Constitution, Nonreductivism, and Emergence

Penultimate Version

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In *Common Sense Metaphysics: Themes from the Philosophy of Lynne Rudder Baker*, Luis R. G. Oliveira and Kevin J. Corcoran, eds., London and New York: Routledge, 2020, pp. 95-113.

Lynne Baker (2000, 2007) has set out a view according to which ordinary material objects can be, and typically are, constituted of objects distinct from them. A marble statue is constituted of a marble lump, and the statue and the lump are distinct objects. The lump constitutes the statue by virtue of being spatially coincident with it, but the lump is not identical to the statue because the lump might have existed without being spatially coincident with a statue. Accordingly, constitution is not identity. In her account of constitution, Baker invokes the notion of the primary kind of which the objects are members, together with the relational contexts that characterize those primary kinds. The primary kind 'statue' is distinct from the primary kind 'lump,' and these two kinds are paired with different relational contexts, statue-favorable circumstances and lump-favorable circumstances. Higher-level property instances are also constituted by distinct property instances, specifically at lower levels of reality. Higher-level causation by property instances is in a significant sense independent of these lower-level constitutions, and many higher-level properties are emergent.

In the second half of the 1980's, back in our Vermont days, Lynne Baker, Hilary Kornblith, and I met regularly to discuss these issues. The positions we developed are broadly similar, but differ in the details. I agree with Baker that constitution is not identity, but the

notion of a primary kind and its relational context does not have the central role in my view that it does on Baker's. I am more resolute about the grounding of higher-level causation in microphysical causation than she is. Although Baker argues for emergence and I oppose it, I contend that the considerations to which she appeals don't establish that her view is committed to emergence in the controversial sense.

The multiple realizability argument for token nonreductivism

In Baker's view, as in mine, many property instances have or perhaps even *are* causal powers. In Kim's physicalist conception, any token causal power of a higher-level property instance is identical with a microphysical causal power of the higher-level property instance's microphysical realization (Kim 1989, 1992, 1998). Against Kim's position, and his more general reductionist conception, there is first of all good reason to maintain that higher-level token entities, whether they be objects, states, properties, or causal powers, are typically not identical with lower-level token entities that realize them. The ship of Theseus is not identical with its token current microphysical realizer since it would have been the same token ship had its token microphysical realizer been just a bit different qualitatively, enough to be token distinct from the actual microphysical realizer. In addition, it would have remained the same ship had the token microphysical realizer actually changed just enough to become a different microphysical token. The ship is thus token multiply realizable modally at one time, and temporally across time. Baker is among those who agree that the ship is not identical with its current plank, dowel, mortise and tenon-realization, nor to its current microphysical realization. However, Baker (2007, 40-1), like Mark Moyer (2006), argues that our ordinary conception of

objects features a notion of sameness by which the ship is the same object as the current token microphysical realizer, one that abstracts from any temporally extrinsic or modal properties. I agree. Moyer and Baker contend that the intuition that ship and its current plank, etc.-realization are identical can be explained away by invoking this conception of sameness, which thus serves to rebut the objection that they are numerically identical despite differing in their modal or temporal properties. For Baker this relation of sameness has a positive role in her account of constitution, as an aspect of the unity of a constituter and a constituted entity.

Familiarly, contemporary nonreductive physicalism about mental types is grounded in modal and temporal arguments against type-identity claims.[1] Multiple realizability arguments against token-identity claims should be almost as persuasive, at least so I claim (Pereboom 2002, 2011). Suppose one agrees that a type A mental state is not identical with type B neural state because, even though type A is realized by type B in normal human beings, A is realized by type B*, distinct from B, in orangutans. Suppose this convinces you that mental type A is not identical to neural type B. Now suppose token mental state M is actually realized by token neural state N and token microphysical state P. It is possible for M to be realized by N*, which features the use of a few neural pathways distinct from but almost exactly qualitatively similar to those used in N. One need not rule at this point on whether N, the actual neural realization, is identical with N*; for all that's been said, N is identical to N*. By analogy to the ship and its planks, a token neural state may retain its identity through the replacement of just a few of its

[1] Hilary Putnam (1967); Jerry Fodor (1974); Richard Boyd (1980); Derk Pereboom and Hilary Kornblith (1991); Stephen Yablo (1992); Lynne Baker (1995, 9–10).

neural pathways. But it is evident that N* is realized by some microphysical state P* distinct from P. It is therefore possible for M to be realized by a microphysical state not identical with P, and thus M is not identical with P. (It's still open that M is identical with the disjunction of possible realizers; see Fodor 1974; Pereboom and Kornblith 1991; Pereboom 2011 for reasons against).

