

Restricted Composition

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12 September 2005

1 Introduction

Let's begin with a simple example. Consider two quarks: one near the tip of your nose, the other near the center of Alpha Centauri. Here is a question about these two subatomic particles: Is there an object that has these two quarks as its parts and that has no other parts? According to one view of the matter (a view that is surprisingly endorsed by a great many contemporary philosophers), the answer to this question is Yes. But I think it is fair to say that according to common sense, the answer to this question is really No, there is no object that has as its only two parts a quark near the tip of your nose and another quark near the center of Alpha Centauri.

Here is a more general question: Under what circumstances do two or more objects compose a further object? According to one view of the matter (again, a view endorsed by a large number of contemporary philosophers), the answer to this question is that for any group of objects, no matter how disparate or spatially separated, there is an object composed of the members of that group.¹ On this view, there are no restrictions on when "composition" occurs. If there are some objects, on this view, then there is automatically another object composed of those objects. But I think it is fair to say that according to common sense, it is not the case that for any group of objects, there is automatically an additional object composed of the members of that group. That is, according to common sense, composition is restricted.

In this essay I will be exploring this common sense view, together with its rival (the view that composition is unrestricted). It will be seen that, although the idea of restricting composition is intuitively very appealing, it proves to be more difficult than one might have thought to come up with a plausible proposal regarding just how composition is to be restricted. But I hope to show that, in the final analysis, it is better to accept the difficulties that go with restricting composition than it is to avoid them by leaving composition unrestricted.

Here is the plan. In Section 2 I will introduce some terminology that is important for understanding our issue, and I will formulate the main question that the views under consideration attempt to answer. In Section 3 I will formulate the general claim – "Unrestricted

¹ This is a rough statement of the view in question. I will give a more careful formulation below.

Composition” – that I will be campaigning against, and I will discuss some of the main advantages and disadvantages of that view. In Section 4 I will examine the pros and cons of a view that is the opposite extreme of Unrestricted Composition, namely, the view that two or more objects never compose a further object. In Sections 5-11 I will consider seven different responses to our main question that can accommodate the common sense view that it is sometimes the case that several objects compose an additional object and also sometimes the case that several objects fail to compose an additional object. It will be seen that each of these “moderate” views has its own costs, the most important of which will be taken up in these sections. But I will conclude in Section 12 that the relative pros and cons of several of the views according to which composition is restricted make those views, in the end, considerably more attractive than Unrestricted Composition.

2 The Special Composition Question

Recall the above example involving two quarks. This is a clear case in which it seems that two objects fail to compose a further object. Now consider a different collection of subatomic particles: all the particles that make up your body right now. This is an equally clear case in which it seems that a bunch of objects do compose a further object. The existence of such cases gives rise to a very natural question: What is the general rule governing when composition occurs and when it doesn't occur?

Peter van Inwagen is responsible for this question's being widely discussed in contemporary metaphysics.² Here is a way of formulating the relevant question that is based on van Inwagen's work.³

$x \text{ overlaps } y =df$ there is a z such that z is a part of x and z is a part of y .

The x s *compose* $y =df$ (i) the x s are all parts of y , (ii) no two of the x s overlap, and (iii) every part of y overlaps at least one of the x s.

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

Several preliminary matters need to be addressed before we begin considering answers to SCQ. First, note that SCQ is not asking for an analysis of the concept of composition. (To ask for such an analysis is to ask what van Inwagen calls The General Composition Question.) Second, we will, following van Inwagen, focus our attention here on physical objects (as opposed to non-physical objects), and on the problem of identifying the circumstances under which some physical objects compose an additional physical object.

Our third preliminary matter involves terminology. There is another notion related to the idea of composition that is also widely employed in discussions of mereology (i.e., the study of parts and wholes). That is the notion of a “sum” or “fusion”, which can be defined as follows.⁴

² See van Inwagen, *Material Beings*. See also Hestevold, “Conjoining.”

³ See van Inwagen, *Material Beings*, pp. 28-29. For an explanation of plural quantification, see Section 2 of van Inwagen's *Material Beings*. Notice that ‘part’ is the only mereological term that is taken as primitive in van Inwagen's definitions.

y is a *sum* (or *fusion*) of the xs =df every one of the xs is a part of y and every part of y overlaps at least one of the xs.

The difference between saying that y is composed of the xs and saying that y is a sum (or fusion) of the xs is that the former but not the latter entails that the xs do not overlap. So, for example, I am a sum of my subatomic particles, and I am also composed of them; but although I am a sum of my subatomic particles and my brain, I am not composed of my subatomic particles and my brain, since my subatomic particles and my brain overlap.⁵ Thus an equivalent way of asking SCQ would be this: What necessary and jointly sufficient conditions must any xs satisfy in order for there to be an object that is a sum of those xs?

Our final preliminary matter involves a common presupposition that is shared by (virtually) all parties to the debate over restricted composition. That presupposition is what we can call “anti-conventionalism”. This is the view that what exists is never a matter of human stipulation or convention. As van Inwagen says,

Let us always remember Abraham Lincoln’s undeservedly neglected riddle: How many legs has a dog got if you call a tail a leg? The answer, said Lincoln, and he was right, is *four*, because calling a tail a leg doesn’t make it one.⁶

3 Unrestricted Composition

We begin our consideration of responses to SCQ with the idea that the members of any collection objects whatsoever automatically form an additional object. Here is our main formulation of the view.

Unrestricted Composition (UC): Necessarily, for any non-overlapping xs, there is a y such that y is composed of the xs.⁷

⁴ See, for example, Goodman, *The Structure of Appearance*; Leonard and Goodman, “The Calculus of Individuals and Its Uses;” Lesniewski, “On the Foundations of Mathematics;” Lewis, *On the Plurality of Worlds*; and van Inwagen, *Material Beings*.

⁵ Come to think of it, I may not even have a brain. For a discussion of the question of whether objects have “arbitrary undetached parts,” see van Inwagen, “The Doctrine of Arbitrary Undetached Parts.”

⁶ Van Inwagen, *Material Beings*, pp. 7-8.

⁷ The reason for the requirement that the xs be non-overlapping is simply that we have defined ‘the xs compose y’ in such a way that overlapping xs are prohibited from composing something. Here is an equivalent formulation of UC in terms of the notion of a mereological sum.

Unrestricted Sums (US): Necessarily, for any xs, there is a y such that y is a sum of the xs.

For defenses of UC, see Lesniewski, “On the Foundations of Mathematics;” Leonard and Goodman, “The Calculus of Individuals and Its Uses;” Goodman, *The Structure of Appearance*; Lewis, *On the Plurality of Worlds*; Van Cleve, “Mereological Essentialism, Mereological Conjunctivism, and Identity Through Time;” Hudson, *A Materialist Metaphysics of the Human Person*; and Sider, *Four-Dimensionalism*.

There are various considerations that count in favor of UC. To begin with, the early pioneers in the field of mereology assumed the truth of UC.⁸ That should count for something. Furthermore, UC is a simple and elegant response to SCQ.

Another point in its favor is that, unlike some responses to SCQ that we will examine below, UC posits the existence of plenty of objects. Thus the proponent of UC will never have to deal with the problems that go with having a sparse ontology.

Finally, a fourth point in its favor is that UC is consistent with the popular thesis that there can be no genuine vagueness in the world.⁹ (According to this thesis, vagueness is merely a linguistic phenomenon, resulting largely from semantic indecision. No one has decided exactly where Mount Everest ends and its foothills begin, but this does not mean that Mount Everest is a vague mountain that gradually fades out of existence as one descends from the peak.)

