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Composition and plethological innocence
Jonathan D. Payton

1. According to Composition as Identity (CAI), a whole is distinct from each of its parts individually, but identical to all of them taken together.[1] It's sometimes claimed that, if you accept CAI, then your belief in a whole is 'ontologically innocent' with respect to your belief in its parts. If you think that the whole *just is* its parts, then by your lights, to affirm the existence of the whole is just to affirm the existence of the parts again, and so is not to take on an *additional* ontological commitment.[2]

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1   For recent defences, see Bohn 2014, 2021, Payton 2021, forthcoming-b, forthcoming-c and Wallace 2011a, 2011b.

2   See e.g. Bohn 2014: 148–52 and Wallace 2011b: 818–21. The claim is strongly associated with Lewis (1991: 81–85), although it's not clear whether Lewis accepts CAI or the weaker thesis that parts and wholes stand in a relation *analogous* to identity. For discussion, see Bohn 2011.

This claim, if correct, is quite powerful. Consider compositional nihilism, the view that composition never occurs and all that exists are mereological atoms (see e.g. Dorr and Rosen 2002). Prima facie, nihilism is more ontologically parsimonious than compositional realism, the view that composition sometimes occurs.[3] For example, where a realist might see some atoms arranged tablewise, which together compose a table, the nihilist sees only the atoms. However, if the realist accepts CAI, then by her lights, the table just *is* the atoms arranged tablewise, and so by her lights, she doesn't believe in anything the nihilist doesn't already believe in. Thus, CAI has an important role to play in our evaluation of these two views. Typically, ontological parsimony is thought to be a theoretical virtue; all else being equal, we ought to prefer a theory that posits fewer objects. If the realist rejects CAI, the nihilist has a decisive advantage, as far as parsimony goes. But if she accepts CAI, then her ontology and the nihilist's are on equal footing in this respect; considerations of parsimony favour neither realism nor nihilism.

Unfortunately, the claim is *not* correct, at least, not on one understanding of what ontological commitment is.

Quine (1948: 21) says that ontology is about what there is. As I understand the Quinean view, ontological commitment is carried primarily by sentences. A person is ontologically committed to Fs by virtue of being committed to accepting a sentence that carries that commitment. A sentence carries a commitment to Fs just in case it quantifies over Fs.

> (Ontological Commitment) S is ontologically committed to Fs just in case S is committed to accepting a sentence of the form '$\exists x F x$'.

If that's what ontological commitment is, then what's ontological innocence? To make a start, distinguish *qualitative* from *quantitative* ontological commitment. To take on a new *qualitative* commitment is to take on a commitment to a new *kind* of thing, that is, to accept that there are Fs when you previously didn't. To take on a new *quantitative* commitment is to take on a commitment to at least one new *thing*, that is, to think that the truth of '$\exists x F x$' requires you to countenance some individual distinct from any you would have already countenanced, prior to and independently of your belief in '$\exists x F x$'.[4] To say that a commitment to Fs is ontologically innocent, with respect to a prior commitment to Gs, is to say that while it may be a new *qualitative* commitment, it's not a new *quantitative* commitment. Ontological innocence is a numbers game. Your belief in Fs is ontologically

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3 Realism comes in different varieties. E.g. according to conservativism, composition occurs more or less when we ordinarily think it does (Korman 2015), while according to universalism, composition *always* occurs; *any* two or more objects compose an object (Lewis 1986: 211–13, Sider 2001: 121–32).

4 When drawing this distinction, Lewis claims that additional quantitative commitments are no cost to a theory, only qualitative ones are (1973: 87). He seems to have changed his mind by the time of his 1991. For discussion, see Daly 2010: ch. 4.

innocent with respect to your belief in Gs just in case your belief in Fs doesn't require you to posit any more entities than you already did by virtue of your belief in Gs.

