Comments on Marta Campdelacreu i Arqués, "Vagueness and Temporal Parts"

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Sider's argument

Let us use, following Sider (2001: 59), "four-dimensionalism" for the following claim:

(4D) Necessarily, each spatio-temporal object has a temporal part at every time at which it exists.

(4D) follows from three other claims, *Instantaneous Plenitude* (IP), *No Permanent Coincidence* (NPC) and *Unrestricted Diachronic Composition* (UDC):

(IP) Necessarily, for every time that some spatiotemporal objects exists, there is something coincident with it at that time that exists only at that time.

(NPC) No two objects are coincident at every time at which any of them exists.

(UDC) For all things that exist at some times, there is something that overlaps them and is overlapped by them at all and only the times at which they exist and that exists at all and only the times at which at least one of them exists.

Take some spatio-temporal object a. At any time t at which it exists, there is, by (IP), some b_t coincident with a at t that exists only at t. By (UDC), there is a fusion of all and only those b_ts that exists at the same times than a. By (NPC), this fusion is identical to a. Hence a has instantaneous temporal parts at all times it exists (4D).

David Lewis' argument from vagueness for unrestricted composition goes as follows:

(i)	For every thing, definitely (it exists) or definitely (it does not exist)	no ontic vagueness
(ii)	For every things, definitely (they are identical) or definitely (they are not)	no ontic vagueness
(iii)	Definitely ($p \rightarrow q$) $\vdash$ Definitely (p) $\rightarrow$ Definitely (q)	logic
(iv)	For every n, definitely (there are just n things) or definitely (not so)	from (i), (ii), (iii)
(v)	Definitely (there is a cat iff $\phi(a_1, \ldots, a_n)$)	composition
(vi)	Definitely (there is no cat iff there are just n things)	composition
(vii)	Definitely (there is a cat) or Definitely (there is no cat)	from (vi), (iv), (iii)
(viii)	Definitely ($\phi(a_1, \ldots, a_n)$) or Definitely ($\neg\phi(a_1, \ldots, a_n)$)	from (vii), (v), (iii)

The argument shows that "$\phi(x_1, \ldots, x_n)$" must be definitely true or false of any n objects that may or may not be a cat. The argument then continues as follows:

(ix)	Every non-trivial condition ϕ on composition is vague	argument from elimination
(x)	No vague condition ϕ on composition satisfies (viii)	metaphysical non-arbitrarity
(xi)	Only the empty and the impossible conditions ϕ satisfy (viii)	from (ix) and (x)
(xii)	There are composite objects.	common sense
(xiii)	$\phi(a_1, \ldots, a_n)$ iff $a_1, \ldots, a_n$ exist	from (xi) and (xii)
(xiv)	There is a cat iff $a_1, \ldots, a_n$ exist	from (xiii), (v), (iii) and 'Definitely (p) $\vdash$ p'

Sider's first argument is an adaptation of Lewis' argument to the temporal case. It consists in a restriction of (v) to diachronic composition, where $a_1, \ldots, a_n$ all exist at (possibly) different temporal instants. He concludes that there is no non-trivial restriction of diachronic composition, because any would be vague. This establishes (UDC).

I think lovers of restricted composition should attack (ix). They could argue, e.g., that nothing that is not conscious could be a person and that persons evolved (or could have evolved) in a Sorites series of small changes: at some such small step, the qualia kicked in and the first person was born. But still there is, such a person could argue against (ix), a substantial, non-trivial condition on there being persons, namely consciousness.

Another, more exotic way of resisting the argument would be to deny (x), that no vague conditions can mark determinate boundaries. Williamson, e.g., could say that everything necessarily exists but that cats are only contingently concrete, i.e. spatio-temporally located. It may then be vague not whether cats exist or how many things there are, but whether cats are concrete. Whether or not they are concrete, is a determinate fact, but in some cases one we cannot know. Such an epistemicist position would hold that no-one could ever know in principle how many things there are and how many of them are cats.

Even if we grant (NPC), however, (IP) is needed to get to (4D). *Sider's second argument* is designed to establish this. The crucial generalisation is from what Sider (2001: 133) calls "D(iachronic)-fusions", fusions of temporally scattered objects, to "minimal D-fusions", fusions that exist *only* at the times those objects exist. He runs the same argument, replacing "cat" with "minimal D-fusion of $a_1, \ldots, a_n$, thereby turning (ix) into (P1'), (x) into (P2') and (viii) into (P3'). This weakens mostly (x); it is much less plausible to assume that coming into existence and ceasing to exist can never be vague than it is to assume that conditions on a-temporal existence must be precise.

If Sider's second argument is successful, it establishes the non-vagueness of any condition on the existence of any things that are not identical to the parts they are composed of (premise (vi)). This is why his argument for (IP) is fallacious: the argument is not sound for $n = 1$. To see this, suppose that there is just one thing, a cat, enduring for an indefinite length of time. For any set of instants of its life, it is itself a D-fusion of any possible assignement of objects to them. But none of these D-fusions is determinately minimal – it is always indeterminate whether the cat lives a little longer. Sider's argument from vagueness establishes that there is no restriction on the composition of temporally scattered things but it does not establish that some of these things are instantaneous.

Marta's argument

Marta, as I understand her, attacks not Sider's second, but his first argument, in particular (v). As I think that Sider's first argument for (viii) is successful, I will criticise Marta's counter-argument.

Marta notes first that Sider (2001: 127,136), in his derivation of (iv), restricts the quantifier to concrete objects, which he defines as entities that are neither sets, nor classes, nor numbers, nor properties, nor relations, nor universals, nor tropes, nor possible worlds, nor situations (Sider 2001: 127). She also notes that his argument for (i) turns on the quantifier being unrestricted (Sider 2001: 128). This is a good point. The quantifier restriction in (iv) only invalidates the argument for (i), however, if "concrete" admits of different precisifications and Sider (2001: 127) claims that this is not the case, though he does not give any argument.

I think, however, that Sider's argument would be stronger if he did not restrict his quantifiers – even with absolute unrestricted quantifiers, (iv) follows from (i), (ii) and (iii) if we allow infinitely long sentences and some infinitary logic to deal with them. But I do not see how this extra assumption could make the argument less plausible.

Here is how I understand Marta's argument against (v):

(1) The least restricted quantification possible quantifies over all objects.
(2) "x is an object" admits of different admissible precisifications.
(3) It is not true under all precisifications that there is an object iff $\phi(a_1, \ldots, a_n)$.
(4) Definitively (if something is a cat [fusion], then it is an object).
(5) Hence, it is not true under all precisifications that there is a cat iff $\phi(a_1, \ldots, a_n)$.

I have doubts that (1) and (2) are compatible. Here is why:

(a) Suppose that there are two different admissible precisifications of "object" – $O_1(x)$ and $O_2(x)$.
(b) Then there is something, a, such that $O_1(a) \wedge \neg O_2(a)$.
(c) Hence, the least restricted quantification possible is over all x such that $O_1(x)$.

(a') Suppose that the least restricted quantification possible is over all objects.
(b') Hence, definitely (there is no x such that x is not an object).
(c') Hence, no precisification O_i is admissible such that there is an a such that $\neg O_i(a)$.
(d') Hence, "object" has only one admissible precisification.

References

Sider, Theodore. *Four-Dimensionalism: An Ontology of Persistence and Time*. Oxford: Clarendon Press, 2001.