

Issues in Contemporary Metaphysics

Lecture 7: Mereology

1. Mereology

Mereology is the logic of parts and wholes. Mereological relations are those relations to do with parthood.

My hand is a part of me.

The atoms compose the table.

Siamese twins overlap.

My Ikea flatpack has 78 different parts.

Terminology

Mereologists introduce some special terms, which have stuck with us since the early 20th century. Parts are either *improper parts* or *proper parts*. The *improper* part of something just is the object itself (Everything is an improper part of itself). The *proper* parts of an object correspond to what we generally think of as parts (hands, bits of Ikea flatpack furniture etc.) When the mereologist just says 'part' he means anything that is either an improper or proper part. *This distinction is hardly ever important, but that's what these terms mean.*

We will be particularly interested in the relation of *composition*. This means what it means in English, but gets a definition anyhow:

The x s compose y at time t =df (i) each x is a part of y at t ; (ii) no two of the x s overlap at t ; and (iii) every part of y overlaps at least one of the x s at t .

Example: My atoms compose me.

Example: My top half and bottom half compose me.

Example: My head and arms *don't* compose me (as it misses out my torso, there's a bit missing)

Some last bits of terminology. Some mereologists call the object that is composed of some things the *fusion* of those things. Some mereologists call the object that is composed of some things the *sum* of those things.

2. The Special Composition Question

Intuitively, some things compose further objects.

Example: My atoms compose me

Example: Car parts compose a car when assembled correctly

Example: Bricks, mortar, plaster and concrete can compose a building

Intuitively, some things don't compose further objects

Example: You and I don't compose a further object

Example: There is no object with just the cast of Dallas and every toilet in London as a part.

Example: These are *gerry-mandered things*.

Van Inwagen introduced the SCQ:

The Special Composition Question (SCQ): What are the necessary and jointly sufficient conditions that any y s must satisfy at time t in order for it to be the case that there is an object composed of those y s at time t ?

3. Restricted Composition

Composition is *restricted* if it *sometimes* takes place and *sometimes* doesn't. That seems intuitively how it works. But finding restricted answers to the SCQ is quite tricky. Maybe you think it has something to do with the objects being *close* to one another.

Contact: The y s compose a further object iff the y s all stand in the ancestral of 'touching' with one another.

So imagine you have a bunch of Lego bricks. Stick them all together. Even though each of them doesn't necessarily touch one another, they all stand in the *ancestral* of touching. So they compose, given *Contact*

Problem one

Taking physics seriously, nothing ever touches. It can, at best, get really close. Maybe, then, we should just say things compose when they get really close to one another?

Problem two

Has some counterintuitive consequences. If I shake hands with George Bush then, from nowhere, a new object appears: Nikk Bush. As me and George are touching, we compose. So there's an object with just me and him as a part. But surely no new object intuitively comes into existence?

We can modify the answers, so maybe it's to do with what forces *bind* the objects. So they have to be *fastened* to one another in a way that me and George wouldn't be. This has similar problems. What happens if I accidentally superglue myself to George. Does that mean Nikk Bush appears? The set reading by Markosian surveys a variety of answers trying to 'get our intuitions right'. They all have similar problems, but I'll leave you to exhaust them yourselves. Far more interesting are the arguments *against* restricted composition.

4. Arguments for unrestricted composition I: Cultural Prejudice

Not every culture believes in exactly the same objects. And we can certainly *imagine* that there are cultures that disagree about what objects there. Let's have some examples.

Example one: Cuts of beef

Example two: Countries

Example three: The Eskimo and the caravan and car.

Example four: Yams

Example five: Incars and outcars

The worry is that a restricted composition will be unnecessarily prejudicing one culture's beliefs. That your answer will say Western culture is right, and give the metaphorical finger to everyone else. Which is weird – why are *our* beliefs any better than there's?

The move at this stage is to say that composition is *unrestricted*. Specifically, that in all of the above cases *all of those objects exist*. This may make a lot of sense in some of the examples. For instance, you might say the French don't believe the sirloin *doesn't exist*, they just don't think it's a particularly good cut of meat. After all, they don't think cow's teeth are a good cut of meat – but surely they still believe in them! Similarly for the countries. We all agree the *plots of land exist*. The debate between Israel and surrounding Arab states isn't *ontological*, it's *political*. All those plots *exist*, there's disagreement over whether they *count as countries in their own right*.

