

# SELF VISITATION, TRAVELER TIME AND NON-CONTRADICTION

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## 1. Introduction

The self-visitation paradox is one paradox of time travel. As Ted Sider puts it, “Suppose I travel back in time and stand in a room with my sitting 10-year-old self. I seem to be both sitting and standing, but how can that be?” (2001, 101). So as not to beg any questions, let us label what is sitting *B* and what is standing *C*. The worry is about how *B* can be *C* in light of the looming contradiction that this one person would be sitting and standing. Sider’s own approach is perdurantist, and holds that *B* is not *C*. My concern, though, is with solutions offered by, or on behalf of, endurantists—more specifically, with solutions holding that *B* is *C*.<sup>1</sup> The endurantist answer I shall criticize is a *relativizer* position maintaining that the sitting and the standing need to be relativized to the *personal time* or *proper time* of the time traveler. This manner of solution has been offered by Paul Horwich (1975, 433-435 ; 1987, 114-115) and also by Simon Keller and Michael Nelson (2001, 344). I will show that such a view has a linguistically suspect element and that there are three further reasons why relativizing only in this way falls short of solving the paradox. This will be enough to squash the relativizer position because it will not be clear how additional relativization could help, and furthermore any additional relativization would only make the linguistic matter worse. I will also present some considerations in favor of a *non-contradiction* endurantist alternative; this view eliminates the need for any relativization by denying that sitting and standing are contradictory properties.

## 2. Relativism and Non-Contradiction

Relativizer solutions to the self-visitation paradox claim that, strictly speaking, *B* is not sitting (simpliciter) nor is *C* standing (simpliciter). Instead, *B*'s sitting is somehow relativized and so is *C*'s standing. So, for example, it is natural to point out that *B* is sitting at some place, say, *here* while *C* is standing somewhere else, say, *there*. Relativizers go on to claim that the appearance of a looming contradiction is due to the fact that the relativizations are often implicit when we make our property attributions.<sup>2</sup> The general idea is that there are no real worries about *B* being *C*, there is no genuine contradiction lurking; *B* and *C* can both be sitting here and standing there. What is impossible is simultaneously sitting and standing in one place.

Relativizing properties to spatial location is just one way to relativize. Paralleling a solution to the problem of temporary intrinsics that relativizes properties to times, it has been suggested that the relativization might instead be to the traveler's personal time or proper time. Both these concepts are, roughly, time as measured by the traveler's wristwatch. Personal time is a concept introduced and defined by David Lewis (1976, 146) as the assignment of coordinates to the stages of a time traveler's life so that regularities—like that food digests and hair grows—match those that commonly hold with respect to time itself (what Lewis calls *external time*). Proper time is a notion of physics that plays a central role in the theory of special relativity. It is time for a particular frame of reference—time according to an ideal clock at rest relative to that frame. The time traveler's proper time is time for his or her frame of reference. It is time as measured by the traveler's wristwatch provided that it is properly functioning.

Keller and Nelson suggest relativizing to personal time<sup>3</sup> as one viable way to solve the self-visitation paradox:

...[Y]ou can trade on the distinction between personal time and external time, and say that Jennifer has the properties *being white-haired at 1985 and age 84* and *being black-haired at 1985 and age 14* (or that Jennifer *has-in-1985-at-age-84* the property *being white-haired*, and *has-in-1985-at-age-14* the property *being black-haired*)  
 These are not incompatible properties (2001, 344).

Similarly, Paul Horwich suggests relativizing to proper time:

When it is said that Charles<sub>1</sub> does have a beard in 1960 but Charles<sub>2</sub> does not, the proper-time index is suppressed. But were we more explicit we would say that Charles<sub>1</sub> has no beard in 1960 at some proper time  $t$ , whereas Charles<sub>2</sub> has a beard in 1960 at some different proper time  $t'$ . ...[W]e have no reason to deny that Charles<sub>1</sub> is Charles<sub>2</sub>, and Leibniz's law remains unshaken (1975, 434-435).

When the differences between personal time and proper time are not important, and for the most part they will not be, I will indiscriminately talk about both at once by speaking of *traveler time*.<sup>4</sup> Keller and Nelson conveniently indicate different traveler times by citing different ages of the traveler. I will do the same.

