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Temporal Parts and Temporary Intrinsics*

1. This paper is concerned with a familiar problem that any account of the metaphysics of material objects must face. The problem I have in mind is what is known as *the problem of temporary intrinsics*, the problem of how objects can persist through change.[1] A popular line of thought, endorsed by David Lewis (1986) among others, holds that if the *Metaphysic of Temporal Parts*—or the *MTP*, for short—is adopted, then the problem of temporary intrinsics can be adequately resolved.[2] On this view, the problem of temporary intrinsics and the MTP are linked, at least in the following sense: the MTP provides a solution to the problem of temporary intrinsics, and so gives us reason for thinking that the MTP is true.

Despite its attractiveness, however, I think this line of reasoning is flawed. To be sure, my dissatisfaction with the MTP is not original. For example, some philosophers have objected to the MTP on the grounds that they do not know what a temporal part is, and hence, that they find the MTP incomprehensible.[3] Others have argued that the MTP makes genuine change impossible and is to be rejected for that reason.[4] However, although

* I'd like to thank David Hunter and Zeno Swijtink for helpful criticism and advice on previous drafts. Thanks also to Henry Laycock, who provided me with vigorous comments at the 2001 meetings of the Canadian Philosophical Association where an ancestor of this paper was presented.

[1] In the terminology of David Lewis (see Lewis 1986, 202). See also Haslanger (1989).

[2] I owe the phrase 'the Metaphysic of Temporal Parts' to Judith Jarvis Thomson (1983).

[3] See Thomson (1983) for a statement of this view.

[4] See Mellor (1981) for a statement of this view.

I am sympathetic to these objections, my objection to the MTP will take a different form. What I wish to do is consider an objection that friends of the MTP press against other solutions to the problem of temporary intrinsics and turn it against the MTP itself. Thus, I will not be arguing that the MTP must be false, nor will I be arguing that there are no arguments in favor of the MTP.[5] Rather, the conclusion I will draw will be conditional: if the MTP provides an adequate response to the problem of temporary intrinsics, then the MTP provides no reason to reject our commonsense view of the nature of material objects.[6]

2. Let me begin with the problem of temporary intrinsics. In order to adequately discuss this problem, I first need to say what an intrinsic property is. The definition of 'intrinsic property' that I have in mind runs as follows: a property P is an *intrinsic property* of an object x if (i) whenever x has P, x's having P does not entail the existence of a wholly distinct object y, and (ii) y's existence is not contingent on the existence of x.[7] So, for example, the property of being red is plausibly intrinsic, since whether or not an object is red does not entail the existence of any other object. The property of being married, on the other hand, is plausibly non-intrinsic, since whether a person N is married does entail the existence of an object distinct from N, namely N's spouse. If a property is non-intrinsic, I will also sometimes say that it is extrinsic, or relational, or derivative.

It is natural to suppose that some commonsense objects persist through changes in their intrinsic properties.[8] I will focus on my car, which

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[5] Other arguments for the existence of temporal parts are the argument from Special Relativity, and the argument from Humean supervenience. For a discussion of the first sort of argument, see Rea (1998); for a discussion of the second, see again Rea (1998) and Haslanger (1994).

[6] I assume that our ordinary, commonsense view of the nature of material objects is that such objects are three-dimensional in nature, and that they persist by enduring. For further explanation of this terminology, see §5 below.

[7] See Lewis (1983) and Langton and Lewis (1998) for discussion of the proper definition of 'intrinsic'. The notion of entailment I have in mind is the necessary truth preserving one.

[8] The following presentation of the problem of temporary intrinsics owes much to Haslanger (1989).

persisted through the loss of its radio, but any ordinary material object will do.[9] More generally, then, we have the following principle about persistence:

(P) Some commonsense objects persist through intrinsic change.

If, however, my car persisted through the loss of its radio, then it would seem to follow that my car existed both before and after the loss of its radio. After all, it is *my car* that previously had a radio and presently lacks one. More generally, then, it seems right to say that if an object persists through a change in its intrinsic properties, then that object exists both before and after the change in question:

(E) If an object O persists through a change C, then O exists both before and after C.

Now, consider again my car. My car changed by losing the property of having a radio. Hence, from (P) and (E) it follows that there is some object with which my car is identical before losing its radio, and some object with which my car is identical after losing its radio. Let us call the object with which my car is said to be identical before losing its radio 'car-plus', and let us call the object with which my car is said to be identical after losing its radio 'car-minus'.[10] The problem can therefore be reformulated as follows: is car-plus identical with car-minus? That is, is

(ID) car-plus = car-minus

true?

