What is an ersatz part?

A/Prof Kristie Miller

The Centre for Time and

Department of Philosophy

The University of Sydney

Mr Johann Hariman

Department of Philosophy

The University of Michigan

Keywords:

Mereology

Composition

Extended Simples

Compositional Nihilism

Ersatz Parts

**Abstract**

This paper develops four proposals for explicating the notion of an ersatz part. It then evaluates each proposal with respect to a number of jobs for which ersatz parts are posited. We argue that each of the four notions of ersatz parthood do better with respect to some jobs, and worse with respect to others. Thus, we think, it’s horses for courses: which notion of ersatz part one chooses will be sensitive to which metaphysical project one is pursuing.

**1. Introduction**

Ersatz parts are generally posited to do certain jobs within a particular metaphysical system when appeal to proper metaphysical parts (that is, what are usually known simply as *proper* *parts*) is not possible. Suppose you think there is a possible world in which a mereological simple is extended along three spatial dimensions. This object is what we are inclined to call statue-shaped. Call it ESS: extended simple statue. ESS seems to have arms, legs and a head. It also seems to have different properties at different locations: it is qualitatively heterogenous.[[1]](#footnote-1) We are inclined to say that ESS has pink arms and white feet. Yet ESS does not have arms, if what it takes to have an arm is for there to exist an object, which is an arm, and for that arm to be a proper part of ESS. How are we to make sense of these intuitions regarding ESS and how are we to understand assertions about ESS that quantify over non-existent parts? Furthermore, how are we to make sense of the variation of properties across ESS, given that we cannot explain said variation in terms of the properties of ESS’s parts? [[2]](#footnote-2)

If you think that extended simples are possible, then you likely think the world just described is possible, and that these questions need answers.

Now let us suppose that there is possible world in which there exist some xs, but the xs do not compose anything. Suppose, further, that we all talk about this world *as if* there is a composite object, y, composed of the xs, and that many of us judge that there is such an object. Notice that if one is a mereological universalist who takes universalism to be necessarily true one will deny that any such world is possible: then the problem that we are about to articulate does not arise. One will, however, suppose such a world to be possible if either one is a mereological universalist who takes universalism to be a contingent truth,[[3]](#footnote-3) if one is a mereological nihilist, or if one is a mereological restrictivist. Why would one find it plausible that in *some* such world we will talk as if there is a composite object, composed of the xs, and that many of us will judge that there is such an object even though there is not? Well, suppose one is a mereological restrictivist. Then one should surely grant that we are at least *sometimes* wrong about when composition occurs, or weaker still, that it is *possible* that we are wrong about when composition occurs.[[4]](#footnote-4) Then there will be a world in which it mistakenly seems to us that some xs compose a y, and thus in which we judge that there exists a composite, y, and in which we talk as though there exists a composite, y, even though there does not. Or suppose one is a mereological nihilist. Then one should certainly think that there are possible xs which fail to compose something, such that we talk as though they do: for that is, according to the nihilist, the actual world. Moreover, many of us are inclined to judge that (for some xs) those xs compose something; but if nihilism is true, they do not. Of course, the nihilist thinks we are wrong in so judging. But nevertheless, she must concede that many of us are inclined to judge that composition occurs when, according to her, it does not.

If one supposes such a world to be possible, how is one to make sense of assertions that quantify over some object, y, that does not exist?[[5]](#footnote-5) How are to explain away our resilient intuitions that the xs compose something? If you think such a world is possible, then you think these questions require answers.[[6]](#footnote-6)

One way to answer these questions is to appeal to the ideas of ersatz composition and ersatz parts. Thus, one might suggest, there is no object, an arm, that is a proper part of ESS; but ESS has an ersatz part that is arm-shaped. Then one can offer truth conditions, or at the very least, assertibility conditions, for ordinary claims such as ‘ESS has a part that is arm-shaped’ by appealing to ersatz parts. Likewise, though the xs do not compose a y, there is an ersatz composite ‘y’, which has ersatz parts. Then we can offer truth conditions, or at the very least, assertibility conditions, for talk about ‘y’ by appealing to ersatz composition.

Relatively little attention has been given to elucidating what is meant by ‘ersatz part’, and none at all to the idea of ersatz composition. This paper remedies that lacuna. We begin, in section 2, by outlining some of the jobs to which ersatz parts have, or might be, put, and explain how, in broad brushstrokes, it is envisaged they will do these jobs. In section 3 we lay out four different accounts of ersatz parthood and the associated notion of ersatz composition. Then in section 4 we consider which of the various jobs each of these accounts is best equipped to fill.

We conclude that there is no single notion of ersatz parthood that best does all of the jobs. Thus which notion one chooses will be sensitive to the metaphysical project in which one is engaged: it will be sensitive to whether one has employment vacancies for all of the jobs in question, and if so, how one weights the importance of the different jobs.

**2. Why Ersatz Parts?**

In what follows we lay out two principles. The first we call NDP—the necessitarian decomposition principle, and the second we call NCP—the necessitarian composition principle. Rejecting either of these principles leaves one with explanatory burdens that may motivate one to posit ersatz parts.

First, some terminology: in what follows, talk of objects will always be talk of concrete objects unless it is stated otherwise. Then we suppose that X is a *proper* *metaphysical part* of O iff (a) X is an object and (b) there are some xs such that O is composed of the xs, and X is one of the xs.[[7]](#footnote-7) (Note that we are taking composition to be different from mereological fusion in that the objects that compose a whole must be non-overlapping.) We suppose that O occupies R iff there is no sub-region of R at which O is not located. That is, O exists at every point in R, though perhaps O exists at points outside of R. O exactly occupies R iff (a) O occupies R and (b) No region that O occupies is disjoint from R. If O exactly occupies R, then none of O exists outside of R, and none of R is such that it is free from O.

Then:

**NDP:** Necessarily, any spatially extended object, O, that exactly occupies region R, is such that for any proper sub-region, R\*, of R, O has a proper metaphysical part that exactly occupies R\*.

**NCP:** Necessarily, for any arbitrary set, S, all of whose members are concrete objects, there is an object, y, composed of the members of S.

Those who accept the possibility of extended simples reject NDP. But one might reject NDP for other reasons. One might wish to avoid the paradox of undetached parts[[8]](#footnote-8) or to defend a “common-sense” view of proper parthood. If one thinks NDP is false then one will likely think there is a possible object such that we have the *mistaken* intuition that the object has a proper metaphysical part exactly located at some region, R. Why so? Well if NDP is false then there are very many possible objects such that for each of them, there is *some* sub-region each occupies, which is not exactly occupied by a proper metaphysical part of the object. But why is it likely that for at least some of these possible objects, we mistakenly suppose there to be a metaphysical part exactly located at the relevant sub-region? Well, first, and most obviously, those who think there are possible extended simples think that those who deny this possibility make exactly this mistake. Second, and more generally, if it is plausible that we are sometimes wrong about when composition occurs, then it ought equally to be plausible that we are sometimes wrong about when (and in what manner) *decomposition* occurs (on the assumption that NDP is false). While we might typically be good at tracking whether, and where, an object has proper metaphysical parts, we should surely grant that it is at least possible that are wrong about this. But then we should expect that for *some* possible object we will mistakenly suppose that object to have a metaphysical part exactly occupying some sub-region occupied by the object, where no such part exists. We need to explain away such mistakes. Call this the job of *explaining away mistaken mereological intuitions.*

Or suppose one thinks there is a possible object, O, that is red at region R, and green at region R\*, such that there is no proper part of O that exactly occupies R and no proper part that exactly occupies R\*. The one incurs the burden of *explaining property variation across heterogeneous objects.*

Finally, those who reject NDP must provide either truth or assertibility conditions for claims that quantify, or appear to quantify, over (non-existent) metaphysical parts.

