Constitution and Dependence[1]

I. INTRODUCTION

Material constitution is the relation that holds between an object and what it is made of. For example, statues may be constituted by lumps of matter, flags by colored pieces of cloth, and human persons (according to a prominent strand of theorizing about personal identity) by biological organisms. Constitution is often thought to be a *dependence relation*. I will later say more about what this means, but the rough idea is this. According to a popular picture, reality is hierarchically structured: some bits of it hang on other, metaphysically prior, bits. This hierarchy may be imposed by a number of relations, constitution being one of them. Thinking along these lines about constitution is fairly widespread. In the *Stanford Encyclopedia of Philosophy* entry on material constitution, for instance, Ryan Wasserman writes that constitution is "taken to be a dependence relation".[2] For better or worse, he is right:

"[W]hat is the precise *nature* of the particular dependence relation that holds between constitutionally related objects? Numerous dependence relations have been discerned in different areas of philosophy and in other disciplines…"[3]

"[T]here must be more to constitution than mere coincidence, and in the literature, there are a number of attempts to make constitution a substantive relation […] All emphasize the dependence of the constituted object […] on the constituting matter…"[4]

"Of course, grounding may not be the only relation of ontological priority, and so [the thesis that grounding is a relation between facts] is consistent with holding that things like statues depend ontologically on their constituent matter." [5]

"Many pluralists who reject four-dimensionalism about objects in favour of three-dimensionalism adopt some version of the view that distinct, coinciding objects are intimately related by an asymmetrical dependence relation of constitution."[6]

Other philosophers, while they do not explicitly say that constitution is a dependence relation, nonetheless say things that have this consequence[7] or make claims in the vicinity, for example that constitution is a "building relation"[8] or that constituted objects are

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[3] Kathrin Koslicki, "Constitution and Similarity," *Philosophical Studies*, CXVII, 3 (2004): 327–364, at p. 340.

[4] Hagit Benbaji, "Material objects, constitution, and mysterianism," *Southern Journal of Philosophy*, XLVI, 1 (2008): 1–26, at p. 8.

[5] Paul Audi "A Clarification and Defense of the Notion of Grounding," in Fabrice Correia and Benjamin Schnieder, eds., *Metaphysical Grounding: Understanding the Structure of Reality* (Cambridge: Cambridge University Press, 2012), pp. 101–121, at p. 103.

[6] Thomas Sattig, *The Double Lives of Objects: An Essay in the Metaphysics of the Ordinary World* (Oxford: Oxford University Press, 2015), p. 83.

[7] Mark Johnston, "Hylomorphism," *Journal of Philosophy*, CIII, 12 (2006): 652–698, at pp. 664–665 and 676–677.

[8] Karen Bennett, *Making Things Up* (Oxford: Oxford University Press, 2017), p. 9 and 21.

"nothing over and above" their constituters.[9]

Why does it matter whether constitution is a dependence relation? First, it is natural to think of the world as having a hierarchically layered structure. Some of the relations apt to impose such hierarchy are relations of determination (currently grounding is the most popular among them).[10] Others are relations of dependence. Whether constitution is a dependence relation helps us get one step closer to a complete taxonomy of the structuring relations that impose the layered hierarchy. Second, whether constitution is a dependence relation makes a difference to the metaphysical status of constituted objects. One might want to say, for example, that persons are fundamental composites.[11] But if constitution is a dependence relation, this is incompatible with persons being constituted, since being dependent on something else is incompatible with being fundamental.[12] Third, whether constitution is a dependence relation can make a difference to the extent to which the addition of constituted objects to one's ontology is a cost in parsimony. Some think that we should only worry about minimizing the number of *fundamentalia* in metaphysical theory

[9] Wiggins "On Being in the Same Place at the Same Time," *Philosophical Review*, LXXVII, 1 (1968), 90–95, at pp. 91–92.

[10] For a useful survey on grounding, see Ricki Bliss and Kelly Trogdon, *Metaphysical grounding*, in E. N. Zalta, ed., *The Stanford Encyclopedia Of Philosophy* (Winter 2016 Edition), http://plato.stanford.edu/archives/win2016/entries/grounding/

[11] See Lynne R. Baker, *Persons and Bodies: A Constitution View* (Cambridge: Cambridge University Press, 2000), p. 22; Patrick Toner, "Hylemorphic Animalism," *Philosophical Studies*, CLV, 1 (2011): 65–81; and Ross Inman, *Substance and the Fundamentality of the Familiar: A Neo-Aristotelian Mereology* (New York: Routledge, 2018), Ch. 7. Note that the distinction between fundamental and non-fundamental entities does not commit one to the view that there are ways or degrees of existence. See Kris McDaniel, *The Fragmentation of Being* (Oxford: Oxford University Press, 2017), Ch. 6 for an application of this more radical idea to persons.

[12] Though see Elizabeth Barnes, "Emergence and Fundamentality," *Mind*, CXXI, 484 (2012): 873–901.

building; non-fundamental entities incur no cost.[13] If constitution is a dependence relation, such theorists have less reason to refrain from positing constituted objects.

Yet I will argue that it is surprisingly difficult to make a good case for the doctrine that constitution is a dependence relation. There are many definitions of constitution on the market, and given some widely accepted theses about ontological dependence, most of them fail to classify constitution as a dependence relation. As it turns out, the best option for those who want to avoid this result is to endorse the kind of mereological hylomorphism that has been put forth by Kit Fine[14] and defended in detail by Kathrin Koslicki[15]: constituted objects have their constituters as proper parts along with a form, which is another proper part.[16]

Before launching into substantive discussion, I should make a few clarifications. The question of whether constitution is a dependence relation is easy to trivialize. First, "constitution as identity" theorists like Harold W. Noonan[17] think that constitution is just a special case of identity.[18] Second, some believe that everything trivially ontologically depends

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[13] See Jonathan Schaffer, "What Not to Multiply Without Necessity," *Australasian Journal of Philosophy*, XCIII, 4 (2015): 644–664.

[14] "Things and Their Parts," *Midwest Studies in Philosophy*, XXIII, 1 (1999): 61–74

[15] *The Structure of Objects* (Oxford: Oxford University Press, 2008); *Form, Matter, Substance* (Oxford: Oxford University Press, 2018)

[16] I reserve the word 'hylomorphism' exclusively for views that accept the existence of forms; for a broader usage, see Simon Evnine, *Making Objects and Events* (Oxford: Oxford University Press, 2016). As Evnine himself recognizes, this issue is purely terminological.

[17] "Constitution Is Identity," *Mind*, CII, 405 (1993): 133–146

[18] A similar move is to identify constitution with the symmetric relation of material coincidence; see Michael Rea, "The Problem of Material Constitution," *Philosophical Review*, CIV, 4 (1995): 525–552.

on itself.[19] If we put these two strands of theorizing together, we get that constitution is a special case of identity, which in turn is a special case of ontological dependence.

This is not the sense in which I am interested in whether constitution is a dependence relation. What I want to know is whether constitution is the kind of asymmetric, irreflexive structuring relation that paradigmatic cases of ontological dependence are usually thought to be. This means that I also will not worry about putative cases of symmetric dependence.[20] Even if such cases are possible, constitution counts as a dependence relation in my sense only if every constituted object depends on its constituter, but not *vice versa*. That is, I am interested in the following question:

> *The Constitution-Dependence Link Question* (CDLQ): Is it the case that constituted objects ontologically depend on their constituters, but not vice versa?

How can we go about answering CDLQ? The most straightforward method would be to go through each possible combination of accounts of constitution and ontological dependence and see what they imply for CDLQ. Unfortunately, this is not feasible in the length of this paper. So instead, I will proceed according to the following plan. In section 2, I will lay out some diagnostics for ontological dependence. Despite much disagreement about the relation, the broad consensus is that it should be answerable to at least one of three core constraints,

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[19] Peter Simons, *Parts: A Study in Ontology* (Oxford: Oxford University Press, 1987), p. 295; Amie L. Thomasson *Fiction and Metaphysics* (Cambridge: Cambridge University Press, 1999), p. 26; Tuomas E. Tahko and E. J. Lowe, "Ontological Dependence," *The Stanford Encyclopedia of Philosophy* (Spring 2015 Edition), Edward N. Zalta, ed., URL = http://plato.stanford.edu/archives/spr2015/entries/dependence-ontological/, §4.2.

