

## Composition as Identity: Part 2

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### Abstract

Many of us think that ordinary objects – such as tables and chairs – exist. We also think that ordinary objects have parts: my chair has a seat and some legs as parts, for example. But once we are committed to the (seemingly innocuous) thesis that ordinary objects are composed of parts, we then open ourselves up to a whole host of philosophical problems, most of which center on what exactly this composition relation is. Composition as Identity (CI) is the view that the composition relation is the identity relation. While such a view has some advantages, there are many arguments against it. In this essay, I discuss several versions of the most common objection against CI, and show how the CI theorist can maintain that these arguments – contrary their initial intuitive appeal – are nonetheless unsound.

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### 1. Introduction

Many of us think that ordinary objects – such as tables and chairs – exist. We also think that ordinary objects have parts: my chair has a seat and some legs as parts, for example. But once we are committed to the (seemingly innocuous) thesis that ordinary objects are *composed* of parts, we then open ourselves up to a whole host of philosophical problems, most of which center on what exactly this composition relation is. *Composition as Identity* (CI) is the view that the composition relation is the identity relation. While such a view has some advantages,<sup>1</sup> there are many arguments against it. Many of the objections against CI involve an appeal to the Indiscernibility of Identicals (II): for any object  $x$  and any object,  $y$ , if  $x = y$ , then for any property  $P$ ,  $Px \leftrightarrow Py$ .<sup>2</sup>

Imagine that we have some Lego blocks, scattered and in no particular order, at  $t_1$ . At  $t_2$  we make a Lego house out of the Lego blocks, such that the Lego blocks compose the Lego house at  $t_2$ . Let us also imagine – what seems plausible – that Lego blocks can survive being scattered (after all, they are scattered and survive at  $t_1$ ), but that Lego houses cannot.<sup>3</sup> Now consider the following objections against CI:

**MANY-ONE:** If CI, then the parts (the Lego blocks) are (strictly and collectively) identical to the whole (the Lego house). But if so, then by II, any property the parts (collectively) have the whole must have as well. But the parts are (collectively) many, while the whole is not. So, the parts are not identical to the whole. So, CI is false.

**TEMPORAL:** If CI, then the Lego blocks are (strictly and collectively) identical to the Lego house. But if so, then by II, any property the Lego blocks (collectively) have the Lego house must have as well. But the Lego blocks (collectively) *existed at time  $t_1$* , while the Lego house did not. So, the Lego blocks are not identical to the Lego house. So, CI is false.

**MODAL:** If CI, then the Lego blocks are (strictly and collectively) identical to the Lego house. But if so, then by II, any property the Lego blocks (collectively) have the Lego house must have as well. But the Lego blocks (collectively) *could have survived being scattered*, while the Lego house could not. So, the Lego blocks are not identical to the Lego house. So, CI is false.<sup>4</sup>

In this essay, I aim to show how the CI theorist can maintain that the above arguments – contrary their initial intuitive appeal – are nonetheless unsound. In Section 2 I will address MANY-ONE; in Section 3 I will address TEMPORAL and MODAL.

## 2. Counting and CI

MANY-ONE is related to another objection which I will call ‘The Counting Objection’. Suppose we believe in unrestricted composition: for any *x*s whatsoever, those *x*s compose one and only one whole or sum. An opponent may give the following argument against our view:

Suppose you have two quarters in your pocket. Because you believe in universal composition, you believe that there is also a sum composed of these two quarters. So let’s count of all of the things that, by your own lights, are in your pocket. Given the usual methods of counting, we existentially quantify over each individual item in your pocket, together with the relevant non-identity claims. We will get a statement as follows (where ‘Px’ is read as ‘x is in your pocket’):

$$(1) \exists x \exists y \exists z (Px \ \& \ Py \ \& \ Pz \ \& \ x \neq y \ \& \ x \neq z \ \& \ y \neq z)$$

Since each of the two quarters is non-identical to the sum of the quarters, there are the two things (the quarters) and the one thing (the sum of the quarters). Hence, there are *three* things in your pocket, not two.<sup>5</sup> This shows that unrestricted composition is ontologically explosive. For any two things, the sum of those two things is something else in addition, in a very literal sense of the word *additional*: we can see that it is one more item in our domain whenever we try to take a count of all of the things that there are.<sup>6</sup>

This argument is intended to show how a commitment to composite objects is ontologically burdensome, since wholes are a commitment over and above the parts. This objection may be pushed further to show that CI is false. If wholes are extra items in our ontology – which can be easily shown (it is argued) by simply *counting up* the parts and the wholes – then CI must be false. For if CI is true, then we should not get *more* entities when we count the whole as distinct from its parts. The whole *is* the parts, according to CI, so the whole should not be an extra entity in our domain. Since this objection aims to disprove CI on the basis of counting, let us call this the Counting Objection.<sup>7</sup>