Now consider those who reject NCP thus holding that there are, possibly, some objects, the xs, that do not compose anything. Those who reject NCP also face the burden of *explaining away mistaken mereological intuitions.* For there will surely be possible cases in which we are mistaken in thinking that the xs compose something. Moreover, if one is a necessitarian mereological nihilist one must explain why it seems to many as though worlds containing some gunky object[[9]](#footnote-9) are possible when they are not.[[10]](#footnote-10)

Those who reject the NCP also share the burden of *providing truth or assertibility conditions* for certain ordinary, apparently true, claims that quantify over non-existent composite objects.

We have thus far outlined three explanatory burdens:

1. The job of *explaining away mistaken mereological intuitions.*
2. The job of *explaining property variation across heterogeneous objects.*
3. The job of *providing truth or assertibility conditions* for certain claims.

Rejecting NDP incurs all three burdens; rejecting NCP incurs (1) and (3). How, exactly, to discharge the burdens of (1) and (3) will depend on which of NDP, NCP, (or both) one rejects.

In what follows we offer a highly schematic outline of how positing ersatz parts and ersatz composition might allow one to do jobs (1) to (3). We then propose four different accounts of ersatz parthood and evaluate how each does with respect to these jobs.

Consider (1) as it arises for those who reject NDP. How can we explain a mistaken belief that an extended object has a proper metaphysical part that exactly occupies region R? We can suggest that the worrisome object has an ersatz, but not a metaphysical, part that exactly occupies R. Our mistaken intuition can be explained away by noting that we sometimes mistake ersatz parts for metaphysical parts (Markosian 1998) and that not every ersatz part corresponds to a metaphysical part. Whether this is plausible will depend, in large part, on what ersatz parts are, that we may mistake them for metaphysical parts.

Now consider (1) as it arises for those who reject NCP. With the notion of an ersatz part under our belts we can define up *ersatz composition.* We can thensuggest that we sometimes mistake a possible world in which there are ersatz composites for a world in which there are metaphysical composites. Moreover, the necessitarian nihilist can suggest that we mistake the genuine possibility of worlds in which there is some ersatz composite which is such that each of its ersatz parts has a proper ersatz part, for worlds in which some metaphysical composite is that each of its metaphysical parts has some metaphysical proper part, thus explaining why we mistakenly suppose worlds containing gunky objects are possible.

Now consider (2). Ersatz parts will meet this burden if an object’s having heterogeneous properties can be explained by appealing to the homogeneous properties of some of its proper ersatz parts.

Finally, consider (3). One can appeal to ersatz parts to provide truth (or assertibility) conditions for claims that quantify, or appear to quantify, over non-existent objects. There is a range of different semantic theses one might endorse. One possibility is that folk talk is ambiguous between referring to metaphysical parts and ersatz parts, and that either is a sufficiently good deserver to vindicate folk talk. Or perhaps folk intend to pick out ersatz parts with phrases such as ‘P is part of O’ and thus that such talk is straightforwardly true. Or perhaps the folk intend to pick out ersatz parts when they utter ‘P is part of O’ iff there is no metaphysical part to be the candidate referent of ‘P’ Any of these three proposals will vindicate ordinary talk as true. Alternatively, perhaps the folk intend to pick out metaphysical parts by their talk of parts. Then one might hold that in some cases ordinary talk is strictly speaking false, but it is assertible if there exists some relevant ersatz part. We will, by and large, try and remain neutral between these views since they can all deploy very similar truth or assertibility conditions for ordinary claims. If one rejects NDP one can hold that a claim, C, that quantifies over a part, P, is true (or assertible) if, roughly, (i) there is no metaphysical part that is a candidate to be the referent of ‘P’ and (ii) substituting into C the name of some appropriate ersatz part, ‘C\*’ for ‘P’ results in a true claim. The same sorts of options present themselves if one rejects NCP.[[11]](#footnote-11) Here, then, one can say that a claim, C, that quantifies over a composite, O, is true, (or assertible) if, roughly, (i) there is no metaphysical composite that is a candidate to be the referent of ‘O’ and (ii) substituting in the name of some appropriate ersatz composite, ‘C#” for ‘O’ results in a true claim.

Now the question arises: what are ersatz parts such that they can fill one or more of these job descriptions?

**3. What is an ersatz part?**

Recall that X is a *proper* *metaphysical part* of O iff (a) X is an object and (b) there are some xs such that O is composed of the xs and X is one of the xs. Call clause (a) the *ontological clause,* since it tells us that there exists an X that is a concrete object. Call clause (b) the *relational clause*, since it posits some particular relationship between X and O: namely that O is composed of some objects, of which X is one.

Since ersatz parts are supposed to play some, but not all, of the role of metaphysical parts, it is natural to conceive of them as failing to meet either the existential or the relational clause. Those who suppose that ersatz parts fail to meet the relational clause suppose that they are concrete objects that enter into a relationship with a whole, O, but where the ersatz part is not one of the concrete objects of which that whole is composed. We call views of this kind *part minimalist.*

Those who suppose that ersatz parts fail to meet the ontological clause hold that the relationship between a ersatz part and whole is one of parthood (understood in some appropriate manner) but suppose that ersatz parts are not concrete objects and hence not metaphysical parts. We call these views *ontically minimalist*

One way to characterise the difference between ontic minimalism and part minimalism is in terms of another widely discussed principle: the doctrine of arbitrary undetached parts (DAUP).

**DAUP:** For every material object M, if R is the region of space occupied by M at time *t*, and if sub-R is *any* occupiable sub-region of R *whatever*, there exists a material object that occupies the region sub-R at *t*. (Van Inwagen 1981, 123).

While those who reject the ontological clause must reject DAUP, those who reject the relational clause might accept DAUP. For DAUP is silent on *which* relationship holds between an object that occupies a region, R, and any object that occupies a sub-region of R. It is consistent with accepting DAUP that the latter are not metaphysical parts of the former. We consider each of these kinds of views in turn.

**3.1 Ontic Minimalism about Ersatz Parts**

According to Markosian, metaphysical parts are genuine objects that genuinely compose objects. By contrast, ersatz parts

…may or may not be genuine objects, but … correspond to the sub-regions of the region of space occupied by an object, along with the matter, or stuff, that fills those sub-regions’ (Markosian 1998, 16).

The suggestion is that ersatz parts correspond to ersatz divisions and that some ersatz divisions do not correspond to metaphysical divisions and thus to metaphysical parts. This view denies the ontological clause: it holds that, for at least some object, O, that exactly occupies R, there is no object, O\*, that exactly occupies sub-region R\* of R. *A fortiori* there is no proper metaphysical part of O that exactly occupies R\*.

The notion of an ersatz division is not further explicated so we must attempt it for ourselves. Consider some object, O, such that (a) O exactly occupies R, and (b) R has occupied points. Consider the set, S, whose members are every occupied point in R. Then we will say that the set of all of the non-empty sub-sets of S—the power set of S minus the empty set—is the set of every possible ersatz division of O.[[12]](#footnote-12)

Second, the definition appeals to occupied points. Different accounts of ersatz parts will have different views about what it is that occupies some, or all, points. We will refer to any point-sized *object* as ‘an Ox’ and use the plural referring expression ‘the Oxs’ to pick out some Oxs.[[13]](#footnote-13) We use ‘the Px’ to pick out any *point-sized piece of matter, portion of stuff*[[14]](#footnote-14), *trope*[[15]](#footnote-15), or *property-at-a–location* and use the plural referring expression ‘the Pxs’ to pick out some Pxs. We use ‘the Gx’ to pick out whatever it is that occupies a point—whether an Ox or a Px—and use the plural referring expression ‘the Gxs’ to pick out some Gxs. We assume that, necessarily, if composition occurs, it obtains between an object and some Oxs

Recall that ontic minimalists reject the ontological clause. They hold that although (let us suppose) no object exactly occupies R\* nevertheless O has an ersatz part, C, that exactly occupies R\*. There are two ways to understand this claim. The first is to hold that C is an abstract object. Then since C is not a concrete object it is not a *metaphysical* part of O. Call this view *abstract ontic minimalism.* The second option is to hold that although claims such as ‘C is a ersatz part of O’ are true, this is because ‘C’ is a plural referring expression that picks out some Gxs. Call this view *eliminative ontic minimalism*.