This reflection inspires a challenge to token-identity claims for mental causal powers, specifically, and certain of their token realizer causal powers. Jessica Wilson (1999) and Sydney Shoemaker (2003, 2007, 2011) have endorsed a token-identity thesis for mental and lower-level causal powers, even they oppose reductive type- and token-identity claims for mental states. On their view, the mental is realized by and grounded in the neural and in the microphysical because the causal powers of a mental state are a proper subset of the causal powers of the lower-level state. It turns out that because the causal powers of a mental property instance are a subset of the causal powers of the realizing complex of microphysical property instances, each causal power of the mental property instance is identical with a causal power of that complex of microphysical property instances.[2]

Here is a modal multiple realizability argument that targets such a token identity thesis for mental causal powers and their microphysical realizers (Pereboom 2011). Consider Alice's belief at some particular time that she lives in Boston—a mental token, an instance of a mental

[2] Jessica Wilson (1999), p. 50; L. A. Paul (2005) also advocates an overlap account as a response to threat of redundant overdetermination, but in her view, the overlap is between property instances.

property—and the causal power it has. Suppose that Alice might have had an illness that would, over time, damage a part of her brain that has a crucial role in realizing this belief (but other parts of her brain have important roles as well), and that it's possible, before the part is damaged, for a neurosurgeon to remove it and replace it with a sophisticated electronic microprocessor—call it a silicon prosthesis. Alice does actually have the illness, and she does not actually undergo the operation. Still, her token belief that she lives in Boston would have retained its token mental causal power had she undergone the operation and had it instead been realized by the token neural-and-silicon causal power. This modal multiple realizability consideration indicates that Alice's token mental causal power is not identical with the token neural causal power that actually realizes it.

A temporal multiple realizability argument for the same conclusion can also be constructed (Pereboom 2011). Suppose Alice actually has the illness. Before the part of her brain threatened by the illness is damaged, the neurosurgeon removes it and replaces it with the silicon prosthesis. After the operation, Alice retains her token belief about where she lives, and it has the token mental causal power it had prior to the operation. But this token causal power is no longer realized by the neural token causal power that realized it prior to the operation, but by a neural-and-silicon token causal power instead. Thus the belief's token mental causal power is not identical with the neural token causal power that realized it just before the operation, or indeed with any token neural causal power. In addition, because the token neural causal power on the one hand, and the token neural-and-silicon causal power on the other are realized by distinct token microphysical causal powers, the token mental causal power is also not identical with any token microphysical causal power. Multiple realizability

considerations thus indicate that mental causal powers are neither identical with token neural nor token microphysical causal powers.[3]

Constitution

The relation of a mental token to its neural and microphysical realization bases is thus not identity, but rather realization or constitution, where these notions are understood not to entail identity. This token nonreductivism generalizes to relations between tokens in other sectors, such as the relation between a token biological process of genetic mutation and the molecular process that realizes it (Kitcher 1992), and to the relation between a flag and the cloth that realizes it (Baker 2007). I have been using both realization talk and constitution talk for the relation I think holds between mental entities and underlying neural and microphysical entities. With Baker, I prefer to use 'constitution.' I will now more precisely specify my account of constitution, whereupon I will contrast my position with Baker's, and provide a critical assessment.

Here is one choice point for an account of constitution. One might specify that (1) the constituter does not necessitate the entity that is constituted; for instance, the lump can exist without the statue existing; or instead that (2) the constituter does necessitate the higher-level

[3] I contend (Pereboom 2002a, 2011) that a mental property instance is identical to a sufficiently abstract physical compositional property instance, and, correlatively, a mental causal power is identical to an abstract physical causal power, where the level of abstraction must be higher than the neural, as this last argument shows.

entity; that, for example, the statue is constituted by particles arranged statue-wise, and this necessitates the statue. Baker opts for (1); she contends that the existence of a constituter may necessitate the existence of what is constituted only in a certain relational context. In my main proposal (Pereboom 2011) I opt for (2); for a token A to constitute token B, the existence of A must necessitate the existence of B. But I noted that a close variant on this view follows Baker in denying this and opting for (1).[4]

On option (1), what I have in mind in the mental/microphysical case is the necessitation of the existence of mental token M by the existence of microphysical token P without the supplementation of P by a fundamental law of physical-to-mental emergence.[5] We can grant that if such upward necessitation requires supplementation by a fundamental emergence law, genuine physicalism is precluded (more on emergence later). But I did not build an anti-

[4] Karen Bennett (2003), at p. 495, note 2, points out, by way of criticizing the constitution thesis Kornblith and I proposed in "The Metaphysics of Irreducibility" (Pereboom and Kornblith 1991) that it is inadequate to physicalism because it does not involve the necessitation of the mental by the physical. However, a constitution relation can be defined that stipulates this necessitation, and this is the sort of relation I have in mind.

