Abstract: A mereological structure is *junky* if and only if each of its elements is a proper part of some other. The young literature on junk has focused on junky worlds and whether they are counterexamples to unrestricted composition. The present note defends the possibility of junky structures that are not worlds. This possibility complicates a recent attempt in the literature to render junk consistent with a weakened form of unrestricted composition. The upshot is that junky non-worlds threaten the weakened form of unrestricted composition as much as junky worlds threaten the traditional version.

A mereological structure is *junky* if and only if each of its elements is a proper part of some other.¹,² Junky structures are not co-extensive with any whole in the structure, but rather with the plurality of wholes in the structure. If a junky structure were co-extensive with a whole then there would be an element of the structure—namely, the one co-extensive with the structure itself—that is not a proper part of some other. While the young literature on junk focuses exclusively on the mereological features of entire worlds, the preceding characterization in terms of structures leaves open the question of

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¹ To my knowledge, ‘junk’ in this technical sense first occurs in print in (Van Cleve 2008, 323).
² I here assume (as is standard—see (Simons 1987, 10)) that the proper parthood relation is asymmetric, transitive, and irreflexive. These properties jointly prohibit small finite collections of objects (singles, pairs, trios, etc.) from satisfying the characterization of junk to which this note is appended. Singles are ruled out straightaway by irreflexivity. Pairs are ruled out by asymmetry plus irreflexivity: if \( a \) is a proper part of \( b \) then \( b \) cannot be a proper part of \( a \) (by asymmetry) nor can it be a proper part of itself (by irreflexivity); so some third object is needed in order for \( b \) to be a proper part (of it). Trios are ruled out by the three properties in tandem: if \( a \) is a proper part of \( b \) then (as we have just seen) there must be some third object \( c \) of which \( b \) is a proper part (by asymmetry and irreflexivity); it follows that \( a \) is a proper part of \( c \) (by transitivity); but \( c \) is not a proper part of \( a \) or \( b \) (by asymmetry) nor is it a proper part of itself (by irreflexivity); so some fourth object \( d \) is needed in order for \( c \) to be a proper part (of it). It is clear how to proceed for quartets, quintets, etc. Thank you to an anonymous referee for prompting me to make this assumption explicit.
whether some junky structures model non-worlds. The present note has two aims. The first is to give an affirmative answer to the question just raised. If junk is possible then junky non-worlds are possible. The second is to articulate a consequence of this answer for Gabriele Contessa’s (2012) interesting suggestion that the necessity of a certain weakened thesis of unrestricted composition is unthreatened by the possibility of junk.

Contessa distinguishes the aforementioned weak version of unrestricted composition from the stronger version familiar in the literature. On the strong version, the members of any collection of objects compose an object. On the weak version, any pair of objects compose a third. The distinction is proposed in response to (Bohn 2009), which argues that junky worlds threaten the necessity of unrestricted composition since the latter entails, while the former preclude, the existence of a totality object. Contessa argues that, whatever we may think of Bohn’s line against strong unrestricted composition (see Watson (2010) and Bohn (2010)), it does not threaten the necessity of weak unrestricted composition, so long as any junky world is such that any two objects that it contains compose a third.

Before discussing the possibility of junky structures that are not worlds, a brief digression on eligibility for parthood is in order. The question of which kinds of entities are eligible for being or having parts is left open by the formal contours of mereology, and philosophers do not always have the same criteria of eligibility in mind when discussing parthood (see (Simons 1987) and (Varzi 2014) for discussion). Following the standard stream of work on the topic, I will here take composition to be applicable to