Of course, one's theory needn't include a claim about exactly how many entities there are. Probably only an existence monist (i.e. someone who thinks that there's exactly one object, the universe) is in a position to give a complete count of the objects they think there are. So, taking on a new quantitative commitment doesn't require you to change your mind about the exact number of entities. It only requires you to think that, given the truth of '$\exists x F x$', there exists some entity distinct from any you already countenanced, prior to and independently of your belief in '$\exists x F x$'. The following is a natural way to capture this thought:

> (Ontological Innocence) S's commitment to Fs is ontologically innocent with respect to S's commitment to Gs just in case S is committed to accepting a sentence of the form '$\forall x (Fx \supset Gx)$'.

Your commitment to Fs is innocent with respect to your commitment to Gs just in case you're committed to thinking that each F is a G.

But now the claim to ontological innocence is undermined. According to CAI, although a whole is identical to all its parts taken together, it's distinct from each of them individually. But then, *even if you accept CAI*, belief in a whole isn't ontologically innocent with respect to belief in its parts. Considerations of ontological parsimony still factor into the dispute between realism and nihilism, and still favour the nihilist.

To illustrate, suppose that two mereological atoms, a_1 and a_2, compose something, b. Let F be the property of being identical to $b - \lambda x.(x = b) -$ and let G be the property of being identical either to a_1 or to $a_2 - \lambda x.(x = a_1 \lor x = a_2)$. Since b is distinct from each of a_1 and a_2, even by the lights of CAI, we have it that $\exists x (Fx \ \& \sim Gx)$, or equivalently, $\sim \forall x (Fx \supset Gx)$. So, even if you accept CAI, your commitment to the Fs (i.e. to b) isn't ontologically innocent with respect to your commitment to the Gs (i.e. to a_1 and a_2). To believe in b is to believe that, given the truth of '$\exists x (x = b)$', there exists some entity distinct from any you would have already countenanced, prior to and independently of your belief in '$\exists x (x = b)$' (Baxter 1988: 578, van Inwagen 1994: 213–14, Koslicki 2008: 41–42).

Some defenders of CAI respond by making revisionary claims about counting. They argue that, even though b is distinct from each of a_1 and a_2, the defender of CAI can count all of these as *two* objects rather than three, thus giving the same count that would be given by the nihilist and restoring ontological innocence (Bohn 2014: 145–46, 2021: 4598–600, Wallace 2011b: 818–22). These arguments are unsuccessful (Payton forthcoming-b). However, the defender of CAI can offer the realist a different kind of parsimony, to help narrow the gap between her view and the nihilist's.

2. Quine says that ontology is about what there is. Rayo (2007: 434–37) adds that plethology is about what there are. To take on an ontological commitment is to take on a commitment to some (kind of) *thing*: to be ontologically committed to Fs is to be committed to there being at least one x such that 'F' is true of x. To take on a plethological commitment is to take on a commitment to some (kind of) *things*: to be plethologically committed to Fs is to be committed to there being some xx such that 'F' is true of those xx.

Here, 'xx' is a plural variable, capable of taking many objects as its value, without ambiguity, on a single assignment.[5] We may speak of the value of a plural variable as *some things*, or as *a plurality*, provided we aren't misled by the grammatical singularity of the latter phrase. A plurality isn't one thing, but many. To engage in plural quantification isn't to engage in singular quantification over a new kind of individual, but rather to quantify over the old individuals in a new way (Rayo 2006: 225).

While plural quantification doesn't commit us to any new individuals, and hence carries no additional ontological commitments in the sense defined in §1, we shouldn't conclude that the apparatus of plural quantification adds only to our *ideology* (Quine 1951). To quantify over pluralities isn't merely to talk in a new way, but to impose a constraint on how the world must be – and more specifically, on *what* there must be – if what we say is true.[6]

As with ontological commitment, I take plethological commitment to be carried primarily by sentences. A person is plethologically committed to Fs, in a derivative sense, by virtue of being committed to accepting a sentence that carries that commitment. A sentence carries a plethological commitment to Fs just in case it plurally quantifies over Fs.

> (Plethological Commitment) S is plethologically committed to Fs just in case S is committed to accepting a sentence of the form '$\exists xxFxx$'.

