Ben Cleary
Comments on Sam Cowling's "How to Benacerraf a Goodman-Lewis" for the 2016 OPA

Sam Cowling's "How to Benacerraf a Goodman-Lewis" provides a very interesting argument for the view he calls 'gnominalism'. As stated in the paper, this is the view that "there are no distinct entities constructed from the same basic entities" (Cowling, 1). Cowling argues for this view by attempting to show how any anti-gnominalist view gives rise to a form of Benacerraf's non-uniqueness problem.

In the paper, Cowling argues against two different anti-gnominalist entities, sets and structural universals, by claiming that these entities give rise to a non-uniqueness problem. I want to discuss two issues. The first is related to Cowling's argument against sets. The second is related to Cowling's argument against structural universals.

I will start with Cowling's argument against sets. The argument is as follows:

> P1. If set theory generates sets from the same basic entities, then there are equally good candidate set-theoretic reductions of numbers, properties, and propositions.
>
> P2. If there are equally good candidate set-theoretic reductions of numbers, properties, and propositions, then set-theoretic reductions are inherently vicious due to their arbitrariness.
>
> P3. If set-theoretic reductions are inherently vicious due to their arbitrariness, we ought to reject set theory.
>
> C1. Therefore, we ought to reject set theory. (Cowling, p. 5)

I will not comment on P1 or P2. The premise I would like to hear more about is P3. Cowling states in a footnote that one could defend set theory on the basis of something other than its potential role in reduction. He notes that one could claim that sets are legitimate because they are the objects of mathematical inquiry. He claims, however, that the fact that set-theoretic reductions are problematic gives us a reason to "reconsider whether our best ontology of mathematics does, in fact, have a place for sets" (Cowling, p. 6, fn. 13). This raises subtle issues about mathematical ontology.

I start with the intuitive claim that mathematicians appear to be studying a variety of objects, including sets and numbers. Cowling seems to argue that sets should be rejected because they cannot serve as a reductive base for some other objects. I wonder if this should be motivated by the claim that we should accept some objects in our mathematical ontology only if they can serve as reductive bases for some other objects. I am not overly familiar with mathematical practice, but I do not know of any attempts to reduce things to numbers. Perhaps this is mistaken. But, if objects should only be included in our mathematical ontology when they act as reductive bases and numbers do not, it would appear that we should exclude numbers from our mathematical ontology.

Perhaps this is a welcome result, but it would be a surprising one. I am curious about what could be said if we wanted to include numbers in our mathematical ontology, but still reject sets. Perhaps we should look to a Quinean criterion of ontological commitment. Thus, we should include numbers in our mathematical ontology because, roughly, our best science quantifies over them. Now we must determine whether our best science quantifies over sets. If it does, then this would not serve to distinguish sets from numbers in a way that excludes the former from our mathematical ontology, but includes the latter. As stated, these are complicated issues, but I would like to invite Cowling to say a little more about them.

The second issue I would like to discuss is Cowling's argument against structural universals. Cowling argues that structural universals give rise to a similar non-uniqueness problem as sets. The specific issue here turns on the purported structural universals of some molecules. Consider two molecules: A-B-C-D and A-C-B-D. The structural universals for these molecules are supposed to be composed of the same simple universals: *A*, *B*, *C*, *D*, and three "occurrences" of *bonded to*. This means that there are two structural universals composed of the same simple universals, but which are supposed to play different roles. One is supposed to be the universal that is instantiated by A-B-C-D, and the other is supposed to be the universal instantiated by A-C-B-D. But there appears to be nothing to distinguish the universals, so it appears arbitrary which universal is instantiated by which molecule. This shows how the anti-gnominalist entities, structural universals, give rise to a form of the non-uniqueness problem.

Cowling briefly mentions that a defender of structural universals might appeal to different "arrangements" that can serve to individuate the universals. But he claims that in appealing to this arrangement, the same arbitrariness arises. Here is what I take to be the defense of structural universals. We could individuate the two structural universals by claiming that the first universal has an arrangement in which *bonded to* is between *A* and *B*.[1] The second structural universal does not have this arrangement. Instead, *bonded to* is between *A* and *C*, not *A* and *B*.

Here is what I take to be the problem that Cowling is alluding to. By claiming that *bonded to* is between *A* and *B* in the first structural universal, we must appeal to an arrangement, which is just another structural universal. This arrangement would be composed of *A*, *B*, *bonded to*, and *is between*. But now we need to distinguish the arrangement that is instantiated when *bonded to* is between *A* and *B* from the arrangement that would be instantiated when *A* is between *B* and *bonded to* because this second arrangement would be composed of the very same universals. And the obvious response is that *is between* is between *bonded to* on the one hand, and *A* and *B* on the other. And appealing to a further arrangement should make it clear that a regress is in the offing.

This can be seen visually below. The defender of structural universals appeals to the arrangement in Figure 1 to distinguish the structural universal instantiated by A-B-C-D from the structural universal instantiated by A-C-B-D. But this seems to require appealing to the universal in Figure 2 to distinguish the arrangement instantiated when *bonded to* is between *A* and *B* from

[1] By 'between', I do not intend to suggest that the universals are bonded to each other. Instead, the particulars that instantiate the relevant universals are bonded to each other.

the arrangement instantiated when *A* is between *B* and *bonded to*, which would correspond to the universal in Figure 3.

A defender of structural universals might make a couple of responses at this point. They might accept that there is a regress, but deny that it is a vicious regress. A second possible response would be to claim that there is no possible arrangement instantiated when *A* is between *B* and *bonded to* because this is an impossible situation. This might be motivated by an appeal to the nature of the universals involved. It lies in the nature of *bonded to* that it can be between elemental universals, such as *A* and *B*. But it lies in the nature of *A* that it cannot be between an elemental universal like *B* and the universal *bonded to*. Such a position would require much more development, but it is not obviously incoherent. So, I would like to invite Cowling to say a little more about whether this is a plausible way to defend structural universals and what problems there might be with pursuing such a strategy.

Figure 1

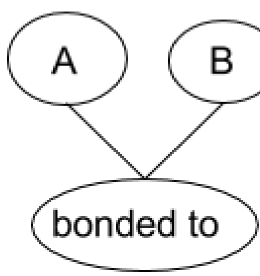

Figure 2

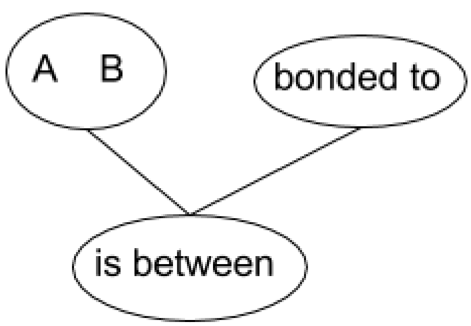

Figure 3