In response, the CI theorist could grant that statements such as (1) are true, yet insist that it does not follow from this that there are a particular number of things in one’s pocket. This is because, she may insist, the truth of (1) is independent from whether we think that it is an appropriate representation of the cardinality facts. It is true that there is one quarter, and another distinct from the first, and that there is a sum of these quarters that is not identical to the first quarter, nor is it identical to the second quarter. *But*, she insists, it is *also* true that the sum is identical to the *two* quarters; the sum is identical to both of the quarters *taken together*, which is perfectly compatible with the sum being distinct from either quarter *individually*. Importantly, the CI theorist embraces the many-one identity claim, (2):

$$(2) \exists x \exists y \exists z (z = x, y)$$

The problem, our CI theorist will insist, is that the identity predicate of first-order logic, which we used in (1) and (2), does not allow us express a statement such as ‘one sum is

identical to two quarters'. This is in part because the only terms allowed to flank the first-order logic identity predicate are singular ones. By the first-order grammatical rules alone, then, one is prohibited from accurately representing the claim *one thing is identical to many*; one does not even have a way of referring to many objects at once in classical first-order logic, so we certainly could not say of many things that *they* are identical to one. We can fix this, however, by introducing a hybrid identity predicate, which allows plurals or singulars in its argument places. Also, we must refer to objects collectively, which we can do by concatenating singular terms.<sup>8</sup> Thus, we would get a grammatically acceptable statement such as (2<sub>h</sub>):

$$(2_h) \exists x \exists y \exists z (z =_h x, y)$$

We can also re-interpret (1) in terms of the plural identity predicate,  $=_h$ , to yield (1<sub>h</sub>):

$$(1_h) \exists x \exists y \exists z (Px \ \& \ Py \ \& \ Pz \ \& \ x \neq_h y \ \& \ x \neq_h z \ \& \ y \neq_h z)$$

Then we can describe the CI theorist as one who accepts the following sort of sentence, (3):

$$(3) \exists x \exists y \exists z (Px \ \& \ Py \ \& \ Pz \ \& \ x \neq_h y \ \& \ x \neq_h z \ \& \ y \neq_h z \ \& \ z =_h x, y)$$

(3) is simply (1<sub>h</sub>) and (2<sub>h</sub>) combined. Since the singular identity relation is special case of the hybrid identity relation, (3) involves the singular non-identity statements of first-order logic together with the hybrid identity statement that is endorsed by a CI theorist.

(3) expresses exactly what the CI theorist believes is going on with the various things in your pocket. But how does this address the original question: how many things are in your pocket? Our usual way of counting dictates that there is an easy inference from statement (1) to a statement such as 'there are three things in my pocket' because we simply *take* (1) to be the correct representation of the sentence 'there are three things in your pocket'. Yet the CI theorist grants the truth of (1)'s equivalent – i.e., (1<sub>h</sub>) – but denies that this always correctly expresses a count statement. So how, exactly, if we utilize sentences such as (3), is a CI theorist supposed to make sense of cardinality? There are at least two options available: *relative counting* and *plural counting*.

*Relative counting* maintains that we cannot determine how many things there are until we have been given a sortal or concept or kind under which to count by. This view of counting is suggested by Frege in *The Foundations of Arithmetic* where he claims:

The Illiad, for example, can be thought of as one poem, or as twenty-four Books, or as some large Number of verses; and a pile of cards can be thought of as one pack or as fifty-two cards (§22). One pair of boots can be thought of as *two* boots (§25).

In §46, Frege continues,

...it will help to consider number in the context of a judgment that brings out its ordinary use. If, in looking at the same external phenomenon, I can say with equal truth 'This is a copse' and 'These are five trees', or 'Here are four companies' and 'Here are 500 men', then what changes here is neither the individual nor the whole, the aggregate, but rather my terminology. But that is only the sign of the replacement of one concept by another. This suggests...that a statement of number contains an assertion about a concept.