There is good reason to think that it is. For by (E), my car exists before losing its radio, and is identical with car-plus; and by (E) my car

[9] I will use the property of having a radio as an example of an intrinsic property. This might seem odd, as it might be objected that an object O cannot have the property of having a radio unless there exists another, distinct, object, namely the radio in question. Nonetheless, I will stick with this example in what follows. So far as I can see, nothing of substance hangs on this choice of example.

[10] 'Car-plus' and 'car-minus' are intended to be singular referring terms, not disguised descriptions.

exists after losing its radio, and is identical with car-minus. So by transitivity of identity, car-plus and car-minus are identical, and so (ID) is true.

On the other hand, there is also reason to think that (ID) is false. For consider: car-plus has a property, namely having a radio, that car-minus lacks. But according to Leibniz' Law, for all objects x and y, if x is identical with y then x and y share all their properties. More formally:

(LL) For all objects x, y, and for all properties F, x = y only if Fx iff Fy.

But then, since car-plus has the property of having a radio while car-minus lacks the property of having a radio, car-plus cannot be identical with car-minus, and (ID) is false.

We have therefore derived a contradiction from our intuitively plausible principles (P), (E), and (LL): it is both the case that car-plus and car-minus are identical with each other, and the case that car-plus and car-minus are not identical with each other. The problem of temporary intrinsics is best understood, I think, as the claim that (P), (E), and (LL), each independently plausible, together form an inconsistent triad.

3. What is to be done? One response is to claim that (P) is false: no objects persist through change. But this response should strike us as very implausible. After all, can it really be said that if my car loses its radio I have new object? Perhaps it can. *Strictly speaking*, somebody might say, upon the loss of its radio I do indeed have a new car; while *loosely speaking* upon the loss of its radio I have my old car, albeit with different properties. On this view, the question whether to retain (P) is a case of semantic indecision: it depends on whether we wish to speak strictly or loosely. I will simply state, without argument, that this seems to me to be an unattractive way to resolve the problem of temporary intrinsics. Consequently, I think that this sort of response should be viewed as a last resort.

Another response is to deny (E). But again, it is hard to see how we could deny (E) and still maintain the intuition that objects sometimes undergo changes in their properties. After all, (E) seems to follow from the very meaning of the word 'change': for to say that something changes is to say that some thing, some one and the same thing, comes to lose or acquire a property.

Finally, we might deny (LL). But this strikes me as extremely ill advised. For do we really want to suggest that a solution to the problem of temporary intrinsics requires a rejection of a fundamental logical principle? It seems to me that we do not. Consequently, it seems to me that we really do need a solution to the problem of temporary intrinsics that retains each of (P), (E), and (LL). Is such a solution available?

4. It might be thought that such a solution is obviously available. For anybody who has thought about the problem of temporary intrinsics will realize at once that what has been ignored is time. Indeed, I presented the problem of temporary intrinsics in a largely atemporal manner: my car has a radio; my car lacks a radio; so my car both has and does not have a radio. However, it would be more appropriate to say that my car both had and does not have a radio. Moreover, it might be argued that this is all that is required to solve the problem of temporary intrinsics. For since there is arguably no incompatibility between a thing's having a property at one time and lacking it at another, it might seem that the problem of temporary intrinsics is no problem at all.

But like many others, I think that this response will not do. For merely to point out that my car had a property that it now lacks does not solve the problem of temporary intrinsics; it merely redescribes it. As David Lewis puts it,

> [i]t is not a solution [to the problem of temporary intrinsics] just to say how very commonplace and indubitable it is that we have different [properties] at different times. To say that is only to insist—rightly—that it must be possible somehow. Still less is it a solution to say it in jargon—as it might be, that bent-on-Monday and straight-on-Tuesday are compatible because they are 'time-indexed properties'—if that just means that, somehow, you can be bent on Monday and straight on Tuesday. (Lewis 1986, 204)

The question is not *whether* time should be integrated into our solution to the problem, but rather *how* time should be integrated into our solution to the problem. And the answer to this question is far from obvious.

Consider a time t at which the sentence 'My car has a radio' is true. What is the underlying logical form of this sentence? A number of different proposals suggest themselves, but I will focus on two:

(i) My car has-at-t a radio.
(ii) My car-at-t has a radio.

