

Commentary  
David Lewis  
*Parts of Classes*  
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David Lewis's *Parts of Classes* is a great book, in all respects. But one of its most interesting thesis, in my mind, is not its core thesis that standard set theory – ZFC – reduces to classical mereology + plural quantification + a primitive singleton-relation, but rather its sub-thesis of how to understand classical mereology, what Lewis calls the thesis of *Composition as Identity*:

(CAI): a whole is the same portion of reality as its many parts taken together; it is them collectively, they collectively are it.

CAI is needed as an assumption for the core thesis of *Parts of Classes* – the reduction of ZFC – on pain of it being unmotivated.<sup>1</sup> But CAI is the most interesting in its own right. It is also as such it is presented by Lewis, and received in the literature.<sup>2</sup>

In what follows, I critically assess CAI as Lewis presents it in *Parts of Classes*. I first argue that Lewis's presentation of CAI has been misunderstood in the literature (section 1). I then argue that the best (if not the only) way to understand it entails a slightly revisionary semantics for a certain form of predication (section 2). I finally end by showing that this might create more trouble than it solves for Lewis (section 3).

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<sup>1</sup> According to the core thesis of *Parts of Classes*, a class is the fusion of the singletons of its members (and something is a member of a class iff that something's singleton is a part of the class). But why exchange the fusion for the class itself if the fusion is a distinct ontological constituent compared to the singletons of its members? The reduction becomes unmotivated.

<sup>2</sup> The idea behind CAI is not original with Lewis. It is for example proposed by Socrates in Plato's *Theaetetus* (204) and by David Armstrong (1978, 1997). A more radical version of it is defended by Baxter (1988a, 1988b). I defend another version of it in Bohn, ms.

Unfortunately, due to limitations of space, I cannot here go into some recent and most interesting discussions of CAI by especially Ted Sider (2007, ms), Ross Cameron (2007, forthcoming), and Kris McDaniel (2008, 2010).<sup>3</sup> Let it here suffice to critically explicate Lewis's own understanding of the thesis.

### 1. Composition as Identity Misunderstood

Here is Lewis:

To be sure, if we accept mereology, we are committed to the existence of all manner of mereological fusions. But given a prior commitment to cats, say, a commitment to cat-fusions is not a *further* commitment. The fusion is nothing over and above the cats that compose it. It just *is* them. They just *are* it. Take them together or take them separately, the cats are the same portion of Reality either way. ... If you draw up an inventory of Reality according to your scheme of things, it would be double counting to list the cats and then also list their fusion. ... I say that composition – the relation of part to whole, or, better, the many-one relation of many parts to their fusion – is like identity. The 'are' of composition is, so to speak, the plural form of the 'is' of identity. Call this the Thesis of *Composition as Identity*. It is in virtue of this thesis that mereology is ontologically innocent: it commits us only to things that are identical, so to speak, to what we were committed to before.<sup>4</sup> (pp. 81–82)

The idea seems clear enough: there is a portion of reality that is ordinarily thought of as some cats, but we can also think of it as one whole thing composed of all and only those cats. That is, in general, the composers collectively and the composed are identical with each other, just thought of under different descriptions.

But Lewis goes on to say that

mereological relations (however restated) are something special. ... they are strikingly analogous to ordinary identity, the one-one relation that each thing bears to itself and to nothing else. So striking is this analogy that it is

<sup>3</sup> I do so in (Bohn, ms).

<sup>4</sup> Some things *xx* *compose* something *y* iff each one of *xx* is a part of *y* and each part of *y* overlaps at least one of *xx*; *x* and *y* *overlap* iff they share a common part; *x* is a *proper part* of *y* iff it is a part of *y*, but is not identical with *y*; and *x* is *the fusion of yy* iff *yy* compose *x*. *Parthood* is primitive, but reflexive, anti-symmetric, and transitive.

appropriate to mark it by speaking of mereological relations – the many-one relation of composition, the one-one relations of part to whole and of overlap – as kinds of identity. Ordinary identity is the special, limiting case of identity in the broadened sense. (pp. 84–85)

Lewis then gives five respects in which composition is like ordinary one-one identity, before he concludes that the analogy has its limits:

In the first place, I know of no way to generalize the definition of ordinary one-one identity in terms of plural quantification. ... And in the second place, even though the many and the one are the same portion of Reality, and the character of that portion is given once and for all whether we take it as many or take it as one, still we do not have a generalized principle of indiscernibility of identicals. It does matter how you slice it – not to the character of what's described, of course, but to the form of the description. What's true of the many is not exactly what's true of the one. After all they are many while it is one. The number of the many is six, as it might be, whereas the number of the fusion is one. And the singletons of the many parts are wholly distinct from the singleton of the one fusion. That is how we can have set theory. (pp. 85–86)