The suggestion is that we can think of thing(s) in various different ways – e.g., as cards, decks, complete sets of suits, etc. – and depending on these various ways of thinking about thing(s), we can yield different numbers or counts in answer to the question *how*

*many?* We can talk about how many *F*s or *G*s are there, where *F* and *G* stand in for specific sortals, concepts, or kinds. But one can *only* take a count *relative* to these sortals, concepts, or kinds; we can never take a count *tout court*.<sup>9</sup>

As concerns the number of things in your pocket, the relative counter maintains that a non-relativized question such as ‘how many *things* are in your pocket?’ is an ill-formed question. The only legitimate counting questions are ones that provide us with a sortal or concept or kind to count by such as ‘How many *quarters* are in your pocket?’ or ‘Or how many *coins* are in your pocket?’ etc. That we sometimes *do* give answers to unqualified *how many?* questions can be explained, perhaps, by the fact that certain relevant sortals are often implicit or pragmatically understood. A bit of reflection, the relative counter will insist, reveals that we seem to always have some sortal or concept or kind in mind when we answer (apparently) unrelativized counting questions.

This does not mean that there is not *an* answer to the question *how many things are there?* And it does not mean that the answer is somehow indeterminate. But it does mean that the answer would not be a single numerical value.<sup>10</sup> There will be a maximum to the number of things there are (the number of smallest parts, e.g.) and there will be a minimum (one sum, e.g.). And there will also be all of the identity statements that hold between the upper and lower bounds. We may have in front of us one deck of cards, which (according to the CI theorist) is identical to four sets of suits, which are identical to 52 cards. If I ask *how many things there are in front of us?*, the answer will be something like: there are 52 cards, and 1 deck, and 4 sets of suits, and the 52 cards are identical to the 1 deck, which is identical to the 4 sets of suits.” So there *is* an answer to the question *how many?* It is just that the answer is slightly more complicated than we may have first suspected. Relative counting allows us to make sense of this complicated answer, by insisting that there can be many-one identities that are sortal-relative.<sup>11</sup>

But what goes for cards and decks and sets of suits, seemingly goes for parts and sums and things-in-general as well. Suppose that a world contains only 2 part-less objects. Suppose CI is true, and that the two parts are identical to one sum. Never mind for now whether ‘part’ and ‘sum’ qualify as sortals or not. We *should* be able to count up how many things there are, even if the story is complicated, and we think that the two objects are identical to the one sum. Analogous to the card/deck case, we should be able to say something like ‘there are two parts and one sum (or whole), and the two are identical to the one’ in answer to a question such as *how many things are in this world?* True, there may not be a single numerical value; we cannot say ‘one’ or ‘two’ or ‘three’ and be right. But that’s because the metaphysical facts are more intricate than we may have first supposed. Even so, there *is* a determinate answer, albeit a slightly complicated one.

Yet relative counting may not be able to account for this, since it is doubtful that ‘part’, ‘sum’, ‘whole’, ‘thing’, ‘object’, etc. count as legitimate sortals, concepts, or kinds. Indeed, the controversy over what exactly counts as sortals, concepts, or kinds, and what does not, is reason enough to be wary of relative counting.<sup>12</sup> This is why some CI theorists may prefer another kind of counting, which I call *plural counting*. *Plural counting* is similar to relative counting in that it allows that there are many-one identities, and it maintains that accepting many-one identities necessitates a different method of counting than traditionally supposed. The difference is that plural counting rejects the needs for sortals or concepts or kinds. One way a plural counter can do this is to borrow some techniques from our traditional methods of counting together with techniques from relative counting. From our usual methods of counting, she will take the ability to *singularly* existentially quantify over some objects, together with the identity and non-identity claims about

those objects. Only instead of traditionally counting objects in our domain – the universe – I suggest she use it to count distinct variables in her singular/plural hybrid identity statements, which correspond directly to objects in our ontology.<sup>13</sup> The distinguishing (hybrid) identity claim that falls out of (3) –

$$(3) \quad \exists x \exists y \exists z (Px \ \& \ Py \ \& \ Pz \ \& \ x \neq_{hy} y \ \& \ x \neq_{hy} z \ \& \ y \neq_{hy} z \ \& \ z =_{hy} x, y)$$

– is (2<sub>h</sub>):  $z =_{hy} x, y$ . We can take such a hybrid identity statement and singularly count all of the variables on either side of the identity predicate. Imagine that all of the variables on the left-hand side of the symbol ' $=_{hy}$ ' are one domain, and that the variables on the right-hand side of the hybrid identity symbol are another domain. Then singularly count all of the variables on first one side, and then the other, using ' $V_L$ ' and ' $V_R$ ' for 'is a left-hand variable' and 'is a right-hand variable' respectively:

$$\text{Left-hand-side Domain: } \exists x (V_L x \ \& \ \forall x \forall y (V_L x \ \& \ V_L y \ \rightarrow \ x = y))$$

$$\text{Right-hand-side Domain: } \exists x \exists y (V_R x \ \& \ V_R y \ \& \ x \neq y) \ \& \ \forall x \forall y \forall z (V_R x \ \& \ V_R y \ \& \ V_R z \ \rightarrow \ (z = y) \vee (z = x))$$

In the first case we get a count of *one*, and on the other we get a count of *two*. (It is important to note that, in this particular example, we never get a count of *three*).