When a predicate 'F' is applied to a plurality, it can be read distributively or collectively. 'F' is read distributively just in case 'Fxx' implies 'Fx' for each x among xx (e.g. 'Alice and Beth are people' implies both 'Alice is a person' and 'Beth is a person') and collectively otherwise (e.g. 'Alice and Beth lifted a piano' implies neither 'Alice lifted a piano' nor 'Beth lifted a piano'). The notion of plethological commitment applies in both cases: '$\exists xx(xx$ are people)' carries a plethological commitment to people and, given the distributivity of 'people', an ontological commitment to persons; '$\exists xx(xx$ carried a piano)'

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5 Plural variables are among the resources of first-order plural logic; for a survey, see Oliver and Smiley 2016. While I treat a plural variable as capable of having many objects as its *value*, we may instead treat a plural variable as capable of having many *values* (Boolos 1985, Rayo 2002).

6 Compare Williamson 2013: 260–61 on higher-order quantification.

carries a plethological commitment to piano-carriers, but no corresponding ontological commitment to piano-carriers.[7]

Given Rayo's notion of plethological commitment, we can introduce a notion of plethological innocence. As before, we distinguish *qualitative* from *quantitative* commitment. To take on a new *qualitative* plethological commitment is to take on a commitment to a new *kind* of plurality, that is, to accept that there are some things that are F, when you previously didn't. To take on a new *quantitative* plethological commitment is to take on a commitment to at least one new *plurality*, that is, to think that the truth of '$\exists xxFxx$' requires you to countenance some plurality (i.e. some *things*) distinct from any you would have already countenanced, prior to and independently of your belief in '$\exists xxFxx$'. To say that a commitment to Fs is plethologically innocent, with respect to a prior commitment to Gs, is to say that while the former may be a new *qualitative* commitment, it's not a new *quantitative* commitment; it doesn't require that you posit any more pluralities than you already did. That is,

> (Plethological Innocence) S's commitment to Fs is plethologically innocent with respect to S's commitment to Gs just in case S is committed to accepting a sentence of the form '$\forall xx(Fxx \supset Gxx)$'.

Given that sentences quantifying over pluralities place constraints on how the world must be – and in particular, on what there must be, if those sentences are true – plethological commitments should be viewed as a metaphysical cost, just as ontological commitments are. Thus, plethological parsimony should be viewed as a theoretical virtue, just as ontological parsimony is. All else being equal, we ought to give preference to theories that posit fewer pluralities, just as we ought to give preference to theories that posit fewer individuals.

You might doubt that the notions of plethological commitment and innocence can do any interesting work independently of the notions of ontological commitment and innocence. First, it might seem natural to simply extend Quine's notion of ontological commitment from individuals to pluralities (see e.g. Florio and Linnebo 2016: 575–78). For, you might think, the crucial idea for a Quinean isn't that ontology is about what there *is*, as opposed to what there *are*, but simply that ontology is about what *exists*, where existence is understood in terms of first-order quantification. Since both individuals and

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7 Following Oliver and Smiley (2016: 75–76, 106), I take plural variables to be *inclusively* plural: taking *either* an individual *or* a plurality as their value. Thus, '$\exists xFx$' implies '$\exists xxFxx$' (though not necessarily vice versa), and every ontological commitment brings a plethological commitment with it (although not necessarily vice versa). We can, however, distinguish 'pure' plethological commitments, i.e. ones that aren't accompanied by corresponding ontological commitments. E.g. if '$\exists xx(xx$ carried a piano)' is true but '$\exists x(x$ carried a piano)' is false, then '$\exists xx(xx$ carried a piano)' carries a *pure* plethological commitment to piano-carriers.

pluralities can be values of bound first-order variables, they 'exist' in the same sense, and so they both belong in one's ontology.