Despite the fact that UC has these four points in its favor, and is therefore an initially attractive theory, it must be noted that none of the above considerations actually entails that UC is true. And, as it turns out, there are some powerful considerations that count against UC. The main consideration against it is simply that UC has many very counterintuitive consequences. One of these involves the two quarks in the example above: according to UC, there is an object composed of that one quark near the tip of your nose and that other quark near the center of Alpha Centauri. But such an object, if it exists, is certainly not recognized by common sense.

At least the two quarks in our example are similar to one another. Another type of counterintuitive consequence of UC has to do with cases involving very disparate items, such as your left shoe and our quark from the center of Alpha Centauri. According to UC, these objects also have a fusion (which is very much like a shoe, except for the fact that part of it is many light years from the rest and is extremely tiny).

These sorts of example could be multiplied endlessly. In general, the objection to UC is that it commits us to many bizarre objects that common sense intuitions cannot countenance.

One possible response to this objection involves saying something along these lines:

Unrestricted Composition is ontologically innocent. For the sum of some xs is nothing “over and above” the plurality of the xs. If you are committed to the plurality, then you are thereby committed to the sum.¹⁰

Unfortunately for the proponent of UC, it is fairly easy to see that this response to the objection fails. For although there is a sense in which it is true that UC is ontologically innocent, there is also an important sense in which it is false.

Here is the sense in which it is true that UC is ontologically innocent. If there are some xs, and if those xs have a sum, then the sum of the xs does not contain any new matter that is not already included in the matter that makes up the xs.

⁸ See Lesniewski, “On the Foundations of Mathematics”; and Leonard and Goodman, “The Calculus of Individuals and Its Uses.”

⁹ In fact, Lewis and Sider have argued that UC is entailed by the conjunction of the thesis that there can be no vagueness in the world and several uncontroversial theses about language. See Lewis, *On the Plurality of Words*, pp. 211-213; and Sider, *Four-Dimensionalism*, pp. 120-139.

¹⁰ David Lewis makes some remarks along these lines on pages 81-82 of *Parts of Classes*.

And here is the sense in which it is false that UC is ontologically innocent. If there are some *x*s, and if those *x*s have a sum, then the sum of the *x*s is something in addition to the *x*s. The easiest way to see this is to consider an example. Suppose we have two mereological simples¹¹ that are several miles apart in some space that is otherwise completely empty. And suppose we are asked, How many objects are there in this space? Well, there is clearly a difference between saying that there are two objects in the space, as common sense tells us, and saying that there are three objects, as UC says. And the difference has to do with the number of objects that are said to exist.

This example makes it clear that, insofar as UC commits us to the existence of more objects than we are otherwise committed to, it is not ontologically innocent. UC may be philosophically respectable, and it may even be true. But ontologically innocent it is not.

A more promising response to the objection that UC has counterintuitive results involves admitting that UC commits us to a great many counterintuitive objects, but at the same time attempting to soften the blow by claiming that in ordinary contexts we restrict the domain of our quantifiers.¹²

Here is an example involving restricted quantifiers: At a party, the host says, “All the glasses are on the table.” But he doesn’t mean that all the glasses in the world are on the table. He means instead that all the glasses at the party are on the table. He is thus restricting the domain of his quantifiers to things at the party. And it should be clear that this sort of thing happens with great frequency in everyday discourse.

The proponent of UC can say, then, that we ordinarily restrict the domain of our quantifiers to objects composed of parts that are more or less in contact with one another and that tend to move around together. Thus, according to this line, a sentence like ‘There is an object composed of Mia Hamm and The Taj Mahal’ is false in ordinary contexts, because in those contexts we are restricting our quantifiers in a way that excludes such spatially scattered objects as the sum of Mia Hamm and The Taj Mahal. But still, according to this line, there nevertheless is an object composed of those two.

As I said, I think this is the most promising way for the proponent of UC to respond to the objection that UC has wildly counterintuitive consequences. But I don’t think this response completely answers the objection. Here’s why. The objection is not merely that if we accept UC then we shall have to say that many typical pronouncements of common sense – such as that there is no object composed of Mia Hamm and The Taj Mahal – turn out to be false. (If that were all there was to the objection, then talking about how we often restrict the domain of our quantifiers would be a satisfactory way of replying to the objection.) Rather, the objection is that UC commits us to the existence of many strange objects that are never dreamt of by ordinary people. And talking about restricting the domain of our quantifiers does not address this problem. For suppose we are in a context in which we have explicitly stated that the domain of our quantifiers is completely unrestricted. (“I’m talking about absolutely everything that there is, including whatever weird, not-recognized-by-common-sense objects there may be.”) Then it is

¹¹ Mereological simples are objects that do not have proper parts (where a proper part is a part that is not identical to the whole). For a discussion of what characteristics an object must have in order to count as a mereological simple, see Markosian, “Simples.”

¹² See for example Lewis, *On the Plurality of Worlds*, p. 213. Quantifiers include phrases like ‘all’, ‘every’, and ‘some’.

still very counterintuitive to say that there is an object composed of Mia Hamm and The Taj Mahal.

Now let's turn to a second objection to UC, namely, that UC entails Four-Dimensionalism. (Four-Dimensionalism, or 4D, is the thesis that objects persist through time by having different temporal parts at the different moments at which they are present. It is to be contrasted with Three-Dimensionalism, or 3D, which is the thesis that objects persist through time by being wholly present at each moment at which they are present.¹³)

Here is an argument to show that UC entails Four-Dimensionalism.¹⁴ To begin with, UC entails that there can be two distinct objects in the same place, and composed of the same parts, at the same time. To see why, think about yourself. You exist now, and you are currently composed of certain particles.¹⁵ The particles that compose you now existed ten years ago, and were then widely scattered throughout the Earth's biosphere. According to UC, even though the particles in question were widely scattered throughout the Earth's biosphere ten years ago, they nevertheless composed something then. Since you were not widely scattered throughout the Earth's biosphere ten years ago, the object that the particles in question composed ten years ago was not you. Moreover, since, according to UC, the arrangement of some objects makes no difference to whether those objects compose something, the object that the particles in question composed ten years ago, and that was then distinct from you, still exists now. (After all, those particles have continued to compose an object at each moment throughout the last ten years, according to UC. And, given this, there is no reason to think that they have not composed the same object throughout that time, especially since the main thing that has happened to the relevant particles since ten years ago is merely that they have gradually come to be much less scattered.)

But it is impossible for two objects (such as yourself and the scattered object composed of the particles in question ten years ago) to become one. Which means that, according to UC, there are now two distinct objects located where you are located, each one of which is composed of the exact same particles. One of these objects (namely, you) is what we might call "mereologically variable" – it is composed of different parts at different times. The other object in question (namely, the object that was composed of your current particles ten years ago, when they (and it) were widely scattered throughout the Earth's biosphere), is what we might call "mereologically constant" – it is always composed of the same parts.

Now, the only plausible way to allow that two distinct objects can be in the same place, and composed of the same parts, at the same time is to say that the relevant objects, like two roads that share a stretch of pavement, are extended things that share a segment or "stage" or "temporal part" (where a temporal part of an object, x, is, roughly, an object that exists for a shorter time than x and that perfectly overlaps x throughout its existence).¹⁶ Thus the proponent of UC must say that you are a mereologically variable object that, at each moment of its existence, shares a temporal part with a mereologically constant object. (And does so with

¹³ On the 3D and 4D views, see Sider, *Four-Dimensionalism*.

¹⁴ The argument that follows is adapted from an argument against UC given by van Inwagen on pp. 74-80 of *Material Beings*.

¹⁵ I'm assuming that you are identical to your body. If you disagree with that assumption, replace all references to you in the above argument with references to your body.