It is useful to contrast the relativizer approach with an alternative. This alternative also claims that the apparent contradiction that seems to push us to the conclusion that *B* is not *C* is, in fact, not a contradiction. In this instance, however, the appearance of contradiction is not due to a failure to recognize implicit relativizations somehow associated with *B*'s sitting and *C*'s standing. Rather it is due to a natural tendency to generalize from ordinary, non-time-travel situations about which it may well be true that no one at a single time both sits and stands. According to *non-contradiction*, what self-visitation scenarios show is that sitting and standing are not contradictory properties after all. Just check out our time traveler: he is simultaneously sitting and standing. Of course, it is not the case both *that he is sitting* and *that it is not the case that he is sitting*—that would be contradictory; same goes for *standing* and *its not being the case that he is standing*. Just as considering the possibility of time travel may reveal to us that really one can exist before being born, so considering the possibility of time travel reveals to us that one can stand and sit at the same time.

### 3. Four Problems

#### *a. Relativization to Traveler Time is Not Implicit*

When a friend of perdurantism raises the problem of temporary intrinsics, pointing out that 20-year-old Elvis was slender and 42-year-old Elvis was rotund, and thinks that this is grounds for concluding that 20-year-old Elvis is not 42-year-old Elvis, a common reaction of endurantists is to point out that 20-year-old Elvis (i.e., Elvis) was slender *in 1955* and 42-year-old Elvis (i.e., Elvis) was rotund *in*

1977. Part of the reason such relativizing to time is a tempting answer to this problem is that it is prima facie reasonable to think that all our ordinary property attributions include some sort of implicit or explicit reference to time. In contrast, relativizing properties to the exact current mass of the sun and maintaining that such relativizations are implicit would be a linguistically ludicrous position; few of us give any regular thought to the sun or to the fact that it has mass, and few of us have any idea what the mass of the sun is at any given time.

Is it prima facie reasonable to think that property attributions include a relativization to traveler times? Its tenability is certainly not on a par with relativizing property attributions to time. If I say, ‘Ralph is sitting’, it is plausible that I mean that Ralph is sitting, say, at noon (assuming it is noon). It is far less plausible that I mean that Ralph is sitting, say, at age 25 (assuming he is 25) because I am far less likely to have any idea of Ralph’s age. Similarly, if I say, ‘Ralph is sitting’ it is plausible that I mean something like that he is sitting now, and far less plausible that I mean he is sitting at his present age or at the time according to his wristwatch or his current proper time or anything similar. That’s just not anything like how we usually think—proper time and personal time are semi-technical notions and the time of existence of propertied individuals is rarely a consideration. Such relativizations are rarely implicit.

Some will be concerned by my saddling the traveler-time relativist, a metaphysician at heart, with the need to provide a theory that is linguistically realistic. Such a concern is misplaced. Though the relativist is offering a metaphysical position, there is also a linguistic element of his or her view, one needed to explain the appearance of inconsistency between sentences like ‘The traveler is sitting’ and ‘The traveler is standing’ that can both be true said about a self-visitation scenario. Failure to provide that explanation threatens to put the traveler-time relativist at a disadvantage in relation to

other endurantist answers to the self-visitation paradox. For example, non-contradiction does not need to claim that our ordinary property attributions are implicitly relativized in any manner. It explains the appearance of contradiction by pointing out our natural tendency to generalize from familiar situations in which no one sits and stands at the same time.

*b. The Compulsory Appeal to Non-Contradiction*

Notice the following problem with relativizing properties to spatial location: just as it can seem contradictory that one thing be both sitting and standing, it surely seems just as contradictory that one thing could be here and there. How can one thing be (wholly) present at two different locations at once? But, by insisting that the traveler is not sitting or standing (simpliciter), though he is sitting here and is standing there, the relativist is thereby committed to holding the traveler is here and the traveler is also there. Thus, relativizing to spatial locations just doesn't fully address what's puzzling about self-visitation. Why accept that our traveler can be here while there in order to avoid holding that he is sitting while standing? The only gain seems to be that the relativizer has traded in apparent contradictions of many sorts for an apparent contradiction of one sort, failing to address this ultimate source of apparent contradiction.