Eliminative ontic minimalism appeals to plural quantification, and holds that syntactically singular terms such as ‘C’, are in fact plural referring expressions that pick out some Gxs. The eliminative minimalist thinks that:

**C is an ersatz part of O** =df (i) There exists an object, O and (ii) O exactly occupies R and (iii) there exist some Gxs and (iv) each Gx occupies a point in R and (v) ‘C’ is a plural referring expression that picks out some of the Gxs.

Eliminative ontic minimalism is a thesis about what makes true, claims such as, ‘C is an ersatz part of O.’ What is the mereological status of ersatz parts on such a view? One possibility is that composition is not identity: composition is a generative, or building relation[[16]](#footnote-16) such that the Oxs jointly compose Oy, and Oy is not identical to the Oxs (taken jointly). Then ersatz parts are not, themselves, composites, for talk of ersatz parts is just talk of some Gxs. Alternatively, one might hold that composition *is* identity.[[17]](#footnote-17) Then the eliminative minimalist can say that ‘C’, which picks out an ersatz part, is co-referential with some plural referring term ‘the Gxs’. C is identical to the Gxs (taken jointly). The many is the one. On this latter version of eliminative minimalism one can define ersatz parthood as follows:

**C is a ersatz part of O** =df (i) There exist an object, O and (ii) O exactly occupies R and (iii) there exist some Gxs and (iv) each Gx occupies a point in R and (v) C=the Gxs.

We wish to remain neutral about which is the best way to understand eliminative ontic minimalism, so henceforth will continue to use the phrase ‘‘C’ is a plural referring expression for the Gxs’ rather than ‘C=the Gxs’. We do not think anything hangs on this.

We have thus far couched the definitions in terms of Gxs; for it is consistent with eliminative minimalism that it is Pxs or Oxs that occupy the points in R. But if it is Oxs that do so, then O has at least some metaphysical parts—each Ox. That is consistent with there being a sub-region of R, R\*, exactly occupied by an ersatz, but not a metaphysical, part of O. Given that eliminative minimalism rejects the ontological clause, that will be so only if the Oxs that jointly occupy R\* do not compose an object, O\*, that exactly occupies R\*. Thus if at least sometimes the Gxs are Oxs, the eliminative minimalist must reject NCP: she must hold that possibly, the xs do not compose a y.

Moreover, if the Gxs are Oxs then O cannot be an extended simple (since it has each Ox as a part). Thus although there is a version of eliminative minimalism that remains neutral about what occupies the points in R, the most robust version of the view will hold that what occupies each point is a Px. The resulting view is more robust since it does not require adopting ancillary views about composition (NCP) and is consistent with there being extended simples that have ersatz parts. Further definitions will thus be couched in terms of points being occupied by Pxs, but the reader can translate that talk into talk of Gxs or Oxs if she sees fit.

Since we want ersatz parts to play some of the roles played by metaphysical parts we want to be able to define the notions of proper parthood, overlap, underlap, being disjoint from, and so forth as they pertain to ersatz parts. We will not attempt to offer all of these definitions, but we offer just a few to show how the eliminative ontic minimalist will do so. Where C and C\* are arbitrary ersatz parts:

**C exactly occupies R**\* =df (i) there are some Pxs and (ii) every one of the Pxs occupies some (point-sized) region of R\* and (iii) no one of the Pxs occupies some region that is disjoint from R\* and (iv) C=the Pxs.

**C\* is a proper ersatz part of C** =df (i) there are some Pxs and (ii) there are some Pys (iii) C\*=the Pxs and (iv) C=the Pys (v) every one of the Pxs is one of the Pys and (iv) there is some Py that is not one of the Pxs.

**C\* overlaps C** =df (i) there are some Pxs and (ii) there are some Pys and (iii) C\*=the Pxs and (iv) C=the Pys and (v) at least one of Pxs is one of the Pys.

Let us now turn to abstract ontic minimalism. Since this is the view that ersatz parts are abstract objects we think it natural to construe it as the view that ersatz parts are sets. Specifically, O’s ersatz parts are sets of occupied points: they are the sets each of which is a member of the set that is every possible ersatz division of O. We can define ersatz parthood as follows:

**C is a ersatz part of O** =df (i) There exists an object, O and (ii) O exactly occupies region, R, and (iii) the Gxs jointly occupy R and (iv) C is a set and (v) every member of C is identical to one of the Gxs.

The abstract ontic minimalist can, like the eliminative minimalist, remain neutral regarding what it is that occupies the points in R. Once again, though, the same considerations apply: if the Gxs are Oxs then O cannot be an extended simple, and it cannot be that the Oxs compose some further object, Oy. Thus, once more, we assume that what occupies the points in R are Pxs since this affords us the most robust version of abstract minimalism. As before, we offer a short list of definitions for key terms as offered by the abstract minimalist. Where C and C\* are arbitrary ersatz parts:

**C\* is a ersatz part of C** =df Every member of C\* is a member of C.

**C\* overlaps C** =df Some member of C\* is a member of C.

**C\* is a proper ersatz part of C** =df Every member of C\* is a member of C, and some member of C is not a member of C\*.

**C and C\* are disjoint** =df No member of C is a member of C\*.

So far we have considered two strategies for explicating ontic minimalism. There is, however, another option. There is a class of views that accept the ontological clause but reject the relational clause. They hold that ersatz parts are concrete objects, but reject the contention that they are *metaphysical* *parts*. We call such views *part minimalist*.

**3.2 Part Minimalism about Ersatz Parts**

While the ontic minimalist holds that one of the relata of metaphysical parthood is missing where we have mere ersatz parthood—namely a concrete object—the part minimalist holds that although both relata are present, the relation of metaphysical parthood fails to be instantiated. Instead some other relation—ersatz parthood—is instantiated. Very roughly then, consider two objects, O1 and O2. O1 exactly occupies R1, and O2 exactly occupies R2, and R1 and R2 are disjoint. Now consider a proper sub-region of R1, R1\*. Some object, O1\* exactly occupies R1\*. Likewise, there is some object O2\* that exactly occupies R2\*, a proper sub-region of R2. It is natural to suppose that O1\* is a proper metaphysical part of O1 and that O2\* is a proper metaphysical part of O2. But according to part minimalists, for all we have said so far, it could be that one (or both) of O1\* and O2\* fail to be proper *metaphysical* parts of O1 and O2 (respectively), but rather, that one, or both, is a proper ersatz part of O1 and O2 (respectively). But, one might wonder, how could that be, and, on the assumption that, say, O1\* is a proper metaphysical part of O1, but O2\* is merely an ersatz part of O2, in what does that difference consist?

Let’s take a step back. We might say that O1 occupies a region, R1, *in virtue of* the existence of some Gxs at R1. How should we think of this in virtue of? The most natural way is in terms of composition. Why does O1 occupy R1? Because the Gxs jointly occupy R1 and the Gxs *compose* O1. Why does O1 occupy R1\*, some proper sub-region of O1? Because there are some Gys, which jointly occupy R1\*, and these Gys *compose* O1\*, and O1\* is a proper metaphysical part of O1. We find O1 in R1\*, because it has a proper *metaphysical* part that occupies R1\*. What makes for metaphysical parthood obtaining between O1 and O1\*, then, is that the Gxs compose O1, and the Gys compose O1\*, and the Gys are a sub-set of the Gxs. Or, as we might say, the in-virtue-of in question is *compositional*.