¹⁶ The above definition of 'temporal part' is loosely based on the definition given by Sider on p. 59 of his *Four-Dimensionalism*. But it is really a definition of 'proper temporal part'. A good definition of 'temporal part' would simply leave out the condition about existing for a shorter time than x.

different mereologically constant objects at different times.) Similar remarks will be true with respect to virtually all other common sense objects, including human beings, chairs, rocks, and stars.

The upshot is that UC entails 4D. But 4D is a highly controversial thesis. Hence this entailment is an important cost of UC.¹⁷

There is a third major disadvantage of UC. It is that UC entails a certain very radical thesis about identity over time for composite objects.¹⁸ We have seen that UC entails that common sense objects, like human beings and chairs, are mereologically variable objects that share temporal parts with various other mereologically constant objects. The existence of mereologically variable objects raises a question for the proponent of UC. The question concerns what it takes for an object that is composed of certain mereological simples at one time to be identical to an object composed of different simples at another time.¹⁹

Here is a closely related question. Given that the proponent of UC is committed to saying that, in some cases, an object composed of some xs at t1 is identical to an object composed of some ys (distinct from the xs) at t2, is there any way that he or she can restrict such “diachronic identity” for composite objects?

Theodore Sider has argued persuasively that the answer to this question is No.²⁰ I won’t have the space here to repeat Sider’s argument, but the basic idea is that if we try to restrict diachronic identity for composite objects in a way that is supported by common sense intuitions about individual cases, we will have to accept either genuine vagueness in the world or else brute facts about diachronic identity for composite objects. And Sider takes both horns of this dilemma to be untenable.

Now, if Sider is right about these matters, then the proponent of UC is also committed to the following, much more extreme, cross-time version of UC. (Note that I intend the domain of times in question to include both instants and extended periods of time.)

Unrestricted Composition with Unrestricted Diachronic Identity (UCUDI): Necessarily, for any non-overlapping xs, for any non-overlapping ys, and for any times, t1 and t2, such that the xs exist at t1 and the ys exist at t2, there is an object, z, such that z is composed of the xs at t1 and z is composed of the ys at t2.

¹⁷ In order to simplify the above argument, I have neglected to consider the several ways of resisting a commitment to 4D that are available to the proponent of UC. But since each of the relevant ways involves an appeal to some highly controversial thesis or other, the upshot remains the same: UC is a view with significant costs.

¹⁸ The argument that follows is adapted from an argument for 4D given by Sider in Chapter 4, Section 9 of his *Four-Dimensionalism*.

¹⁹ As I suggested above, the natural thing for the proponent of UC to say regarding identity over time in a case involving the same simples considered at two different times is that such a case always involves a single composite object persisting through time.

²⁰ Sider, *Four-Dimensionalism*, Chapter 4, Section 9. Sider actually argues for the conjunction of UC with the claim that diachronic identity for composite objects must be unrestricted. Note that, as Sider acknowledges, proponents of Brutal Composition (see below) have a way of resisting his argument. So do those who are willing to admit genuine vagueness into the world.

One consequence of UCUDI is that there is an object that was composed of the shoes Abraham Lincoln was wearing at the time of his inauguration and is now composed of the players on the 2004 US Olympic soccer team. Another consequence is that there is an object that is composed of all your parts right now and that will, in ten minutes, be composed of all the eyeglasses in the world. In short, UCUDI entails the existence of all manner of strange persisting objects, including temporally gappy objects and objects that change radically over time in bizarre ways. In fact, considering the unusual nature of many of these putative objects, it is tempting to say that anyone who truly believes UCUDI does not understand by the words 'persisting object' what the rest of the world does. This is surely a very high price associated with UC.

4 Nihilism

I mentioned above that one advantage of UC is that it is a simple and elegant response to SCQ. UC shares this feature with a rival that is at the opposite end of the spectrum. I have in mind the view that there are no objects composed of two or more parts. Here is an official statement of the view.

Nihilism: Necessarily, for any non-overlapping x s, there is an object composed of the x s iff there is only one of the x s.²¹

In addition to simplicity and elegance, another characteristic that Nihilism shares with UC is its consistency with the denial of vagueness in the world. Among its other virtues is that Nihilism may allow one to avoid certain traditional puzzles concerning composite objects, such as the ancient puzzle involving the ship of Theseus, the so-called paradox of undetached parts, and the problem of the many.²²

Still, Nihilism has its drawbacks. Chief among these is that there are not enough objects in the world, according to Nihilism, to satisfy common sense intuitions about what there is. For Nihilism entails that there are no tables, chairs, rocks, planets, or stars. It also entails that there are no dogs, fish, or elephants. This complete lack of macroscopic objects, given our ordinary beliefs in such things, is a general problem for Nihilism. But there is also a particular version of this problem that concerns us: Nihilism entails either that there are no people or that people are simples. And of course most of us would reject both of these alternatives.

One way for the Nihilist to reply to the charge of having an impoverished ontology is to make use of a technique, developed by van Inwagen, that involves paraphrasing ordinary sentences that strike us as true – but that are false according to the Nihilist – into sentences that, according to the Nihilist, are in fact true.²³

²¹ 'Iff' means *if and only if*. For a longer discussion of Nihilism, see van Inwagen, *Material Beings*, Section 8.

²² For descriptions of these and other "problems of material constitution", see the Introduction to Rea, *Material Constitution*.

²³ See van Inwagen, *Material Beings*, Section 11. Van Inwagen develops the technique of paraphrasing as part of his defense of his own view (which is not Nihilism, and which will be discussed below). It should be noted that van Inwagen uses the paraphrasing strategy in a way that differs slightly from the way in which it is used here. For according to van Inwagen, it is not that a sentence like (1) is strictly speaking false but, rather, that it is true because the proposition it expresses is the proposition expressed by (1a).

Here's the idea. Suppose we are in a situation in which ordinary people would say that there is a chair in the corner, but no ordinary person would say that there is an elephant in the corner. Consider these sentences.

- (1) There is a chair in the corner.
- (2) There is an elephant in the corner.

The Nihilist says that in the imagined circumstances, (1) and (2) are both false. (For according to the Nihilist there is neither a chair nor an elephant in the corner, but only some simples arranged in various ways.) But the Nihilist wants to be able to capture the sense in which (1) is correct, as well as the sense in which (2) is incorrect. So consider the following paraphrases of (1) and (2).

- (1a) There are some simples arranged chairwise in the corner.
- (2a) There are some simples arranged elephantwise in the corner.

The Nihilist can say that (1a) is true while (2a) is false, and that, moreover, the truth of (1a) corresponds to the sense in which (1) is correct (even though it is, strictly speaking, false); whereas the falsity of (2a) corresponds to the sense in which (2) is incorrect (in addition to being strictly speaking false).

More generally, the Nihilist can say that sentences that entail the existence of composite objects, and that we would ordinarily take to be true, are literally false but nevertheless correct, because they correspond to literally true paraphrases like (1a); while sentences entailing the existence of composite objects that we would ordinarily take to be false are both literally false and incorrect, because they correspond to sentences like (2a).²⁴

²⁴ There is, however, a potential problem with this approach. (The problem is raised by Sider in "Van Inwagen and the Possibility of Gunk.") Suppose it is possible for there to be a situation that the non-Nihilist would describe as involving a chair that is not composed of simples. That is, every part of what appears to be a chair has proper parts, so that there are smaller and smaller parts "all the way down," without there ever being a part of the chair that is a simple. In such a situation (if it were possible), we would be inclined to say "There is a chair here." But the usual Nihilist paraphrase – 'There are some simples arranged chairwise here' – will not do, since there are no simples in the imagined scenario.