Almost the same problem arises for the relativizer to traveler times, who must accept that our traveler is simultaneously 10 years old and however old *C* is! If he or she does accept this, then that does promise to allow that *B* is *C*. But, if one is not prepared to hold that our traveler can simultaneously be sitting and standing, if one insists on relativizing to traveler times to avoid that

consequence, why would one accept that our traveler could simultaneously have experienced two different amounts of time? Why would one accept that our traveler could be 10 and, say, 37 years old?

This problem generalizes. To explain away the appearance of contradiction, all relativizers try to relativize to something that serves to distinguish *B*'s sitting and *C*'s standing. They try to make it plausible that *B* is sitting relative to ###, that *C* is not standing relative to ###, that *C* is standing relative to \*\*\* and that *B* is not sitting relative to \*\*\*. At first glance, there are lots of ways of accomplishing that: relativizing to locations, to traveler times, or even to footwear. But, ultimately, the point of explaining away the appearance of the looming contradiction is to preserve the endurantist intuition that *B* is *C*, and so whatever serves to distinguish *B* and *C* via the relativization also must be tied to both *B* and *C*. Thus, we should always ask whether *that* generates an apparent contradiction. Roughly, we need to ask whether the traveler could be relative to ### and relative to \*\*\*? Can our traveler be here and there? Can he be 10 years old and 37 years old? Can he be wearing these shoes and those shoes?

When we do, we run up against these tensions in the relativizer position that can only be solved by invoking an element of non-contradiction. Evidently, an apparent contradiction will always be generated since the relata are chosen to distinguish *B* and *C* regarding their sitting and standing. So, what it seems a relativizer must say is that, with regard to the distinguishing relativizations, despite appearances, there is really no contradiction—the time traveler can, at once, be here and there, two different ages, or fill in your preferred relata. The relativizers addressing the self-visitation paradox must make some sort of non-contradiction-style move, exactly the kind of move they resist about sitting and standing.

Now, reasonably enough, I have assumed that, at the time of the self visitation, if *B* is sitting at age 10, then *B* is age 10. Similarly, I assume that, if *C* is standing at age 37, then *C* is age 37. So, I assume that, according to the traveler-time relativist, *B* is age 10 (simpliciter) and age 37 (simpliciter). A traveler-time relativist might deny these seemingly obvious facts, holding instead that even having experienced a certain amount of traveler time requires relativization to traveler time. *B* can be age 10 at age 10, but not be age 10 (simpliciter). *C* can be age 37 at age 37, but not age 37 (simpliciter). If so, the time traveler relativist will deny that, on their view, the traveler is age 37 and also age 10. This, however, is a purely theoretically motivated response that carries no intuitive force. Notice that my assumption is not really needed to raise the problem. Without the assumption, though no formal contradiction would be entailed by the conjunction that the traveler is sitting at age 10 and standing at age 37, this does not make it any easier to see how that conjunction could be true in light of the relativizations to two different traveler times. Furthermore, we should also keep in mind that each time we move away from what seem to be the ordinary entailments of natural language (e.g., *B* is now sitting at age 10, therefore *B* is now age 10) it becomes less plausible that the so-called implicit relativizations are really there.

### *c. Multidimensional Time*

I have heard it expressed in conversation that the self-visitation paradox reveals an advantage that relativizing properties to traveler times has over relativizing properties to times. The idea is that, though these two positions are equally successful regarding the problem of temporary intrinsics, only

relativizing to traveler times succeeds in addressing the self-visitation paradox. What I will show in this subsection is that there are scenarios that make trouble relativizing to traveler time that is much like the trouble that self visitation makes for relativizing to time: in these scenarios, a person can be sitting and standing at a single traveler time.

Suppose that time is not one-dimensional, and so a time traveler could time travel back to a time at which he did not exist on his original time line but at which he does exist along a spur off that line upon by his arrival. Our concern will not be with the time traveler, but with a person of this temporally multidimensional universe, an ordinary person who exists along both time lines, but behaves differently along the different lines. He was sitting at noon along the original time line but the arrival of the time traveler startled him and, as a result, he was standing at noon along the second line. Of course, as he is not a time traveler himself, he has experienced exactly the same amount of traveler time at noon along each time line. He is sitting at age 37 and standing at age 37 without contradiction.