[20] See Elizabeth Barnes, "Symmetric Dependence," in Ricki Bliss and Graham Priest, eds., *Reality and Its Structure* (Oxford: Oxford University Press, 2018), pp. 50–69.

which I will call the Modal, the Inclusion and the Feature Constraints. While each constraint is somewhat controversial, their disjunction is not: virtually everyone agrees that each instance of ontological dependence has to satisfy at least one of them. In section 3, I will argue that all *bona fide* instances of constitution violate the Feature Constraint and that some also violate the Modal Constraint. So, for constitution to count as a dependence relation, at least those instances that violate both would need to satisfy the Inclusion Constraint. However, in section 4 I will argue that most non-hylomorphist accounts of constitution also violate the Inclusion Constraint. The only exception is Lowe's Proper Parthood Account, which I will argue should be ruled out on independent grounds because it violates Weak Supplementation. As we will see in section 5, only a mereological form of hylomorphism satisfies the Inclusion Constraint. This constraint is merely a necessary condition of ontological dependence. However, I will argue that there are substantive and defensible accounts of ontological dependence on which it is also necessary. This means that only mereological hylomorphists are in a good position to maintain that constitution is a dependence relation.

II. DIAGNOSTICS FOR ONTOLOGICAL DEPENDENCE

Ontological dependence received considerable attention in the last few years. As a highly general, category-neutral relation, it is widely thought to hold between sets and their members, structured events and their constituents, tropes and their bearers, boundaries and their hosts, and so on.[21]

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[21] Fabrice Correia, "Ontological Dependence," *Philosophy Compass*, III, 5 (2008): 1013–1032, Kathrin Koslicki, "Ontological Dependence: An Opinionated Survey," in Miguel Hoeltje, Benjamin Schnieder and Alex Steinberg, eds., *Varieties of Dependence: Ontological Dependence, Grounding, Supervenience, Response-Dependence* (Munich:

A closer look reveals two markedly different strands in the ontological dependence literature. Some philosophers, whom I will call "pluralists", think of ontological dependence as a genus of relations with various species in it.[22] They often distinguish between rigid and generic dependence, existential and identity dependence, timeless and temporal forms of dependence, and so on. "Monists", by contrasts, are only concerned with the *generic* notion of ontological dependence.[23] While monists and pluralists agree that no kind of ontological dependence can be defined in purely modal terms, views on how ontological dependence (or its species) should be characterized are quite diverse, ranging from primitivism[24] to essence-[25]

Philosophia, 2013), pp. 31–64, and Tahko and Lowe, "Ontological Dependence," *op. cit.*, provide helpful overviews.

[22] See E.J. Lowe, "Ontological Dependency," *Philosophical Papers*, XXIII, 1 (1994): 31–48, Kit Fine, "Ontological Dependence," *Proceedings of the Aristotelian Society*, XLV, 1 (1995): 269–90, Thomasson, *Fiction and Metaphyisics*, *op. cit.*, Ch. 2, Fabrice Correia, *Existential Dependence and Cognate Notions* (Munich: Philosophia Verlag, 2005) and "Ontological Dependence," *op. cit.*, Benjamin Schnieder, "A certain kind of trinity: dependence, substance, explanation," *Philosophical Studies*, cxxix, 2 (2006), 393–419, Kathrin Koslicki, "Varieties of Ontological Dependence," in Correia and Schnieder, *Metaphysical Grounding*, *op. cit.*, pp. 186–213 and "Ontological Dependence," *op. cit.*, and Tahko and Lowe, "Ontological Dependencem," *op. cit.*

[23] See Ross P. Cameron, "Turtles all the way down: regress, priority and fundamentality," *Philosophical Quarterly*, LVIII, 230 (2008): 1–14; Jonathan Schaffer, "On what grounds what," in David Chalmers, David Manley and Ryan Wasserman, eds., *Metametaphysics* (Oxford: Oxford University Press, 2009), pp. 347–383; Alexander Paseau, "Defining Ultimate Ontological Basis and the Fundamental Layer," *Philosophical Quarterly*, LX, 238 (2010): 169–175; and Barnes, "Emergence and Fundamentality" and "Symmetric Dependence," *op. cit.*

[24] Thomasson, "Fiction and Metaphysics," *op. cit.*, Ch. 2, Michael Potter, *Set Theory and its Philosophy* (Oxford: Oxford University Press, 2004), at pp. 39–40, Schaffer, "On what grounds what," *op. cit.*, Barnes, "Emergence and Fundamentality," *op. cit.*, at p. 879.

[25] Fine, "Ontological Dependence," *op. cit.*, Koslicki, "Varieties of Ontological Dependence," *op. cit.*

and grounding[26]-based definitions. Instead of trying to settle these debates, I will focus on a

few diagnostic criteria from which, I believe, we can crystallize an uncontroversial necessary

condition of ontological dependence.

II.1. The Modal Constraint. Most theorists agree that the ontological dependence of any x

on any y implies that x in some way modally constrains y. Based on the most commonly cited

examples, this is likely to take either of two forms, widely known as 'Rigid Necessitation' and

'Generic Necessitation'. Henceforth, I will use 'D' for the relation of ontological

dependence, 'E' for the existence predicate (on which more in a moment) and 'Ψ' as a

second-order variable that ranges over kinds.

Constitution and parthood are usually treated as time-relative relations, and sometimes

so is ontological dependence. However, since the time-relative nature of these relations will

not play any significant role in the discussion to follow, I will henceforth leave time indices

implicit in my formal definitions. We can then formulate Rigid and Generic Necessitation as

follows:

(*Rigid Necessitation*) $\forall x \forall y \ [Dxy \rightarrow \Box(Ex \rightarrow Ey)]$

(*Generic Necessitation*) $\forall x \forall y \ \{[Dxy \rightarrow \exists \Psi \ [\Psi y \ \& \ \Box(Ex \rightarrow \exists z \ \Psi z)]\}$

Rigid Necessitation says that for any x and y, if x ontologically depends on y then necessarily,

if x exists so does y. Put intuitively, the principle requires that an ontologically dependent

entity necessitate the existence of *that very thing* that it depends on. By contrast, Generic

Necessitation requires that there be some kind the dependee falls under such that the

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[26] Correia, "Existential Dependence and Cognate Notions," *op. cit.*, at p. 66; cf. Schnieder, "A certain kind of

trinity", *op. cit.*

dependent thing's existence necessitate the existence of *some instance or other* of that kind. I will understand the word 'kind' broadly. I will not require the kind in question to be *y*'s "primary kind", that is, the kind to which it most fundamentally belongs (see section 4.1). I will, however, assume that kinds need to be something more specific than *thing* or *material object*.[27] To give a sense of what I have in mind, here are some examples. 'Person', 'elm tree', 'Homo Sapiens', 'boy scout', and 'caterpillar' are all kind terms. Some of them are typically considered "substance kinds" (nothing can stop being a member of them without going out of existence), whereas others are usually thought to be "phase sortals" (things can cease to belong to them but keep persisting). Some are arguably "infima species" (kinds that do not have more specific sub-kinds), while others are not. But they could all be used to formulate *bona fide* dependence theses.

Rigid and Generic Necessitation correspond to the two species of ontological dependence most commonly distinguished by pluralists: rigid and generic dependence. But one does not need to be a pluralist to think that each *instance* of ontological dependence implies a respective instance of one of these necessitation theses. Note also that theses about rigid and generic dependence are largely independent from each other: the Sacramento Zoo only generically depends on its animals but does not rigidly depend on any particular animal; moreover, it rigidly depends on the state capital Sacramento but does not generically depend on Sacramento as a state capital (it could have been in Sacramento without the latter being a

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[27] One reason to think this is the so-called "qua problem": kind terms should help secure determinate reference, but words as broad as 'thing' and 'object' fail to achieve that. See Michael Devitt and Kim Sterelny, *Language and Reality*, 2nd ed. (Cambridge: MIT Press, 1999), at pp. 79–80 and Amie L. Thomasson, *Ordinary Objects* (Oxford: Oxford University Press, 2007), at pp. 38–42. See also Kris McDaniel, *The Fragmentation of Being*, *op. cit.*, at p. 176 for other reasons for thinking that 'thing' and 'object' are not kind terms.

state capital).