In general, the problem for the Nihilist's paraphrasing strategy involves possible cases involving (what appear to be) objects that are not composed of simples. Let's say that an apparent object is *gunky* iff it has no simples among its parts, so that every proper part of the object is itself composed of smaller parts. (The notion of "atomless gunk" comes from David Lewis. See his *Parts of Classes*, p. 20.) Then the problem is that it may be possible for objects to be gunky, which means that paraphrases like (1a) and (2a) will not always work.

One potential Nihilist response to this problem is to deny the possibility of "atomless gunk". That is, the Nihilist could claim that it is impossible for there to be any physical objects at all (apparent or genuine) without there also being simples.

Another potential Nihilist response to the problem is to resort to talk about stuff. Recall that the Nihilist's goal was to come up with literally true sentences that could serve as the paraphrases of sentences like (1) that strike us as correct but that are, according to the Nihilist, strictly speaking false. Well, as long as the Nihilist is willing to countenance talk about stuff that is not reducible to talk about things, this goal can be achieved through paraphrases like the following. (On the distinction between things and stuff, and the irreducibility of talk about stuff, see Markosian, "Simples, Stuff, and Simple People.")

- (1c) There is some stuff arranged chairwise in the corner.

Unfortunately for the Nihilist, not everyone will be convinced that the paraphrasing approach can do everything it is supposed to do. Here's why. Part of what the paraphrasing strategy is supposed to do is capture the sense in which it is correct, in certain situations, to say that there is a chair in the corner. So far so good. But the other thing the paraphrasing approach is supposed to do for the Nihilist is to soften the blow of having to say that there are no common sense objects like chairs. And it is not clear that just being able to say that there are many cases of simples²⁵ arranged chairwise makes up for having to say that there are not really any chairs. After all, the relevant intuition is not merely that in certain situations there is something correct about saying that there is a chair in the corner. The intuition is that it is literally true in those situations that there is a chair in the corner. To the extent that this intuition is right, the paraphrasing approach fails.

Moreover, recall what I described above as a particular version of the general problem of an impoverished ontology that faces the Nihilist: the problem of having to say either that there are no people or else that people are simples. Suppose the Nihilist embraces the first horn of this dilemma. Then paraphrasing will only go so far toward solving the problem. For although we can say that there are some simples arranged personwise in the region where we take you to exist right now, what are we to say about the fact of your apparent consciousness? Suppose you are having the thought that would ordinarily be expressed by saying "I think, therefore I am." Then there seems to be consciousness going on in the region we take to be occupied by you, and it may or may not be possible to capture what is true about that with paraphrases like 'There are some simples arranged consciousnesswise in this region'. But either way, we will also need to account for the apparent fact that there is a single *subject* of that consciousness, which is the *same subject* that will be having a similar thought later on (when it will be different simples that are arranged consciousnesswise).²⁶ This is likely to be a difficult problem for the Nihilist to solve, which may be a good reason for the Nihilist to embrace the second horn of our current dilemma, and say that people are in fact mereological simples.²⁷

5 Contact

UC and Nihilism are both, in van Inwagen's terminology, "extreme answers" to SCQ. Let us consider some "moderate answers" to our question, according to which there are some possible cases in which certain simples fail to compose an additional object, and some possible cases in which certain other simples (or even the same simples arranged differently) do compose a further object. One such view is based on the idea that in order for some xs to compose something, they must not be spatially separated from one another, i.e., they must be in contact with one another. Here is an official formulation of this view.

(2c) There is some stuff arranged elephantwise in the corner.

For now the Nihilist can maintain that the truth of (1c) accounts for what is correct about (1), and also that the falsity of (2c) accounts for what is incorrect about (2), even in a world that is entirely gunky.

²⁵ Or stuff.

²⁶ For a more careful presentation of a similar argument against Nihilism, on which the above argument is loosely based, see van Inwagen, *Material Beings*, Section 12.

²⁷ Something like this may be what Roderick Chisholm ends up saying, although for somewhat different reasons, in "Is There a Mind-Body Problem?"

Contact: Necessarily, for any non-overlapping xs, there is an object composed of the xs iff the xs are in contact with one another.²⁸

Although the idea it is based on has some intuitive appeal, Contact nevertheless has some very counterintuitive consequences. Here's one: whenever I place a hand on my daughter's shoulder, a new composite object, with she and I as parts, comes into existence. Here's another: whenever two people stand in the same room, there is an object composed of the two people in question and the floor they are standing on. In general, Contact seems to be far too liberal about the nature and number of composite objects in the world.

To make matters worse, Contact also appears to be too conservative about the nature and number of composite objects in the world. For the different particles that make up an atom are not, after all, in contact with one another. Which means that, according to Contact, there are not actually any atoms.²⁹

6 Fastenation

A more promising idea is that in order for some objects to compose a further object, they must be somehow stuck together, so that they move around jointly. Here is a view based on this idea.

Fastenation: Necessarily, for any non-overlapping xs, there is an object composed of the xs iff the xs are fastened together.³⁰

In my experience, something like Fastenation is the first thing that comes to mind among most non-philosophers when they initially consider SCQ. So I think the view probably has at least as much intuitive appeal as any other response to our question. But, unfortunately, Fastenation is nevertheless subject to some serious objections. Here is one that comes from van Inwagen.³¹ Suppose two people, while shaking hands, become paralyzed so that they are unable to pull their hands apart. Then according to Fastenation there is a new object in the world, composed of the two paralyzed handshakers. But that seems to be the wrong result.

Here is a second objection to Fastenation.³² The multigrade relation³³ of being fastened together is a relation that comes in degrees. So we must ask, Which degree of fastenation is relevant to bringing a new object into the world? The problem is that any particular answer to this question (such as .5 on a scale from 0 to 1, or .673621) seems intolerably arbitrary.

One possible reply to this objection is to say that any degree of fastenation at all is sufficient to make it be the case that there is an object composed of the xs. Here is a view based on this idea.

²⁸ Van Inwagen discusses this view in Section 3 of *Material Beings*.

²⁹ Van Inwagen makes this point in Section 3 of *Material Beings*.

³⁰ See van Inwagen, *Material Beings*, p. 56, and Markosian, "Brutal Composition." Van Inwagen calls the view in question "Fastening."

³¹ Van Inwagen, *Material Beings*, pp. 57-58.

³² This and the remaining objections to Fastenation-type views discussed below are presented in Markosian, "Brutal Composition."

³³ A multigrade relation is one that can relate different numbers of objects.

Weak Fastenation: Necessarily, for any non-overlapping xs, there is an object composed of the xs iff the xs are fastened together to some degree greater than zero.

But this view, besides being subject to the above paralyzed handshakers objection to Fastenation, also seems to give awkward results in cases involving some xs that are fastened together but to only a very small degree. In light of this, the proponent of Fastenation may want to consider the following variation on the view.

n-Fastenation: Necessarily, for any non-overlapping xs, it is true to degree n that there is an object composed of the xs iff the xs are fastened together to degree n.

But here we run into a different problem: n-Fastenation presupposes that for any xs, there is a degree to which the xs are all fastened together; but no doubt this presupposition is false. Perhaps this problem can be solved, however, by saying that it is the weakest degree of fastenation among any two of the xs that determines the degree to which there is an object composed of those xs.

Still, n-Fastenation entails that there can be genuine vagueness in the world and, as was noted above, many philosophers consider this idea (as opposed to the idea that vagueness must be in our language) to be utterly untenable. Those philosophers will of course have no truck with n-Fastenation.

A philosopher who does not mind positing vagueness in the world, on the other hand, may well want to embrace n-Fastenation. Alternatively, he or she may want to combine elements of both Weak Fastenation and n-Fastenation into the following view.