[5] In Pereboom (2002a and 2011) I argue that the nonreductive view is not committed to emergentism, but I don't specify nonemergence as a condition on constitution. Andrew Melnyk (2008) raises the concern about ruling out emergence for my (Pereboom 2002a) account. For another thorough discussion of the need for formulations of physicalism to preclude emergence, see Jessica Wilson (2005), cf. Horgan (1993).

emergence condition into my characterization of constitution. Ruling out emergence would thus require a separate condition on physicalism. (Note that no physicalist has proposed to rule out emergence by way of a more fundamental condition on physicalism – it's not clear how this might be accomplished.)[6]

Supposing multiple realizability, non-identity, and upward necessitation as accepted constraints on constitution, what remains to be specified about the relation between higher-level tokens and the lower-level tokens that constitute them? The existence of a token statue is necessitated by the microphysical constitution of the universe; we need a condition that limits

[6] This concern is expressed by Jessica Wilson (2005). Andrew Melnyk (2003) rules out emergence in his characterization of realization by specifying that propositions expressing the higher-level or nonfundamental facts be derivable from propositions expressing the fundamental physical facts alone, where fundamental emergence laws are not included from the fundamental physical facts; see his *A Physicalist Manifesto*, (2003), pp. 20–32, 88–110. In his view, "The necessitation of the nonphysical [i.e., physical in the broad sense] by the physical [i.e., physical in the narrow or fundamental sense] that is entailed by realization requires no fundamental physical-to-nonphysical bridge laws. By contrast, of course, the strong emergence of the nonphysical from the physical would require precisely that the nonphysical be derivable from the physical only via physical-to-nonphysical bridge laws that are fundamental" (*A Physicalist Manifesto*, 2003, p. 32). The reason a proposition about an emergent property won't be derivable from the appropriate base is just that this base does not include, by initial specification, propositions expressing fundamental emergence laws.

constituters in an intuitive way. Baker proposes spatial coincidence of the constitute and what it constitutes.[7] Against this, Ted Sider argues that it is conceivable for two spaceships to be made of such extraordinary material that they can fly through each other, for a moment wholly coinciding spatially, without one constituting or realizing the other at all. If there is a corresponding metaphysical possibility, spatial coincidence is too weak (Sider 2002, cf. Zimmerman 2002).[8] Another option, the one I endorse (2011), is that a further feature is the *made up of* relation (or equivalently, the *wholly made up of* relation), which I conceive as basic in the sense that it cannot be fully analyzed into more fundamental relations, for instance, more fundamental mereological relations. The *made up of* relation is asymmetric and irreflexive: the lattice is not made up of the diamond, and the diamond is not made up of itself.[9]

[7] Baker (2000), pp. 39–42.

[8] Ted Sider, "Review of Lynne Baker's *Persons and Bodies,*" *Journal of Philosophy* 106 (2002), pp. 45–8; for the analogous point about composition, see Peter van Inwagen (1990), pp. 52–53. Dean Zimmerman (2002) develops an extended critique of Baker's claims for the role spatial coincidence can have in an account of constitution.

[9] Baker's constitution relation is also irreflexive and asymmetric (Baker 2000, pp. 39–42). One difference from my proposal is that Baker attempts to secure asymmetry by way of conditions that indirectly imply it. I criticized her strategy in Pereboom 2002b; Baker replies in (2002) and in (2007), pp. 163–64.

It also has a specific direction: the less fundamental is made up of the more fundamental.[10] But the core of the *made up of* relation is unanalyzable and thus primitive. This is in the clear; we know what we mean when we say that the diamond is made up of a lattice of carbon atoms, and that the brain is made up of a configuration of various kinds of neurons, without having a reductive analysis for the *made up of* relation.

Must a further condition be added to preclude the whole lump from constituting not only the whole statue but also the head of the statue? It's not natural to say that the head is made up of the whole lump. We might add to the account that for x to constitute y, x and y must be materially coincident (Pereboom 2011). On Dean Zimmerman's (2002) recommendation, material coincidence can be characterized mereologically: x and y are materially coincident just in case they, at some level, are made out of the same parts.[11] An

[10] On Karen Bennett's (2015) account, all building relations, including constitution, are relations are irreflexive, asymmetric, and such that their input is more fundamental than their output. A third element is some sort of intimate connection; spatiotemporal coincidence won't do, and Bennett does not offer an alternative informative analysis. In my account of constitution, this intimate connection is the *made up of* relation, understood to involve or be supplemented by material coincidence. For a relevant general discussion of the grounding relation with some similar themes, see Kit Fine (2001) and Jonathan Schaffer (2009).