Call the thesis that each instance of ontological dependence satisfies either Rigid or Generic Necessitation the

$$(\textit{Modal Constraint})\ \forall x \forall y\ \{\mathrm{D}xy \rightarrow [\Box(\mathrm{E}x \rightarrow \mathrm{E}y) \vee \exists \Psi\ (\Psi y\ \&\ \Box(\mathrm{E}x \rightarrow \exists_z \Psi z))]\}$$

The Modal Constraint seems highly plausible. Ontological dependence is often introduced with modal idioms: x ontologically depends on y when x "needs" y to exist or x "requires" a thing of the same kind as y to exist. It was once widely accepted that the modal idioms in these characterizations could be used to *define* (respective species of) ontological dependence.[28] Such analyses are widely rejected today, mostly due to influential counterexamples by Fine.[29] Some sort of modal connection nonetheless seems at least necessary for any kind of ontological dependence.[30]

The formulations of both Rigid and Generic Necessitation explicitly use an existence predicate. Before moving on, it is worth saying a few words about this device.[31] Since Rigid and Generic Necessitation are supposed to be non-trivial theses (many pairs of entities do not stand in the relations defined by them), the existence predicate is intended to be non-

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[28] Such analyses have been endorsed by Jeffrey Tlumak, "Cross-Categorical Priority Arguments," *Metaphilosophy*, XIV, 1 (1983): 32–39, Joshua Hoffman and Gary Rosenkrantz, *Substance among other categories* (Cambridge: Cambridge University Press, 1994), at pp. 95–6, and Peter Simons, "Farewell to Substance: A Differentiated Leave-Taking," *Ratio*, XI, 3 (1998), 235–252, at p. 236, among others.

[29] "Ontological Dependence," *op. cit.*

[30] See Correia, *Existential Dependence and Cognate Notions*, *op. cit.*, for a detailed attempt to work these out.

[31] Many thanks to an anonymous referee for demanding more clarity on the role of the existence predicate in different notions of ontological dependence.

trivial in the sense that $\forall x \mathrm{E} x$ is not a theorem. This appears to confer commitment to a framework of possible worlds with variable domains of quantification. It is worth pointing out that while most theorists of ontological dependence are happy to take on this commitment[32], those who prefer a fixed-domain framework have ways to interpret the existence predicate so that Rigid and Generic Necessitation still come out non-trivial. I will briefly survey three such options. In doing so, I will focus on reinterpreting Rigid Necessitation; Generic Necessitation can also be understood in obviously analogous ways.

One strategy is to adopt the necessitist thesis that necessarily everything is identical something but that concrete things could have been nonconcrete.[33] That is, each possible world has the same domain of quantification, but the elements of the domain may differ from world to world with respect to whether they are concrete. The existence predicate can then be understood to express *exists as a concrete object*: Rigid Necessitation says that for any x and y, if x ontologically depends on y then necessarily, if x exists as a concrete object then so does y.[34]

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[32] See, for example, Fine, "Ontological Dependence," *op. cit.*, at p. 270, Correia, *Existential Dependence and Cognate Notions*, *op. cit.*, at pp. 18–19 and "Ontological Dependence," *op. cit.*, at pp. 1014–1015, Koslicki, "Ontological Dependence," *op. cit.*, at p. 38, and Tahko and Lowe, "Ontological Dependence," *op. cit.*, §2.

[33] Bernard Linsky and Ed Zalta, "In Defense of the Simplest Quantified Modal Logic," *Philosophical Perspectives*, VIII (1994): 431–58 and "In Defense of the Contingently Nonconcrete," *Philosophical Studies*, LXXXIV, 2–3 (1996): 283–94; Timothy Williamson, *Modal Logic as Metaphysics* (Oxford: Oxford University Press, 2013)

[34] Strictly speaking these reinterpretations of Rigid and Generic Necessitation are not fully adequate, since they only capture ontological dependence between objects that are actually concrete. However, this suffices for our present purposes, since the relata of material constitution are concrete objects (though see Harbecke's account in section 4.2). A more general reinterpretation could go like this. Call a relatum's *concreteness status* its property of being concrete (for concrete objects) or abstract (for abstract objects). Then necessitists can understand

11

The second strategy ensures a fixed domain of quantification by stipulating that the elements of the domain are not objects but individual natures (for example, not Alvin Plantinga but the property of being Alvin Plantinga). The idea is that even if an object is not contained by every possible world, its individual nature is; however, that individual nature is instantiated only in some worlds, namely those where it is appropriate to say that the respective object exists.[35] This view largely mirrors the necessitist approach, but talk of necessarily existing but only contingently concrete objects gets replaced with talk of necessarily existing but only contingently instantiated individual natures. Rigid Necessitation then comes down to the following thesis: for any x and y, if x ontologically depends on y then necessarily, if x's individual nature is instantiated then y's individual nature is instantiated.

Finally, one could combine fixed domains of quantification with Rigid and Generic Necessitation by adopting a kind of context-insensitive counterpart theory. In a nutshell, unrestricted quantifiers range over the totality of all possible worlds, and *de re* modal statements are interpreted in terms of world-bound objects bearing counterpart relations to

Rigid Necessitation as follows: for any x with concreteness status C and y with a concreteness status C*, if x ontologically depends on y then necessarily, if x has C then y has C*. *Mutatis mutandis* for Generic Necessitation. (Note that contemporary necessitists do not identify 'nonconcrete' and 'abstract'.)

[35] This view is inspired by Alvin Plantinga, *The Nature of Necessity* (Oxford: Clarendon Press, 1974) and has first been formulated (though not endorsed) by Karen Bennett, "Proxy 'Actualism'," *Philosophical Studies*, CXXIX, 2 (2006), 263–94. But as Bennett points out, it is not Plantinga's own view. Plantinga does posit individual natures, but the elements of his domains of quantification are their instances rather than these natures themselves. Thus, Plantinga's quantifiers are variable-domain rather than fixed-domain. Bennett's modified version, in which the elements of the domain are the individual natures themselves, is what she dubs the "Linsky-Zaltafied" version of Plantinga's view.

objects in other possible worlds. This much is familiar from the work of David Lewis[36] (those who shy away from embracing his modal realism can instead think of counterparts as abstract representations rather than full-fledged objects). However, Lewis's own treatment of *de re* modal claims was context-sensitive: objects can have the same property necessarily and contingently relative to the counterpart relation specified. Such treatment of *de re* modality is alien to the thinking of most theorists of ontological dependendece, but fortunately a handy fix is available. Laurie Paul offered a context-insensitive version of counterpart theory according to which objects have their necessary properties necessarily in virtue of their counterparts being represented as having those properties in every possible world, but the counterpart relation is invariant across contexts.[37] In defending this view, Paul accounts for the shiftiness of our modal intuitions by endorsing a plenitude ontology of objects: our intuition regarding whether Queen Elizabeth necessarily stems from a particular sperm and egg is unstable because there is an object (Elizabeth$_1$) each counterpart of which is represented as originating from the same sperm and egg and an overlapping object (Elizabeth$_2$) that has counterparts represented as originating from a different sperm and egg, and our use of the name 'Elizabeth' is indeterminate between them. Thus on Paul's context-invariant counterpart theory, Rigid Necessitation gets reinterpreted as the following non-trivial principle: for any x and y, if x ontologically depends on y then in any possible world w in which x has a counterpart, y has a counterpart too. Likewise for Generic Necessitation.

There may be further strategies; by briefly presenting these ones, my goal has been to show that even philosophers with an antecedent commitment to fixed-domain quantifiers can make sense of Rigid and Generic Necessitation without trivializing them. All they need

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[36] *On the Plurality of Worlds* (Cambridge: Blackwell, 1986)

[37] "The context of essence," *Australasian Journal of Philosophy*, LXXXII, 1 (2004): 170–84

to do is find the right interpretation of 'exists'. Depending on one's preferred fixed-domain strategy, ontological dependence may have consequences for the dependee object's concreteness status, the instantiation of its individual nature or the presence of a counterpart of it in other possible worlds. Either way, ontological dependence has modal consequences that are relevantly analogous to face-value readings of Rigid and Generic Necessitation.

II.2. The Inclusion/Feature Constraint. As Koslicki has observed, *bona fide* cases of ontological dependence appear to fall into either of two categories.[38] The first includes cases of what she calls 'constituency,' where the dependent thing is a compound of the entities it depends on. Complex events and propositions, sets, and certain structured wholes (for example molecules) belong here: they ontologically depend on the entities they are made up of. Instead of 'constituency' (which sounds confusingly similar to 'constitution'), I will refer to the first group of cases of *inclusion*. Many instances of ontological dependence feature what I will call "inclusive relations": the dependent entity includes the entities it depends on as components of some sort.