Even though Lewis's initial idea seems clear enough, his subsequent talk of analogy has created some confusion. For example, Peter van Inwagen (1994) takes it to mean that Lewis doesn't really hold that a whole and all its parts are *identical*, but rather that the relation between them is *analogous* to identity. But, as van Inwagen goes on to point out, either a whole and all its parts are identical or they are not identical. If they are merely analogous to being identical, but not really identical, then they are not identical, and the whole is something distinct from its parts, in which case CAI, with its claim that mereology is ontologically innocent, collapses into obscurity.

Beyong-Uk Yi (1999) likewise separates between on the one hand, a *stronger* version of CAI according to which a whole and all its parts are identical literally and strictly speaking, and on the other hand, a *weaker* version of CAI according to which a whole and all its parts are identical only by analogy. Yi, like van Inwagen, interprets Lewis as only accepting the weaker, analogous sense of CAI. (Yi, like van Inwagen, rejects both the stronger and the weaker thesis).<sup>5</sup>

<sup>5</sup> The distinction between a weak and a strong version of CAI is also found in (Sider, 2007), among other places.

But this is a mistake. Lewis proposes what he calls *the thesis of Composition as Identity* according to which a whole (the fusion/the composed) and all its parts (the composers) are one and the same portion of reality thought of under two different descriptions.<sup>6</sup> His talk of analogy is always with respect to the ordinary one-one identity (“ $x=y$ ”), not with respect to the more general form of many-one identity (“ $xx=y$ ”). But of course composition is not ordinary one-one identity. After all, composition is a many-one relation, while ordinary one-one identity is not. Recall, according to Lewis, «ordinary identity is the special, limiting case of identity in the broadened sense». So, according to Lewis, there is a more general notion of identity to which composition belongs.<sup>7</sup> So, it is not that composition is analogous to identity as such, but rather that composition is analogous to ordinary one-one identity, which is not saying that composition isn’t really identity. Composition is literally and strictly speaking identity in the general sense, but it is not literally and strictly speaking ordinary one-one identity. Lewis’s talk of analogy with respect to one-one identity is best thought of as intended to illuminate and motivate a more general notion of identity to which composition belongs.

Much of the reason why van Inwagen and Yi interpret Lewis as only holding the weaker thesis is Lewis’s two comments on the limits of the analogy with ordinary one-one identity (quoted above).

The first comment is that there seems to be no way to generalize the definition of ordinary one-one identity in terms of plural quantification:

$x=y =_{df}$  for any  $zz$ ,  $x$  is one of  $zz$  iff  $y$  is one of  $zz$ .

The most natural generalization does not work:

$xx=y =_{df}$  for any  $zz$ ,  $xx$  are among  $zz$  iff  $y$  is among  $zz$ .

Assume my arms, legs, head and torso are identical with my body. Then there is a plurality of things, namely my arms, legs, head and torso, such that my arms, legs, head and torso are among them, but without my body being among them because my body is not one of my arms, legs, head and torso, at least not on any ordinary understanding of ‘among’, or ‘is one of’. So the most natural

<sup>6</sup> Lewis of course allows that the composers are more *objectively natural* – better cut nature at its joints – compared to the composed, or vice versa. See (Lewis 1983, 1986).

<sup>7</sup> See (Lewis, 1993).

generalization does not work. That seems to be Lewis's first point on the limits of his analogy.

But all this shows is that many-one identity cannot be *defined* in terms of plural quantification in the same way one-one identity can. It shows nothing to the effect that composition is not really relating identical things as such. First, plural quantification with ordinary one-one identity doesn't even have the syntactic resources to form well-formed formulas that express many-one identities, so why expect it to be able to define it? Second, identity is a primitive notion if anything is, so the lack of a full definition of it is to be expected. So, Lewis's first point on the limits of his analogy need not and should not be interpreted as a point against composition being identity, but only as a point against composition being ordinary one-one identity.

Lewis's second comment is that there is no generalized principle of indiscernibility of identicals: if  $xx=y$ , whatever is true of  $xx$  is true of  $y$  and vice versa. But if  $xx$  is a plurality of more than one thing, then, for example,  $xx$  is not one in number, but  $y$  is, and  $xx$  forms a set that  $y$  does not. So there seems to be no generalized principle of indiscernibility of identicals. That is Lewis's second point on the limits of his analogy.