[11] Dean Zimmerman provides an attractive precise characterization of this condition (i.e., 6*). First, a definition:

alternative is to add the requirement that x and y be spatially coincident, but it will be controversial that there is no possible mismatch between the material structure of an object and the spatial structure of its location.[12] Might material coincidence supplant the *made up of* relation? Constitution is intuitively irreflexive, asymmetric, and directed from the more fundamental to the less fundamental. The *made up of* relation secures these characteristics, while material coincidence is reflexive and symmetrical.

S is *a complete decomposition* of *x* =df. Every member of *S* is a part of *x*, no members of *S* have any parts in common, and every part of *x* not in *S* has a part in common with some member of *S.*

Here is the condition:

(6*) x and y share at least one complete decomposition.</NDIS>

Zimmerman points out that (6*) is equivalent to the claim that, at some level, x and y are made out of the same parts (Zimmerman 2002), p. 297.

To avoid such a mereological characterization issuing in identity (we're assuming the pluralist position on material constitution), following Judith Thomson, I would deny the mereological principle:

Extensionality: $\forall x \forall y\ [x = y \leftrightarrow \forall z(Pzx \leftrightarrow Pzy)]$; ('Pxy' stands for 'x is a part of y').

Judith Thomson (1983), pp. 201–20; Ryan Wasserman, "Material Constitution." The statue and the lump share all of their parts, but they are not identical since they differ in modal properties.

[12] Raul Saucedo (2010) argues for the possibility of mismatches of this sort.

Let me characterize the resulting notion more formally. Constitution is a relation between concrete physical entities; they might be states, events, property instances, or causal powers.[13] Suppose x and y are concrete physical entities. The *made up of* relation is asymmetric, irreflexive, and directed so that the less fundamental is made up of the more fundamental, while its core is primitive. Entities x and y are materially coincident just in case they, at some level, are made out of the same parts. Then,

(C1) x materially constitutes y at t if and only if

(a) y is made up of and materially coincident with x at t;

(b) necessarily, if x exists at t, then y exists at t and is made up of and materially coincident with x at t; and

(c) possibly, y exists at t and it is not the case that y is made up of and materially coincident with x at t. (Pereboom 2011)

The last clause (c) precludes the identity of x and y (on the assumption of the necessity of identity), as does clause (a), since the *made up of* relation is irreflexive.

[13] Lynne Baker, *Persons and Bodies* (2002) pp. 39–42. In *Persons and Bodies*, the account of constitution is specified for concrete individuals such as statues and pieces of marble. I assumed in my (2002b), pp. 616–23, that it also applied to token beliefs, but in her (2002, p. 631), reply Baker dissented. Later, in *The Metaphysics of Everyday Life* (2007), pp. 167–68, Baker specifies a notion of constitution for property instances. I agree that there is such a notion and that it applies to instances of belief properties.

Constitution is a relation that is most naturally conceived as holding between objects, and between states or states of affairs. Plausibly, a brain is constituted by a complex microphysical object, and a neural state, or state of affairs, is constituted by a microphysical state, or state of affairs. What about properties and their causal powers? If properties and causal powers are abstract entities, then it might not be natural to think of them as constituted. However, property-instances and causal power-instances are plausibly nonabstract ways particular things are, and then the prospects are good. A diamond's property instance of *being hard*, a causal power, is plausibly made up of and materially coincident with an instance of a compositional property featuring bonds among carbon atoms, also a causal power. Similarly, it makes sense to say that any of the particular mental causal power of Alice's belief that she lives in Boston is made up of and materially coincident with a particular neural causal power.

Baker's account of constitution

Baker's paradigms for constituted entities are artifacts produced by human beings, such as statues, flags, and driver's licenses, by contrast with non-human entities found in the natural world. These examples accord with her genera focus on the metaphysical analysis of the human social world. Her conception of constitution as she sets it out in *The Metaphysics of Everyday Life* (2007), which is revised relative to earlier formulations (in particular relative to the formulation in her *Persons and Bodies* (2000)), is as follows:

> F and G are *primary kind propert*ies, properties things have without which they would not exist *x* and *y* are concrete individuals.
>
> 'F*' designates the property of *having F as one's primary-kind*.

G-favorable circumstances are the circumstances, the context, required for something to be a G.