Proposal (i)—which I will call *relationalism*—holds that so-called intrinsic properties are disguised relations. According to relationalism, in other words, the property of having a radio is a two-place relation that holds between my car and a time. Thus, according to relationalism objects do not have properties simpliciter; rather, objects have properties at, or in relation to, times.

Proposal (ii), on the other hand—which I will call the *temporal part response*—holds that ordinary objects undergo changes in intrinsic properties in virtue of having as parts temporal parts which themselves have properties. Let us turn to discussion of this response.

5. The temporal part response is favored by a number of philosophers, among them Cartwright (1975), Armstrong (1980), Quine (1981), Lewis (1986), Sider (1997), and Heller (1999). Proponents of the temporal part response often explain it by saying that according to it objects *perdure* through change, but do not *endure* through change. For ease of exposition, let us adopt this terminology:

> something *persists* iff, somehow or other, it exists at various times; this is the neutral word. Something *perdures* iff it persists by having different temporal parts, or stages, at different times, though no one part of it is wholly present at more than one time; whereas it *endures* iff it persists by being wholly present at more than one time. (Lewis 1986, 202)

Of course, it is one thing to talk about temporal parts and temporal stages, or about objects being wholly present at different times; it is another thing to make this talk comprehensible. Consequently, the next thing we need to do is to try to explain what a temporal part is. Unfortunately, this is by no means an easy task.

For example, it might be supposed that a part P of an object O is a temporal part of O if P is a part of O at one time and is not a part of O at another time. But consider poor Jerry, who lost his finger in a wood-chopping accident as a child. According to this definition of 'temporal part' Jerry's finger is a temporal part of Jerry, since there is a time—namely before the wood-chopping accident—at which Jerry's finger is part of him, and another time—namely after the wood-chopping accident—at which Jerry's finger is not part of him. But I think that this is not what friends of the MTP have in mind when they talk about temporal parts.

Temporal parts are sometimes introduced on analogy with spatial parts. So, for example, just as highway 101 has different spatial parts, some located at or near San Francisco, others at or near Santa Rosa, so too it is argued that ordinary objects have different temporal parts, some located at or near some times, others at or near other times. As Theodore Sider puts it, "[a] road has spatial parts in the subregions of the region of space it occupies; likewise, an object that exists in time has temporal parts in the various subregions of the total region of time it occupies." (Sider 1997, 197) Similarly, Mark Heller remarks that "[i]nsofar as time is just one more dimension, roughly alike in kind to the three spatial dimensions, we should expect that our claims about object's spatial characteristics have analogues with respect to its temporal characteristics." (Heller 1999, 314) The analogy is not perfect, of course, since prima facie at least, there are many ways in which the spatial and temporal dimensions diverge. For example, time appears to have a direction of flow, whereas space does not, and temporal units of measurement are quite different from spatial units of measurement. Still, we can make the spatial-temporal analogy a bit more precise if we help ourselves to the notion of a region of space, and to the notion of a stretch of time.

First, regions of space. Following Cartwright (1975), let us say that a region of space is a set of points of space. Such regions of space might also be called 'places'. Second, stretches of time. A stretch of time T is any interval of moments of time t1, t2, ... tn where t is a moment of time if t has no temporal duration, and where for any two moments of time t and t', either t occurs before t' or t' occurs before t. If a stretch of time T has no temporal duration, we will say that T is a moment of time.

We can now define the predicate '__ is a temporal part of …'. Following Thomson (1983), let us define this predicate as follows: suppose y exists through a stretch of time T that begins at t0 and ends at tn. Then x is a temporal part of y iff x comes into existence after t0 and goes out of existence before tn and x occupies some region of the space occupied by y for all of the time that x exists. I will assume that such a definition, or one very much like it, is something to which the MTP is committed.