Now consider O2 and O2\*. Here, the part minimalist might suggest that the in-virtue-of will not be cashed out in terms of composition. Moreover, she might suggest we should already be happy to acknowledge that there are instances of in-virtue-of relations just like this. Consider an extended simple, S, that exactly occupies region R. It is natural to say that it does so in virtue of the existence of the Gxs that jointly occupy R. But it is not the case that those Gxs compose some object, and that object is S: none of the Gxs is a proper metaphysical part of S, so the sense in which S occupies R in virtue of the Gxs is not the sense in which any of the Gxs is a part of S. Perhaps, instead, the in-virtue-of in such cases is a kind of non-compositional grounding relation.[[18]](#footnote-18) It is because of the existence of the Gxs, and their distribution, that S exists where it does, with the properties it has: but not because the Gxs compose S. We wish to remain neutral about exactly the best way of understanding the nature of this non-compositional in virtue of relation. The point is that the part minimalist will suppose there to be such a relation. Given that there is, let us return to consider O2 and O2\*. The part minimalist can hold that O2 occupies R2 in virtue of the Gxs being such that they jointly occupy R2, and O2\* occupies R2\* in virtue of the Gys being such that they jointly occupy R2\*. But the Gxs do not compose O2, nor do the Gys compose O2\*. O2 and O2\* both occupy R2\*, but this is no case of interpenetration: both O2 and O2\* occupy R2\* in virtue of the very same things, the Gys, jointly occupying R2\*. Each is “made up of” but not composed by, the same things, the Gys, at R2\*. It is clear that in such a case O2\* is not a proper metaphysical part of O2. The suggestion of the part minimalist is that in such a case O2\* is a proper *ersatz* part of O2.

In light of this the part minimalist might hold that there is a more general notion of parthood of which metaphysical and ersatz parthood are two different kinds. The idea, here is that the part minimalist offer a new *analysis* of parthood. Rather than taking the notion to be primitive (as is more usually the case), instead, she would offer an analysis of the notion in terms of locative relations and an in-virtue-of relation. With this analysis of parthood under her belt she can then on go to define metaphysical parts and ersatz parts in terms of this new analysis of parthood. Here, then, is a suggestion for how she might define parthood.[[19]](#footnote-19)

**Parthood**: P is a part of Q iff (i) P is a concrete object and Q is a concrete object and (ii) P occupies regions R1…Rn in virtue of the existence of Gx1…Gxn at those regions and (iii) Q occupies regions R1\*....Rn\* in virtue of the existence of Gy…Gyn at those regions, and (iv) all of the regions occupied by P are regions occupied by Q, and (v) all of the Gxs in virtue of which P occupies the regions it does, are Gys in virtue of which Q occupies (some or all) of the regions it does.[[20]](#footnote-20)

Notice that given this definition of parthood, it is possible for an object, O, to be located at a region, R, in virtue of the existence of some Gxs that jointly occupy R, without it being the case that the Gxs are metaphysical parts of O. Indeed, on this account it is possible for P to be part of Q even though none of the Gys in virtue of which Q occupies the region it does, are metaphysical parts of Q or (metaphysical) parts of P. (Notice that given the definition of ersatz parthood, below, it follows that each of the Gxs are ersatz parts of Q, and each of the Gys are ersatz parts of P). All this very general notion of parthood requires is that if P is a proper part of Q, then there is some region R\* that is a proper sub-region of the region occupies by Q, such that both P and Q occupy that region in virtue of the existence of the very same set of Gys jointly occupying that region. Now, to be sure, this is not the usual notion of parthood with which we are familiar. That is as intended. Rather, the idea is that this is a *very* general notion of which metaphysical and ersatz parthood are kinds. It is the metaphysical parthood relation with which we are most familiar. The part minimalist will say that there is a relation of metaphysical parthood between P and Q just in case P is a part of Q, and the relevant in-virtue-of relations are to be understood in terms of composition. More specifically:

**Metaphysical Parthood:** P is a metaphysical part of Q iff (i) P is a part of Q, and (ii) P exactly occupies region R in virtue of the existence of Ox1…Oxn at each of the sub-regions of R and (iii) P is composed of Ox1…Oxn, and (iv) Q exactly occupies region R\* in virtue of the existence of Ox1\*…Oxn\* at each of the sub-regions of R\* and (v) Q is composed of Ox1\*...Oxn\*.

Metaphysical parthood is a more familiar notion. Returning to the case of O1 and O1\*, we can see why O1\* is a proper metaphysical part of O1: O1 is composed of the Gxs, and O1\* is composed of the Gys, and the Gys are a sub-set of the Gxs, and O1 and O1\* occupy R1\* in virtue of the Gys jointly occupying R1\*.

Turning, now, to ersatz parthood, the part minimalist can hold that there is ersatz parthood where P is part of Q, but the correct way to understand the in-virtue-of relation is not in terms of composition. Without spelling out what relation does hold between P and Q other than that it is not compositional, we can, at least, say the following on behalf of the part minimalist:

**Ersatz Parthood:** P is a ersatz part of Q iff (i) P is a part of Q and (ii) Q occupies region, R, and (iii) P exactly occupies R and (iv) P exactly occupies R in virtue of the existence of the Ox1…Oxn that jointly exactly occupy R and (v) Q occupies R in virtue of the existence of Ox1..Oxn that jointly exactly occupy R and (vi) Q does not occupy R in virtue of being composed of Ox1..Oxn.

Returning to O2 and O2\*, then, we can see why O2\* is an ersatz part of O2, but not a metaphysical part. For O2 and O2\* both occupy R2\* in virtue of the existence of some Gys that jointly occupy R2\*, and it is not the case either that O2 is composed of the Gxs, or that O2\* is composed of the Gys. So by Parthood, and Ersatz Parthood, it follows that O2\* is an ersatz part of O2.

It is worth noticing that the definition of ersatz parthood remains silent on whether P is composed of Ox1..Oxn. (In the example, above, of O1 and O2\*, neither is composed of any of the Gxs). Call the view according to which P is composed of Ox1…Oxn *compositional part minimalism*. No mereological nihilist is a compositional part minimalist. Call the view according to which P is not composed of Px1…Oxn *non-compositional part minimalism*. Only non-compositional part minimalism is consistent with mereological nihilism.

It follows, then, that the part minimalist denies the following principle:

**PRINC**: If an object, O, exactly occupies region R, and there exists an object, O\*, that exactly occupies region R\*, and R\* is a proper sub-region of R, then O\* is a proper metaphysical part of O.

But there is independent reason to be suspicious of PRINC. Suppose one thinks it is possible for there exist to inter-penetrable matter. Let us say that two bits of matter, M and M\* inter-penetrate just in case M and M\* occupy exactly the same space-time points. Suppose region R, is occupied by inter-penetrating matter, such that every point within R is occupied by two numerically distinct point-sized pieces of matter. Let us suppose, for simplicity, that each point is occupied by a piece of matter of kind K, and a piece of matter of kind K\*. Now suppose there is an object, K1, which exactly occupies R and is composed of all of the matter of kind K1, and an object, K1\*, which exactly occupies R\* (a sub-region of R) and is composed of matter of kind K\*. We would not want to say that K1\*, is a proper part of K1. For it is not the case that every piece of matter that is a proper part of K1\*, is a proper part of K1: indeed, no piece of matter that is a proper part of K1\*, is a proper part of K1.