   Second, it might seem that a commitment to Fs can only be plethologically innocent if, and because, it s already ontologically innocent. A commitment to Fs is plethologically innocent just in case each F-plurality is identical to some plurality you already countenanced. But it's generally accepted that pluralities are extensional, that is, identical just in case they include all and only the same individuals:[8]

   (Extensionality) $xx = yy \equiv \forall x(x \leqslant xx \equiv x \leqslant yy)$

So, to say that each F-plurality is identical to a plurality you already countenanced is to say that it includes no individuals beyond those you already countenanced. Your belief in Fs is plethologically innocent only if, and because, it's ontologically innocent.[9]

   A defender of CAI can block this reasoning. She can claim that her belief in composite objects is plethologically innocent but not ontologically innocent. Recall the case of the two mereological atoms, a_1 and a_2, and the whole that they compose, b. Even if you accept CAI, your commitment to b isn't *ontologically* innocent with respect to your commitment to a_1 and a_2. However, your commitment to b is *plethologically* innocent with respect to your commitment to a_1 and a_2. Adding b to the stock of individuals you believe in increases your *ontology*, but not your *plethology*.

   To illustrate: the three individuals, a_1, a_2 and b, yield four pluralities (ignoring the 'pluralities' of a_1, a_2 and b, which don't affect the argument to come):

   (1) $a_1@a_2$
   (2) $a_1@b$
   (3) $a_2@b$
   (4) $(a_1@a_2)@b$

   (Here, '@' is a term-forming operator, which takes two old terms to a new term that denotes together what the old terms denote individually.[10]) If you reject CAI, then each of 2–4 is an addition to your plethology, with respect to 1: each of 2–4 includes b, something not already included in $a_1@a_2$; each is therefore distinct from $a_1@a_2$. However, if you accept CAI, then b just *is*

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8   Here, '$\leqslant$' denotes an inclusion relation that may obtain between an individual and a plurality, between two individuals, or between two pluralities. '$\leqslant$', or something like it, is often taken to regiment the English phrases '. . . is one of . . .' and '. . . is / are among' – see Oliver and Smiley 2016: 108–9 and sources cited therein – but adjudicating this issue is beyond the scope of this paper. Extensionality is sometimes thought to raise independent trouble for CAI (Sider 2007, 2014). See Payton forthcoming-c for discussion.

9   This argument applies whether 'F' is distributive or collective, and whether the plethological commitment is 'pure' or not (see n. 7).

10   For relevant discussion, see Oliver and Smiley 2016: chs. 6 & 10 and sources cited therein.

$a_1@a_2$, and hence is *included* in $a_1@a_2$.[11] By your lights, none of these pluralities includes anything not already included in $a_1@a_2$. So, you can reduce the number of pluralities you believe in from four to one:

(1) $a_1@a_2$
(2) $a_1@b$ $\rightarrow$ $a_1@(a_1@a_2)$ $\rightarrow$ $a_1@a_2$[12]
(3) $a_2@b$ $\rightarrow$ $a_2@(a_1@a_2)$ $\rightarrow$ $a_1@a_2$
(4) $(a_1@a_2)@b$ $\rightarrow$ $(a_1@a_2)@(a_1@a_2)$ $\rightarrow$ $a_1@a_2$

This despite the fact that, by your lights, b is an additional individual, distinct from each of a_1 and a_2.

Thus, CAI drives a wedge between ontological and plethological innocence. The notion of plethological innocence has work to do, independently of the notion of ontological innocence. Moreover, CAI renders belief in composite objects plethologically (but not ontologically) innocent.

Of course, nothing I've said settles the dispute between realism and nihilism. That dispute must still be decided by the overall balance of costs and benefits (parsimony, conformity to prior knowledge, ability to resolve philosophical puzzles etc.). What I've argued is that, despite the argument rehearsed in §1, the balance of costs and benefits is affected by whether the realist accepts CAI. If the realist rejects CAI, then the nihilist has the advantage with respect to both ontological and plethological parsimony. But if she accepts it, then while the nihilist retains her advantage with respect to the ontological variety, she no longer has an advantage with respect to the plethological variety. Whether this is enough to tip the scales in the realist's favour is a question for another day.[13]

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11 Since b is distinct from each of a_1 and a_2, the defender of CAI rejects the principle, $x \leqslant y@z \supset (x = y \lor x = z)$. For discussion, see Payton 2021: 4591.

12 In general, if aa are included in bb then $aa@bb = bb$. So, $a_1@(a_1@a_2)$ are just $a_1@a_2$ again. Similar reasoning applies to 3 and 4.

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