Commentary

Kathrin Koslicki
The Structure of Objects
Oxford: Oxford University Press, 2008

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Kathrin Koslicki's *The Structure of Objects* is a defence of a neo-Aristotelian approach towards composition, focusing especially on ordinary material objects. The central claim of the book is that a structure-based mereology for ordinary material objects can be given in terms of a single relation of parthood. Combined with an independent commitment to a realist yet moderate ontology of kinds, Koslicki's neo-Aristotelian mereology produces an account of composition which is opposed to the Composition-as-Identity (CAI) model familiar from the work of David Lewis; she argues instead that wholes are not to be identified with their parts, the two are numerically distinct.

It is impossible to do justice to Koslicki's rich book in this short commentary, which is why I will, in the spirit of this special issue, focus on her critique of the Lewisian account of composition and analyse the advantages that she claims her neo-Aristotelian approach to have over the CAI model.

The book consists of an overview of the 'standard' conception of the composition of material objects, the Lewisian four-dimensional account, and Kit Fine's alternative neo-Aristotelian model, as well as an analysis of Plato's and Aristotle's views on composition. From this basis Koslicki sets off to defend her own approach, a middle ground between the deflationary conception of structure present in Plato's and Fine's accounts on one hand and Aristotle's stronger, teleological approach on the other hand. In addition to the formal, mereological description of her account, Koslicki also provides a defence of the underlying ontology of kinds, motivated independently of mereological considerations, and explicates her conception of structure with case studies involving logic, chemistry, music, and linguistics.

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I will not discuss all of these aspects of Koslicki's book, interesting though they are. Instead I will compare Koslicki's approach to composition with the Lewisian approach. I am sympathetic to Koslicki's account and her reservations concerning Lewis's (as well as Ted Sider's) model, but I will also raise some concerns about her arguments and discuss some challenges that the positive thesis faces.

Let us begin with Koslicki's critical survey of the Lewisian approach. Koslicki's main targets are the principle of Unrestricted Mereological Composition (UMC) and the CAI thesis[1], which she discusses in Chapters 2 and 3 of *The Structure of Objects*. As Koslicki explains, Lewis thinks that Classical Extensional Mereology (CEM) is the only genuine kind of mereological composition (see Simons, 1987, pp. 37–41). It is CEM's commitment to UMC which Koslicki, quite rightly, considers to be the most crucial element in Lewis's account. Since Lewis's original argument for UMC is very dense, Koslicki follows Sider's (2001, p. 123) well-known version of Lewis's argument, which is commonly known as the 'vagueness argument'.

The vagueness argument claims that if UMC were false, there would have to be two adjacent cases in a continuous series such that in one composition occurs, but in the other it does not. Further, the argument claims that there is no such continuous series with a sharp cut-off concerning composition. The typical examples include baldness and heaps, but any sorites series will do: the point is that in all cases of composition, it either definitely occurs, or definitely does not occur. However, unless we accept unrestricted composition, we would need some criteria to judge where the sharp cut-off between non-composition and composition lies. Here is a passage from Sider himself which may help to explicate the argument:

> If not every class has a fusion then there must be a restriction on composition. Moreover, the only plausible restrictions on composition would be vague ones. But there can be no vague restrictions on composition, because that would mean that whether composition occurs is sometimes vague. Therefore, every class has a fusion. (Sider, 2001, p. 121)

The somewhat counter-intuitive upshot is that even my nose and the Eiffel tower compose an object, or indeed the fusion of the upper half of a trout and the lower half of a turkey, i.e. Lewis's 'trout-turkey'.

[1] See also Einar Bohn's discussion of CAI in his commentary of *Parts of Classes* in the present issue.

Koslicki, who is a friend of restricted composition, challenges the idea that (in all cases) composition either definitely occurs or definitely does not occur. Lewis' defence of this idea (1986, p. 212), as Koslicki (p. 34) points out, is unsatisfactory: it is based on the assumption that parthood (or overlap) is not vague. But since the original argument for unrestricted composition concerns the question of whether composition can ever be vague, and since the mereological notion of composition is *defined* in terms of parthood, it appears to be circular to assume that parthood cannot be vague at the outset.