Then: x constitutes y at t = df. There are distinct primary kind properties F and G, and G-favorable circumstances such that:

(1) F*x & G*y, and

(2) x and y are spatially coincident at t, and ∀z(z is spatially coincident with x at t and G*z → z = y)

(3) x is in G-favorable circumstances at t, and

(4) it is necessary that: ∀z[(F*z at t & z is in G-favorable circumstances at t) → ∃w(G*w at t & w is spatially coincident with z at t)], and

(5) It is possible that ∃t{(x exists at t & ∼∃w[G*w at t & w is spatially coincident with x at t])}, and

(6) If x is of one basic kind of stuff, then y is of the same basic kind of stuff. (Baker 2007: 161)

(2) secures the spatial coincidence of constituter and what it constitutes; I've presented my case for using the *made up of* relation together with material coincidence instead. Baker maintains that (4) secures the asymmetry of constitution. But if asymmetry is important, why not specify it more explicitly and directly? I do this by specifying asymmetry as a feature of the *made up of* relation. (5) secures non-identity of constituter and what it constitutes, which I, following Baker, accomplish in a similar way, with (c). What motivates (6) is the concern to avoid material and immaterial entities standing in the constitution relation. One might avoid this issue by restricting the account to material constitution, as I do.

Upward necessitation without relational context?

By contrast with my C1, Baker's account does not specify that constituters necessitate what they constitute independently of the relevant relational context, which appears in the account as the G-favorable circumstances. To cite one of her examples, the existence of the rectangular piece of plastic in my pocket, in her view the constituter of my driver's license, doesn't necessitate the existence of a driver's license. The existence of the license requires in addition driver's-license favorable circumstances, which features human beliefs, desires, and intentions. Similarly, the existence of the piece of green inked cotton/linen mixture in my wallet, for Baker the constituter of a US $1 bill, doesn't necessitate the existence of a US $1 bill. The existence of the US $1 bill requires, in addition, US-currency favorable circumstances, which again features human beliefs, desires, and intentions. Baker classifies being a driver's license and being a US $1 bill as *intention-dependent* properties, *!D properties* for short: "ID properties are properties that cannot be instantiated in the absence of beings with beliefs, desires, and intentions." (Baker 2007, 11).

One response, to my mind plausible, is that when one understands what a driver's license really is, it's not credible to maintain that is constituted by a piece of plastic. A driver's license is a legal permission to drive, and that permission is a complex entity in which intentions of policymakers, for example, have a crucial role. The card in my pocket is a tag or indicator of that license, but the license itself is a much more expansive entity than just that card. One might thus propose that the license is constituted not of the piece of plastic, but of the

realization of the more expansive entity. The existence of the resulting complex constituter would necessitate the existence of the license. C1 would then be vindicated.

Non-necessitation independently of G-favorable circumstances does heavy lifting for Baker in response to Jaegwon Kim's causal exclusion problem for the nonreductivist's account of mental causation, and this is a potential reason to retain this aspect of her account. Here is one formulation of a causal exclusion argument: the nonreductivist proposes that token mental property instance M causes token mental property instance M*. If so, then M also causes M*'s microphysical constituter, property instance MP*. But property instance MP, M's microphysical constituter, also causes MP*. This results in overdetermination of MP* by MP and M. Given the unacceptability of such overdetermination, the nonreductivist must give up the claim that M causes M*, thus denying mental causation. Baker responds by denying that MP causes MP*, since MP is causally insufficient for MP*. It's only in certain mental-property-favorable circumstances that MP constitutes M, in the absence of which MP* will not be caused:

> On [my] view, the microphysical constituter (MP) of Jane's willing to raise her arms (M) is not a complete cause of the microphysical constituter (MP*) of Jane's raising her arms (M*). …consider a world with the same laws as ours in which Jane's brain is in a vat in the same microphysical state that it's in in the example. In that world, MP would not cause MP*, because in that world Jane doesn't have arms to raise. Hence, MP is not nomologically sufficient for MP*. (2007: 118)

So there is no overdetermination in this case, and thus no problem for mental causation on the nonreductivist view. However, against this, there will be a microphysical state that's the constituter of (M together with the M-favorable circumstances) that is nomologically sufficient

for MP*. So the overdetermination problem arises nonetheless, and the non-necessitation feature of Baker's account won't provide the effective response envisioned.

One might argue that C1's requirement of upward necessitation independently of relational context helps secure physicalism, in particular the physicality of constituted tokens, and so I have suggested (Pereboom 2011). But I agree with Baker (2013) that global supervenience will do as much to secure physicalism as the upward necessitation specified in C1 (although I also argue that neither is sufficient for physicalism, since both require supplementation by a no-emergent-law condition). However, in addition to securing physicalism as a general claim, one might also want to specify what it is that makes particular entities physical. On my proposal, an important part of this account is that they are constituted of entities over which physics quantifies, where constitution is a full grounding relation conceived as necessitating the entity constituted.