With these distinctions in hand, philosophers often go on to distinguish three-dimensionalism from four-dimensionalism. Three-dimensionalism constitutes what I take to be our commonsense view of the nature of material objects. According to it, material objects persist through time by being wholly present at every moment at which they exist. Four-dimensionalism, on the other hand, is the view that material objects persist

through time by having as parts temporal parts which exist at some times, but not at others. The MTP is therefore a version of four-dimensionalism.[11]

6. So much by way of stage setting; let us return to the question of how the MTP purports to solve the problem of temporary intrinsics. Recall the problem: the intuitively plausible principles (P), (E), and (LL) together form an inconsistent triad, since they appear to entail both that (ID) is true, and that (ID) is false. But according to the MTP, this is a mistake. For according to the MTP, 'car-plus' and 'car-minus' pick out different entities: 'car-plus' picks out one temporal part of the four-dimensional object that is my car, and 'car-minus' picks out a distinct temporal part of that same four-dimensional object. Thus, the MTP claims that (ID) is simply false, and hence, that no contradiction results from the conjunction of (P), (E), and (LL).

Despite the attractiveness of this solution, however, it seems to me to face serious problems. In particular, I will argue that it faces the following dilemma: either it entails that objects that have temporary properties do not have them intrinsically; or it entails that objects that have intrinsic properties do not have them temporarily. In other words, I will argue that the MTP provides a solution to the problem of temporary intrinsics only by denying that there are any temporary intrinsics. This conclusion may be something that friends of the MTP can learn to live with. I will argue, however, that they can do so only by acknowledging that a standard MTP objection to relationalism fails. In the end, then, it seems to me that friends of the MTP must either acknowledge a fundamental problem with the MTP, and with its proposed solution to the problem of temporary intrinsics, or they must acknowledge that the temporal part response to the problem of temporary intrinsics provides no reason for thinking that the MTP is true. In the next sections I will try to make these general complaints a bit more precise.

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[11] This terminology is not entirely free from problems, and leaves a number of issues unaddressed. For one thing, the phrase 'three-dimensionalism' suggests that ordinary material objects lack a temporal dimension, and this is false if it is intended to mean that ordinary material objects lack temporal extension or duration. For another thing, it is unclear what it means for an object to be wholly present at every moment at which it exists. Still, I find the terminology to be familiar and useful, and I will make use of it in what follows.

7. The conclusion that the MTP entails that there are no temporary intrinsics is best argued for, I believe, if we shift to the formal mode. Consider the following sentence-schema:

(1) O has P at t, and O lacks P at t'.

Here 'O' is a variable ranging over ordinary material objects, and 'P' a variable ranging over intrinsic properties of ordinary material objects. Thus, (1) is to be read as saying that the material object O has an intrinsic property P at one time, but not at another.

Again, any solution to the problem of temporary intrinsics must show how it is possible for some sentences having the same form as (1) to be true. Now, according to the MTP an ordinary material object O has an intrinsic property P at time t if, first, O has at t a temporal part TP; and second, TP has P. And according to the MTP an ordinary material object has an intrinsic property P at a time t1 and not at another time t2 if O has different temporal parts TP1 and TP2—TP1 existing at t1, and TP2 existing at t2—such that TP1 has P and TP2 lacks P. So according to the MTP, if a sentence having the same form as (1) is true, it must be made true by the truth of a sentence having the same form as (2):

(2) O has a temporal part TP1 at t1, and TP1 has P, and O has a temporal part TP2 at t2, and TP2 lacks P.

But it now appears that according to the MTP if some sentences having the same form as (1) are true, then no properties of ordinary material objects are intrinsic properties; or no sentences having the same form as (1) are true. Equivalently, in the material mode: according to the MTP either intrinsic properties are disguised relations, and so are not temporary *intrinsics* after all, or no intrinsic properties are ever had temporarily, and so are not *temporary* intrinsics.

Why do I say this? To see why, let us ask what sorts of material objects the variable 'O' ranges over in (1) and (2). There are two possible options for the friend of the MTP. Either 'O' ranges over four-dimensional objects, or 'O' ranges over temporal parts. Suppose 'O' ranges over four-dimensional objects. Then if a sentence having the same form as (1) is true it follows that if an object O has a property P, P is not an intrinsic property of O. For according to the MTP, to say that an object O has a property P is to say, first, that there is a temporal part TP that has P; and second, that O

bears a certain relation to TP. In other words, a sentence like (1) can be true only if O bears some relation to a temporal part which has P. Thus, on the assumption that 'O' ranges over four-dimensional objects, and on the assumption that no property the having of which depends on the existence of another object can be an intrinsic property, no ordinary material object ever has an *intrinsic* property.