Moreover, the part minimalist can offer a replacement principle to capture the intuitions PRINC was supposed to capture, namely:

**PRINC\***: If an object, O, exactly occupies region R, and there exists an object, O\*, that exactly occupies region R\*, and R\* is a proper sub-region of R, then O\* is a proper part of O.

PRINC\* appeals to the general notion of proper parthood just defined. PRINC\* entails that if O exactly occupies R, and O\* exactly occupies R\*, and R\* is a proper sub-region of R, then either O\* is a proper metaphysical part of O, or if is a proper ersatz part of O. The part minimalist can maintain that this is sufficient to capture the intuitions at issue.

From here, the part minimalist can straightforwardly define the various other mereological notions that involve ersatz parts. We define the notion of an ersatz part being a ersatz part of a ersatz part and leave the rest of the definitions as an exercise for the reader. Where C and C\* are arbitrary ersatz parts:

**C\* is a ersatz part of C** =df (i) C\* is a ersatz part of O and (ii) C is a ersatz part of O and (iii) C\* exactly occupies R and (iv) C occupies R\* and (v) all of the Oxs in virtue of which C\* exactly occupies R are Oxs in virtue of which C occupies R\*.

We have, thus far, outlined four different proposals for understanding what it is to be a ersatz part: abstract ontic minimalism—according to which ersatz parts are abstract objects—eliminative ontic minimalism—according to which talk of some part P, is really talk of some plurality of Gxs compositional part minimalism—according to which ersatz parts are concrete composite objects that fail to bear the relation of metaphysical parthood to the objects of which they are ersatz parts—and non-compositional part minimalism—according to which ersatz parts are concrete objects which are neither composed of objects (the Gys), nor enter into the relation of metaphysical parthood with the objects of which they are ersatz parts. Perhaps there are other ways to characterise ersatz parts but we think these are the most promising.

**4. Ersatz Composition**

So far we have explicated four views about ersatz parthood. For those who deny NCP, however, the burden of explaining why it sometimes seems to us as though there are metaphysical composites when there are not requires more than just an appeal to ersatz parts. One might appeal to ersatz composition to meet this burden. There are two ways to flesh out ersatz composition that bear some structural similarities to our distinction between ontic minimalism and part minimalism. To make the distinction clearer, let us suppose, as before, that composition is a building relation. It takes in certain entities as input, as it were, and generates some further whole of which those things are parts. Then according to one strategy, what distinguishes ersatz composition from metaphysical composition (or composition as we generally know it) is not the nature of the building relation, but rather, its inputs. The relata of ersatz composition are, on this view, ersatz parts rather than metaphysical parts and thus what is generated via the building relation are ersatz composites not metaphysical composites. This view is relevantly like ontic minimalism insofar as it supposes that the relevant relation (composition as opposed to parthood) is the same wherever we have composites, but that what differs between ersatz parts and ersatz composites as opposed to metaphysical parts and metaphysical composites is the nature of the relata.

Such a view is well suited to those who endorse abstract ontic minimalism. For according to abstract ontic minimalists ersatz parts are abstract objects. Thus ersatz composites, on this view, are objects composed of abstract objects. They are, therefore, clearly not metaphysical composites. Thus the abstract ontic minimalist might endorse the following view of ersatz composition:

**AOM:** The xs ersatzly compose y iff = df (i) the xs compose y and (ii) each x is a set, S and (ii) each set, S, is such that every one of its members is a Px.

On this view although the xs compose y, each of the xs is a set whose members are properties-at-locations or tropes (Pxs). Hence that which is composed, y, is not a concrete object and thus not a metaphysical composite.

This is not the only way to think about ersatz composition. Indeed, it is not a way that is amenable to either the part minimalist or the eliminative ontic minimalist. What sets apart ersatz composites from metaphysical composites is that any name for the former picks out a plurality of Pxs, while the latter while the latter are composed of some Oxs. Thus the eliminative ontic minimalist understand ersatz composition as follows:

**EOM:** The xs ersatzly compose y iff = df (i) each x is a Px and (iii) ‘y’ refers to the Pxs, taken jointly.

Finally, the part minimalist must say something different again. Part minimalists, recall, think that ersatz parts just are ordinary concrete objects, it is simply that they fail to enter into the metaphysical parthood relation with some objects with which they occupy the same regions. They cannot, therefore, suppose that ersatz composition is simply composition as we know it, obtaining between different kinds of relata. The part minimalist needs to hold that ersatz composition is an entirely different relation to metaphysical composition which takes in as inputs the same inputs as metaphysical composition—namely concrete objects—but generates ersatz composites rather than metaphysical composites. Given this, the part minimalist will define ersatz composition as follows:

**PM:** The xs ersatzly compose y iff = df (i) every x is a ersatz part of y and (ii) there is no ersatz part of y that does not overlap one of the xs.

Ersatz composites, then, are composites composed entirely of ersatz parts. Since ersatz parts are objects that enter into a parthood relation that is not the metaphysical parthood relation, it follows that ersatz composites are not metaphysical composites. If mereological nihilism is, possibly, false then there are worlds in which ersatz composites exactly occupy the same regions as metaphysical composites. But in worlds in which mereological nihilism is true that is never the case.

With our notions of both an ersatz part and a ersatz composite in hand, we can now evaluate how each of views does with respect to the three jobs.

**5. Evaluating the Proposals**

Recall that there are three jobs we want ersatz parts to do.

1. *Explain away mistaken mereological intuitions.*

2. *Explain property variation across heterogeneous objects*

3. *Provide truth or assertibility conditions*.

We consider each in turn.

**5.1 Explaining away mistaken mereological intuitions**

Suppose one rejects NDP. Then one faces the problem of explaining why it seems as though some possible object, O, has a metaphysical part that exactly occupies some region, R, when O has no such part. Here, we think, the part minimalist is on firmest ground.

The intuition is to be explained away by noting that in such cases ersatz parts are being mistaken for metaphysical parts. Part minimalists can point out that this amounts to mistaking a concrete object that occupies a region but bears no relation of metaphysical parthood to some further object, for a concrete object that occupies a region and does bear a relation of metaphysical parthood to some further object. Since the part minimalist thinks that metaphysical and ersatz parthood are kinds of parthood, and thus that metaphysical parthood is a technical notion, it is plausible that we might mistake one of kind of parthood for another.

What of ontic minimalism? Abstract minimalism seems least well placed. For it is difficult to make the case that one is mistaking an abstract object for a concrete object that enters into parthood relations. The abstract minimalist cannot say that there is an ersatz part that occupies the region at which we mistakenly believe there to exist a metaphysical part. To try and ameliorate this worry we suggest that the abstract minimalist define a notion of *association* and *exact association* as the analogues of occupation and exact occupation. Where ‘R\*’ names an arbitrary region:

**C is associated with R\*** =dfEvery occupied point that is a member of C is a point in R\*.

**C is exactly associated with R\*** =df Every occupied point that is a member of C is a point in R\*, and no point in R\* is not a member of C.

Then although no ersatz part ever exactly occupies a region, ersatz parts are exactly associated with regions. Thus, according to the abstract minimalist, we mistake an ersatz part being associated with some region, for a metaphysical part occupying that region. While this view is perfectly coherent, we think it less straightforward and less explanatory than that offered by the part minimalist.

What of eliminative ontic minimalism? The eliminative ontic minimalist will say that we mistake the fact that some Pxs jointly exactly occupy R, and R is occupied by O, for there being some concrete object that exactly occupies R and is a proper part of O. Is that plausible? It will seem plausible to anyone who rejects NCP. For such a person supposes that we often mistakenly suppose that some xs compose a y. If there is a good explanation for how it is that we mistakenly suppose that the xs compose a y, then we have at least *prima facie* reason to suppose that where we mistake an ersatz part for a metaphysical part we are doing something very similar. Thus, we think, the success of eliminative minimalism in this respect will depend on the extent to which it is able to explain away mistaken intuitions about when metaphysical composition occurs. It is to that task we now turn. If one rejects NCP, by contrast, one might try to explain away this mistaken intuition by suggesting that in such cases one mistakes an ersatz composite for a metaphysical composite.

