to the obtaining of any dependence relations. Or, to put it more simply, we need some objects to be independent. That's not an argument against holism—that's just a denial of holism.

Holistic explanations have a long and rich history in philosophy. They are, it's safe to say, out of fashion in much of contemporary metaphysics.[31] But it isn't clear that they should be, especially considering the interesting work that holistic explanation can do, and the interesting explanatory models it provides. And more importantly, holistic explanations don't look like the kind of thing that we should dismiss without argument, simply by asserting that dependence is asymmetric. A non-symmetric dependence relation allows for holistic as well as foundationalist models of metaphysical explanation, and that's one major reason why non-symmetry, rather than asymmetry, should be the default assumption for dependence.

5.2 Dependence and grounding relations

The other main moral of the story is this: if dependence can be non-symmetric, then dependence needs to be separated from talk of grounding, priority, in virtue of, and so on. These relations are relations that aim to take us from the derivative to the fundamental. They take us from things we treat with less ontological seriousness, or 'get for free', down to the ultimate ontological bedrock. But if dependence is non-symmetric, it can't play this role, and it can't be jumbled together with these other relations.

Suppose that the symmetric dependence interpretation of Armstrong really is the best interpretation. If that's the case, then for Armstrong nothing is independent. His basic ontology is states of affairs and their constituents. But both are dependent (each depend on the other). That doesn't mean that Armstrong should think nothing is

[31] Although if you look a little outside of 'mainstream' metaphysics—especially to feminist metaphysics—you will find plenty of champions of holistic explanation. See especially Haslanger (1995). Some of the most salient examples can be found in feminist discussions of social construction and social kinds. See, for example, Haslanger (2016) and Witt (2011). Much of the discussion of holism in feminist philosophy is more directed toward epistemology, but often has striking consequences for metaphysical holism—see especially Haraway (1991) and Harding (1993).

fundamental. It just means that dependence isn't a good guide in all cases to getting at fundamentality.

Dependence is something distinct from theoretical gizmos—like grounding, priority, and in virtue of—tailored specifically to take us from the less fundamental to the more fundamental. Dependence can do a lot of interesting work in our theories, but it can't do that. Nor can dependence be used to *explain* priority, grounding or the like. Whatever sense (if any) we can make of those other relations and whatever work they can do (if any) in our theories, they need to be clearly separated from dependence.[32]

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