Sider's attempt to circumvent this problem relies on the non-vagueness of logic, which Koslicki also grants (p. 36). What Koslicki does not grant is that this non-vagueness of logic contains everything that we can say about e.g. the existential quantifier: we may agree on the *meaning* of the quantifier, but disagree about its *range*. Koslicki thinks that the proponent and the critic of UMC can very well disagree about what and how many things exist, that is, what the existential quantifier can be legitimately said to range over. If she is right, the real disagreement is over what it means to be an object (or fusion), and hence the circularity objection to Lewis's original formulation stands its ground.

I believe that Koslicki is on the right lines: Sider's novel formulation of the Lewisian vagueness argument has at least one questionable premise. However, Sider (2003) has replied to Koslicki's concern, and Koslicki (p. 39) acknowledges that, at least insofar that vagueness is merely *linguistic*, the critic of UMC faces a challenge because vagueness requires *precisifications*: «Wherever there is vagueness (of the type relevant to the argument, anyway), there must be different non-vague candidate meanings "in the neighborhood of" the vague term» (Sider, 2003, p. 137). The classic move here is to adopt a «relatively precise background language» so that one can describe the different precisifications without the threat of *ontological* vagueness (instead of mere linguistic vagueness). But, the argument continues, no such background language is available in the case of quantifiers. There is more to be said about Sider's argument, but I shall instead raise a challenge for Koslicki's position (and for anyone else who wishes to deny UMC).

The upshot of Koslicki's discussion is that the debate about what it means to be an object (or fusion) remains open. Although this result blunts the vagueness argument somewhat, the burden of proof would seem to remain on the critic of UMC, since the proponent of UMC *does* have a simple answer to the question concerning what it means to be an object: any mereological fusion

constitutes one. The greatest challenge for the denier of UMC is to provide a *positive* account of what it means to be an object. Of course, Koslicki's ultimate goal is to do just that (and we will look into this shortly), but since her account is based on an ontology of kinds that needs to be motivated independently, her positive account does not provide a direct reply to the vagueness argument. I do however think that the vagueness argument can be refuted in the lines of Merricks (2005) and Tahko (2009), namely, by identifying a sharp cut-off in continuous series in terms of emerging causal powers.

Let us now briefly consider Koslicki's (pp. 40 ff.) analysis of the Lewisian CAI thesis, which states that composition is a kind of, or at least analogous to, numerical identity. Accordingly, fusions such as the trout-turkey are supposed to be unproblematic. Since the CAI thesis has been criticised extensively, Koslicki does not spend much time with it, she simply points out that the claim that a commitment to mereological sums does not carry with it any further ontological commitment 'over and above' the constituent objects of that sum is suspect. Koslicki (p. 42) asks us to consider a world which contains two mereological atoms, a and b, and hence according to UMC also a further object c, namely the sum of a and b. Now, we can agree that c is numerically distinct from a and b, so if one is ontologically committed to the sum of a and b, namely c, then one is committed to a further object c. According to Koslicki, this further commitment is objectionable, whereas a proponent of unrestricted composition claims that it is harmless since this commitment is supposedly 'nothing over and above' the commitment to the constituents of the mereological sum.

While I think that Koslicki's case against CAI is very plausible, I wish to make one point here. Even if the phrase 'nothing over and above' is ill-chosen, it is not clear to me that mereological fusions in Lewis's sense in fact do carry much ontological weight. The reason for this – and why Koslicki and other critics of UMC and CAI might think otherwise – is that in the Lewisian model the meaning of 'object' carries much less ontological weight than it does for someone like Koslicki. Therefore, perhaps a more charitable reading of Lewis's 'nothing over and above' is in the lines of Armstrong's (1997, p. 12) 'no addition to being', that is, sums should not be considered to add to the furniture of the world since they are merely concatenations of mereological atoms. Admittedly, introducing such additional metaphors may not be particularly helpful, but Armstrong's metaphor does at least serve to emphasize

the idea that 'object' could be understood as a mere umbrella term for the sum of its parts rather than an addition to the furniture of the world. Be that as it may, I wish to dedicate the remaining space to Koslicki's own, neo-Aristotelian conception of composition.