Things get a bit more tricky with the yams/taytu/yowanna and the incars/outcars. This is because we have brought *time* into the picture. We'll return to them in lecture 9 – for now, we'll set them aside. But you get the picture: for any things, we say those things compose. In doing so, no culture is wrong when they assert the existence of a composite (but will be wrong when they deny the existence of a composite).

5. Arguments for unrestricted composition II: Vagueness

Premise one: If restricted composition is true then there is (i) a case, C_1 , where composition occurs, and (ii) a case, C_n , where composition does not occur, and (iii) there is a continuous series of cases connecting C_1 and C_n .

Premise two: In no continuous series can there be a sharp cut-off point in whether composition occurs or not i.e. there can never be two exceedingly similar cases such that composition definitely occurs in one case but definitely does not occur in the other.

Premise Three: In any case, it is not vague whether composition takes place or not i.e. composition definitely occurs, or composition definitely does not occur.

Conclusion: It is not the case that composition is restricted.

Defence of premise one

Given restricted composition there are cases where atoms do compose.

Example: Atoms composing a teddy bear.

Given restricted composition there are cases where atoms do not compose.

Example: Teddy bear after it's been fed through a wood chipper.

In between those cases, there are a 'continuous series' (basically, an infinite series) of cases in between.

Example: Snapshot images of the teddy bear as its fed through the wood chipper.

Defence of premise two

Can the slightest infinitesimal movement of a single atom make *all the difference* as to whether or not the atoms of a teddy bear compose or not? Intuitively not. Compare: there are cases of people who are fat, and cases of people who are

not fat. We don't think that losing one billionth of an ounce will make the difference to this. (Some people, *epistemicists* about vagueness, disagree)

Defence of premise three

Go back to 'fat'. There can be vague cases of people being fat – people on the borderline between fat and not fat. If you think vagueness is a *linguistic* phenomena, this is because no-one ever sat down and fixed exactly what the difference would be. But it seems *weird* to say that something existing could be vague. Something could exist; something might fail to exist. But what would it be for it to *vaguely* exist? Hovering in some shadowy world between existence and non-existence?

Moreover, the phrase 'There is something that vaguely exists' is problematic. Commits us to:

$\exists x (x \text{ vaguely exists})$

But you're saying it *does* exist! So the argument goes (Sider has a variation in the set reading) 'vague existence' makes no sense. (Obviously there are people who dissent)

The other unrestricted composition: nihilism

Anyhow, that's the defence of the three premises. So composition has to be unrestricted. So we should be universalists. There is an alternative in this case! We might be *nihilists*. Composition *never occurs*. Then there would never be a case, like the teddy bear before it goes in the wood chipper, of atoms composing and the vagueness argument is averted.

6. Universalism

Sometimes called *unrestricted mereological composition*. Whatever things exist compose. Weird, strange objects now exist. We *overpopulate* our ontology with whacky entities that intuitively don't exist.

Isn't that a reason to think it's false? Maybe. Have a look at the readings. What the universalist says is that *quantification is restricted*. You're familiar with restricting your quantifiers:

'All the beer is in the fridge'

Represented as:

$\forall x (x \text{ is a beer} \rightarrow x \text{ is in the fridge})$

But in most cases you're *restricting* that universal quantifier. *You're not quantifying over everything*

The universalist says the same here. Usually, when you deny the existence of these objects *you're telling the truth*. You're telling the truth for whilst they (unrestrictedly) exist, they don't exist in the domain you're restricted your quantifiers to. No more problematic than all the beer being in the fridge, even if there are some beer bottles that aren't in the fridge. Only speaking *unrestrictedly* do we come to see that all these other weird objects exist. But these weird objects aren't counterintuitive because of this restriction strategy.

7. Nihilism

The other position is that things never compose. Now this is not to say that there are no objects! Far from it: there are just the sub-atomic particles of physics. So, *really*, all there is to the world are just sub-atomic particles (protons, electrons etc.). But wait! Protons (etc.) turn out to be composed of further objects (quarks). So because of this they seem to be susceptible to the same line of thinking – how do we know there are protons (etc.) as opposed to just some quarks stuck together? Parallel thinking leads us to believe that there are no protons! So all that exists are the *smallest* things possible. Things that have *no parts*. These things are called *mereological simples*. They are, as it were, the very bottom level of reality.