If one is an ontic minimalist then ersatz composites turn out to be abstract (composite) objects. Thus the abstract ontic minimalist has to suggest that in mistaking ersatz composites for metaphysical composites we mistake an abstract object for a concrete one. That does not seem to us plausible. The eliminative minimalist is, we think, better placed. Now, one might think that when the eliminative minimalist says that we mistake an ersatz composite for a metaphysical composite all she really says is that we mistake a plurality of Pxs for a single concrete object. If that were right, one would suspect that eliminative minimalism offers no greater explanatory power than the mereological nihilist already had. But the eliminative minimalist can say more, if she holds the version of eliminative minimalism that embraces composition as identity. For then she can say that ersatz composition is an identity relation between the many ersatz parts and the ersatz whole. Unlike standard mereological nihilists, then, the eliminative minimalist need not say that we mistake the many for one. For she thinks there is a single composite present: the ersatz composite. It is just that the ersatz composite, the one, is identical to the many Pxs. Thus we mistake one composite for another. That seems a better explanation of our mistake than is otherwise open to those who reject the NCP.

Let us, now, turn to consider how part minimalism fares. We have already seen that compositional part minimalism is inconsistent with mereological nihilism. Does non-compositional part minimalism fare better? Yes. The non-compositional part minimalist agrees that we sometimes mistake ersatz composites for metaphysical composites. For her, though, ersatz composites are concrete objects *ersatzly* composed entirely of ersatz parts. In effect, such objects are extended metaphysical simples (they have no proper metaphysical parts). An appeal to ersatz composition thus affords the non-compositional part minimalist a nice strategy for explaining away another (putatively) mistaken intuition (at least according to necessitarian mereological nihilists): that worlds containing gunky objects are possible. For she can suggest that we mistake a world in which some object is that every one of its ersatz parts has a proper ersatz part, with a world in which some object is such that every one of its metaphysical parts has a proper metaphysical part. More generally, to mistakenly suppose that there exists a gunky world (a world where every objet is gunky) is to mistake a world in which for every extended simple, S, that occupies a region, R, and for every sub-region, R\*, in R, there exists an extended simple, S\*, that exactly occupies R and is an ersatz part of S—a world in which there are extended simples all the way down, related by relations of ersatz parthood—for a world in which every metaphysical composite has a proper metaphysical part. It is relatively easy to see how one might mistake the former for the latter, so the non-compositional part minimalist has a nice way of explaining away our mistaken intuitions about the possibility of gunk.

Despite that, non-compositional part minimalism will not be to everyone’s. Consider a world, *w*, which mereological nihilists typically suppose to be possible: a world in which all simples are point-sized. The ontology of *w* is exhausted by the Oxs. We want to explain why it seems as though some of the Oxs compose a metaphysical composite, y. The suggestion is that the nihilist appeal to ersatz composition: we mistake the existence of an ersatz composite, Cy, for the existence of y. But according to the non-compositional part minimalist Cy is a concrete object that is ersatzly composed of the Oxs: Cy is an extended simple. This contradicts our original assumption that *w’*s ontology is exhausted by the Oxs. In fact if ersatz composition is unrestricted then *w* is a world in which for any arbitrary Oxs, there is some extended simple that has those Oxs as ersatz parts: then *w* is a world with simples “all the way up”. Thus non-compositional part minimalism provides a way to explain away our mistaken intuitions about composition only the assumption not only that there exist extended simples, but also that worlds in which there exist only point-sized (and not extended) simples are impossible.

Here, then, is how things stand. Part minimalism and eliminative minimalism do the best job of explaining away the relevant intuitions if one rejects NDP. Eliminative minimalism and non-compositional part minimalism do best at explaining away the relevant intuitions if one rejects NCP; but the latter view incurs considerably many other costs and thus, on balance, eliminative minimalism comes out ahead. If one rejects NDP and NCP then, at least with respect to the first job, one should endorse eliminative minimalism unless one is independently motivated to accept the picture of mereology and ontology offered by non-compositional part minimalism.

**4.2 Explaining Property Variation**

Suppose that one rejects NDP and explains property variation across an extended object that lacks metaphysical parts, by appealing to ersatz parts. Consider, first, ontic minimalism. Abstract ontic minimalism faces problems analogous to those we outlined in the previous section. If ersatz parts are to fill this job description they need to instantiate properties. But the sorts of properties that sets cannot instantiate are precisely the sorts of properties that we want ersatz parts to be able to instantiate. Here, we think, the abstract minimalist ought to introduce the idea of association:

**C is associated with Property P** =dfThe members of C jointly instantiate P.

Nevertheless, the abstract ontic minimalist has to deny that, for a large range of properties, any ersatz part ever instantiates those properties. Instead, ersatz parts are associated with those properties. Thus the abstract minimalist cannot say that a heterogeneous simple is red at some region in virtue of having an ersatz part that exactly occupies that region and is red. Instead, she must hold that the simple is red at that region in virtue of having an ersatz part that is exactly associated with that region and is associated with redness. This view is not especially simple, nor is it clear what explanatory benefit is accrued by appealing to ersatz parts.

We think eliminative ontic minimalism fares better. The eliminative minimalist can simply say that the left hand side of the simple is red because there is an ersatz part, EP, that exactly occupies that region and is red. Since ‘EP, just picks out the plurality of Pxs that jointly exactly occupy the region in question its redness is determined by the properties of each of the Pxs in a perfectly straightforward manner.

Part minimalists can tell much the same story. Suppose S is a heterogeneous simple that is red at region R. Part minimalists will point out that this is because S has an ersatz part that exactly occupies R and is red. S has the properties it does in virtue of the existence of its most basic ersatz parts—the Oxs—that jointly exactly occupy the region exactly occupied by S.[[21]](#footnote-21)

How, then, do matters stand with respect to job two? We think that eliminative ontic minimalism and either version of part minimalism are equally well placed to fill the second job.

**4.3 Providing Truth or Assertibility Conditions**

One can appeal to ersatz parts to provide truth (or assertibility) conditions for certain everyday claims that seem to be true, but which also seem to quantify over non-existent objects. Which ordinary claims are problematic depends on whether one rejects NDP, NCP, or both. Suppose one rejects NDP. Then consider an ordinary claim of the form ‘P is part of O’ which seems both assertible and true. Suppose that O has no metaphysical parts. One option is to hold that claims of this form are true if P is an ersatz part of O. Here, the thought is, everyday talk was only ever about ersatz parts, and only in the metaphysics room do we make claims about metaphysical parts. Thus ‘P is part of O’ is straightforwardly true since it expresses the true proposition ‘P is a ersatz part of O’. The second option is to concede that ‘P is part of O’ expresses the proposition ‘P is a metaphysical part of O’ and is therefore strictly speaking false. But ‘P is part of O’ is assertible in ordinary discourse just in case a closely related proposition, namely, ‘P is a ersatz part of O’, is true. Abstracting away from the details of either proposal, those who reject NDP can say that any sentence in ordinary discourse that quantifies over parts is either true, or is false but assertible, iff replacing ‘part’ in that sentence with ‘ersatz part’ yields a true sentence.