Chapter 7 of *The Structure of Objects* is where Koslicki does the bulk of the work towards her neo-Aristotelian account of composition. Perhaps the most important claim of this approach is that «material objects have *formal* parts in addition to their ordinary material parts» (p. 168). What are these formal parts? Koslicki describes them as a *recipe* that specifies «a range of selection requirements which must be satisfied by an object's material components» (p. 197). These requirements may include for instance the spatio-temporal proximity and the manner of arrangement of the object's material components. This is no doubt the most interesting and controversial part of Koslicki's account, so I will devote the rest of my discussion to it. These formal components of objects are also what determines when we have a genuine, successful case of composition – for Koslicki, what it means to be an object is that the recipe of a given object is satisfied by a selection of material components. Although the view is certainly controversial in postulating non-material parts, the concept of a recipe[2] is intuitively appealing: there are some criteria to judge when a set of material components composes an object of a certain kind, and the *arrangement* of those components according to a given recipe is crucial for an object of that particular kind.

Another point of interest in Koslicki's position is that she takes the formal components of objects to be proper parts of their respective wholes. The driving idea behind this is that any genuine kind of object has a set of formal proper parts, which act as the recipe according to which the relevant material components compose a whole of that particular kind. From these elements we get Koslicki's Neo-Aristotelian Thesis (p. 181):

> (NAT) Neo-Aristotelian Thesis: The material and formal components of a mereologically complex object are proper parts of the whole they compose.

[2] Koslicki's concept of a 'recipe' is metaphorical and encompasses three constraints that are associated with the *kind* that an object belongs to. These include (i) constraints concerning the *types* of material components of the object, (ii) constraints concerning the *arrangement* or *configuration* of the material components composing the object, and in some cases (such as water molecules), (iii) constraints concerning the *number* of material components of which a given whole must be composed.

The immediate advantage of NAT over the Lewisian line is that we can rule out gerrymandered fusions such as the trout-turkey: there are no recipes for such objects.

I will not discuss the details of Koslicki's argument for NAT here[3], rather, I wish to examine the general motivation for this view, which stems from an ontology of kinds. The commitment to an ontology of kinds is apparent in what Koslicki calls the Restricted Composition Principle (RCP, p. 173): a set of objects composes a further object of a particular kind just in case the original set of objects satisfies the formal constraints associated with that kind. Importantly, RCP is only appealing to those who are willing to accept that there are genuine natural kinds from which the formal constraints imposed on their composite objects emerge. Koslicki defends her own commitment to genuine kinds in Chapter 8 of *The Structure of Objects*, but I believe that there may be an interesting argument available to her even without a lengthy discussion of the ontology of kinds.

The argument that I have in mind (although I do not necessarily wish to commit to it myself) goes as follows:

(1) There is at least one genuine natural kind.
(2) Any genuine natural kind imposes formal constraints for its composite objects.
(3) Hence, at least one object has formal parts in addition to its material parts.

(3) follows from (1) and (2) given Koslicki's account of formal constraints (in Chapter 7 of *The Structure of Objects*). This argument, if correct, implies that NAT must be true of at least one object. From this result it is not difficult to extrapolate that NAT is probably true of many other objects as well, insofar as there is more than one genuine natural kind. Hence, only a thorough nihilist about natural kinds could deny NAT altogether (because she would deny the first premise). Since such nihilism is not commonplace, we have good reasons to take NAT quite seriously. Proponents of UMC will thus find themselves committed to not just one but two fairly counter-intuitive theses, namely the existence of things like trout-turkeys as well as the lack of genuine natural kinds.

Koslicki herself defends a much stronger account of natural kinds, but she does motivate the account with similar considerations, even though her

[3] But see (Bennett, 2011) for a reconstruction and a critique of this argument.

emphasis is on 'extra-mereological' considerations (pp. 233–234). In particular, she notes that the combination of an ontology of natural kinds and NAT produces a much more rigorous picture about the nature of wholes: in the Lewisian picture where everything, including trout-turkeys, goes, the existence of composite objects is motivated only by UMC and standard mereology. This has the unfortunate consequence of producing 'pseudo-kinds', whereas in Koslicki's neo-Aristotelian picture the existence of wholes of a particular kind can be motivated independently of mereological considerations. The upshot is a much more usable and intuitively plausible account of what it means to be an object.

It may be that Koslicki's positive picture is more appealing to those who are sympathetic to a neo-Aristotelian, realist ontology of kinds to begin with, but she does a good job in pointing out the advantages of the combination of this ontology of kinds with a neo-Aristotelian view of composition over the standard, Lewisian picture. The commitment to non-material formal parts that is central to this account can be regarded as an ontological cost, but I do believe it to be a necessary cost; I for one am more open to non-material formal parts rather than all manner of gerrymandered objects.

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