Baker (2013) contends that it is theoretically desirable that the constituter and the thing constituted be the same type of entity, and that this desideratum supports the absence of a necessitation-independent-of-relational-context requirement in an account of constitution. She argues that an object can be constituted of an object, but an object can't be constituted by a state of affairs. In her example, the object head-and-handle – call it 'HH' – which can exist even if its head-part and the handle-part are detached, would be a candidate for constituting the hammer, but HH arranged hammer-wise would not be, since HH arranged hammer-wise is a state of affairs and not an object. But if this is accepted, in this case the constituter won't necessitate the constituted thing, for the existence of HH alone will not necessitate the existence of the hammer.

In response, I don't see why HH arranged hammer-wise can't constitute the hammer. Intuitively, it's specifically the molecules arranged brain-wise that constitute the brain, and if they weren't arranged brain wise but scattered throughout the universe, they wouldn't constitute the brain. This consideration counts against the relatively abstract requirement that constituter and constituted entity must be of the same metaphysical type. In addition, it's not obvious that there is a deep ontological distinction between objects and states of affairs. A view on which objects are constructed from temporal object stages, objects and states of affairs are indeed not deeply ontologically different. Accordingly, I think it's plausible that HH arranged hammer-wise constitutes the hammer, and that the necessitation-independent-of-relational-context requirement is in the clear. [14]

At the same time, Baker's preferences can be accommodated by a characterization close to (C1), in which, on the recommendation of her account, (b) is revised to specify that the existence of y is necessitated by the existence of x in an appropriate relational context, and (c) is similarly altered. Suppose 'D' designates the y-favorable circumstances—the relational context required for something to be y. Then:

(C2) x materially constitutes y at t if and only if

(a) y is made up of and materially coincident with x at t;

(b) necessarily, if x exists and is in D at t, then y exists at t and is made up of and materially coincident with x at t; and

(c) possibly, y exists at t and it is not the case that y is made up of and materially coincident with x in D at t.

[14] Thanks to Karen Bennet and Ted Sider for discussion of this issue.

C2 replicates C1 except that C2, by virtue of its condition (b), requires the existence of x to necessitate the existence of y in the relevant relational context, but not independently of that context, as in C1. On C2, by contrast with C1, the piece of plastic can constitute the driver's license, and the cloth can constitute the flag. In Baker's hammer example, HH can constitute the hammer without the specification that HH be arranged hammer-wise, since the arrangement can be built into the hammer-favorable circumstances. In this way, C2 can secure the desideratum that only objects can constitute objects. I'm not, however, convinced that the move to C2 is required, and I think that C1's requiring that the constituter necessitate the thing constituted independently of relational context is a reason to prefer it to C2 or to Baker's account.

Higher-level causation and its lower-level ground

An important feature of Baker's position is that higher-level causation generally is significantly metaphysically independent of causation at lower levels. I also defend such an independence claim, but our positions may still differ – I'm not sure. She notes the difference between her position and Kim's by saying: "The causal powers of higher-level property instances cannot be reduced to those of their consituters," (Baker 2007, 115) and I agree with that. But she then specifies that higher-level property instances can have independent causal efficacy, which she characterizes as follows:

> (IC) A property instance that has an effect e has *independent causal efficacy* (i) it would have had its effect e even if its constituting property instance had been different, and (ii)

> it has causal powers that could not have been conferred by its constituting property instance alone.

It's noteworthy in this context that Baker (2013) comments by way of criticism of my view that I am a trickle-up theorist about mental causation, and by implication, about higher-level causation generally. I hold that mental causation, and higher-level causation more generally, is fully grounded in the microphysical base conditions of the universe. By implication, Baker rejects a trickle-up view about mental causation, and higher-level causation more generally.

Perhaps the core disagreement concerns whether the causal powers of higher-level properties are fully grounded in the properties of their constituters. On C1 they are, on Baker's view and on C2 they are not. For example, if the driver's license is constituted just of the piece of plastic, then the causal powers of the driver's license wouldn't be grounded in the causal powers of its constitution. Instead these causal powers are largely a function of the relevant expansive relational context. But this difference in views seems superficial. The deeper issue is whether the higher-level property instance has causal powers that are not conferred by the microphysical constitution of the expansive context, absent emergence laws. About that broad microphysical constitution Baker writes:

> although a constituted property-instance does not supervene on its constituting property-instances, it may supervene ultimately on its subatomic constituters together with the microphysical supervenience base of all the circumstances in which the instance of the constitution relation obtains. The supervenience base will be very broad – too broad to be specified or to be useful in explanation – but it may be metaphysically sufficient for the constituted property instance. (Baker 2007, 119)

I contend that the causal powers of all higher-level entities are conferred by that broad supervenience base, conceived without emergence laws. Would Baker agree? Perhaps by contrast with Baker, I claim that this broad supervenience base explains why the higher-level properties have the causal powers they do, and that this is a useful instance of metaphysical explanation.