To show how a count of variables could yield a count *simpliciter* of objects in our domain, I suggest the Plural Counter borrow a technique used by the Relative Counter: the Plural Counter should borrow the intuitive procedure of allowing more complicated answers to questions such as *how many?* She can take a statement such as (3), logic book count all of the variables on either side of any of the identity statements that fall out of (3), and produce a count such as: 'there is one thing and two things, and the one thing is identical to the two things'. The Plural Counter grants (in this case) that there is at least one thing, and also that there is at most two things. *But she also endorses an identity claim that cannot be ignored in our count.* Thus, similar to the relative counter, she will deny that there is a flat-out, singular numerical value. Rather, she will claim that there is one of something, and two of some other things, but also that the one thing is identical to the two things. Thus, her answer to *how many?* in this case will reflect this, and will be something like: there is one thing and two things, and the one thing is identical to the two things. Because the answer *includes* the hybrid identity claims that the plural counter accepts, we eliminate confused cases of double counting whereby someone might think there is one *and* two *and* three things, and then *adds all of these things up*, yielding a total of six things. This would be just as illegitimate as thinking that there is one man, Superman, and another, Clark Kent, and another, Kal-El, yielding a total of three things, etc.

So there are at least two ways that a CI theorist can respond to the Counting Objection: by adopting either *relative* or *plural counting*. Once one of these alternative methods of cardinality are accepted, then one cannot object to CI on the grounds that a commitment to wholes is a further commitment above and beyond a commitment to the parts. For such a charge relies on a traditional (singular) method of counting that the CI theorist rejects. Moreover, this move does double duty, for it allows the CI theorist to avoid objections such as MANY-ONE.

MANY-ONE: If CI, then the parts are (strictly) identical to the whole. But if so, then by II, any property the parts (collectively) have the whole must have as well. But the parts are many, while the whole it not. So, the parts are not identical to the whole. So, CI is false.

A CI theorist may embrace either relative counting or plural counting, both of which maintain that we almost always have complex answers to *how many?* questions, where these complex answers include the hybrid identity statements the CI theorist accepts. Given this, it is not true that, given the Indiscernibility of Identicals, the parts are many *and not one* or the whole is one *and not many*. Rather, it is this: we have something(s) in front of us. This something(s) – whatever it(they) is(are) – is many and one. Put in terms of relative counting, the parts are many *parts* and the whole is one *whole* and the parts are identical to the whole. Or to leave the sortals out of it: there are many things and one thing and the many are identical to the one. There is no outright contradiction because we never generate the inconsistent ‘one and not one’ or ‘many and not many’. If many-one identities are genuinely accepted – as the CI theorist believes – MANY-ONE fails to gain traction, since a CI theorist will reject the premise that maintains that the parts have a numerical property that the whole does not – e.g., that the parts are six in number but the whole is not, etc. Any intuitive resistance to this position can be assuaged by pointing out that numerical predicates such as ‘are six in number’ ordinarily assume a method of counting the CI theorist rejects. Thus, our CI theorist can use relative or plural counting to escape MANY-ONE as well as the Counting Objection.

Perhaps there are arguments against relative and plural counting – arguments that are not question-begging against CI. But these have yet to be given. At the very least, then, it should be recognized that arguments such as MANY-ONE and the Counting Objection simply assume a method of counting that a CI theorist will surely reject. It remains to be seen whether the alternative systems of cardinality the CI theorist adopts bear under rigorous scrutiny.

### 3. CI, Temporal Parts, and Modal Parts

Let us return to the Lego example, and recall our two arguments<sup>14</sup>:

TEMPORAL: If CI, then the Lego blocks are (strictly and collectively) identical to the Lego house. But if so, then by II, any property the Lego blocks (collectively) have the Lego house must have as well. But the Lego blocks (collectively) *existed at time  $t_1$* , while the Lego house did not. So, the Lego blocks are not identical to the Lego house. So, CI is false.

MODAL: If CI, then the Lego blocks are (strictly and collectively) identical to the Lego house. But if so, then by II, any property the Lego blocks (collectively) have the Lego house must have as well. But the Lego blocks (collectively) *could have survived being scattered*, while the Lego house could not. So, the Lego blocks are not identical to the Lego house. So, CI is false.

I will now address TEMPORAL and MODAL on behalf of the CI theorist.