Suppose, on the other hand, that the variable 'O' in (1) ranges over temporal parts. Then although it is plausible to suppose that the properties picked out by 'P' in (1) are intrinsic properties, it is also arguable that all sentences having the same form as (1) are false. This is because it is arguable that no temporal part can have a property P at one time and lack P at another time. And this is because it is arguable that temporal parts are such that if a temporal part has a property at any time at which it exists, it has that property at all times at which it exists. Thus, if 'O' ranges over temporal parts, then no properties had by temporal parts are temporary properties.

Evidently, this objection depends crucially on the principle that temporal parts have their properties essentially, and I do not know how to defend this claim. Seizing on my ignorance, friends of the MTP will perhaps object that a temporal part *can* have a property P at one time and yet lack P at another. Perhaps; as I said, I do not know how to show that this claim is false. However, even if this assumption is granted, it is of no help in the present context. For temporal parts were appealed to in an attempt to show how it is possible for ordinary material objects to have properties at some times and lack them at others. But it is of no help to be told that what makes *this* possible is that *temporal parts* can have properties at some times and yet lack them at others. After all, that is precisely the problem we are trying to address. Is the friend of the MTP going to claim that temporal parts have temporal parts? If so, the same objections that were directed against the MTP's original solution to the problem of temporary intrinsics can be directed against such a proposal. Is the friend of the MTP going to claim that it is a brute and inexplicable fact that temporal parts can gain and lose properties? This simply trades one puzzle for another.

The present objection to the MTP can therefore be put as follows: either the variable 'O' in (1) and (2) ranges over four-dimensional objects, or it ranges over temporal parts. If 'O' ranges over four-dimensional objects, then if any sentence having the same form as (1) is true, this can only be because no properties had by the objects over which 'O' ranges are

intrinsic properties. On the other hand, if 'O' ranges over temporal parts, then no sentence having the same form as (1) is true, since no properties had by the objects over which 'O' ranges are had only temporarily. Either way, the MTP fails to provide a solution to the problem of temporary intrinsics, since it denies that there are any temporary intrinsics.

8. So far as I can tell, there are two lines of response open to a friend of the MTP. First, she can argue that the conclusion of the above argument does not follow from its premises: contrary to what I have argued, the MTP does not entail that no ordinary object ever has an intrinsic property only temporarily. Alternatively, she can grant the conclusion of the above argument, but argue that it does not present a problem for the MTP's proposed solution to the problem of temporary intrinsics. I will suggest that neither response is satisfactory

Let us consider the first response. How might this response proceed? It is unlikely that a friend of the MTP will take the variable 'O' in (1) and (2) to range over temporal parts, since what we are concerned with are ordinary material objects, and not their temporal parts (if indeed they have any). Let us therefore take the variable 'O' in (1) and (2) to range over four-dimensional objects. Then where I say that if an object O has a property P, O has P only derivatively, and hence, that where 'P' ranges over intrinsic properties of material objects no sentence of the form 'O has property P at t' is true, the friend of temporal parts can say that a sentence of the form 'O has property P at t' is true just in case O has a temporal part, and that temporal part has P. Thus, this first response amounts to the claim that all it means for an ordinary material object—here understood to be four-dimensional in nature—to have an intrinsic property P is for that object to have a temporal part which has P.

Clearly, the viability of this response will depend on answers to two questions. First, is it plausible to suppose that an object x might have a property P in virtue of a distinct object y having P? And second, is it plausible to suppose that an object x might have an *intrinsic* property P in virtue of a distinct object y having P?

First question first. I think it should be granted that the idea that an object might have a property P in virtue of another object having P is not implausible. For example, it is plausible to suppose that what makes it the case that my car has a scratch is the fact that it has a door that has a scratch. Since the door of my car is not identical with my car, this is arguably a case of one object—namely my car—having a property in virtue

of another object—namely my car's door—having that same property. Thus, our first question should be answered in the affirmative: an object can have a property P in virtue of a distinct object having P.

What about the question whether an object might have an *intrinsic* property P in virtue of a distinct object having P? Here I think there is trouble. For on the face of it the idea that an object x might have an intrinsic property P in virtue of standing in a relation to a distinct object y that has P seems incoherent: after all, if P is intrinsic, then x should be able to have P regardless of its relation to y, or indeed to any other object. Recall our definition of an intrinsic property: a property P is an intrinsic property of an object x if x's having P does not entail the existence of a distinct and contingently existing object y. And as we have seen, in the case of four-dimensional objects and temporal parts, a four-dimensional object can only have a property P in virtue of having a temporal part that has P. What this suggests is that if intrinsic properties are properties which can be had by an object regardless of what is the case with any other object, then the MTP does away with intrinsic properties altogether, replacing them with relations instead. Granted, these relations are not relations to times, but are instead relations to temporal parts, but the point remains the same.