Weak Fastenation With Degrees: (i) Necessarily, for any non-overlapping xs, there is an object composed of the xs iff the xs are fastened together to some degree greater than zero. (ii) Necessarily, for any non-overlapping xs that are fastened together to some degree greater than zero, and for any x among those xs, x is a part of the object composed of the xs to the degree to which x is fastened to the rest of the xs.

Here is a final problem for Fastenation. How can we define the phrase 'the xs are fastened together'? It will not do, for example, to say that the xs are fastened together iff it is fairly difficult to move them away from one another without damaging them.³⁴ For on that definition, a newborn calf and its mother would count as being fastened together. And it turns out that other likely proposals seem to be equally problematic. So it looks like the proponent of Fastenation will be stuck with a view whose main concept must be taken as primitive.

7 Van Inwagen's Proposed Answer

In *Material Beings*, van Inwagen comes to the conclusion that there are no inanimate, composite objects. But, he reasons, if some simples function together in such a way that their

³⁴ Compare the definition considered by van Inwagen on pp. 56-57 of *Material Beings*.

activities constitute a life, then there is a composite object – a living thing – that they compose. On this view, the only objects in the world are simples and living organisms.

Before we look at an official formulation of this view, we need to get a bit clearer on two main concepts that the view is based on: the notion of the activities of some objects constituting a certain event, and the notion of a life. Van Inwagen does not offer a definition of ‘the activities of the xs constitute event E’, but he does offer several instructive examples, including the following: (i) the activities of the cattle constituted the stampede, and (ii) the activities of the water molecules in the pan constituted the cooling of the water in the pan.³⁵ Although van Inwagen himself does not put it this way, I take it that the idea is roughly that the activities of some xs constitute an event, E, when E is a larger event that is a mereological sum of the events that are the activities of the xs.

What about the second main concept that van Inwagen’s view is based on, that of a life? This too is a notion that van Inwagen does not attempt to define but, instead, one that he explains in various other ways.³⁶ Chief among the things he says in his explanation are that lives are events of a certain kind. At one point he imagines a disembodied intellect who has never heard of organic life and who is examining some earthly organism for the first time. He imagines this disembodied intellect saying the following.

What I am observing is an unimaginably complex self-maintaining storm of atoms. This storm moves across the surface of the world, drawing swirls and clots of atoms into it and expelling others, always maintaining its overall structure. One might call it a homeodynamic event.³⁷

Here is the view, making use of the concept of the activities of some xs constituting an event and the concept of a life, that van Inwagen proposes.

Van Inwagen’s Proposed Answer (VIPA): Necessarily, for any non-overlapping xs, there is an object composed of the xs iff either (i) the activities of the xs constitute a life or (ii) there is only one of the xs.³⁸

I mentioned above that the Nihilist may be able to avoid certain traditional puzzles concerning composite objects, such as the puzzle involving the ship of Theseus, the paradox of undetached parts, and the problem of the many. Van Inwagen can make a similar claim about his view.³⁹ Another potential advantage of VIPA is that it, unlike Nihilism, allows us to account for the single subject of a consciousness, as well as the persisting subject of a single consciousness over time, in a relatively straightforward way. For van Inwagen can plausibly say that the subject of a single consciousness is the organism that is conscious, and that the persisting subject of an extended consciousness is the enduring organism.

³⁵ Van Inwagen, *Material Beings*, p. 82.

³⁶ Van Inwagen, *Material Beings*, Section 9.

³⁷ Van Inwagen, *Material Beings*, p. 87.

³⁸ Van Inwagen, *Material Beings*, p. 82. In his formulation, van Inwagen says “the activity of the xs constitutes a life” rather than “the activities of the xs constitute a life.” I don’t think anything turns on this difference.

³⁹ See *Material Beings*, Sections 13, 14, and 17.

VIPA does have its disadvantages, however. Here is the main one. According to VIPA, the only composite objects in the world are organisms, and the only inanimate objects in the world are simples. This means that according to VIPA there are no rocks, chairs, bicycles, or stars. There are only simples and organisms. The main objection to the view that people are likely to have, then, is that there seem to be far more objects than VIPA allows. This is the reason that van Inwagen developed the strategy of paraphrasing, which was discussed above in connection with Nihilism. I will not repeat here everything that was said above about the paraphrasing strategy as a way of dealing with the too-few-objects objection, but it should be clear that all the same considerations raised above will apply in the case of that objection and VIPA.

A second main objection to VIPA is that it (when combined with certain other plausible principles about the nature of lives) entails that there can be genuine vagueness in the world. The reason is that there appear to be indeterminate cases of an object's being "caught up" in a life. For instance, consider some simples that would ordinarily be taken to compose a carbon atom. Suppose those simples get ingested by a woman drinking tea, so that they are eventually absorbed into her bloodstream.⁴⁰ At precisely what instant does it come to be the case that those simples are caught up in that woman's life? Van Inwagen admits that there is no determinate answer to this question, that it follows from his view that there are times at which it is neither determinately true nor determinately false that those simples are parts of the relevant woman, and that it also follows that parthood and composition are both vague notions.⁴¹ This is why VIPA entails that there can be genuine vagueness in the world.⁴²

8 Brutal Composition

There is another conclusion that one could draw from consideration of all the disadvantages of the different answers to SCQ that we have considered thus far. One could take all of this to show that there simply is no true answer to SCQ. That is, one could maintain that while some xs compose an object and others fail to do so, there is no systematic pattern to these phenomena. When some xs do compose an object, a person who reached this conclusion might say, there is no further reason for the fact that those xs compose something. It is just a brute fact.

Before we can officially formulate this view, we need to address a preliminary matter. Suppose there is no rhyme or reason as to when composition occurs and when it doesn't, as the view in question suggests. There could still be a truth of the form "Necessarily, for any xs, there is an object composed of the xs iff _____." It would just have to be an infinitely long list of every possible situation involving some xs that compose a further object. But such a list would certainly be an uninformative "answer" to SCQ. In fact, it would really be no answer at all. Similarly, even such finitely long and true sentences as 'Necessarily, for any non-overlapping xs, there is an object composed of the xs iff the xs compose something' should not count as real answers to SCQ, since they are merely trivially true. So what the view we are currently considering must deny is that there is a finitely long, non-trivial answer to SCQ. Here then is the view.

⁴⁰ The example is van Inwagen's. See *Material Beings*, pp. 94-95 and p. 217.

⁴¹ *Material Beings*, pp. 217ff.

⁴² Van Inwagen also accepts as a consequence of his view that there can be genuine vagueness in the world about matters of identity – about, for example, whether this thing now is the same thing that was here earlier.

Brutal Composition (BC): There is no true, non-trivial, and finitely long answer to SCQ.⁴³

BC has certain advantages (some of which it shares with other responses to SCQ). One important advantage of BC is that it is consistent with all of our common sense intuitions about particular cases of composition. Another advantage of BC is that it is consistent with the idea that there cannot be genuine vagueness in the world. And a third advantage of BC (which it shares with Nihilism) is that it seems to allow the 3Der (who denies that ordinary objects have temporal parts) to solve certain puzzles that fall under the heading of “problems of material constitution” in a relatively easy way.⁴⁴ (In fact, the proponent of BC can plausibly claim to have much more satisfying solutions to the problems of material constitution than the Nihilist, since the BCer solves the problems without denying the existence of common sense objects like ships and cats.) Moreover, despite the fact that BC shares each of these advantages with at least one other proposal mentioned in this paper, BC is the only proposal discussed here that enjoys all three of the relevant advantages.