Baker on emergence

Baker contends that intention-dependent (ID) higher-level properties, such as being a US $1 bill and being a driver's license, are emergent. By contrast, I do not endorse emergent properties. However, debates about emergent properties threaten to be merely verbal. I will now argue that Baker makes no case for the claim that there are emergent properties in the sense of 'emergent' on which it's controversial that there are such properties.

Baker (2007, 237) begins her discussion by distinguishing two senses of 'emergent property':

(1) "a (reducible) "network" property that consists in some organizational feature of the bearer's substrate," and

(2) "a novel property that is irreducible to other properties."

She then specifies that the second use is the one that concerns her. What's crucial is her elaboration of (2). Baker endorses what she calls a mereological characterization of emergence, on which emergent properties are properties of wholes that transcend the properties of their parts. More precisely,

(2E) "Emergent properties of a whole are distinct from the properties of their parts, and cannot be explained or predicted on the basis of the properties of their parts ("their microstructures"). (Baker 2007, 237)

ID properties, in Baker's view, first of all, "are ontologically distinct from the properties of the entities' parts," and second "cannot be explained or predicted on the basis of the properties of the entities' parts" (Baker 2007, 239). To illustrate, "the property of committing perjury, for example, is a property that transcends the perjurer's parts, and is a new kind of behavior that cannot be predicted on the basis of the laws governing the parts of the perjurer or of any simpler system." (Baker 2007, 238) She concludes that "ID properties, on any noneliminativist characterization of them, are emergent properties on the standard characterizations." (Baker 2007, 239)

In my view, nonreductive physicalism is neutral on whether emergentism about any property is true; it can either accept it or reject it. Kim (1999) contends, by contrast, that nonreductive physicalism is committed to emergentism: "The fading away of reductionism and the enthronement of nonreductive physicalism as the new orthodoxy simply amount to the resurgence of emergentism—not all of its sometimes quaint and quirky ideas but its core ontological and methodological doctrines" (1999, 5). On Kim's account, emergentism distinguishes two kinds of higher-level properties, *resultant* and *emergent*, that arise from the basal conditions of physical systems (1999, 6-7). The basal conditions of a physical system are made up of (i) the basic particles that constitute the physical system, (ii) the intrinsic properties of these particles, and (iii) the relations that configure these particles into a structure. Resultant higher-level properties are *theoretically* predictable from facts about their basal conditions.

Those that are emergent, by contrast, cannot be predicted from those facts. The variety of predictability at issue is the derivability of the instantiation of higher-level properties from an entity's basal conditions alone. Theoretical predictability contrasts with *inductive* predictability. Having regularly observed that a higher-level property of a certain sort is realized by certain basal conditions, the instantiation of the higher-level property from the presence of the basal conditions would then be predictable. However, such inductive predictability is not at issue. Rather, what emergentists distinctively maintain is that facts about basal conditions, no matter how complete, will not suffice for derivation of certain actually instantiated higher-level properties, on account of which those properties are emergent (Kim 1999, 8).

Construing emergence in terms of *prima facie* epistemic notions such as predictability is indirect. Emergence is at root not an epistemic but a metaphysical phenomenon. Metaphysically, higher-level properties of a thing are emergent just in case their instantiations are not necessitated by their basal conditions alone. The reason emergent properties are not predictable from basal conditions alone is that those conditions do not necessitate them. The non-predictability of emergent properties is grounded in non-necessitation.

Nonreductive physicalism is not committed to emergentism on either an epistemic or on the more fundamental metaphysical characterization.[15] Physicalism requires the necessitation

[15] Randolph Clarke (1999) provides a clear statement of emergentism and argues that the nonreductivist can avoid it. For a defense of emergentism, see Timothy O'Connor, "Emergent Properties," *American Philosophical Quarterly* 31 (1994), pp. 91–104; Jonathan

of higher-level properties by microphysical basal conditions, absent any emergence laws. However, this is compatible with nonreductivism about those properties, since such necessitation does not preclude the multiple realizability of those higher-level properties. The necessitation of a higher-level property instance by the microphysical basal conditions is compatible with its necessitation by the alternative microphysical basal conditions had it been differently realized.

By Kim's characterization, emergentism also endorses downward causation; that is, it claims higher-level property instances can cause lower-level effects (1999, 28-31). As applied to mental causation, emergentism asserts that emergent mental property instances can cause microphysical property instances. Kim proposes that a problem for such downward causation derives from consideration of causal exclusion. Suppose emergent mental property instance M1 causes microphysical property instance P2. Then M1 will be realized by some microphysical property instance P1, M1 and P1 will compete as the cause of P2, and P1 will win out. Only by identifying M1 and P1 can M1's status as cause be salvaged.