I conclude, then, that this first response is unsuccessful. For on the assumption that ordinary material objects have properties in virtue of bearing relations to temporal parts, it follows that no ordinary material object ever has an intrinsic property.

9. Let us turn now to the second response I mentioned above. This second response allows that the MTP entails that ordinary material objects do not have intrinsic properties, but insists that the sense in which this is true is not objectionable and hence, that the MTP is not objectionable as a solution to the problem of temporary intrinsics.

In order to evaluate this response we need to compare the temporal part response with relationalism. As I am using the term, relationalism is the view that objects have properties in virtue of being related to different times. So, for example, some objects are-at-t red; others are-at-t' red; and so on.[12] And what this means is that the property of being red is not a one-

[12] Again, recall that relationalism is the view that the instantiation relation is relativized to times. I don't mean to suggest, however, that according to relationalism expressions like 'is-at-t red' are fused predicates, that they have no semantic or

place relation that takes a single object as argument, but is rather a two-place relation that takes as argument both an object and a time. Now according to the MTP, relationalism is objectionable as a solution to the problem of temporary intrinsics because it counts properties as two-place relations. David Lewis, for example, remarks that according to relationalism,

> all [temporary intrinsics] must be reinterpreted as relations that something with an absolutely unchanging intrinsic nature bears to different times. The solution to the problem of temporary intrinsics is that there aren't any temporary intrinsics. This is simply incredible, if we are speaking of the persistence of ordinary things… If we know what shape is, we know that it is a property, not a relation. (Lewis 1986, 204)

Mark Hinchliff echoes Lewis, saying that relationalism "denies our intuition that the shapes are properties. Any sort of change on this theory involves relations not properties… In effect, [relationalism] denies that an object can undergo any sort of change in its properties." (Hinchliff 1996, 121) So according to Lewis and Hinchliff, relationalism entails that so-called properties are really disguised relations, and so denies the possibility of genuine change.

As against this, however, there are two things to be said. First, despite what Lewis and Hinchliff say, I intuit no such thing about the nature of properties. That is, I do not know that shape is a property rather than a relation. This is not to say that I have no intuitions about the nature of properties so-called. For I do have the following intuition: if *being bent*, say, is an n-place relation, then *being more bent than* is an n+1 place relation. That is, while I do not have any strong intuitions about whether or not *being bent* is a property or a relation, I do have the intuition that *being bent* is a fewer-placed relation than is *being more bent than*. And this, I suggest, is all we have to go on.

It is true, of course, that in natural language we distinguish properties from relations: we call *being bent*, *being round*, *being red*, and so on, properties; and we call *being more bent than*, *being rounder than*, and *being more red than* relations. However, this settles nothing as it stands. For we can agree with this observation and maintain both that *being bent*,

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syntactic structure. I simply want to emphasize the fact that according to relationalism, the instantiation relation is what is being temporally modified.

being round, *being red*, and so on are relations, *and* that they are different from *being more bent than*, *being rounder than*, and *being more red than*. For we can insist that what we ordinarily call a property is simply a two-place relation, and that the difference between properties and relations so-called is that for any so-called property you take, and for any so-called relation you take, the so-called property will always be a fewer-placed relation than the so-called relation in question. So the first thing to be said in response to Lewis and Hinchliff is that their intuitions are merely that.[13]

The second, and more important, thing to be said against Lewis and Hinchliff is this: suppose that Lewis and Hinchliff are right, and that if we know what shape is we know that it is a property, not a relation. How is this supposed to help the friend of the MTP? It will help the friend of the MTP only if the MTP entails that shape is a property, and not a relation. But if, as I have argued, the MTP also entails that shape is a relation, then this objection to relationalism applies equally well to the MTP. Again, a dilemma presents itself: either it is incredible to think that shape is a relation, or it is not incredible to think that shape is a relation. If it is incredible to think that shape is a relation, then the MTP is open to the same objection that relationalism is open to. And if it is not incredible to think that shape is a relation, then Lewis's and Hinchliff's observation does not constitute an objection to relationalism in the first place.