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3 For simplicity, I will speak of worlds as though they are concrete cosmoi. More cumbersome exposition would deploy something like ‘the unique all-inclusive cosmos represented by a world’, which allows that worlds themselves are not concrete.
spatiotemporally located concrete particulars exclusively. That is, the predicate ‘objects’, as it occurs in the above expressions of the respective versions of the thesis of unrestricted composition, is applicable only to spatiotemporally located concrete particulars. For example, numbers, propositions, and universals do not count as objects on this usage. Most importantly for present purposes, this usage seems to be what Bohn and Contessa have in mind. Thus Bohn, in introducing junky worlds by example, asks us to consider a world a la Pascal in which our universe is but a particle housed in a larger universe, which in turn is just a particle in some yet larger universe, and so forth (2009, 28). He then states that conceiving of this world amounts to conceiving of a world in which everything is a proper part. Now, one could object that a Pascal world fails to amount to a junky world if it contains entities that are ineligible for parthood, perhaps numbers or universals, since the world in question would then contain some entities that are not proper parts (to wit, numbers and universals) despite its fitting the Pascal structure Bohn describes. But I think this kind of objection to Bohn’s example is at best uncharitable and likely a non sequitur. Rather than so objecting, one should assume that Bohn only intends to quantify over spatiotemporally located concrete particulars.

So concludes the stage setting. Let us look now at the possibility of junky non-worlds. Imagine an infinitely tall spruce, each part of which is a proper part of some other. Put more carefully: imagine an infinite plurality of tree parts, each of which is a

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4 Here ‘concrete’ indicates a capacity for independent existence and is intended to rule out tropes, on a certain way of understanding them. (It is controversial whether tropes can exist independently. In fact, I am inclined to think they can, but the issue is not important here.) Probably the most prominent stream in the literature on unrestricted composition that focuses exclusively on spatiotemporally located concrete particulars begins with (van Inwagen 1990). To appreciate the extent to which spatiotemporally located concrete particulars are the exclusive relata of the parthood relation in debates about unrestricted composition—sometimes acknowledged as such explicitly, sometimes indicated as such implicitly by choice of examples—see (Lewis 1986), (Sider 2001), (Van Cleve 2008), and (Markosian 2008). For alternative characterizations of unrestricted composition that explicitly allow entities outside the category of spatiotemporally located concrete particulars to be parts, see (Armstrong 1997) and (Lewis 1991).
proper part of some other, that are arranged just like an infinitely tall spruce. Now consider two possible worlds $w_1$ and $w_2$. $w_1$ is such that the only objects that exist are the elements of our infinite spruce structure. That is, $w_1$ is a junky world that consists of exactly one infinitely tall tree (or tree-like plurality). This kind of case is familiar from the literature. $w_2$ is just like $w_1$ except that at $w_2$ there exists an ordinary (finitely tall and whole) elm in addition to the infinitely tall spruce. So long as it is allowed that the elm can fuse with any of the elements in the spruce structure to compose something, $w_2$ is a junky world, for that supposition secures that everything at $w_2$ is a proper part of something at $w_2$. What is interesting, however, is that $w_2$ is not the only junky structure that exists according to $w_2$, for the spruce is just as much a junky structure at $w_2$ as it is at $w_1$. This is because nothing about the existence of the elm secures or even suggests that the spruce at $w_2$ fails the criteria for being junky, and yet the existence of the elm is all that differs between $w_1$ and $w_2$. Indeed, the case for junky non-worlds does not even require the elm, for even at $w_1$ there are sub-pluralities of the spruce plurality that meet the criteria for being junky. For example, consider the plurality of all the spruce structure’s elements except for one pine needle. Call this sub-plurality ‘spruce-minus’. Just like the original spruce, spruce-minus is a plurality of tree parts each of which is a proper part of some other. Yet spruce-minus is less than everything that exists at $w_1$. These considerations show that the possibility of junky non-worlds is on equal footing with the possibility of junky worlds.

Let us turn to the advertised consequence of the possibility of junky non-worlds. I will argue that junky non-worlds like the spruce at $w_2$ threaten weak unrestricted composition as much as junky worlds threaten strong unrestricted composition.
To see the threat, notice that weak unrestricted composition universally quantifies over pairs of objects. Accordingly, it is plausible that substitution of arbitrary ordinary sortal terms that apply to concrete objects for the occurrence of ‘objects’ within the scope of the universal quantifier is truth preserving. That is, if ‘any pair of objects compose a third’ is necessarily true, then, say, ‘any pair of trees compose an object’ ought to be necessarily true as well. But $w_2$ is a counterexample to this latter mentioned claim, for the spruce and the elm at $w_2$ fail to compose anything. They fail to compose anything because the spruce is junky and junky entities, given the definition of junk, cannot be parts. Suppose a junky entity $J$ were a part of something. This entails that every element in $J$ is a part of that thing, which entails that every element in $J$ co-fuses. But if every element in $J$ co-fuses then there is some whole that is the fusion of every element in $J$. And that fusion would be an element in $J$ that is not a proper part of any element in $J$, thus violating the definition of junk. So $w_2$ furnishes a pair of trees that fail to jointly compose an object. It thus constitutes a counterexample to the necessity of weak unrestricted composition. Labeling the argument for clarity, we get:

1. It is a consequence of weak unrestricted composition that any two trees compose an object. (from definition of weak unrestricted composition)
2. Junky entities are not proper parts of anything. (from definition of junk)
3. The spruce at $w_2$ is a junky entity (ex hypothesi)
4. The spruce at $w_2$ is a tree (assumption)
5. The elm at $w_2$ is a tree (ex hypothesi)
6. The spruce at $w_2$ and the elm at $w_2$ fail to compose an object (2, 3)
7. So there is a pair of trees that, contra weak unrestricted composition, fail to compose an object. (1, 4, 5, 6)

I see two principal options for responding to this argument. The first is to deny 4 and hold that the junky spruce structure is not a tree. The second is to deny 1 by maintaining that some trees or tree-like entities, to wit junky ones, are not objects. If some trees are not objects then it is not a consequence of weak unrestricted composition—which is a thesis about objects—that any two trees compose an object.

Neither option leaves weak unrestricted composition a better candidate for necessary truth than strong unrestricted composition. The spruce structure’s infinite height should have no bearing on whether it is a tree, and it is difficult to find any other reason for denying that it is a tree unless we simply ban the use of ordinary singular sortals to talk about junky structures, in which case the issue will turn on whether extra-ordinary sortals of whatever kind junky structures are allowed to fall under ought to count as substitutable for ‘objects’ in ‘any two objects compose an object’. This is just a roundabout way of arriving at the second option, according to which junky structures like the spruce in the example are not ‘objects’. “It is clear that the junky spruce is not an object,” the proponent of the second option might contend, “after all, it is a non-jointly-composed plurality and pluralities are objects only if they are jointly composed.” Now, one may use the string ‘object’ however one wishes, so long as one makes that usage clear, but clarity in this case reveals that the use of ‘object’ required by the second option entails that objects are wholes. And once this way of speaking is granted, the game is up,
for it allows the proponent of the second option to conclude that junky structures cannot be objects on pain of conceptual incoherence.⁵

Perhaps this linguistic response to the threat from junky non-worlds is compelling, perhaps not. What matters for present purposes is that it has a parallel in the junky worlds/strong unrestricted composition dialectic. If language may be claimed by one’s antecedent commitments in the way required by the second option then the defender of strong unrestricted composition could discharge Bohn’s original argument simply by pointing out that, since the joint members of ‘collections of objects’ always compose a further object, junky worlds cannot count as collections of objects (or, perhaps, not collections of objects). After all, strong unrestricted composition does not entail that any collection that contains both objects and non-objects composes an object; it is rather a thesis about collections exclusively containing objects. Yet we have seen that junky worlds are pluralities that contain a large supply of junky structures that, on the going hypothesis, are not objects (recall how easy it was to generate spruce-minus; we can identify infinitely more such junky pluralities by mentally subtracting infinitely more pine needles one by one from the original spruce structure). So Bohn’s line—this parallel response goes—is of no consequence for strong unrestricted composition, which is a thesis exclusively about collections of objects. All junky worlds end up showing is that the members of certain collections containing both objects and non-objects fail to jointly compose an object; but the proponent of strong unrestricted composition is under no pressure to resist that consequence. The strong unrestricted composition theorist says “give me just some objects, as many as you wish, as qualitatively diverse as you wish, and in as wide and varied a spatiotemporal scattering as you wish—so long as you are not

⁵ Cf. (Schaffer 2010), which argues that junk is incoherent and “worldless.”
giving me anything that is not an object or a constituent of one of the objects—and I will fuse them all into some one maximal object.” He is not committed to the fusion of non-objects.