Can we say anything more precise? Although Koslicki does not give a detailed positive characterization of inclusion, she warns us not to construe it along mereological lines.[39] Sets, for example, plausibly depend on their members but do not have them as parts; and one might make similar claims about the relation between structured propositions and their components or properties and their bundles. Now, one could argue here that there is room to treat all cases as instances of proper parthood; we just need to accept a kind of mereological pluralism flexible enough to accommodate relata of diverse ontological

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[38] "Varieties of Ontological Dependnece," *op. cit.*

[39] *Ibid.*, at p. 204, n17

categories.[40] Adherents of such a pluralist view can understand inclusive relations simply as relations of proper parthood, where 'proper parthood' is used in the broadest possible sense to refer to a category-neutral relation that comes in several species, perhaps each obeying a different set of mereological principles. Those of a more conservative theoretical bent can still explain inclusion by piggybacking on the pluralist's notion of proper parthood: a relation is inclusive, they could say, just in case it is either (i) proper parthood (in the traditional sense in which it is a relation restricted to material objects) or (ii) one of the relations that *mereological pluralists* (mistakenly, from these theorists' point of view) consider species of proper parthood, such as propositional containment, property-bundling, and so on.

The previous paragraph's last sentence ends with the phrase 'and so on'. This is because it is impossible to give a complete list of inclusive relations without making controversial assumptions about the nature of propositions, the ontology of properties, and other substantive issues in metaphysics. Fortunately, for my present purposes we do not need to. This is because the variety of ways in which a relation could be inclusive is limited by what kinds of things it can take as relata, and there is near-universal consensus that the relata of constitution are concrete material things. This rules out more exotic inclusive relations, such as set membership or property-bundling, and leaves only one salient option on the table: if constitution is inclusive, it is a special case of proper parthood (in the sense restricted to material things).[41]

I hope to have said enough to clarify the notion of inclusion at issue. However, Koslicki also argues that many other instances of ontological dependence do not fit the inclusion

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[40] Cf. Kit Fine, "Towards a Theory of Part," *Journal of Philosophy*, CVII, 11 (2010): 559–89.

[41] I will relax this assumption when discussing Harbecke's account of constitution in section 4.2, which construes the relation as one between sets and material objects.

model. Tropes, boundaries and holes are often thought to depend on their "hosts" or "bearers" but are not made up of them. For this reason, Koslicki distinguishes a second type of ontological dependence, which she calls "feature-dependence": tropes, boundaries and holes are *features of* what they depend on. Feature-dependence arguably involves "superficial" entities we tend not to think of as things in their own right. As in the case of inclusion, Koslicki does not give a precise characterization of what it takes for something to be feature-dependent; nor will I try to do so here. Instead, I will use the following heuristic: when y is feature-dependent on x, it is appropriate to say that y is "the y of x". This heuristic yields the right result for the core cases (boundaries, holes and tropes are boundaries, holes and tropes *of* their bearers), and I will rely on it in what follows.

Koslicki is a pluralist, but we do not have to follow her in that regard in order to appreciate that all cases of ontological dependence appear to involve either inclusion of feature-dependence. Call this the *Inclusion/Feature Constraint* (henceforth I will use 'I' and 'F' as predicates for inclusion and feature-characterization, respectively):

(*Inclusion/Feature Constraint*) $\forall x \forall y \, [(Dxy \rightarrow (Ixy \vee Fxy)]$

In words: for any x and y, if x ontologically depends on y then x either includes y as a component or characterizes y. Although it is plausible to think that *both* the Modal Constraint and the Inclusion/Feature Constraint are true, the argument I will make in the next few sections requires only a much weaker assumption, which I will call the

(*Disjunctive Constraint*)

If x ontologically depends on y, then

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a) x and y satisfy the Modal Constraint or

b) x includes y as a component or

c) x characterizes y

Or more formally:

$$\forall x \forall y \; \{Dxy \rightarrow [\Box(Ex \rightarrow Ey) \lor \exists \Psi \; (\Psi y \; \& \; \Box(Ex \rightarrow \exists z \; \Psi z)) \lor Ixy \lor Fxy]\}$$

It should be evident how weak the Disjunctive Constraint is: all it demands is that each instance of ontological dependence satisfy at least *one* of the previously specified constraints. Still, one might wonder whether even this disjunctive condition demands too much from ontological dependence.[42] After all, constitution is an asymmetric relation that entails but is not entailed by spatiotemporal coincidence. Coincidence is symmetric, but (one might think) there are plenty of asymmetric conditions other than b), c) and a) (assuming in this last case that the modal constraint does not hold symmetrically) which, combined with coincidence, yield an asymmetric of relation. My answer is that to get CLDQ we need more than just an account of the asymmetry of constitution: we need an account of why constitution is an asymmetric *dependence* relation. Defining a constitution-like relation so as to ensure its asymmetry is easy[43]: any asymmetric relation combined with coincidence could do the job. Let's say, for example, that x *schmepends* on y if x spatiotemporally coincides with y and the first letter of the English word for x comes before the first letter of the English word for y in

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[42] Thanks to an anonymous referee for forcefully pressing this concern.

[43] Although some, most notably Wasserman ("The Constitution Question," *op. cit.*), deny that it is possible in the case of constitution.

the Latin alphabet. Schmependence is obviously not a kind of dependence, although it is assuredly an asymmetric relation. Now, of course, extant accounts of constitution do not fail as spectacularly at capturing a notion of dependence as does schmependence. But as we will see in section 4, they are problematic for similar reasons: although they impose the desired asymmetry of constitution via metaphysical relations rather than the alphabetic order of the relata's names, they do not thereby establish that constitution is an asymmetric dependence relation.

Constitution may be an asymmetric relation without being an asymmetric *dependence* relation. To also qualify as the latter, it needs to bear at least one of the commonly accepted marks of dependence: it needs to have one of the modal profiles assigned to dependence relations *or* be an inclusion relation *or* be a feature-characterizing relation. Which is to say, it needs to satisfy the Disjunctive Constraint; nothing else and nothing less will do.

III. TESTING CONSTITUTION AGAINST THE DIAGNOSTICS: NARROWING DOWN THE OPTIONS

If constitution is a dependence relation, each instance of it satisfies at least one clause of the Disjunctive Constraint. Fortunately, we can simplify the task of evaluating which theories of constitution satisfy this constraint by ruling out most logically possible ways they could do so.

First, constitution never satisfies Rigid Necessitation. This is obvious from one of the standard motivations for constitution: constituted objects are mereologically more flexible than mere sums. While sums are usually thought to be set-like in having their parts necessarily, the objects they constitute can gradually undergo even a complete change of parts. Constituted objects are also mereologically flexible *across possible worlds*: it is possible for a constituted object to exist without its actual constituter ever having existed, contrary to

Rigid Necessitation.

One might think constitution still obeys Generic Necessitation: surely constituted objects require the existence of *some sum or other*. While this may be true of sums, it does not generalize to other possible constituters. For example, according to the constitution theory of persons, human persons are contingently constituted by organisms but could have been constituted by detached cerebra.[44] Moreover, it is hard to find a broader kind of thing human persons are necessarily constituted by. For example, it is far from clear why we would even need to be constituted by biological tissue instead of, say, robots.[45]

One does not have to accept this example to be convinced that constitution does not always come with generic necessitation. When an object is constituted by something other than a mereological sum, it often is not true of any particular kind that necessarily if the constituted object exists then so does an object of *that* kind. For example, an art installation might be constituted by a shoe but could have been constituted by an entirely different kind of object. Jeremy Bentham's auto-icon used to be constituted by Bentham's dead body, but its head has been replaced by a wax replica and in an alternative history the auto-icon could have entirely stopped being constituted by organic material. Cases like these could be multiplied; in none of them is there any kind to which the actual constituter belongs and an instance of which has to exist for the constituted object to exist.

Since all instances of constitution violate Rigid Necessitation and at least some violate Generic Necessitation, for constitution to be a dependence relation, the latter instances need to satisfy the Inclusion/Feature Constraint: if constituted objects ontologically depend on

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[44] See Sydney Shoemaker, "Self, Body and Coincidence," *Proceedings of the Aristotelian Society*, Supplementary Volume LXXIII, 1 (1999): 287–306 and Baker, "Persons and Bodies," *op. cit.*, Chs. 4–5.

[45] Baker ("Persons and Bodies," *op. cit.*, at p. 113) explicitly allows for the possibility of inorganic persons.

their constituters, they either characterize or include these constituters. We can quickly rule out the former: constituted objects are not features of their constituters. It is incorrect to say that a statue is the statue *of* its constituent lump or that a person is a person *of* its organism. Constituted objects are material objects, which are not the kind of "second rate" denizens of reality that boundaries, hosts or tropes are often thought to be.[46]

This narrows down our options to b): if constitution is a dependence relation, constituted objects include their constituters as components. And so long as constitution is a relation between objects or between an object and its matter, the kind of inclusion at issue should be proper parthood (in the narrow sense restricted to material objects). But as I will show in the next section, the notion that constituted objects include their constituters is much harder to substantiate than usually thought.