Interestingly, assuming that one and the same spatial locations can exist along two different time lines of multi-dimensional time, the same problem arises for the relativizer to spatial locations: the multi-dimensional time traveler could be sitting here and also standing here, just along two different time lines. Notice that relativizing to times encounters no problems with this new scenario. Neither does non-contradiction.

*d. What Else is Happening at the Traveler Times?*

Back to our self-visitation scenario. Giving the traveler-time relativizer way too much, let us grant (for the moment) that our time traveler is neither sitting (simpliciter) nor standing (simpliciter) though he is sitting at age 10 and standing at age 37. Let us also set aside worries about extending traveler-time relativism to situations involving multidimensional time. In this subsection, I will show that, in the self-visitation scenario itself, for the endurantist, the time traveler is not only sitting relative to traveler time age 10, *he is also standing relative to traveler time age 10*. (I could also show that he is sitting relative to traveler time age 37 and standing relative to traveler time age 37, but I will ignore this bit of overkill.)

Traveler times are temporal indices and lots of different events in lots of different locations can be happening at a given traveler time. “We may assign locations in the time traveler’s personal time not only to his stages himself but also to the events that go on around him” (Lewis 1976, 146). At age 18, I met my wife and also at that traveler time the Red Sox were finishing their 1978 season. When *B* is sitting at age 10, he is also, say, wearing a blue shirt, coffee is brewing nearby, and Super Bowl XIV is concluding. All of this goes on when he is 10. So far so good, but something else is going on then: At that traveler time, *C* is standing. *C* is doing it over there at that traveler time, not over here, but *C*’s doing it all the same. Every person or object has its own traveler-time scale but that *x* is *F* at *t* can be true even if *t* is a point on the traveler-time scale of something other than *x*. Since *B* is *C* according to the traveler-time relativist, the apparent contradiction has not been explained away by the imposed relativizations.

The time-travel relativist will no doubt object to the preceding argument. Yes, the coffee is brewing *when* the traveler is age 10, but the coffee isn't brewing *at age 10*. Presumably, the coffee is not that old! Similarly, Super Bowl XIV is finishing *when* the traveler is age 10 but Super Bowl XIV does not finish *at age 10*; Super Bowls last a dreadfully long time, what with all the commercials, but they do not last a decade! It may look like I was careless about how the properties are supposed to relativize to traveler times.

Not so. The relativization to traveler time as an answer to the self-visitation paradox is supposed to be parallel to the relativization to time as an answer to the problem of temporary intrinsics. It is just a matter of deploying a different kind of time (or in the case of personal time something much like time), where temporal notions like simultaneity and occurrence-at-a-time make good sense. So, despite Keller and Nelson's use of phrases like 'in-1985-and-at-age-14' or my own use of 'at age 10' and 'at age 37', and how these phrases might ordinarily be understood, the appropriate way to construe the relativizations is as specifying a traveler time of occurrence; '*x* is sitting' is supposed to be synonymous with '*x* is sitting at *t*', where *t* indexes the amount of traveler time that has passed for *x*. This, of course, leaves open that *x* elsewhere might have other properties at *t* or things other than *x* might have properties at *t*. In the relevant sense, the coffee is brewing at the traveler's traveler time age 10 and Super Bowl XIV is finishing at the traveler's traveler time age 10. Analogously, the traveler, as well as sitting at the traveler's traveler time age 10, is also standing then.

Maybe what is needed is a revision of traveler-time relativism, one that is not perfectly parallel to the relativization-to-time answer to the problem of temporary intrinsics. Instead, on behalf of the relativist, let us take '*x* is sitting' as elliptical for '*x* is sitting at age *t*', where the latter means

something like what it ordinarily does: ‘ $x$  is sitting as  $t$  years has passed for  $x$ ’. More generally, the idea is that ‘ $x$  is  $F$  at  $t$ ’ means ‘ $x$  is  $F$  at  $t$  on  $x$ ’s traveler-time scale’. So, with this new style of relativization, nothing can have a property relative to  $t$  on another thing’s travel-time scale. To say that the coffee is brewing is to say that it is brewing as so and so years have passed for it..To say the Super Bowl is finishing is to say that it is finishing at exactly the traveler time at this point in its existence. So, though the traveler is sitting at age 10, the coffee is not brewing at age 10 and the Super Bowl is not finishing at age 10. Similarly, one might hope that it is no longer true that  $C$  is standing at age 10.