An analogy may be helpful. Consider the following two collections:

Collection A: an apple, an orange

Collection B: an apple, a bare particular (distinct from the apple), the universals orangeness, roundness, juiciness, sweetness, mass m, charge c (for some values of m and c plausible for an orange), the instantiation relation

The strong theorist is committed to there being a fusion of all the members of A. But he is not committed to there being a fusion of all the members of B. Since he is committed only to concrete objects fusing arbitrarily, he is not committed to fusions of members of collections that contain, as independent members, items that are not concrete objects, for example, the universal orangeness.

For the purposes of the analogy, let us assume that the correct ontology of property exemplification is bare particular theory plus realism about universals. Notice the metaphysical difference between collections A and B. Both involve the same cross-category inventory of ontologically fundamental items (let us suppose), but in A those items are appropriately related to yield two objects and nothing that is not an object or an already “packaged” constituent of an object, where the verb ‘to package’ here is short for

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6 The sort of constituents of objects that I have in mind are bare particulars, universals, and tropes. These are non-objects in the presently relevant sense because they are not concrete particulars. They are thus ineligible for parthood.
whatever metaphysical mechanism is responsible for property exemplification. In B, however, there are entities that are neither objects nor packaged constituents of objects, and this is why the strong theorist need not say that there is a fusion of all the entities in B, even though, at a certain level of ontological inventory, A and B are committed to the same entities. In short, the difference is that, without having to make any metaphysical changes to the entities in B, it contains, as independent members of the collection, entities that are not objects. (By contrast, A can only be understood as containing non-objects as independent members if we make a metaphysical change to it, for example, if we “unpackage” the orange’s *sweetness* universal.) And the strong theorist is within his rights to deny that the members of any such collection compose a fusion, for he is only committed to fusing members of collections exclusively containing objects as independent members (which members may themselves have constituents that are not objects, so long as those constituents are packaged and thus not independent members of the collection).

Now consider *w₂*. One might wish to understand it as just a plurality of objects, much like A. However, given the weak theorist’s response about how properly to apply the predicate ‘object’, and without having to make any metaphysical changes to *w₂*, it can also be understood as a plurality that contains as independent members both some objects and some non-objects. For example, it can be understood as the plurality of the elm, a certain needle, and spruce-minus; and spruce-minus, according to the defense of weak unrestricted composition in question, is not an object. So *w₂* is analogous to collection B in that, without having to make any metaphysical changes to its contents, it has legitimate claim to being a collection containing non-objects as independent members. So, just as
with B, the strong theorist need not maintain that there is a fusion composed of all and
only the entities at \( w_2 \). It follows that if the weak theorist is correct to deny that spruce-
minus is an object, then the strong theorist has grounds for allowing the possibility of
junk without having to give up strong unrestricted composition. Such grounds are
analogous to those allowing him to accept universals, propositions, or numbers without
having to give up unrestricted composition.

The linguistic response to argument 1-7, according to which junky pluralities are
not objects in the sense of ‘object’ relevant to unrestricted composition, is thus a double-
edged sword. If it works in favor of weak unrestricted composition then it also works in
favor of strong unrestricted composition, rendering weak unrestricted composition otiose
in the present dialectic. It is an interesting question whether to give up the linguistic
response or, alternatively, to give up the junk objection to the necessity of strong
unrestricted composition. But, while interesting, that is a question that I am not aiming to
answer here. One might choose to answer it in various ways based on prior commitments
or future work. The present point is simply that the weak theory is no better off with
respect to the junk debate than the strong theory.

In closing, I wish to emphasize that I have not argued that junk is possible (though
I am inclined to think that it is). Nor have I argued that if it is possible then unrestricted
composition is not necessarily true (though I am inclined toward that thought, as well).
My concern has been to argue (i) that the case for junky non-worlds is as strong as the
case for junky worlds and (ii) that the problem junky non-worlds pose to the putative
necessity of weak unrestricted composition is as deep as the problem junky worlds pose
to the putative necessity of strong unrestricted composition.
References