Despite this fact, not everyone in the philosophical community has converted to BC. And the view does admittedly have what seem to be several important disadvantages. The first of these is simply that many people find it to be implausible. There is a general feeling, shared by many philosophers, that a question as intuitively graspable as SCQ must have an answer. A proponent of BC is likely to respond to this objection by agreeing that we should initially assume that any philosophical question as important and clear as SCQ has an answer, but also by claiming that in a case like this one, after careful consideration of all the likely answers has turned up nothing that seems to work, it is appropriate to conclude that there is in fact no answer.

A closely related objection that is likely to be raised against BC involves the idea that compositional facts are not the right sort of facts to be brute facts. Terence Horgan puts the objection this way.

[A] good metaphysical theory or scientific theory should avoid positing a plethora of quite specific, disconnected, *sui generis*, compositional facts. Such facts would be ontological danglers; they would be metaphysically queer. Even though explanation presumably must bottom out somewhere, it is just not credible – or even intelligible – that it should bottom out with specific compositional facts which themselves are utterly unexplainable and which do not conform to any systematic general principles. Rather, if one bunch of physical simples compose a genuine physical object, but another bunch of simples do not compose any genuine object, then there must be some reason *why*; it couldn't be that these two facts are themselves at the explanatory bedrock of being.⁴⁵

⁴³ This view is defended in Markosian, “Brutal Composition.” In that paper I distinguish BC from the thesis that compositional facts are brute facts, although I say that the two theses naturally go together. (A brute fact is a fact that does not obtain in virtue of some other fact or facts.) Here, for the sake of simplicity and brevity, I will run these two claims together.

⁴⁴ For more on how BC apparently allows the 3Der to solve these problems, see Markosian, “Brutal Composition.”

⁴⁵ Horgan, “On What There Isn't,” p. 695. For a more detailed reply to the objection than is given here, see Markosian, “Brutal Composition,” pp. 234-236.

It's not clear why Horgan suggests that the notion that compositional facts could be brute facts is *unintelligible*. After all, as Horgan himself admits, there must be some brute facts. (For to suppose otherwise is to commit oneself to either infinite regress or circularity.) As for the *credibility* of the notion that compositional facts could be brute facts, I think a proponent of BC ought to insist that it is perfectly credible and that, moreover, the concept of composition possesses the three main characteristics – (i) being relatively easy to grasp on an intuitive level, (ii) being such that there seem to be clear-cut cases of both instantiation and non-instantiation, and (iii) being such that no account of what it is in virtue of which some xs instantiate that concept seems to be forthcoming – that make a concept a suitable candidate for the status of brutality in our theorizing.

Another objection to BC comes from Theodore Sider.⁴⁶ Here is a modified version of Sider's argument. The proponent of BC has to say that there can be cases in which two or more objects compose an additional object and also cases in which two or more objects fail to compose an additional object.⁴⁷ So consider a pair of possible cases such that the simples in one case compose an object, and the simples in the other case do not. Now imagine further a series of cases that "connect" the two original cases, so that any two adjacent cases in the series are near-duplicates of each other with regard to any respect that one might take to be relevant to the question of whether composition occurs: the number of simples involved, the spatial proximity of those simples to one another, the degree to which those simples are fastened together, etc. (Depending on how many cases you are willing to include, the series can be such that any two adjacent cases are arbitrarily close to being qualitative duplicates in the relevant respects.) Now, since we have at one end of the series a case of composition, and at the other end a case of non-composition, it follows that somewhere in the series there will be a pair of adjacent cases such that in one case composition occurs and in the other case composition does not occur. Thus, there will be two cases that are near-duplicates of each other in all of the other respects, but that differ with respect to composition. And that seems implausible. Thus, this "continuum argument" seems to show that BC is false.

Here is how I think the BCer ought to reply to this argument.⁴⁸ It's true that we have intuitions according to which the factors that vary across the series are relevant to determining whether composition occurs. But it's also true that when you try to follow up those intuitions, and formulate answers to SCQ based on them, you end up with a set of incompatible moderate answers, each member of which has serious problems. So we know that those intuitions have to be given up. The upshot, according to this line of reasoning, is that you can't get a good argument based on the relevant intuitions, since we already know that those intuitions lead to implausible answers to SCQ.

According to this reply to the continuum argument, then, it's true that there is an "abrupt cutoff" in the relevant series of cases,⁴⁹ but this does not pose a problem for the view. A BCer who makes this response to the argument might draw the following analogy. Suppose someone claims that people who are left-handed are not left-handed in virtue of being any particular

⁴⁶ See Sider, *Four-Dimensionalism*, pp. 121-125. Sider presents his version of the "continuum argument" as part of a larger argument for 4D, and the larger argument for 4D is based on Lewis's argument for UC. See Lewis, *On the Plurality of Worlds*, pp. 211-213.

⁴⁷ Otherwise, either Nihilism or UC would be true.

⁴⁸ The following reply to Sider's continuum argument against BC is adapted from pp. 237-240 of Markosian, "Brutal Composition," which also contains a discussion of an alternative reply.

⁴⁹ Where an "abrupt cutoff" in the series is a pair of adjacent cases such that in one case composition occurs while in the other case it does not.

height. And suppose someone else argues against this claim by pointing to a series of possible cases ranging from a five-foot-tall left-hander at one end of the series to a seven-foot-tall right-hander at the other end of the series. It would be implausible to argue that there could not be an “abrupt cutoff” in this series of people (i.e., a pair of adjacent cases in which two people who are near-duplicates with respect to height differ with respect to being left-handed), precisely because we don’t think that a person’s height determines whether that person is left-handed. Similarly, the BCer can say, once we accept that composition does not occur in virtue of the number of simples involved in a given case, or the spatial proximity of those simples to one another, or the degree to which those simples are fastened together, etc., then we will see that there is nothing implausible about an abrupt cutoff in the series of cases described in the continuum argument.

9 The Serial Response

It might be thought that the above responses to SCQ are all too simplistic, and that they go wrong in presupposing that there is a single “monolithic” answer to SCQ. Perhaps there is no one relation that any xs must stand in in order for it to be the case that there is an object composed of those xs. Perhaps the truth of the matter is that there are different types of “building blocks” in the world, and that for each such type, there is some unique relation such that whenever some xs of that type stand in that relation to one another, then there is an object composed of those xs.

Here is a sentence schema that will be useful in formulating a view based on this idea.

(SERIES) Necessarily, for any non-overlapping xs, there is an object composed of the xs iff *either* the xs are F1s and related by R1, *or* the xs are F2s and related by R2, *or ...* the xs are Fns and related by Rn.

And here is a response to SCQ that involves an appeal to SERIES.

The Serial Response to SCQ: The correct answer to SCQ is an instance of SERIES.⁵⁰

One advantage of such a view is that it may allow us to avoid counterexamples to certain other answers to SCQ that involve a more narrow focus on just one particular factor that is said to be involved in composition, while at the same time yielding results that are consistent with common sense intuitions about specific cases. Another advantage of The Serial Response is that some people have an intuition according to which different factors must be involved in different cases of composition, and this view fits that intuition.

There are two main objections to The Serial Response.⁵¹ The first is simply that no one has yet formulated a plausible instance of SERIES. But perhaps someday someone will. The second objection is that, rather than avoiding the problems that afflict typical moderate answers to SCQ, The Serial Response seems to compound those problems. In general, the problem with

⁵⁰ Cf. van Inwagen’s discussion of “series-style” answers to SCQ in Section 7 of *Material Beings*. Compare also the view proposed by Rosenberg in “Comments on Peter van Inwagen’s *Material Beings*,” as well as the “Finite Serial Response” discussed in Markosian, “Brutal Composition.”