Motivations

Nihilism is motivated not just on the grounds of vagueness, but also for other reasons. For instance, some people think this is the true lesson of physics. Others think that if there were composite objects then the world would be causally overdetermined (Merricks, *Objects and Persons*) Next week, we'll see how it solves certain paradoxes of material constitution.

The Paraphrasing Strategy

Here's a problem for nihilism: it's *obviously* false. If I know anything, surely I know that there are tables, and statues, and mountains, and *people*. Nihilism says all these things do not exist. If we left it at that, then we'd have a problem, and *prima facie* reason to think it was false.

But nihilists do not leave it there. Just as universalists have their restriction strategy concerning quantification, nihilists introduce a *paraphrasing strategy*. This is just like what we've seen in earlier lectures. 'There are properties' might be paraphrased, so that it doesn't involve committing to the existence of properties. Similarly, they say that it's okay to use the sentences 'There are mountains' but that there's a paraphrase that doesn't involve committing to these things.

We can do the same here. When we make statements about composite objects can offer paraphrases that don't quantify over such things. We quantify instead over *pluralities* of simples. To do this we need to supplement our logical language. Standard first order logic can't hack plural quantification:

'Al, Bob and Carl lifted the piano'

No translation! It's not $(Fa \ \& \ Fb \ \& \ Fc)$ where F is the predicate of having lifted the piano. Such predicates are *collective*. So they are satisfied by *many* things together *not* by any one thing amongst them.

Another Example: 'Surrounded the building'

Collective predicates can't be captured in first order logic. So we extend the logic (don't sweat the details) such that there are these collective predicates that apply to many things at once. We introduce a new *plural* quantifier (say $\exists xx$)

So how does this help?

'There is a table' is paraphrased as: 'There are some simples arranged tablewise'

'The bullet penetrated the car engine, blowing a hole in it.' is paraphrased as: 'Some simples arranged bulletwise intermingled with some simples arranged car enginewise causing those simples to be arranged holewise.'(?)

Problem one: What about me?

Here's the big problem with nihilism: surely I know that I exist! I am *clearly* not a sub-atomic particle or other such mereological simple. So as nihilism says everything is a simple, we've got a contradiction. Something has to go.

Can we feasibly deny that we exist? Surely the *cogito* demonstrates that this is false? Objections to the *cogito* included Lichtenberg's objection that what we should actually conclude is merely that there is thinking. That boggles the mind. How can there be thoughts with thinkers? Can thoughts float free? (Isn't that what happens in the *BFG* with dreams?) But we can see now that with nihilism we can accept Lichtenberg's objection without accepting a metaphysics of Roald Dahl.

Take ' is thinking' to be a collective predicate. So many things can fulfil that function without any one thing thinking. (compare to lifting the piano) So even though there are many things that (collectively) think there isn't a thinker anymore than three people who lift a piano demands the existence of some fourth thing. Even though there exists nothing that lifts the piano, there exist many things that do. Even though there exists nothing that thinks, there exist many things that do. So there can be thinking, without a thinker.

Maybe that works – maybe it doesn't. Some nihilists try and avoid the problem by not quite being nihilists. For instance, van Inwagen believes there are no tables, chairs, mountains etc. But the above *cogito* style reasoning leads him to believe there are *some* objects that are composite. Namely, organisms (whereas Merricks is a nihilist who adds in conscious beings) Call these (semi-)nihilists *Eliminativists*. Is this *ad hoc*? Maybe. But I mention it for you to examine yourselves.

Problem two: Atomless gunk

Here's the other one: there might be gunk and no simples. 'Gunk' is a term from David Lewis.

x is atomless gunk iff every part of x has a part.

So if the world was gunky, there would be no simples. So there are no simples as at every stage we find we can keep dividing further and further, and it never ends! There's never a case of when there is something indivisible and partless.

Given nihilism all that exists are simples. Gunk isn't simple. If there's gunk, nihilism is false. Indeed, if we're thinking nihilism has to be a *necessary* truth then even the *possibility* of gunk would be a problem. So is gunk possible? Sider's other paper in the set readings covers this question. I leave you to read it and see what his argument for the possibility of gunk is meant to be, and how plausible it is.