Now suppose that one rejects NCP. Consider sentences such as ‘there is a dog over there’. Suppose over there are located some xs, and those xs do not compose anything. Then perhaps ‘the dog’ picks out a ersatz composite. Since the nihilist can agree that there exists an ersatz composite located over there, she can agree that ‘there exists a dog over there’ is true. Alternatively, perhaps she thinks that ‘the dog’ picks out a metaphysical composite if it picks out anything. Then she thinks that ‘there is a dog over there’ is strictly speaking false. But, she can maintain, it is assertible just in case there is a ersatz composite located over there, and that ersatz composite has certain dog-like properties. In general, those who reject NCP can say that sentences that quantify over some composite, C, are either true, or are false but assertible, if, when we replace ‘C’ with the name of a ersatz composite, C\*, we generate a true sentence.

Our four views do not, however, do equally well with respect to providing said truth, or assertibility, conditions. The abstract minimalist cannot accept the perfectly general schemas just described. Consider the sentence ‘the statue has a part that is red’ where the statue is an extended simple. The sentence we generate with the replacement of ‘part’ for ‘ersatz part’ is: ‘the statue has an ersatz part that is red’. But that sentence is false, rendering the original sentence neither true nor assertible. For the abstract minimalist, the relevant related sentence that is true is ‘the statue has a ersatz part that is associated with redness’. Thus she needs to maintain that sentences such as ‘the X has a part that is Y’ are either true, or assertible, iff there is a true sentence generated by replacing ‘part’ with ‘ersatz part’ and replacing any name of a property, ‘Y’ with ‘associated with Y-ness’. Likewise, she will need to offer different assertibility or truth conditions for sentences that mention occupation of regions. So she cannot offer a simple schema like the one outlined above, but instead a series of more complex rules that take us from ordinary claims, to sentences that make true, or make assertible, those claims. This represents some cost to the view.

Eliminative minimalism, too, faces some costs. Arguably, talk about parts is continuous with ordinary discourse. Talk about ersatz parts should likewise be continuous if either talk about parts just is talk about ersatz parts, or if talk about parts is rendered assertible by true sentences about ersatz parts. The eliminativist minimalist must say that syntactically singular expressions such as ‘a part’ and ‘a composite’ are really plural referring expressions. Of course, there so exist such expressions in natural language. But it is not clear that we would expect ‘a part’ or ‘a composite’ to be amongst them. So this may well involve some cost.

Finally, compositional part minimalism cannot offer a semantics for ordinary claims that seem to quantify over non-existent metaphysical composite objects: so she can offer no help at all to those who reject NCP. The non-compositional part minimalist does better: she can accept the general schema, offered above, and take sentences that quantify over ersatz composites to offer truth or assertibility conditions for sentences quantifying over composites. But while the non-compositional part minimalist can make good sense of ordinary talk, she can make no sense at all of a claim such as ‘in w, all simples are point-sized’ being true, since for her, the space of possibilities does not include any such world.

Overall, then, we think that part minimalism does the best job of offering consistent truth or assertibility conditions for ordinary claims rendered problematic by a rejection of NDP. Part minimalism offers a semantics that is continuous with ordinary discourse. It allows one to adopt the generalised schema we first outlined to make sense of any assertions that quantify over parts and it treats talk about parts in the same way that it treats talk about dogs, at least at the level of grammar. Here, then, is table 1, which shows how each view fares:

Table 1. How does each view fare?

**5. Conclusion**

What is an ersatz part? We approached this question by laying out three job descriptions for ersatz parts to satisfy, and developing four different notions of ersatz parts. The table above suggests that—with, perhaps, the exception of abstract ontic minimalism— the different notions of ersatz parts fit some job descriptions better than others. One might wonder whether this result raises a concern about the fruitfulness of ersatz parts: if they’re supposed to do important metaphysical work, why should they be characterised as different kinds of things according to different purposes? But we think this concern is misled. The fruitfulness of ersatz parts does not turn on whether ersatz parts are in all cases one and the same kind of thing. The latter issue is something for those facing the given explanatory tasks to address; our own task was to provide those who do face such tasks with some direction as to their options, and we believe we have done so.

**Works Cited**

Bennett, Karen (2011). “Construction Area (No Hard Hat Required). *Philosophical Studies* 154 (1): 79-104.

Bohn, Einar (2014). “From Hume’s Dictum via Submergence to Composition as Identity or Mereological Nihilism” Pacific Philosophical Quarterly. DOI: 10.1111/papq.12034

Bohn, Einar (2014) “Unrestricted Composition as Identity.” In D Baxter and A Cotnoir (eds.) *Composition as Identity* OUP 143-169.

Bohn, Einar (forthcoming) “Composition as Identity and Plural Cantor’s Theorem.” *Logic and Logical Philosophy.*

Brenner, Andrew (2015). “Mereological Nihilism and Theoretical Unification.” *Analytic Philosophy* 56(4): 318-337

Carrara, M. and Enrico Martino (2015). “Grounding Megethology on Plural Reference”. *Studia Logica:* 103)4\_:697-711

Cameron, Ross (2007). ‘The Contingency of Composition.’ *Philosophical Studies* **136**, pp. 99–121.

Contessa, Gabriele (2014). “One’s a Crowd: Mereological Nihilism Without Ordinary Object Eliminativism. *Analytic Philosophy* 54(4): 199-221.

Cotnoir, Aaaron (2013). “Parts as Counterparts”. *Thought: A Journal of Philosophy* 2(3): 228-241.

Cotnoir, Aaron (2014). “Composition as Identity: Framing the Debate” In A. J Cotnoir and D Baxter (eds.) *Composition as Identity* OUP, 3-24.

Horgan, Terence and Potrč, Matjaz. (2000). ‘Blobjectivism and Indirect Correspondence’, *Facta Philosophica*, 2: 249-270.

Jaeger, Andrew (2014). “A Tale of Two Parts” *Res Philosophica* 91 (3):477-484

Korman, Daniel and Chad Carmichael (forthcoming). “What do the folk think about composition and does it matter?” in D Rose (ed) *Experimental Philosophy and Metaphysics.* Bloomsbury.

Lewis, David (1993). “Mathematics in Megethology”. *Philosophica Mathematica* 1(1): 3-23.

Markosian, N. (1998). ‘Simples’, *Australasian Journal of Philosophy*, 76: 213-26.

Markosian, Ned (2004a). ‘SoC it to Me? reply to McDaniel on MaxCon simples’, *Australasian Journal of Philosophy*, 82: 332–340.

Markosian, Ned (2004b). ‘Simples, stuff and simple people’, *The Monist*, 87: 405–428.

McDaniel, K. (2009). ‘Extended Simples and Qualitative Heterogeneity’, *Philosophical Quarterly*, 59 (235): 325-31.

[McDaniel. Kris (2010). “Composition as Identity Does Not Entail Universalism”.](http://philpapers.org/rec/MCDCAI) *Erkenntnis* 73 (1):97-100.

McDaniel, Kris (2014). “Compositional Pluralism and Composition as Identity.” In D Baxter and A Cotnoir (eds). *Composition as Identity,* OUP, 130-143.

Merricks, Trenton (2001). “Objects and Persons. OUP.

Miller, Kristie and David Braddon-Mitchell (2006). ‘The physics of extended simples’ *Analysis* 66(3): 222-226.

Miller, Kristie (2010) “The existential quantifier, composition and contingency” *Erkenntnis* 73(2): 211-235

Moltmann, Frederika (forthcoming). “Plural Reference and Reference to a Plurality. Linguistic Facts and Semantic Analyses.” In Masimiliano Carrara, Alexandra Arapinis and Friederike Moltmann (eds). *Unity and Plurality. Logic, Philosophy and Semantics.* OUP.

Parson, Josh (2004). ‘Distributional properties’, in F. Jackson & G. Priest (eds.), *Lewisian themes*, Oxford: Oxford University Press, 173-180.

Parsons, Josh (2006). ‘Conceptual Conservatism and Contingent Composition’, Unpublished.

Paul, Laurie (2002). ‘Logical Parts’, *No*ûs, 36 (4): 578-96.