IV. THE INCLUSION CONSTRAINT VS. ACCOUNTS OF CONSTITUTION

If constitution is a dependence relation, those instances that violate Generic Necessitation have to satisfy the Inclusion Constraint. Do they? Below I will focus on the broader question of whether constitution in general satisfies the Inclusion Constraint. This will do no harm, since everything I will say carries over to the special case of constitution-without-Generic Necessitation.

Whether constitution implies inclusion hangs on what constitution is. Up to this point it was possible to postpone the issue, but now we have to address it head-on. This section will divide into two parts, in which I will discuss broadly modal and broadly mereological (but non-hylomorphist) accounts of constitution, respectively. This division is somewhat

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[46] Cf. Dean W. Zimmerman, "Theories of Masses and Problems of Constitution," *Philosophical Review*, CIV, 1 (1995): 53–110, at pp. 91–92.

arbitrary; as we will see, some accounts involve both modal and mereological elements. Still, the grouping is intuitive, and either way it plays no role in my argument.

IV.1. Broadly modal accounts of constitution. The earliest modal account of constitution is the Destruction Account, which was proposed by Frederick Doepke[47] and further developed by Peter Simons. The following formulation is based on Simons':

> (*Destruction Account*) *x* constitutes *y* iff
>
> (D1) *x* materially coincides with *y*,
>
> (D2) *x* could survive *y*'s total destruction[48]

Both phrases require explanation. Simons' own phrasing is that "*x* could be a substratum of *y*'s total destruction".[49] It is clear from the context that by 'substratum' he means something like "that which would remain", not substratum ("bare particular") in the strict metaphysical sense. With this, Simons intends to convey two separate conditions. The first one is that *x* could survive *y*'s "total destruction", where what counts as total is context-dependent; for a thing to be totally destroyed it is neither necessary nor sufficient for all of its proper parts to be destroyed. For example, a stone wall survives complete replacement of its proper parts but is completely destroyed by laying out its composing stones on the ground.[50] The second idea is that in some sense, *x* and *y* coincide. For our present purposes, by this we can mean

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[47] "Spatially Coinciding Objects," *Ratio*, XXIV (1982: 45–60)

[48] I am omitting Simons's time indices.

[49] Simons, *Parts*, *op. cit.*, at p. 238

[50] *Ibid.*, at pp. 239–40

complete sharing of proper parts.[51] More precisely, using 'N' for coincidence and 'PP' for proper parthood, we can define coincidence as follows:

$$\forall x \forall y\ [Nxy \leftrightarrow \forall z(PPzx \leftrightarrow PPzy)]$$

In words: for any objects x and y, x coincides with y iff any proper part of x is a proper part of y and vice versa (this also implies that identity is a special case of coincidence). Simons's Destruction Account gives us no reason to think that constitution satisfies the Inclusion Constraint. The only inclusion-like relation it requires between constituted objects and their constituters is material coincidence, which (as defined above) is symmetric and therefore does not count as inclusion in the intended sense. What I am interested in is whether the relation between constituted objects and their constituters satisfies the Disjunctive Constraint *via* the Inclusion Constraint, and no symmetric relation can ensure that it does. Now, to be fair, according to Doepke's own version of the view constituted objects do not coincide with their constituters in the sense defined above; although they have a common decomposition into the same parts, Doepke maintains that constituted objects have proper parts their constituters lack (for example I am constituted by a mass of matter that does not have my heart as a part). But to streamline the discussion, I will put this complication to the side for the time being. Since E.J. Lowe made a similar kind of mereological asymmetry

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[51] Wasserman, "The Constitution Question," *op. cit.*, at p. 700. Another common definition is in terms of complete sharing of parts. But that definition implies that coincident objects have each other as improper parts (since each object has itself as an improper part), and I prefer to stay neutral about that (for the moment at least). Either way, those who believe in coincidence are committed to rejecting the extensionalist commitment that complete part-sharing suffices for numerical identity.

central to his definition of constitution and his account is more fully developed, it will be more convenient to return to this issue in section 4.2 when discussing Lowe's account.

Doepke later adopted a different account in terms of non-causal explanation. As Doepke himself did not give a precise statement of this account, I will rely on Wasserman's reconstruction of it and will replace Doepke's own mereological condition with a simpler coincidence clause (this is harmless, for the reasons explained above):

> (*Explanatory Account*) *x* constitutes *y* iff
>
> (E1) *x* materially coincides with *y*,
>
> (E2) *x* is accidentally F,
>
> (E3) *x*'s being F explains the existence and persistence conditions of *y*[52]

The Explanatory Account no more helps classify constitution as dependence relations *via* inclusion than does the Destruction Account, since their merelogical clause is the same. One might think, however, that E3 could help here. After all, the explanation of the existence and persistence conditions of *y* in terms of *x*'s being F is the kind of explanation metaphysicians invoke these days with 'grounding', 'in virtue of' and similar locutions. Moreover, grounding and ontological dependence are both hierarchical structuring relations. So, one might think, perhaps all along we should have counted something like grounding or metaphysical

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[52] I am omitting Wasserman's indices. I understand E1 in line with the above definition of coincidence. By 'accidentally' I simply mean 'contingently'; that is, E2 says Fx & ~□Fx. For Doepke's own formulation, see *The Kinds of Things: A Theory of Personal Identity Based on Transcendental Arguments* (Chicago: Open Court, 1996), at p. 201. See also Noël B. Saenz "A grounding solution to the grounding problem," *Philosophical Studies*, CLXXII, 8 (2015), 2193–2214, at p. 2211 for an account similar in spirit to Doepke's Explanatory Account.

explanation as a diagnostic tool for discovering ontological dependence, not the Disjunctive Constraint.

Tempting as this line of thought may be, it is misguided. While some authors frequently use 'grounding' and 'dependence' interchangeably in informal contexts, this is simply a mistake; explanation and dependence are orthogonal notions. First, ontological dependence is not sufficient for explanation, not least because the former is a category-neutral notion, while the latter is restricted to facts or propositions. Second, and more importantly, ontological dependence also is not necessary for metaphysical explanation. There is no reason to expect that explananda would automatically depend on their explanantia in any interesting sense. Causal and non-causal overdetermination are cases in point: a multiply realizable going-on O is explained by but does not depend on any going-on (or its kind) $G_i \in \{G_1 \ldots G_n\}$, yet each of $G_1 \ldots G_n$ is an individually sufficient determiner of O. While it might feel natural to speak of grounding/explanation and dependence in the same breath, this can only lead to confusion, and it is no accident that they are treated separately in the specialized literatures. So, the Explanatory Account gives us no reason to categorize constitution as a dependence relation.[53]

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[53] That grounding, and determination in general, is not simply the converse of ontological dependence (or some restricted version of it) is now starting to be acknowledged more widely: see Tahko and Lowe, "Ontological Dependence," *op. cit.*, §5; Lina Jansson, "Explanatory Asymmetries, Ground, and Ontological Dependence," *Erkenntnis*, LXXXII, 1 (2017), 17–44; Kerry McKenzie, "Structuralism in the Idiom of Determination," forthcoming in the *British Journal for the Philosophy of Science*, §5.1; and my own "The Deflationary Theory of Ontological Dependence," *Philosophical Quarterly*, LXVIII, 272 (2018), 481–502, at pp. 481–2. By drawing the distinction I am not ruling out all conceptual connections between grounding and dependence; see, for instance, Correia, *Existential Dependence and Cognate Notions*, *op. cit.*, at p. 66 and Benjamin Schnieder, "Grounding and Dependence," forthcoming in *Synthese*, §3 and §5.1.