⁵¹ The objections that follow are adapted from Markosian, “Brutal Composition,” pp. 230-232.

moderate answers to SCQ is that they must identify some multigrade relation that is linked in the relevant way with the concept of composition; and, as our discussion so far has made clear, it is difficult to do this without generating counter-intuitive consequences or presupposing the possibility of genuine vagueness in the world. In particular, it is difficult to specify conditions that can plausibly be said to be sufficient for composition without opening oneself up to a great many apparent counterexamples. The Serial Response apparently compounds the problem because it requires identifying not just one multigrade relation that is linked to the concept of composition in the relevant way, but several; and moreover, The Serial Response also requires identifying several additional concepts (the referents of the expressions in place of 'F1', 'F2', etc.) that are also linked both to the concept of composition and to the relevant multigrade relations.

10 The Multi-Factor Approach

Some law schools employ an admissions policy that takes into account several different factors. For example, such a school might look at both a candidate's LSAT scores and his or her GPA. Moreover, the minimum LSAT score required for admission might vary inversely with respect to the minimum GPA. Thus, on such a system, candidates with relatively low LSAT scores need to have relatively high GPAs to get in, and those with relatively low GPAs need relatively high LSAT scores.

In many such cases, a particular law school's admissions policy can be captured by a formula. For example, the formula

$$[(\text{LSAT} \times 2) + (\text{GPA} \times 10)] \geq 695$$

means that if the sum of (the candidate's LSAT score times two) plus (the candidate's GPA times ten) is greater than or equal to 695, then the candidate is admitted; and otherwise he or she is not. Such an admissions policy can also be captured equally well by a graph, such as the one in Figure 1 below, with LSAT scores represented on its x axis, GPAs represented on its y axis, and a shaded area representing pairs of values for the two factors that correspond to positive admissions decisions.

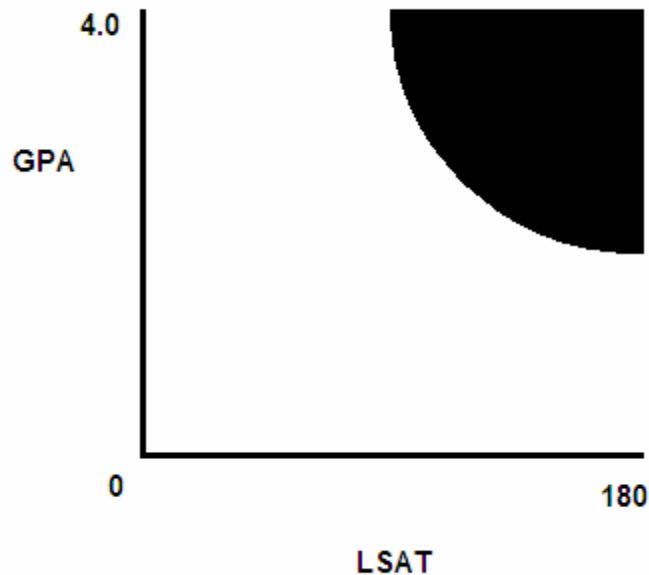


Figure 1

A student of SCQ might well think that composition works in a similar way. Perhaps there are several factors that determine whether composition occurs in a given case, and perhaps, for each factor, the “minimum score” required for composition to take place varies inversely with respect to the other factors. Here is a simplistic theory to illustrate this idea. Suppose that for any x s, there are two factors relevant to whether those x s compose a further object: the degree of fastenation among the x s, and the degree to which the x s collectively contrast with their environment. Let each of these factors be quantifiable on a scale from 0 to 1. Then perhaps this formula,

$$(\text{degree of fastenation} + \text{degree of contrast with environment}) \geq 1.5,$$

could represent the true answer to SCQ, which could be stated as follows.

The Fastenation + Contrast View: Necessarily, for any non-overlapping x s, there is an object composed of the x s iff the sum of the degree of fastenation among the x s and the degree of contrast between the x s and their environment is greater than or equal to 1.5.

And this answer to SCQ could also be represented by a graph like the one in Figure 2 below.

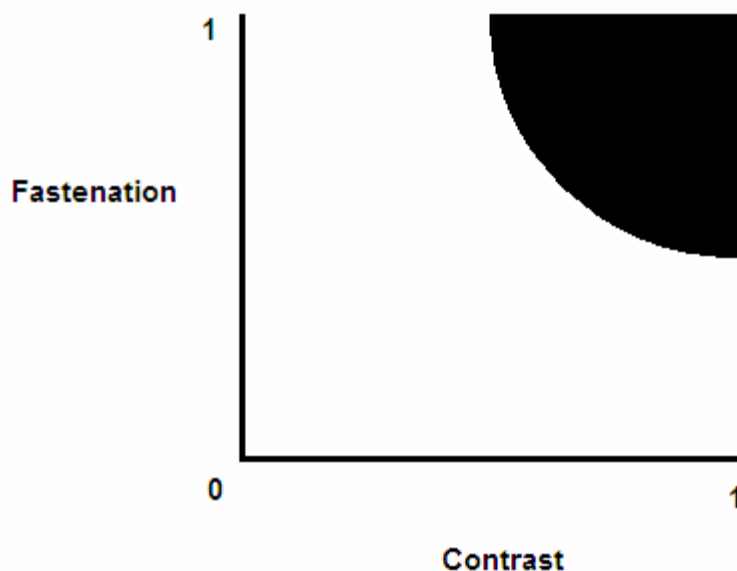


Figure 2

I suspect that no actual philosopher will want to endorse The Fastenation + Contrast View. But this answer to SCQ illustrates a general approach to answering SCQ that has been undeservedly neglected. The general approach, which I will refer to as The Multi-Factor Approach (or MFA), involves saying that the correct answer to SCQ incorporates multiple, interdependent factors, on the model of The Fastenation + Contrast View. And although I have introduced the idea with a simplistic theory involving just two factors, it should be clear that MFA is consistent with there being any number of different, interdependent factors that are relevant to composition. Thus, for example, one who adopts MFA is free to say that for any non-overlapping *x*s, whether those *x*s compose a further object depends on (i) the degree of fastenation among the *x*s, (ii) the degree of contrast between the *x*s and their environment, (iii) the spatial proximity of the *x*s to one another, (iv) the degree to which the activities of the *x*s constitute a life, (v) the degree of similarity among the *x*s, and (vi)-(xxxii) twenty-seven other factors. Moreover, a philosopher who endorses MFA, and says that there are thirty-two factors relevant to whether composition occurs, can choose among a vast number of different possible ways of combining those thirty-two factors (such as adding all of the relevant numbers; or multiplying them; or adding some and multiplying others; or adding some, subtracting others, and dividing by another; and so on).

One important thing to notice about MFA is that, as the example of The Fastenation + Contrast View illustrates, each multi-factor answer to SCQ can be equally well represented by either a formula (such as: $(\text{degree of fastenation} + \text{degree of contrast with environment}) \geq 1.5$) or else a graph (such as the one in Figure 2). The reason for this is that each multi-factor answer to SCQ corresponds to a function, and that function can be represented by (among other things) either a formula or a graph. Thus, for example, The Fastenation + Contrast View

corresponds to a function from ordered pairs (each one consisting of a value for the degree of fastenation among the xs and a value for the degree of contrast between the xs and their environment) to Yes or No verdicts (indicating that the xs do or do not compose a further object). Similarly, any multi-factor answer to SCQ corresponds to a function from n-tuples (where each member of the n-tuple represents a possible score with respect to one factor that is relevant to composition) to Yes or No verdicts; and that function could be represented equally well by either a formula or a multi-dimensional graph.