But note, Lewis in *Parts of Classes* also says that

the many and the one are the same portion of Reality, and the character of that portion is given once and for all whether we take it as many or take it as one ... It does matter how you slice it – not to the character of what's described, of course, but to the form of the description. (p. 87)

So, the point seems to be that there are different ways of describing one and the same thing; one such way is as one whole, another such way is as many parts. According to Lewis, there is no principle of indiscernibility of identicals cutting across, so to speak, all such ways of describing something.<sup>8</sup>

But this does nothing to show that the whole and all its parts are not one and the same portion of reality; it merely shows that some truths are relative to

<sup>8</sup> This same point is perhaps made clearer by Frege (1884, p. 59):

While looking at one and the same external phenomenon, I can say with equal truth both "It is a copse" and "It is five trees", [...]. Now what changes here from one judgment to the other is neither any individual object, nor the whole, the agglomeration of them, but rather my terminology. But that is itself only a sign that one concept has been substituted for another.

some ways of describing it. So, again, Lewis's second point on the limits of his analogy need not and should not be interpreted as a point against composition being identity, but only as a point against composition being ordinary one-one identity.

## 2. Composition as Identity Proper

But it is hard – too hard – to understand how  $xx$  can be identical with  $y$  without  $xx$  being indiscernible from  $y$ . Contra Lewis, any relation of identity worthy of its name entails indiscernibility. Fortunately, Lewis is unnecessarily pessimistic on this point. Here is a simple suggestion for an appropriately generalized principle of indiscernibility of identicals:<sup>9</sup>

$$(GPII) \forall xx \forall yy (xx = yy \rightarrow (\phi(xx) \leftrightarrow \phi(yy))),$$

where  $xx$  and  $yy$  are plural variables, each taking pluralities of *one or more* things as its value. GPII is just the standard principle of indiscernibility of identicals for ordinary one-one identity, but with plural variables in place for singular variables. To make this an *appropriately* generalized principle, any predication whose truth depends on a form of description of the portion of reality in question must be a *relative* predication, i.e. must be relative to a form of description of the portion of reality it is a predication of.<sup>10</sup> This relative aspect is needed to avoid paradox.

Assume my body is composed of my arms, legs, head and torso, and consider the following three kinds of predication: '...is  $n$  in number', '... is one of ...', and '...form set  $S$ ', where  $n$  is a number and  $S$  is a set. My body is one in number, but my arms, legs, head and torso are not one in number; my body is one of my body, but my body is not one of my arms, legs, head and torso; and my body forms the set  $S$ , but my arms, legs, head and torso do not form the same set  $S$ . Now, if, as per CAI, my body is identical with my arms, legs, head and torso, then by GPII we are riddled with paradoxes: one and the same thing both is one in number and is not one in number; it is one of some things and not one of those things; and it forms set  $S$  and does not form that set  $S$ . But if,

<sup>9</sup> I defend this principle in (Bohn, ms).

<sup>10</sup> The relative aspect of the predication should be placed in the semantics of the predication, not in the syntax, if not only to avoid overcomplicating the notation.

on the other hand, the relevant predications only hold relative to a description of the portion of reality in question, then there are no paradoxes: the portion of reality in question is one in number relative to description D, but not one in number relative to description D\*; it is one of some things relative to D, but not one of those things relative to D\*; and it forms set S relative to D, but does not form set S relative to D\*.

### 3. Composition as Identity: Trouble for Lewis?

As far as I can see then, given CAI, GPII must be accepted on pain of incoherence, and much predication must be relativized to descriptions for the same reason. But it is not clear that Lewis can accept this, and hence CAI might spell more trouble than it solves for Lewis.

Consider again the above types of predication that need to be relativized in order for GPII to be an appropriately generalized principle of indiscernibility of identicals: ‘...is n in number’, ‘...is one of...’, and ‘...form set S’. Lewis in *Parts of Classes* takes them all at face value. He treats numerical properties as intrinsic one-place properties of whatever the number holds of; he treats singleton formation as a primitive two-place relation of set theory that holds between a thing and its singleton (see especially ch.1 and section 2.1); and he treats ‘...is one of...’ as a primitive two-place copula of plural logic that relates the singular to the plural (see especially section 3.2). But if there is to be a principle of indiscernibility of identicals along the lines of GPII, as any relation of identity seems to entail, these three types of predication (as well as many others) must be relativized on pain of incoherence. But then, contra Lewis, they are two-place, three-place, and three-place properties, respectively.

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