I have left to last an influential modal account by Lynne Baker. The account underwent a number of changes in the face of counterexamples to earlier formulations, but each version relies on two technical expressions. 'Primary kind property F of x' refers to the most specific kind property that x has and which determines its persistence conditions; following Baker, I will use 'F*x' as short for 'x has F as its primary kind property'. I will also use the shorthand 'Cu$^F x$' for 'x is in F-favorable circumstances', which for Baker means that x is in an environment that allows it to have F. 'E' is used for the existence predicate, 'S' for spatiotemporal coincidence and 'B' for being of a certain basic kind of stuff. Below, then, is a definition of constitution that closely follows Baker's (as before, I am omitting time variables):

(*Kinds Account*) $\forall x \forall y$ (C$xy \leftrightarrow$

(K1) F*x & G*y &

(K2) Sxy & $\forall z$ [(Szx & G*z) $\rightarrow z = y$)] &

(K3) Cu$^G x$ &

(K4) $\Box \forall z$ [(F*z & Cu$^G z$) $\rightarrow \exists v$(G*v & Szv)] &

(K5) $\Diamond$ [Ex & ~$\exists v$(G*v & Svx)] &

(K6) B$x \rightarrow$ By)[54]

This is a complicated definition, but it is easy to notice that it does not yield a notion of constitution that satisfies the Inclusion Constraint. In fact, it is even further from that goal than the previous definitions, since K2 requires *spatial* rather than mereological coincidence.

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[54] Lynne R. Baker, *The Metaphysics of Everyday Life: An Essay in Practical Realism* (Cambridge: Cambridge University Press, 2007), p. 161

Baker considers this a virtue, since in her view constitution is entirely independent from mereology. Of course, given the plausible assumption that the mereological structure of objects is isomorphic to the structure of the space they occupy, K2 still entails that constituted objects mereologically coincide with their constituters. Still, nothing in Baker's definition gives us the kind of asymmetry that would make constitution satisfy the Inclusion Constraint; beside spatial coincidence, all that K2 requires of a constituted object y is that it be the only object of its primary kind constituted by x at the time. This does not specify any sense in which constituted objects *include* their constituters but in which the constituters do not include what they constitute. Thus, by the Kinds Account constitution does not satisfy the Inclusion Constraint and consequently the Disjunctive Constraint.

This closes my discussion of broadly modal accounts of constitution. None of these accounts justifies classifying constitution as a dependence relation. As we saw in section 3, the only way constitution could gain entry into our catalogue of dependence relations is by satisfying condition c) of the Disjunctive Constraint, that is, by constituted objects asymmetrically including their constituters in some sense (more precisely: at least those instances that violate Generic Necessitation would need to satisfy this constraint). But broadly modal accounts attempt to locate the asymmetry as modal or explanatory. And these sorts of asymmetries are simply not the right ones if we are looking for a relation that satisfies the Inclusion Constraint. In the next section, I will investigate whether non-hylomorphist mereological accounts do any better.

IV.2. Non-hylomorphist mereological accounts of constitution. Arguably the most well-known mereological account of constitution is J.J. Thomson's, and goes as follows (modulo time indices, which I am omitting):

(*Mutual Parthood Account*) *x* constitutes *y* iff

(M1) *x* and *y* are parts of each other,

(M2) *x* has some of its parts necessarily, but *y* has none of *x*'s parts necessarily, but

(M3) not vice versa[55]

The Mutual Parthood Account explicitly denies the antisymmetry of parthood, according to which $\forall x \forall y$ [(P*xy* & P*yx*) → *x*=*y*], that is, if *x* and *y* are parts of each other then *x*=*y* (here and throughout I use 'P' for 'is a part of'). While perhaps this makes the material coincidence of *x* and *y* easier to make sense of, it does not license the intuition that *y* ontologically depends on *x*. Just like in the previous cases, the mereological relation between *x* and *y* is symmetric; the intuitive asymmetry of constitution is imposed by M2 and M3, which are modal conditions (and the wrong kinds of modal conditions to make constitution satisfy the Modal Constraint).

It could be objected that M2 *does* bring with itself a kind of mereological asymmetry.[56] After all, constitutionally related objects stand in a mereological relation and there is a salient modal asymmetry between them. Couldn't we then define up a mereological relation that holds between them asymmetrically? For example, the constituting object *x* bears the

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[55] Cf. J.J. Thomson, "The Statue and the Clay," *Noûs*, XXXII, 2 (1998), 149–173, at p. 157. A more formal statement goes as follows: $\forall x \forall y$ {C*xy* ↔

(M1) P*xy* & P*yx* &

(M2) $\exists z$ {P*zx* & □ (E*x* → P*zx*) & $\forall v$[P*vz* → ◊ (E*y* & ~P*vy*)]} &

(M3) ~ {$\exists z$[P*zy* & □ (E*y* → P*zy*) & $\forall v$((P*vz* → ◊ (E*x* & ~P*vx*))]}}

This definition is equivalent to Thomson's except for its omission of time variables.

[56] Thanks to a referee for raising a similar worry. Similar objections could be leveled against some of the above-discussed attempts to locate the asymmetry, and my response to them is similar to my response to this one.

relation of *having more of x's parts necessarily* to the constituted object *y*. This relation is both asymmetric and, in a salient sense, mereological – couldn't it qualify as a kind of inclusion? I do not think so, for the same reason schmependence (as defined at the end of section 2) does not qualify as a kind of dependence. The mere presence of an asymmetry between some mereologically related objects does not make for an asymmetric mereological relation between them in the sense required by the Inclusion Constraint. Inclusion, as I characterized it, is proper parthood in the broadest possible sense, that is, in the sense assumed (again, perhaps mistakenly) by mereological pluralists. This includes a lot more than proper parthood between material objects (I mentioned propositional containment and property-bundling as examples) but is still not liberal enough to include M2. Imposing an extra modal condition on improper parthood does not yield a relation that qualifies as a salient notion of proper parthood even by the lights of the most permissive mereological pluralists. I conclude that the Mutual Parthood Account does no better than the previously considered views in rendering constitution a dependence relation.

The remaining two accounts I shall consider abandon modal notions altogether and attempt to capture the asymmetric nature of constitution entirely in terms of inclusive relations. Below I will discuss an influential proposal by E.J. Lowe. But before that, it will be instructive to discuss a similar account by Jens Harbecke, since (for reasons that will be clear later) Lowe's account can be seen as a natural fix in response to a serious problem with Harbecke's. The following formulation closely follows Harbecke's:

(*Simple Parthood Account*) $\forall x \forall y \{Cxy \leftrightarrow [\forall z (Pzy \rightarrow z \in x) \ \& \sim x{=}y]\}$

In words: an object *x* constitutes another object *y* just in case they are numerically distinct

and every part of y is an element of x.[57] This formulation stands in need of clarification. Unusually among constitution theorists, Harbecke thinks that constitution cannot be a relation between singular objects or between a piece of matter and an object; instead, it holds between a "set or collection […] of parts" and an object.[58] Although Harbecke seems undecided between sets and collections in his informal exposition, his formal definition (which explicitly uses the 'member of' relation) suggests that he thinks of constitution as a relation that takes a set as its first relatum and a material object as its second relatum (note that on the plausible assumption that material objects are not sets, this makes redundant the requirement that the constituter and the constituted be distinct).

There are two worries about this way of construing the constitution relation. The more immediate one is that it is extensionally inadequate. Despite disagreement on particular cases, there is broad consensus in the literature that constitution is a relation between concrete material things, that is, objects or pieces of matter – not a relation between a set and a material object. But even setting the category of the relata aside, the Simple Parthood Account is too liberal in what it classifies as cases of constitution. It implies, for example, that the set of all my parts (one of which is my ear) constitutes my ear. After all, since my ear is a part of me and parthood is transitive, every part of my ear is a member of the set of all my parts; thus, the first condition is satisfied. Moreover, my ear is not identical to the set of all my parts; thus, the second condition is satisfied too. Surely, though, my ear is not

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[57] "Is Mechanistic Constitution a Version of Material Constitution?," in Ken Aizawa and Carl Gillett, eds., *Scientific Composition and Metaphysical Grounding* (London: Palgrave-Macmillan, 2016), pp. 91–121, at p. 108. Harbecke also adds a third criterion requiring that both the constituted and the constituting object *exist*, which I will ignore in what follows (and have all along been implicitly treating as trivially a condition of all putative definitions of constitution).

[58] *Ibid.*, 106

constituted by the set of all my parts.

Now, to be fair, 'constitution' is a technical term of art and philosophers have some wiggle room in how they wish to use it. But even if we put aside the worries about extensional adequacy, we face another problem: on Harbecke's definition constituted objects do not include their constituters in any useful sense. If anything, the opposite is true: since everything is a part of itself and according to the Simple Parthood Account any part of a constituted object is a member of the set that constitutes it, it follows that *constituted objects themselves* are members of the set that constitutes them. So, constituted objects are included by their constituters, rather than including them. This means that on this account, too, constitution violates the Inclusion Constraint and cannot qualify as a dependence relation by way of satisfying it.