10. Faced with this dilemma, I think it is clear that friends of the MTP should insist that relationalism's characteristic claim—that an object's having a property depends on its being related to a time—is objectionable in a way that the MTP's claim that an object's having a property depends on its being related to a temporal part is not. Our definition of 'intrinsic' went as follows: a property P is an intrinsic property of an object x if x's having P does not depend on the existence of a distinct and contingently existing object y. So we can ask: is a temporal part TP of an object O distinct from O? And relatedly, does the MTP really make properties into disguised relations? If these two questions are answered in the negative, then there will be reason to think that the MTP is not objectionable as a response to the problem of temporary intrinsics.

Consider the question whether a temporal part TP of an object O is an object which is distinct from O. Temporal parts, although not identical

[13] I am not claiming that either Lewis or Hinchliff intends this observation to be a knockdown refutation of relationalism. Intuitions are, after all, only intuitions.

with the four-dimensional objects of which they are parts, are yet not discrete from those objects either. Rather, one is quite literally a part of the other. So although it is true that the MTP entails that ordinary objects have properties in virtue of being related to temporal parts which have properties, it might be thought that the relation between the object and its temporal parts is sufficiently intimate to temper the charge that the MTP makes properties into relations.

Nonetheless, I think that this response will not do. Recall Lewis's remark that the problem with relationalism is that according to it temporary intrinsics 'must be reinterpreted as relations that something with an absolutely unchanging intrinsic nature bears to different times'. But equally, it would seem that according to the MTP temporary intrinsics must be reinterpreted as relations that something with an absolutely unchanging intrinsic nature bears to different temporal parts. According to the MTP, a four-dimensional object acquires and loses the property of being red, say, in virtue of gaining and losing a temporal part that is red. Again, it is hard to discern any important difference between relationalism and the MTP on this count.

To this it might be objected that this objection misconstrues the relation temporal parts bear to the objects of which they are a part. For it might be argued that if TP is a temporal part of an object O, then *necessarily* TP exists and is a part of O. For if an object O is a sum of temporal parts, then O depends for its existence on that sum of temporal parts and thus, if O exists, then necessarily its parts exist. And given our definition of 'intrinsic property', namely, that a property P is an *intrinsic property* of an object x if x's having P does not depend on the existence of a distinct and contingently existing object y, it might be thought to follow on the MTP that ordinary objects *can* have intrinsic properties. But again, it seems to me that this objection is misguided. For it is not clear that if TP is a part of an object O, then TP is *necessarily* a part of O. For consider some candidate four-dimensional object, say Descartes.[14] On this view, Descartes could not have existed for a shorter period of time than he did exist for. For suppose Descartes could have existed for a shorter period of time than he did exist for. According to the MTP, this could only be because a temporal part that was in fact a part of Descartes might not have been a part of him. But if objects have their temporal parts necessarily, then Descartes could not have lacked any temporal part that he in fact had,

[14] The following argument was suggested by van Inwagen (1990).

and so could not have existed for a shorter period of time than he did exist for. And this strikes me as highly implausible.

What about the question whether the MTP makes properties into disguised relations? I have been arguing that since the MTP entails that an ordinary object's having of a property depends on that object's bearing a relation to a temporal part, the MTP entails that so-called intrinsic properties of ordinary material objects are in fact relations. But there is an obvious response to this claim, viz., that while it is perhaps true that the MTP entails that the properties had by ordinary material objects are relations, this is compatible with the claim that the properties had by temporal parts are intrinsic. For example, if temporal parts have their properties essentially, then they have those properties regardless of their relations to other objects. And this means that those properties are intrinsic properties of the temporal parts. So it might be thought that the MTP is compatible with the existence of intrinsic properties after all.

I should note at the outset that it is unclear why the claim that temporal parts might have intrinsic properties would make us less worried about the nature of the properties had by ordinary material objects since, after all, what we are primarily concerned with are ordinary material objects and their properties. Still, if we set this worry aside, this seems to be a fair objection. Unfortunately, I'm not sure how to respond to it, since as I've said, I'm not sure how to answer questions concerning the modal properties of temporal parts. For example, consider a temporal part TP which comes into existence at a time t and goes out of existence at a later time t', and which is gray and square. Could TP have come into existence at a time earlier than t? Could TP have existed for a longer or shorter stretch of time? Could TP have been red and circular instead of gray and square? I have no idea about how to begin addressing these questions.

