Composition

David Sanson
Illinois State University
dsanson@gmail.com

Wilson's Abstract

Material composition is typically understood in terms of classical mereology, sometimes "souped-up" so as to include formal parts or functional elements capable of accommodating structure. In her talk, Wilson will propose and defend an account of material composition that takes seriously the scientific appearances according to which composition involves causal relations among composing elements.

Material Composition

Many material objects seem to be composed of parts. Your body, for example, is composed of your arms, legs, torso, and head. So an account of material composition is an account of such objects, and how they are related to their parts.

Classical Extensional Mereology (CEM)

Definitions

It is standard to take x is a part of y as primitive, and define some other concepts in terms of it.

Proper Part x is a proper of part of y = x is a part of y and $x \neq y$
Atom (or Simple) x is an atom (or a simple) = x has no proper parts.
Composite x is composite = x has proper parts.
Overlap x and y overlap = x and y have at least one part in common.
Disjoint x and y are disjoint = x and y do not overlap.
Composition The xs compose y = each of the xs is a part of y and every part of y overlaps at least one of the xs.
Fusion (or sum) y is the fusion (or sum) of the xs = the xs compose y.

Axioms

Reflexivity Everything is a part of itself.
Transitivity If a is a part of b and b is a part of c, then a is a part of c.
Unrestricted Composition For any things, there is at least one thing they compose.
Uniqueness of Composition For any things, there is at most one thing they compose.

Suppose exactly three distinct simples, a, b and c, existed. According to CEM, how many composite objects exist, and what are they?

Alternatives to CEM

Most of the debates concern Unrestricted Composition and Uniqueness of Composition.

Unrestricted Composition and the Special Composition Question

Special Composition Question (SCQ) Under what conditions do some x's compose a y?

The answer, according to Unrestricted Composition, is "always". This entails the existence of trout-turkeys and trogs.

Trout-turkey An object composed of front end of a trout and the end of a turkey.
Trog An object composed of a tree and a dog.

The Mereological Nihilist rejects Unrestricted Composition. Her answer to SCQ is "almost never".

Mereological Nihilism There are only simples.

(Why is it "almost never" instead of "never"? Because everything is a part of itself, so everything composes itself.) This entails that there are no composite objects, and so (presumably), no human bodies, no dogs, no trout, no trees…

The common-sense answer is "sometimes": there are trees, human bodies, dogs, trout, etc., but there are not trogs or trout-turkeys, etc. The common-sense answer owes us an account of what makes the cases where composition occurs different from the cases where it does not. This is hard to do.

Uniqueness of Composition and Structure

Consider some tinkertoys. By Unrestricted Composition, there is at least one thing composed of them. By Uniqueness of Composition, there is exactly one thing composed of them.

Suppose that, at t1, the tinkertoys are in a scattered pile. Suppose at t2, the tinkertoys compose a tinkertoy house. Suppose at t3, they are once again scattered in a pile.

1. The fusion of the tinkertoys, f, exists at t1, t2, and t3.
2. The tinkertoy house, h exists at t2, but not at t1 or t3.
3. Therefore, $h \neq f$.

But h and f are composed of exactly the same tinkertoys.

A Few References

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