These problems stem from two sources. One is Harbecke's idiosyncratic view of constitution as a relation between a set and an object. The other is his misconstrual of the mereological asymmetry between the constituter and the constituted: to put it roughly, he thinks that the constituter includes all there is to the constituted object and some more, whereas intuitively it should be the other way round. E.J. Lowe's mereological account (which, to be clear, predates Harbecke's) is an improvement on both scores. It uses proper parthood (rather than just parthood) in the definiens and stipulates an extra condition of spatiotemporal coincidence. It goes as follows (modulo time variables, which I am omitting):

(Proper Parthood Account) $\forall x \forall y$ [$Cxy \leftrightarrow$

(P1) Sxy &

(P2) $\forall z$ ($PPzx \rightarrow PPzy$) &

(P3) $\sim\forall z\,(\mathrm{PP}zy \rightarrow \mathrm{PP}zx)]$[59]

Informally, Lowe's definition requires that constituted objects be spatially coincident and that every proper part of the constituter also be a proper part of the constituted object, but not vice versa. This definition *does* establish a mereological asymmetry between an object and its constituter with the intuitively right direction: there is "more to" the constituted object than its constituter. For example, a lump that constitutes the statue has various metal pieces as proper parts, and these are also proper parts of the statue; by contrast, the statue's head or arms are not proper parts of the constituting lump (although the smaller pieces that constitute them are). We earlier saw that Doepke's original version of the Destruction Account contained a similar asymmetry, so if Lowe's Proper Parthood Account can help classify constitution as a dependence relation, so can Doepke's.

This raises the question of whether constituted objects include their constituters as proper parts according to the Proper Parthood Account. The answer is 'No'. For take an object (Statue) constituted by another object (Lump). Suppose for *reductio* that Lump is a proper part of Statue. According to the principle of Weak Supplementation, whenever some x is a proper part of some y, there has to be a z that is also a proper part of y and is disjoint from x (where 'disjoint from' can be understood as 'sharing no part with'). More precisely:

(WS) $\forall x\forall y\,\{\mathrm{PP}xy \rightarrow \exists z\,[\mathrm{PP}zy\,\&\,\sim\exists v\,(\mathrm{PP}vz\,\&\,\mathrm{PP}vx)]\}$

Applying WS to the case at hand, if Statue has Lump as a proper part it also has another proper part disjoint from Lump. But it is unclear what that proper part could be. By clause

[59] *A Survey in Metaphysics* (Oxford: Oxford University Press, 2002), at p. 73

P1, Statue spatiotemporally coincides with Lump. Although spatiotemporal coincidence does not imply mereological coincidence in the strict sense of Statue and Lump sharing *all* their parts, it does plausibly imply that there are some things (for example atoms and molecules) such that they jointly compose Lump and each part of Statue overlaps at least one of them. If that is the case, Statue does not have any part disjoint from Lump. Indeed, the parts that according to Lowe the statue has but its constituting lump does not (the statue's arm, head, and so on.) still overlap the lump. Therefore, no proper part of a constituted object is disjoint from its constituter, contrary to WS. Thus, given WS, we can rule out our starting assumption that Lump was a proper part of Statue. If the Proper Parts Account is true, it is not the case that if *x* constitutes *y* then it is a proper part of *y*. Since (material) proper parthood is the only viable way constitution could satisfy the Inclusion Constraint, the Proper Parts Account does not allow us to classify constitution as a dependence relation via that constraint.

At the time of proposing the Proper Parthood Account, Lowe himself accepted Weak Supplementation and accordingly thought that constituted objects had their constituters *neither as proper nor as improper parts*. One might therefore find it natural to abandon WS in order to be able to say that constituted objects do include their constituters as proper parts. Lowe did exactly that in a revision of his earlier account, where he renounced his commitment to WS.[60] But this is a steep price to pay. I am inclined to think that proper

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[60] In "Mereological Extensionality, Supplementation, and Material Constitution", *Monist*, XCVI, 1 (2013): 131–148, at p. 146 Lowe amends his original definition of constitution with the following condition: *x* and *y* do not stand in the relation defined by P1–P3 to a third object, *z*. In effect, this amendment implies that nothing can be simultaneously constituted by multiple objects. Given the standard examples of constitution, this seems like a bad result: on the constitution view of persons people are constituted by human animals, but they are also

parthood (at least between material objects) obeys Weak Supplementation as a matter of conceptual truth: the principle captures the deep-seated intuition that if x is a proper part of material object y, then there is "more to" y than x, and that x's removal from y leaves a "remainder". Once we deny this, we lose our grip on what it means for a material object to have proper parts.

Obviously, this will not convince those who reject WS for theoretical reasons, nor is this the place to try to persuade them.[61] But in what follows I will presuppose WS without argument, and those who are willing to give it up should feel free to read the rest of the paper as defending the following weaker conclusion: if constitution is a dependence relation, then *either* a mereological form of hylomorphism is true or WS is false.

V. MEREOLOGICAL HYLOMORPHISM

Broadly speaking, hylomorphism is the view that ordinary objects are matter-form compounds. This still leaves room for a number of different views along at least two different axes. First, opinions differ about what forms are: universals, particulars, or entities of a sui generis category that straddles this distinction? Second, there are different views on the relation between a compound's matter and form. The two most salient options, which I will focus on here, are predication (the form of a matter-form compound is predicable of the matter of that compound) and parthood (matter-form compounds have forms as their

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constituted by mereological sums. I will not spend more time on this difficulty, though, since this fourth condition is independent of Lowe's rejection of WS.

[61] See Aaron Cotnoir, "Strange Parts: The Metaphysics of Non-classical Mereologies," *Philosophy Compass*, VIII, 9 (2013): 834–845 for an overview of non-classical mereologies and a discussion of the analytic status (or otherwise) of Weak Supplementation.

parts).[62]

For our present purposes, the important question is the latter one, namely, what the relation is between forms and matter-form compounds. Various considerations may inform our choice here, but in the present paper I am only interested in one: which version of hylomorphism can be used to give an account of constitution that allows us to classify it as a dependence relation? Note that it is one thing to be a hylomorphist and quite another to give a hylomorphist definition of constitution. For example, one might think that we should use the concepts of matter and form to *replace* the notion of constitution with something more serviceable that plays roughly the same theoretical roles.[63] This is a defensible approach, but not one that addresses the main question of this paper.

Hylomorphists with an interest in analyzing constitution typically say that constituted objects should be conceived of as matter-form compounds and their constituters as their matter.[64] If so, the relation between the two could be used to analyze constitution. On the predicational view, this turns out to be the relation between a piece of matter, stripped of the

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[62] Much of the forthcoming discussion, including the taxonomy, is indebted to Kathrin Koslicki (p.c.).

[63] Sattig (*The Double Lives of Objects*, *op. cit.*, Chs. 1–2) takes this approach, although he defends a highly deflationary form of hylomorphism.

[64] For views along these lines, see Kit Fine, "Acts, Events and Things," in *Proceedings of the Sixth International Wittgenstein Symposium: Language and Ontology*, Vienna: Holder-Pichler-Tempsky, 97–105, "Things and Their Parts," *op. cit.*, and "Coincidence and Form," *Proceedings of the Aristotelian Society*, Supp. Vol. LXXXII, 1 (2008), 269–90; Johnston, "Hylomorphism," *op. cit.*; and Koslicki, *The Structure of Objects* and *Form, Matter, Substance*, *op. cit.*

form, and the same piece of matter with the form predicated of it.[65] Notwithstanding the potential advantages of such a view, it does not justify calling constitution a dependence relation, since it does not make the relation satisfy the Inclusion/Feature constraint. First, the matter-form compound is not a *feature* of its constituent matter in the sense of characterizing it. To be sure, the *form itself* may be thought of as a feature of the matter (the form is the form *of* the matter it is predicable of). But that is not what's needed to make constitution a dependence relation, since constitution is not the relation the matter bears to the form; it is the relation the matter bears to the matter-form compound. However, it is not appropriate to say that a matter-form compound is the matter-form compound *of* some matter: even if forms are predicable kinds of things, matter-form compounds themselves are not. Second, the matter-form compound does not strictly speaking *include* the matter. If it did, then given WS it would need to have a further proper part, but the only salient candidate for that is the form, which according to the predicational view is not a proper part of hylomorphic compounds. Now, to be sure, similarly to Lowe some hylomorphists reject WS in response.[66] But for the reasons mentioned above, I do not think this is an acceptable answer. Again, I will not argue for the point here: if you think that dropping WS should not be off the table, you should read me as arguing that for those who want to recognize constitution as a dependence relation, the only alternative to the rejection of WS is to recognize both the matter and the form of a hylomorphic whole among its parts.