Assuming TEMPORAL is valid,<sup>15</sup> the only option for the CI theorist seems to be to deny the truth of one of the premises. But how? They all just *seem* intuitively true.

One way would be to insist that ordinary objects are composed of more than merely spatial parts. This is not a novel thesis. Lewis (1986), Heller (1984), Sider (1997), Sider (2001), among many others, are just some examples of philosophers who endorse the view that ordinary objects are composed of temporal as well as spatial parts. According to one interpretation of this view, ordinary objects are four-dimensional sums (or worms) of spatial and temporal parts. What grounds certain temporal facts, about you – e.g., that you used to be 3 feet tall, that you are going to be bald, etc. – is that a temporal part of a four-dimensional sum *is* in fact 3 feet tall, *is* in fact bald, etc. According to such a view, ‘change’ is qualitative difference between temporal parts. The leaf *changes* from green to red by having a temporal part that *is* green and another temporal part that *is* red. This is

no violation of the Indiscernibility of Identicals because it accepted that the temporal part that is green is non-identical to the temporal part that is red. Since four-dimensionalism is discussed extensively in the literature, I will not elaborate on the details of the view. The important point for the CI theorist is that she can avail herself of this metaphysical thesis to refute arguments such as TEMPORAL.

If ordinary objects are four-dimensional sums of spatial and temporal parts, and assuming that Lego blocks and Lego houses are ordinary objects, the CI theorist can maintain that the four-dimensional Lego-block-sum is distinct from the four-dimensional Lego-house-sum. Along with the four-dimensionalist, the CI theorist can dismiss apparent cases of co-location or *complete spatial overlap* (e.g., the Lego blocks and the Lego house occupy some region  $R$  at time  $t_2$ ) as cases of *partial spatio-temporal overlap*. Strictly speaking, the CI theorist may insist, the Lego house is not composed of all and only the Lego blocks, since the four-dimensional Lego-block-sum includes some temporal parts that are not included in the Lego-house-sum. Indeed, by hypothesis, the Lego house does not exist until  $t_2$ , so any relevant Lego parts at  $t_1$  compose the Lego blocks, not the Lego house.

What this amounts to is a denial of the crucial identity claim that the Lego blocks are (strictly and collectively) identical to the Lego house. This is an identity claim that the CI theorist may accept if we are only considering spatial parts. As soon as temporal facts get into the mix, a CI theorist may insist, then we are no longer assuming just spatial parts, and so the identity claim in question needs to be re-evaluated. If we are considering a four-dimensional object such as a Lego-block-sum that has *all* of its spatial and temporal parts in common with a Lego-house-sum, *then* the CI theorist will accept the identity claim that the Lego blocks are (strictly and collectively) identical with the Lego house. This would be a case of total spatial and temporal overlap. But then an argument such as TEMPORAL would not get off the ground, since by hypothesis, there is no temporal feature that the parts (the Lego blocks) have that the whole (the Lego house) does not, and so the appeal to the Indiscernibility of Identicals would be futile. So by accepting temporal as well as spatial parts, the CI theorist can either (i) deny the claim that the Lego blocks are identical to the Lego house (because the four-dimensional block-sum has parts distinct from the four-dimensional house-sum) or else (ii) deny that there is some feature that the block-sum has that the house-sum does not (because if they do in fact have all of their parts in common, then the objection fails to gain traction). Either way, the CI theorist can maintain that TEMPORAL is unsound.<sup>16</sup> Moreover, and importantly, neither option is a denial of CI, since if (i) is true, then there are two relevant wholes – the block-sum and the house-sum – each of which is identical to its parts, and if (ii) is true, then there is one relevant whole (the Lego house) which is identical to its parts (the Lego blocks).<sup>17</sup>

But what about MODAL? Surely even if the four-dimensional Lego-block-sum completely and exactly overlaps the four-dimensional Lego-house-sum, with all of the spatial and temporal parts included in such an overlap, the Lego blocks still have some features that the Lego house does not – namely, some modal features. In other words, even granting four-dimensionalism to the CI theorist, there is still MODAL waiting.