But nonreductive physicalism might indeed countenance downward causation of this sort while rejecting emergent properties. (Both Baker and I endorse such downward causation.) One can first of all respond to Kim's exclusion objection for downward causation in a standard way: even that M1 causes M2, one can legitimately agree that M1 also causes M2's constituter P2 because if M1 is constituted by P1, M1 and P1 are sufficiently tightly related so as not to

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Schaffer (2010) argues that there are emergent quantum phenomena; Carl Gillett (2016) develops a notion of strong emergence and provides possible illustrations.

compete as causes of P2 (Pereboom and Kornblith 1991; Pereboom 2002a, 2011; cf. Bennett 2003, 2008). Furthermore a commitment to such downward causation is not by itself sufficient to render the nonreductive position radical in the sense that it is incompatible with the necessitation of mental property instances by basal conditions as Kim characterizes them.

Downward causation would be radical if it resulted in contraventions of the microphysical laws. More specifically, it would be radical if it resulted in contraventions of the microphysically laws that are discoverable without taking into account higher-level properties—*ordinary* microphysical laws. Ordinary microphysical laws don't take into account putative emergent phenomena. Timothy O'Connor (2008, 195) provides an illustration of radical downward causation conceived on this model: "If, for example, the multiple powers of a particular protein molecule were emergent, then the unfolding dynamics of that molecule at the microscopic level would diverge in specifiable ways from what an ideal particle physicist . . . would expect by extrapolating from a complete understanding of the dynamics of small-scale particle systems." As Randolph Clarke (1999) argues, the nonreductive physicalist is no more beholden to the contravention of the ordinary microphysical laws than is her reductionist counterpart. The key difference between nonreductive and reductive physicalism is that for the nonreductivist higher-level properties and their instances are not identical with lower-level properties and their instances due to multiply realizability. Because of this, instances of higher-level properties do not necessitate their actual specific basal conditions, and those basal conditions will not be accessible given knowledge of the higher-level properties alone. However, these differences do not preclude the necessitation of higher-level facts from the ordinary microphysical basal conditions, conceived as not including emergence laws. Given such

necessitation, it's hard to see how there could be contraventions of ordinary microphysical laws.

Let's return to Baker's contention that intention-dependent (ID) properties are emergent. I contend that Baker hasn't made a case for the claim that there are emergent properties in the sense in which it's controversial that there are such properties, the sense on which emergent properties are not necessitated by physical basal conditions absent emergence laws. Consider her example of an ID property that she classifies as emergent: "The property of committing perjury, for example, is a property that transcends the perjurer's parts, and is a new kind of behavior that cannot be predicted on the basis of the laws governing the parts of the perjurer or of any simpler system" (Baker 2007, 238). Note, first, that on this characterization some properties that are independent of intentions would count as emergent. The property of being a planet, for example, would be emergent, since the properties of a planet cannot be predicted on the basis of the properties of the parts of the planet, such as rock and gas that constitute it, or of properties of the parts of systems more basic than those parts, such as the properties of the microphysical constituents of the rock and gas. (I'm including in the properties of the parts the relational properties of those parts, for example the spatial relations the parts have with each other.) However, the motions of the planet cannot be predicted from the properties of its parts, and the non-predictability in this case can be accounted for by the fact that the motions are not necessitated by its part-properties. But it remains open that these motions are necessitated by its part-properties together with the properties of the parts of a relevant expansive sector of the universe, including the parts of the planet's solar system. Analogously, it's open that the property of committing perjury is necessitated by the properties

of the parts of the perjurer together with the parts of the relevant society of which the perjurer is a member.

It's not controversial that the motions of planets aren't necessitated by the part-properties of planets. More generally, it's not controversial that there are properties of things that are not necessitated by the part-properties of those things. On a notion of emergence on which the mark of emergence the absence of such predictability, it's not controversial that there are emergent properties. It is, however, controversial that there are properties of things that are not necessitated by their part-properties together with the properties of the parts of the systems in which they have a role. Given what Baker has said about intention-dependent properties, it remains open that such properties are not emergent on this notion.

Final words

The account of constitution I've proposed is similar to and indebted to Baker's, and to many discussions with her over the past decades. Perhaps the core difference in philosophical outlook that motivates the variation between her account and mine is that in her overall view, the metaphysics of everyday life is in a significant sense independent of any commitment to physicalism, while on my view physicalism has a more prominent part to play. Like me, Baker accepts physicalism, that is, physicalism about the created universe. Accordingly, the difference is slight, and concerns only the specific role the physicalism that each of us accepts has in the

metaphysics of everyday life, and in the metaphysics of nonfundamental levels of reality more generally.[16]

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