In fact, these considerations – about MFA, the fact that each multi-factor answer to SCQ corresponds to a unique function, and the fact that each such function can be represented by a graph like the one in Figure 2 – bring to light a simple and intuitive way of representing any answer to SCQ that has heretofore gone unnoticed. Think of a many-dimensional space, with one dimension for each factor that anyone could possibly think is relevant to composition. Then each possible answer to SCQ can be thought of as a particular way of shading the regions of that multi-dimensional space. Nihilism, for example, corresponds to such a space with no points shaded anywhere in the multi-dimensional space; and Unrestricted Composition corresponds to such a space with every point shaded; and different moderate answers to SCQ correspond to different ways of shading some but not all of the points in the space.

Another thing to notice about MFA is that it is consistent with both the view that there is no genuine vagueness in the world and the view that there is genuine vagueness in the world. The Fastenation + Contrast View is an example of an MFA-style view that does not allow vagueness in the world; and for a variation that does allow ontological vagueness, just think of a similar graph, but with some points that are white (indicating cases in which composition determinately fails to occur), other points that are black (indicating cases in which composition determinately occurs), and still other points in varying shades of grey (indicating cases in which it is indeterminate whether composition occurs).

Why should we even consider an approach to SCQ that is as complicated as MFA? Well, I suspect that this approach will appeal to many people who feel that such monolithic answers to SCQ as Fastenation, Contact, and VIPA all fail precisely because composition is really a complicated matter involving various different, interdependent factors.

One advantage of MFA over Brutal Composition is that it preserves an intuition that many people have according to which there must be a correct answer to SCQ. Another advantage that MFA has over all of the other response to SCQ considered so far in the literature is that it preserves an intuition that many people have according to which various factors can be relevant to whether composition occurs in a given case. Another advantage the proponent of MFA can claim over at least some of its rivals is that it, like Brutal Composition, is consistent with common sense intuitions regarding specific cases of some xs that may or may not compose an object. Another advantage proponents of MFA can tout is the consistency of their approach with every leading theory of vagueness. And, finally, it is worth noting that MFA appears not to be susceptible to arguments like Sider's continuum argument. (For the proponent of MFA can say that the true answer to SCQ is in fact sensitive to subtle differences in the different factors that are relevant to whether composition occurs, in a non-arbitrary way.)

Despite all of these appealing features of MFA, there are likely to be some objections. The main one I expect people to make is similar to an objection I mentioned above in connection with The Serial Response to SCQ: No one has yet come up with a promising theory that fits the approach. Another possible objection is that MFA requires that all of the different factors

allegedly relevant to whether composition occurs must be in some sense commensurable, whereas it is in fact plausible to think that many pairs of them will be incommensurable.⁵²

11 The Mystery Response

Perhaps some readers will be tempted at this point to say that there must be a true answer to SCQ, but that it is just a mystery. Maybe the answer to the question is something that it is impossible for us to know. Or maybe it is something that is knowable, even to us, but is for whatever reason unknown to us so far. Either way, the various disadvantages of the theories we have considered to this point seem to make this option at least worth considering.

One potential advantage of this Mystery Response to SCQ is that it allows us to preserve an intuition many people have according to which a question as straightforward as SCQ must have an answer. Another potential advantage of The Mystery Response is that it appears to be quite realistic about the fact that we don't seem to have discovered any completely satisfying answer to SCQ yet. A third advantage of The Mystery Response is that it is consistent with all of our common sense intuitions about particular cases of composition. And a fourth advantage is that The Mystery Response is consistent with the idea that there cannot be genuine vagueness in the world.

The main disadvantage of The Mystery Response, on the other hand, is that seems to be something of a philosophical cop-out. (Although its proponents are likely to say, in response, "What can we do? We're completely convinced that there is an answer to SCQ, but equally convinced that we haven't seen it yet.")

12 Conclusion

Choosing among alternative philosophical theories always involves a cost-benefit analysis. To help the reader with our current choice, I have included, as an appendix, a table summarizing the main benefits and costs of the different responses to SCQ we have considered here. As the table shows, each of the seven ways of restricting composition we have examined has its own costs. But to many of us, such costs as accepting brute compositional facts or admitting genuine vagueness into the world are relatively minor when compared to the triple whammy associated with UC. For the proponent of UC must first accept all of the many counterintuitive objects that the view entails; then he or she is forced to endorse the 4D view of persistence; and, finally, the proponent of UC must also accept UCUDI, with its radical and bizarre conception of persisting objects. In light of all of this, the choice for many of us will be clear: one way or another, composition must be restricted.⁵³

⁵² For the record, I think the best response to the second objection is to deny that the different factors must be commensurable. After all, there can be a function from ordered pairs of values (for example) to Yes or No verdicts even if the values in question are incommensurable with one another.

⁵³ I am grateful to Hud Hudson, Shieva Kleinschmidt, and Dean Zimmerman for helpful comments on earlier drafts of this essay.

Appendix: The Main Costs and Benefits of Various Responses to SCQ

Part One: Unrestricted Composition, Nihilism, Fastenation, and Van Inwagen's Proposed Answer

View	Main Benefits	Main Costs
UC	<p>Is traditional in mereology</p> <p>Simple, elegant</p> <p>Entails existence of plenty of objects</p> <p>Consistent with denial of vagueness in world</p>	<p>Counterintuitive results: far too many objects</p> <p>Entails 4D</p> <p>Entails UCUDI</p>
Nihilism	<p>Simple, elegant</p> <p>Consistent with denial of vagueness in world</p> <p>May allow one to avoid certain "problems of material constitution"</p>	<p>Counterintuitive results: too few objects</p> <p>Must say either that there are no people or else that people are simples</p>
Fastenation	<p>Satisfies many common sense intuitions about particular cases</p>	<p>Counterintuitive results: paralyzed handshakers</p> <p>Problems with degrees (which may lead to positing vagueness in world)</p> <p>Difficulties with defining 'the xs are fastened together'</p>
VIPA	<p>May allow one to avoid certain "problems of material constitution"</p> <p>Can account for persisting subject of a single consciousness</p>	<p>Counterintuitive results: too few objects</p> <p>Entails genuine vagueness in world</p>

Appendix: The Main Costs and Benefits of Various Responses to SCQ

Part Two: Brutal Composition, The Serial Response, The Multi-Factor Approach, and The Mystery Response

View	Main Benefits	Main Costs
Brutal Composition	<p>Consistent with common sense intuitions about particular cases</p> <p>Consistent with denial of vagueness in world</p> <p>May allow 3Der to solve various “problems of material constitution”</p>	<p>Implausible to say that question like SCQ has no answer</p> <p>Implausible to say that compositional facts are brute facts</p> <p>Must admit that adjacent cases in Sider’s continuum can differ with respect to composition</p>
Serial Response	<p>May avoid counterexamples better than standard answers to SCQ</p> <p>Fits intuition that different factors are involved in different cases of composition</p>	<p>No one has yet come up with promising version</p> <p>Appears to multiply difficulties facing monolithic answers</p>
Multi-Factor Approach	<p>Preserves intuition that SCQ has an answer</p> <p>Preserves intuition that various factors can be relevant to composition</p> <p>Consistent with common sense intuitions about particular cases</p> <p>Consistent with different theories of vagueness</p> <p>Avoids Sider’s continuum argument</p>	<p>No one has yet come up with a promising version</p> <p>Possible problems with commensurability</p>
The Mystery Response	<p>Preserves intuition that SCQ has an answer</p> <p>Realistic about fact that we don’t seem to have discovered it yet</p> <p>Consistent with common sense intuitions about particular cases</p> <p>Consistent with denial of vagueness in world</p>	<p>Seems to be a philosophical cop out</p>

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