There are at least two moves available to the CI theorist: one novel and the other not. The un-novel move would be for the CI theorist to piggy-back on the answer that the four-dimensionalist gives in response to metaphysical puzzles of total spatio-temporal overlap. Four-dimensionalists tout their view's ability to solve many metaphysical puzzles as a reason to accept the view as true. However, such advantages fall short with cases of total spatio-temporal overlap. In Gibbard's famous Goliath and Lump1 case, we are to imagine that some lump of clay, Lump1, and a statue, Goliath, come into and go out of

existence at the exact same time. Goliath and Lump1 have entirely overlapping spatio-temporal careers, for there is no time Goliath exists and Lump1 does not and no time Lump1 exists and Goliath does not. Still, it seems that Lump1 *could have survived being squished*, whereas Goliath could not. So it may initially seem that Lump1 has a property that Goliath does not: *could have survived being squished*. However, a four-dimensionalist (among others) may insist that these modal properties are only apparent differences between Lump1 and Goliath. Rather, they will insist that when it comes to *de re* modal predication, we must recognize that such predication is flexible and dependent on a certain way of conceptualizing the object in question. So, it may be true that Goliath is identical to Lump1. But to say that Lump1 one could have survived being squished is just to say (for example) that Lump1 has *lump* counterparts that survive being squished, which is consistent with Lump1 having *statue* counterparts that do not survive being squished. And all of this is consistent with the fact that Lump1 is identical to Goliath.<sup>18</sup> And what goes for Goliath and Lump1 will go for our Lego blocks and the Lego house. If the CI theorist accepts flexible *de re* predication, then she can explain how it is that modal properties that seemingly distinguish parts from wholes are really just two different ways of conceptualizing what is in fact identical. The only difference is that instead of the identity claim in question being a one-one relation (Goliath = Lump1) it is many-one (Lego blocks =<sub>h</sub> Lego house, or parts =<sub>h</sub> whole). It's the same move with a broader application. So, one way the CI theorist can block MODAL is by denying that modal predicates such as *could have survived being scattered* apply to the Lego blocks but do not apply to the Lego house.

A novel, more radical way the CI theorist could block MODAL would be to adopt the modal analog of a temporal parts view. Suppose our CI theorist is a modal realist. She thinks that any way the world could be is the way that some possible world is. She also thinks that these concrete possible worlds are spatio-temporally and causally isolated from other worlds. Individuals are world-bound and are related to each other by relations of similarity, which form the basis of the cross-world counterpart relation. Since the details of modal realism are discussed extensively elsewhere I will not elaborate on the details.<sup>19</sup> If our CI theorist is also a modal realist, she might endorse a kind of five-dimensionalism or *lump* view,<sup>20</sup> where ordinary objects are trans-spatio-temporal-world sums of spatial, temporal, and world (or modal) parts. This would be to take the 'part' part of 'counterpart' seriously. And then her move in response to MODAL would be the modal analog of the temporal parts move made in response to TEMPORAL. If ordinary objects are trans-world sums or lumps of spatio-temporal-world parts, and assuming that Lego blocks and Lego houses are ordinary objects, the CI theorist can maintain that the trans-world Lego-block-lump is distinct from the trans-world Lego-house-lump. The CI theorist can dismiss apparent cases of *complete spatio-temporal overlap* (e.g., Goliath and Lump1) as cases of *partial world overlap*. Strictly speaking, the CI theorist may insist, the Lego house is not composed of all and only the Lego blocks, since the trans-world Lego-block-lump includes some world parts that are not included in the trans-world Lego-house-lump. Indeed, by hypothesis, the Lego-house-lump does not have any world parts that survive being scattered, but the Lego-block-lump does, so the trans-world Lego-house-lump has parts that distinguish it from the trans-world Lego-block-lump. The fact that each of these trans-world lumps overlaps in the actual world (i.e., partial world overlap) is no more of a problem than partial temporal overlap is for the four-dimensionalist.

What this amounts to is a denial of the crucial identity claim that the Lego blocks are (strictly and collectively) identical to the Lego house. This is an identity claim that the CI theorist may accept if we are only considering spatial and temporal parts. As soon as

modal facts get into the mix, the identity claim in question needs to be re-evaluated. If we are considering a trans-world lumpy object such as a Lego-block-lump that has *all* of its spatial, temporal *and* modal parts in common with a Lego-house-lump, *then* the CI theorist will accept the identity claim that the Lego blocks are (strictly and collectively) identical with the Lego house. This would be a case of total spatial, temporal, and world overlap. But then MODAL would never get off the ground, since by hypothesis, there is no spatial, temporal, or modal feature that the parts (the Lego blocks) have that the whole (the Lego house) does not, and so the appeal to the Indiscernibility of Identicals would be futile. So by accepting modal as well as spatial and temporal parts, the CI theorist can either (i) deny the claim that the Lego blocks are identical to the Lego house (because the trans-world block-lump has parts distinct from the trans-world house-lump) or else (ii) deny that there is some feature that the block-lump has that the house-lump does not (because if they do in fact have all of their parts in common, then the objection fails to gain traction). Either way, the CI theorist can maintain that MODAL is unsound.<sup>21</sup> Moreover, and importantly, neither option is a denial of CI, since if (i) is true, then there are two relevant wholes – the trans-world block-lump and the trans-world house-lump – each of which is identical to its parts, and if (ii) is true, then there is only one relevant whole (the Lego house) which is indeed identical to its parts (the Lego blocks).