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[65] See, for example, Michael J. Loux, "Aristotle on Form, Matter, and Ontological Strategy," *Ancient Philosophy*, XXV, 1 (2005), 81–123. According to Johnston ("Hylomorphism," *op. cit.*), forms are structural relations plurally predicable of the parts of a hylomorphic compound.

[66] See Johnston, "Hylomorphism," *op. cit.* In "Response to Kathrin Koslicki," *dialectica*, LXI, 1 (2007), 161–6, Fine also rejects WS, though for different reasons.

This brings me to mereological hylomorphism. The best-developed version of this view is found in Kathrin Koslicki's work, who defines constitution as follows:

(*Mereological Hylomorphist Account of Constitution*) Some objects, $m_1 \ldots m_n$, constitute an object O iff

(H1) $m_1, \ldots, m_n$ are material parts of O

(H2) There are some forms, $f_1 \ldots f_n$, which set the constraints under which they, along with some material parts, compose an object

(H3) $m_1, \ldots, m_n$ satisfy the constraints set by $f_1, \ldots, f_n$[67]

This view is somewhat unorthodox in that it characterizes constitution as a many-one relation between material parts and the whole they are material parts of. Those who think that constitution is strictly a one-one relation can simply define it as a special case of the relation specified by the Mereological Hylomorphist Account, namely the one where $m_1 = m_2 = \ldots = m_n$. Either way, on this account constituting objects are proper parts of the objects they constitute, thereby satisfying the Inclusion Constraint.

That the Mereological Hylomorphist Account satisfies the Inclusion Constraint certainly removes an *obstacle* from constitution qualifying as a dependence relation, but it does not by itself imply that it is in fact a dependence relation. After all, I put forth the Disjunctive Constraint as a merely necessary condition of ontological dependence. Moreover, Koslicki does not say that constitution is a dependence relation, and some hylomorphists explicitly

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[67] "The Structure of Objects," *op. cit.*, at p. 185

say things that appear to imply that it is not.[68] To adjudicate this question we need something stronger than the Disjunctive Constraint. Below I will describe two substantive accounts of ontological dependence, each of which implies that constitution is a dependence relation. While I cannot defend either account in detail, I will give some reason to take them seriously.

First, one could accept a kind of *deflationary pluralism* about ontological dependence. Such views are pluralistic in so far as they recognize several species of the relation, but they are also deflationary because they identify these species with familiar metaphysical relations that can themselves be understood without the idioms of dependence. A simple version of deflationary pluralism would take each clause of the Disjunctive Constraint to correspond to a species of ontological dependence, that is, each of rigid necessitation, generic necessitation, characterization (in the sense at issue in the Feature Constraint) and inclusion would itself be a type of ontological dependence. While it is difficult to find explicit endorsements of this view, the idea that composition is itself a kind of ontological dependence is a recurring theme in contemporary metaphysics, possibly driven by the intuition that "we enjoy a direct grasp on the nature of composition […] that makes a compositional approach to world-

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[68] Hylomorphism often comes as part of a general neo-Aristotelian package deal, part of which is the notion that ordinary objects are *substances*. Combined with the popular view that substances are ontologically independent, it follows that if constituted objects are substances then constitution cannot be a dependence relation. On the other hand, Koslicki rejects the independence criterion of substancehood (*Form, Matter, Substance*, *op. cit.*, Ch. 6) and is at least open to the idea that constituted objects ontologically depend on their constituent matter (*Ibid.*, at p. 163), though she is more agnostic about this than about the parallel thesis that they depend on their form.

building superior to any other approach".[69] If composition is itself a type of ontological dependence and constituted objects are (in part) composed of their constituters, as the Mereological Hylomorphist Account has it, it follows that constitution, too, is a dependence relation.

I prefer a different view, which also takes as its starting point the general idea that composition is a kind of dependence but maintains that it is not a kind of *ontological* dependence.[70] According to this view, which I call "Dependence Deflationism", ontological dependence is something like a "weighted total" of certain non-ontological kinds of dependence: an entity x ontologically depends on another entity y just in case x bears sufficiently many non-ontological kinds of dependence relations to y and y does not bear too many to x. According to my preferred version of the view, the non-ontological types of dependence in question are asymmetric rigid necessitation, asymmetric generic necessitation, and "inclusion" in the sense circumscribed earlier (what counts as "sufficiently many" and "too many" are left unspecified because I take the concept of ontological dependence to be both context-sensitive and semantically vague). On this view, too, given the Mereological Hylomorphist Account it is plausible that constituted objects ontologically depend on their constituters. The constituter bears the proper parthood relation to the constituted object; the constituted object does not bear any non-ontological type of dependence (neither Rigid nor Generic Necessitation) to the constituter; and so, the weighted total of (non-ontological)

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[69] L.A. Paul, "Building up the world from its fundamental constituents," *Philosophical Studies*, CLVIII, 2 (2012), 221–56, at p. 222. See also Jaegwon Kim, "Explanatory Knowledge and Metaphysical Dependence," *Philosophical Issues*, V (1994): 51–69, at p. 67; Earl Conee and Theodore Sider, *Riddles of Existence: A Guided Tour of Metaphysics* (Oxford: Clarendon Press, 2005), p. 68; and Alexander Skiles "Against Grounding Necessitarianism," *Erkenntnis*, LXXX, 4 (2015), 717–51, at p. 721.

[70] "The Deflationary Theory of Ontological Dependence," *op. cit.*

dependence relations favors the ontological dependence of the constituted object on its constituter.

These views share an important advantage. As I pointed out, modal and broadly inclusive relations are frequently used as sources of *evidence* for the presence and direction of ontological dependence.[71] A simple explanation and justification of this practice is that these relations bear conceptual links to ontological dependence either by themselves being species of the relation (in line with Deflationary Pluralism) or by figuring in the weighted total that determines the direction of ontological dependence (as Dependence Deflationism has it). While this is not a conclusive argument for accepting one of these views, it gives us a strong reason to at least take them seriously.[72]

This being said, endorsing either view would be a substantially stronger commitment than the fairly uncontroversial Disjunctive Constraint. Proponents of CLDQ who are unwilling to make this further commitment will have to find another way of bridging the gap between the Mereological Hylomorphist Account of constitution and the thesis that constitution is a dependence relation. All I have attempted to show in the last few paragraphs is that there are defensible theories of ontological dependence, which, in conjunction with Mereological Hylomorphism, allow us to infer this thesis. There may well be other accounts that could fill this role. Would-be proponents of CLDQ who shy away from going deflationary should read the foregoing discussion as an invitation to supply their own.

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[71] *Ibid.*, at pp. 497–8

[72] In fact I also defended a stronger claim: Dependence Deflationism gives better justice to the evidential weight of modal and inclusive relations in evaluating hypotheses about ontological dependence. However, for my present purposes we can stay neutral about this stronger claim.

I started this paper with the intuitive and widely endorsed thesis that constitution is a dependence relation. To assess the plausibility of this thesis, I took a closer look at what its truth would require and adopted the Disjunctive Constraint as a minimal condition that any dependence relation has to satisfy. Then I went over a number of non-hylomorphist accounts of constitution and argued that on most of them, constitution does not satisfy the Disjunctive Constraint. So on these accounts even if constitution might superficially strike us as a dependence relation, in fact it is not.

Those who want to classify constitution as a dependence relation ought to adopt a kind of mereological hylomorphism. I do not wish to pretend that this is the last word on the issue. Lowe's revised version of the Proper Parthood Account, as well as certain non-mereological hylomorphist views, might license the claim that constitution is a dependence relation at the cost of giving up Weak Supplementation. While I cannot in advance rule out further alternative views that could render constitution a dependence relation, the literature on the relation is already extensive enough to make the prospects of such an account relatively dim.

Where does this leave us? While constitution is widely considered a dependence relation, it is surprisingly difficult to provide a precise characterization of the notion that justifies this intuition, and Mereological Hylomorphism may well be the only account that helps us justify it. But I leave it up to the reader what to make of this result. Some may think that it gives us ample reason to endorse Mereological Hylomorphism. Those initially hostile to hylomorphist views might simply accept the conclusion that constitution is not a dependence relation. Yet others might want to go as far as rejecting Weak Supplementation

to save the intuition that constitution is a dependence relation. Either way, I take myself to have shown something interesting. It should not be simply *assumed* that constitution is a dependence relation, and we should especially not assume this in advance of having an account of what constitution exactly *is*.

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