Moreover, this sort of response is open to the following rejoinder. One would naturally assume that if an ordinary material object O has a property P in virtue of having as a part a temporal part TP which itself has P, then the property P had by O is the same property as that had by TP. But on this response, this assumption is mistaken. For the property P had by O is a relational property, whereas the property P had by TP is an intrinsic property, and it is hard to see how one and the same property could be both intrinsic and relational.

Perhaps this is not a genuine worry; perhaps it merely points to an ambiguity in the language we use to attribute so-called properties to objects. For example, it might be argued that when we use the predicate 'is

red' to attribute an intrinsic property to an ordinary material object O, what we attribute to O is instead a relation, whereas when we use the predicate 'is red' to attribute a property to a temporal part TP, we succeed in attributing a genuine intrinsic property to TP. This sort of hybrid view doesn't strike me as obviously wrong, but it does strike me as being very unattractive. For the predicate 'is red' does not appear to be ambiguous in the way in which the predicate 'is a bank' is ambiguous.

Although these remarks are inconclusive, I nonetheless conclude that this second response fares no better than the first. For since the MTP entails that an ordinary object's having a property involves that object bearing a relation to a temporal part, the MTP entails that the properties had by ordinary objects are relational rather than intrinsic. And the observation that temporal parts can have properties non-derivatively would not appear to affect this fact.

11. Where does this leave us? I first argued that the MTP faces a dilemma: either the MTP entails that no ordinary material object ever has a property only temporarily, or the MTP entails that the properties had by ordinary material objects are disguised relations, and so are not intrinsic. I then suggested that there are two responses open to friends of the MTP: either they can deny that the MTP entails that properties are disguised relations; or they can grant this, but argue that this is not a problem for the MTP. The first sort of response was found unconvincing, given our definition of 'intrinsic property'. And the second response was also rejected on the grounds that the MTP fares no better than relationalism on this score.

But the question remains: what *is* an adequate solution to the problem of temporary intrinsics, and what would such a solution tell us about the nature of material objects? The answers to these questions will depend on whether one thinks that properties can be relations. If you are of the opinion that any view that counts properties as relations must be false, then it seems to me that you must reject relationalism along with the MTP, and look for some other solution to the problem of temporary intrinsics. On the other hand, if you are not convinced that turning properties into relations is in and of itself reason to reject an account of the metaphysics of material objects, then you are free to endorse either relationalism or the MTP.

For the reasons given above, I am not convinced that turning properties into relations is sufficient reason for rejecting an account of the

metaphysics of material objects. However, I incline towards the view that ordinary material objects are three-dimensional in nature, that they persist by being wholly present at every moment at which they exist, and that they gain and lose properties by bearing relations to different times. Granted, this requires the rejection of some pre-theoretical views about the nature of material objects; but the MTP also forces us to abandon certain of our pre-theoretical views. For in addition to committing its proponents to the existence of temporal parts, the MTP also entails that properties are disguised relations. In the end, then, it seems to me that the MTP forces us to abandon too many of our pre-theoretical intuitions about the nature of material objects, and so represents a misguided account of the metaphysics of ordinary material objects.

There are a number of important issues that I have not addressed in this paper. My aim, however, has not been to consider every argument for or against the MTP. Rather, my aim has been to suggest that the MTP provides a solution to the problem of temporary intrinsics only by denying the existence of properties that are both temporary and intrinsic. And the conclusion I drew from this was conditional: if the MTP provides an adequate response to the problem of temporary intrinsics, then the MTP provides no reason to reject our commonsense view of the nature of material objects. Thus, it seems to me that we are better off looking away from the MTP, and towards some version of three-dimensionalism, for an account of the nature of material objects.

ABSTRACT

The problem of temporary intrinsics is the problem of how objects can persist through change. A popular line of thought holds that if the *Metaphysic of Temporal Parts*—or the *MTP*, for short—is adopted, then the problem of temporary intrinsics can be adequately resolved. On this view, the problem of temporary intrinsics and the MTP are linked, at least in the following sense: the MTP provides a solution to the problem of temporary intrinsics, and so gives us reason for thinking that the MTP is true. In this paper I argue this line of reasoning is flawed. I consider an objection that friends of the MTP press against other solutions to the problem of temporary intrinsics and turn it against the MTP itself. The conclusion I draw is therefore conditional: if the MTP provides an adequate response to the problem of temporary intrinsics, then the MTP provides no reason to reject our commonsense view of the nature of material objects.

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