Of course, a commitment to modal parts may seem absolutely crazy. Indeed, no one I know publicly defends such a position.<sup>22</sup> This is primarily due to the fact that I assumed modal realism to get it going, and most philosophers think that modal realism is absolutely crazy. One might wonder whether it is theoretically possible to commit to modal parts and yet have some sort of Ersatz view of possible worlds. This would presumably involve allowing that objects can have abstract things as parts, since worlds would be some sort of abstract linguistic entity, sets of sentences, or some such thing. Such a move may be controversial, and would need significant fleshing out, but perhaps it would make the commitment to modal parts more palatable.<sup>23</sup>

I do not want to defend any of the moves suggested above here, since an adequate treatment of them would take more time and attention than I have presently. However, the important point is that we have now shifted the debate away from charges that CI violates the Indiscernibility of Identicals and onto issues about whether these further views – e.g., four-dimensionalism, modal realism, lump theory, ersatzism, etc. – are defensible in their own right. This is a significant and substantial result, given that in the literature on CI, so many have heretofore found Indiscernibility of Identicals Arguments (IIAs) completely decisive against CI. It remains to be seen whether CI will survive given the sorts of views I am suggesting she be saddled with. But these arguments have yet to surface. Until then, CI is still a live philosophical position. I have remarked elsewhere<sup>24</sup> that it is curious that so much ink has been spilled arguing against a view that is so rarely endorsed or defended. But perhaps, in light of the above discussion, all of the time spent arguing against CI is merited after all. If many of the arguments against CI are shown to be invalid or unsound, as I have argued in Part 1 and Part 2, respectively, and if CI has other, positive theoretical advantages as well,<sup>25</sup> then CI is not merely a live philosophical position, but a highly competitive one.

### *Short Biography*

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## Notes

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<sup>1</sup> Discussed in Composition as Identity: Part 1.

<sup>2</sup> Opponents to CI who appeal to the Indiscernibility of Identicals include: Lewis (1991), McKay (2006), Van Inwagen (1994), and Yi (1999). Note: as discussed in Part 1, Lewis (1991) argues against a strong CI, not a weak CI.

<sup>3</sup> Example modified from Thomson's Tinkertoy case in Thomson (1983).

<sup>4</sup> I have added 'collectively' where appropriate to indicate the appropriate, valid interpretation of each argument. See Part 1 for discussion.

<sup>5</sup> For simplicity, let us assume (implausibly) that the quarters have no parts.

<sup>6</sup> This point can also be pushed to show that if universal composition is true, then we know *a priori* that there are an odd number of objects in the universe. Since such *a priori* knowledge is absurd, universal composition must be false. I will not address this worry here. But perhaps it is enough to note that if CI is true, such an objection is undermined – which may be seen as yet another advantage for CI (for fans of universal composition at least).

<sup>7</sup> I am assuming that this objection intends to deliver a weighty metaphysical conclusion – i.e., that CI is false – from our methods of cardinality. One may think that this is the conclusion that Van Inwagen (1994) was after, since the argument I have given above mimics his land-parcel example. However, in conversation and correspondence, Van Inwagen has explained that he did not intend to be arguing for a weighty metaphysical conclusion (for he did not intend to be making a metaphysical point at all). Rather he intended that 'the conclusion of [his 1994] paper...was a thesis about *words*'. In particular, he took the conclusion of what I am calling the Counting Objection to show that CI sentences such as *the parts are (collectively) identical to the whole* 'mean nothing at all...they are...*not even false*'. If so, then one can take my points here as an effort to show how CI identity statements *are* coherent and *do* mean something. In answering what I took to be a metaphysical point about the consequences of CI and cardinality, I can do double duty: I can (i) answer the metaphysical point and in so doing (ii) further flesh out the meaning and coherence of CI as a philosophical position. So even though Van Inwagen did not intend the Counting Objection to yield a metaphysical conclusion, such an argument *is* available and is initially challenging to the CI theorist. Thus, it is incumbent upon the CI theorist to address the objection, no matter who endorses it (or does not). Finally, Van Inwagen has suggested in conversation that he intended some of his arguments in Van Inwagen (1994) to be a version of an Indiscernibility of Identicals argument against CI, which is the topic of the present essay.

<sup>8</sup> For elaboration on this point, see Composition as Identity: Part 1. The introduction of the hybrid identity predicate addresses objections against CI raised in Van Inwagen (1994). See also Sider (2007) and Yi (1999) for discussion.