Schaffer, Jonathan (2007). “From Nihilism to Monism” *Australian Journal of Philosophy* 85(2): 175-191.

Sider, Theodore (2007). ‘Parthood’, *Philosophical Review*, 116 (1): 51-91.

Sider, Theodore (2013). “Against Parthood” *Oxford Studies in Metaphysis* 8: 237-292.

Sider, Theodore. (1993). ‘Van Inwagen and the possibility of gunk’. Analysis, 53, 285–289.

Sider, Theodore (2001). Four-dimensionalism. Oxford University Press, Oxford.

Spencer, Joshua (2010). ‘A Tale of Two Simples’, *Philosophical Studies*, 148 (2): 167-81.

Spencer, Joshua (2013). “Strong Composition as Identity and Simplicity”. *Erkenntnis* 78(5): 1177-1184.

Tallant, Jonathan (2014). “Against Mereological Nihilism” *Synthese* 191(7): 1511-1527.

Van Inwagen, Peter (1981). ‘The Doctrine of Arbitrary Undetached Parts’, *Pacific Philosophical Quarterly*, 62: 123-37.

Van Inwagen, Peter (1990). *Material Beings.* Ithaca, New York: Cornell University Press.

[Wallace, Meg (2011). “ Composition as Identity: Part 1.](http://philpapers.org/rec/WALCAI-6)” *Philosophy Compass* 6 (11):804-816. [Composition as Identity](http://philpapers.org/browse/composition-as-identity) in [Metaphysics](http://philpapers.org/browse/metaphysics)

[Williams, J Robert G (2006). ‘Illusions of Gunk’](http://philpapers.org/rec/WILIOG), *Philosophical Perspectives* 20 (1):493–513.

1. Defenders of the view that qualitatively heterogeneous extended simples are possible include McDaniels (2009) Jaeger (2014) Cotnoir (2013) and Markosian (2004b). See Spencer (2010) for arguments against the possibility of heterogeneous extended simples (but not homogenous extended simples). [↑](#footnote-ref-1)
2. These sorts of considerations led Markosian (1998; 2004(a) 2004(b) to posit ersatz parts. This proposal is also considered in McDaniels (2009). [↑](#footnote-ref-2)
3. Such as Cameron (2007) Parsons (2006) and Miller (2010). [↑](#footnote-ref-3)
4. Though defenders of restrictivist hold that our ordinary judgments about composition are typically correct, they surely not think that we are never wrong in these judgments. See for instance Korman and Carmichael (forthcoming). [↑](#footnote-ref-4)
5. Mereological nihilists and mereological restrictivists who deny that certain “ordinary” composite objects exist face this problem. These include van Inwagen (1990) Contessa (2014) Merricks (2001) Brenner (2015) and Sider (2013). [↑](#footnote-ref-5)
6. This worry is close to, but distinct from, one articulated by Tallant (2014). [↑](#footnote-ref-6)
7. Thus we might also distinguish logical parts, as per Paul (2002), that are properties of objects. Ersatz parts, then, are neither metaphysical parts nor logical parts. [↑](#footnote-ref-7)
8. See van Inwagen (1981) for a discussion of the paradox. [↑](#footnote-ref-8)
9. A gunky object is an object such that every proper part of that object has a proper part. [↑](#footnote-ref-9)
10. Arguments purporting to show that worlds containing some gunky object are incompatible with mereological nihilism being true at that world have been defended by Sider (2001 and 1993) and deployed by Schaffer (2007). These arguments are considered (but not defended) by Sider (2013) and Cotnoir (2013). Williams (2006) develops an account that attempts to explain away the apparent possibility of gunk, on behalf of the nihilist. [↑](#footnote-ref-10)
11. But in this case the options are (a) the folk intend to pick out ersatz composites when they talk of composites or (b) folk talk is ambiguous between ersatz composites and metaphysical composites but either is a good enough deserver to vindicate folk talk or (c) the folk intend to pick out ersatz composites where there are no metaphysical composites to be the referent of the relevant term or (d) the folk intend to pick out metaphysical composites, and as such their talk is, at least sometimes, assertible but not true. [↑](#footnote-ref-11)
12. The definition of an ersatz division mentions occupied points rather than occupied (point-sized) regions or sub-regions. That is because some suppose it possible that there exist extended regions that lack sub-regions. For instance, if one thinks that in order for an extended region, R, to have sub-regions, space and time must be well defined notions at regions smaller than R, then one should at least allow the possibility of extended regions that lack sub-regions. See Braddon-Mitchell and Miller (2006). Spencer (2010) also allows for this possibility. Nevertheless, if a region is extended it must have what we call *ersatz regions.* There must be a way of mapping a coordinate system onto the region such that according to that coordinate system the region has extension along at least one dimension. We will say that the ersatz regions of a region, R, correspond to the power set (minus the empty set) of the set of points in some coordinate system that maps R. On the assumption that R is exactly occupied by some object, O\*, it follows that every point in the coordinate system that maps R is occupied. That is enough to allow us to define ersatz divisions in terms of power sets of occupied points. For ease of presentation we will typically talk about the sub-regions of regions; in cases where regions are extended but lack sub-regions, such talk can be translated into talk of the ersatz regions of regions. [↑](#footnote-ref-12)
13. We assume that there are such plural referring expressions. For a defense see Sider (2007), Wallace (2011), van Inwagen (1990), McDaniel (2010), Bohn (2014). In addition, plural reference has been defended much more broadly including by Moltmann, F. (forthcoming), Lewis (1993) and Carrara and Martino (forthcoming). [↑](#footnote-ref-13)
14. This is Markosian’s (1998) preferred solution. [↑](#footnote-ref-14)
15. This is McDaniel’s (2009) solution. [↑](#footnote-ref-15)
16. Of the sort that Bennett defends in her (2011). [↑](#footnote-ref-16)
17. For a defense (and discussion) of such views see Bohn (forthcoming a, forthcoming b) Spencer (2013); Wallace (2011) McDaniel (forthcoming) and Cotnoir (2014). [↑](#footnote-ref-17)
18. Of the sort introduced by defenders of grounding. [↑](#footnote-ref-18)
19. Once again, only as it pertains to concrete objects. [↑](#footnote-ref-19)
20. Notice, once more, that it is consistent with part minimalism that points are occupied by either Pxs or Oxs. But suppose the part minimalist holds the ersatz part analogue of NDP, namely that, necessarily for any extended object, O, that exactly occupies R, for every sub-region of R there exists an object that exactly occupies that sub-region and is a ersatz part of O. Given the jobs required of ersatz parts, it seems plausible to accept this analogue principle. But then if the points occupied by ersatz parts are Pxs it follows that since, according to part minimalism, ersatz parts are concrete objects, the Pxs are not ersatz parts. Instead, some non-point sized objects must be the ersatz parts of extended objects. But then the part minimalist is committed to the existence of extended ersatz parts which themselves have neither ersatz nor metaphysical parts. On the assumption that the part minimalist wishes to appeal to ersatz parts all the way down, as it were, to explain the properties of objects at locations, this is not an appealing view. Given this, we focus on a version of part minimalism that assumes that each Gx is an Ox: there are point-sized simple objects that occupy the points occupied by extended ersatz parts. [↑](#footnote-ref-20)
21. Explaining the heterogeneity of extended simples in a gunky world naturally cannot appeal to the properties of objects that lack proper ersatz (and metaphysical) parts such as point-sized simples. But it is not clear that grounding the heterogeneity of such simples in ersatzly gunky worlds is any more problematic than would be grounding the heterogeneity of metaphysically gunky objects in a metaphysically gunky world. Whatever account is offered for the latter could, in principle, be modified to suit the former. [↑](#footnote-ref-21)