<sup>9</sup> I am leaving the exact details of relative counting intentionally vague, since I can imagine many variations on the Fregean theme suggested above. All that matters for my purposes is that a theory of counting qualifies as *relative counting* if it claims (i) there generally cannot be a unique numerical answer (e.g., '52') to the unrelativized question *how many things are there?*, and (ii) there can only be a unique numerical answer to questions that include a legitimate sortal, concept, or kind term (e.g., 'how many *cards* are there?').

<sup>10</sup> Except in the lonely world containing just one part-less object.

<sup>11</sup> Importantly, relative counting does not entail relative identity. Alston and Bennett (1984) disagree, but their argument fails to recognize irreducibly plural referring expressions, which is (to my mind) crucial for defending a plausible account of relative counting. Blanchette (1999) and Carrara and Sacchi (2007) agree that relative counting does not entail relative identity, but for different reasons.

<sup>12</sup> See Feldman (1973) for discussion.

<sup>13</sup> There could be co-referring variables, but these would result in one-one identity statements that can be filtered out of our final count statements. When counting, the CI theorist focuses only on all of the singular non-identity statements, together with the singular-plural hybrid identity claims.

<sup>14</sup> Again, I am including 'collectively' where appropriate to suggest the valid interpretation of each argument. See Part 1 for discussion.

<sup>15</sup> Since Baxter denies that *identity* obeys the Indiscernibility of Identicals, and Lewis denies that *composition* obeys it, both TEMPORAL and MODAL are unsound according to these alternative versions of CI. I have already given my reasons for not preferring these two views (see Part 1).

<sup>16</sup> This is not the only way a CI theorist could resist Temporal – she could, for example, be an endurantist and insist that certain properties – e.g., shapes – are relativized to times. However, my point is merely to show at least one way in which a CI theorist could avoid the present objections. I leave it to the reader to consider alternative ways of doing so.

<sup>17</sup> See Varzi (2000) for a similar kind of move made in response to a slightly different worry.

<sup>18</sup> See Sider (2001: 113) for discussion.

<sup>19</sup> See Lewis (1986) and deRosset's (2009) Philosophy Compass article 'Possible Worlds 1'.

<sup>20</sup> Weatherston (MS) dubs trans-world fusions 'lumps'.

<sup>21</sup> Incidentally, this move would provide the CI theorist with an interesting response to the charge that CI entails Mereological Essentialism (ME), given by Merricks (1999). If the CI theorist embraces modal parts, she could *embrace* ME, and explain why this is not be counterintuitive. ME claims that any composite object, O, is composed of all and

only its parts  $O_1, \dots, O_n$ , in every possible world in which  $O$  exists. But this will turn out trivially true on a lump theory of objects. Suppose  $O$  is a lumpy, trans-world object, with parts  $O_1, \dots, O_n$  in different possible worlds. But then  $O$  does not exist in any *one* world – by hypothesis,  $O$ 's parts  $O_1, \dots, O_n$  are scattered across different possible worlds. If ME was false, then  $O$  would exist in a world without  $O_1, \dots, O_n$ . Yet in every world in which  $O$  exists (none of them!),  $O$  is composed of all and only its parts  $O_1, \dots, O_n$ . So ME is never false; so it is true. Now suppose  $O$  is a world-bound object – a strange object that has no modal properties because it is not worldally extended; it is just a world-*chunk*. It exists in only one possible world, and no other. (This is analogous to an object that has no temporal properties because it is not temporally extended; it is just a time-*slice*.) And suppose  $O$  is composed of (world-bound) parts  $O_1, \dots, O_n$ . If ME was false, then  $O$  would exist in a world without  $O_1, \dots, O_n$ . Yet in every world in which  $O$  exists (just the one!),  $O$  is composed of all and only its parts  $O_1, \dots, O_n$ . So, again, ME is never false; so it is true. So either way – whether we are considering lumpy, trans-world fusions, or unlumpy, world-bound fusions – ME is true. Moreover, a CI theorist who embraces a lump theory of objects will account for modal variance in an analogous way that the four-dimensionalist accounts for change – by qualitative difference of modal parts.

<sup>22</sup> McDaniels (2004) defends something like it, although he interprets modal parts differently than I do here.

<sup>23</sup> Moreover, as with my suggested response to TEMPORAL, embracing one of the two moves suggested here need not be the only move available to the CI theorist.

<sup>24</sup> Composition as Identity: Part 1.

<sup>25</sup> Discussed most explicitly in Part 1, but also this essay, footnotes 4, 17.

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