That is a false hope. On this revision of the theory, it is true that the coffee is not brewing at age 10. Similarly, Super Bowl XIV is not concluding at age 10. But, even on this revision,  $C$  is standing at age 10! According to the revised theory, ‘ $x$  is standing at age 10’ means ‘ $x$  is standing as 10 years have passed for  $x$ ’. So,  $C$  is standing as 10 years have passed for  $C$ ,  $C$  is standing at 10 years on  $C$ ’s traveler time scale. Why? Because, for the endurantist,  $C$  is  $B$  and exactly 10 years have passed for  $B$ ;  $B$ ’s scale and  $C$ ’s scale are the same scale. The traveler is not the coffee or Super Bowl XIV, but the traveler is the traveler. Even on this revision, it is true that the time traveler is sitting at age 10 and that the time traveler is standing at age 10.

One last shot. It is tempting to suggest yet another version of traveler-time relativism. One might propose that ‘sitting at age 10’ be understood as ‘sitting as a 10-year-old’. But this will not work either. In order to begin to help, ‘ $x$  is sitting as a 10-year-old’ has to be understood as saying something like ‘ $x$  is sitting as a  $t$ -year-old does’ or ‘ $x$  is sitting in a  $t$ -year-old manner’. It cannot merely mean ‘ $x$  is sitting at traveler time  $t$ ’ or ‘ $x$  is sitting at  $t$  on  $x$ ’s traveler-time scale’, or else we encounter again the problems already detailed in this subsection. Still, at first, this can seem the

promising way to go. About the self-visitation scenario as usually described and naturally understood, *B* is sitting in a 10-year-old manner and *C* is not standing in a 10-year-old manner; *B*'s sitting and *C*'s standing are distinguished. Unfortunately, that is a fluke. There are variations of the scenario on which, when *C* is 37, *C* does stand in a 10-year-old manner. Keep in mind one does not have to be 10 to stand as a 10-year-old does! Just so, let us change the scenario. Suppose *C* is standing upon arrival from the time-travel trip in a childish, "10ish" way. Now, *B* will be sitting in 10-year-old manner and *C* standing in a 10-year-old manner, an apparent contradiction for the relativizing endurantist.

#### 4. A Conclusion and a Suggestion

**The conclusion:** Relativizing to traveler times fails as a response to self-visitation worries. Those who have previously been critical of such a move have focused on problems with the notion of personal time itself, not with the consequences of the relativization. Jonathan Simon (2005, 360 n. 19) says that his concern with this move is making appropriately rigorous sense of personal time. Sider (2001, 106) thinks appealing to personal time cannot add anything new to the problem because Lewis's notion of personal time is a defined notion; facts about personal times supervene on ordinary facts involving external time. What I have shown is that the exact details about what traveler time is do not matter. Even if the relativization is to proper time, so long as traveler time is something like time according to the traveler's wristwatch, the traveler-time relativizer is in trouble. **The suggestion:** In light of the fact that all relativizer approaches to self visitation appear to involve an element of non-

contradiction, and especially given the other metaphysical and linguistic problems associated with positing implicit relativizations only to traveler times, it is time for the endurantist to give the non-contradiction answer more serious consideration.<sup>5</sup>

## REFERENCES

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## ENDNOTES

1. Markosian (2004, 672-3) floats an endurantist solution modeled after perdurantist answers described by Lewis (1976, 147) and Sider (2001, 101) according to which neither *B* nor *C* is the time traveler. Instead, *B* and *C* are two of the traveler's spatial parts at the time of the self visitation. While useful insofar as it suggests that the endurantist is no worse off than the perdurantist regarding the paradox, as an endurantist, I would be disappointed should this turn out to be the only viable endurantist solution. In ordinary situations, like my present one, I am wholly right here, right now; there is no part of me somewhere or somewhen else that is needed to make me whole. That, for me, is the basic intuition that makes endurantism seem like just so much common sense. On Markosian's view, however, in the self-visitation scenario, though for all the world *B* appears to be all of the time traveler, *B* is only part of the time traveler. Now, I recognize that the self-visitation scenario is not an ordinary situation, but giving up that *B* is the traveler should be resisted. It is a move that strays pretty far from the core endurantist intuition.

2. It is not important exactly what the relativization is or even whether, strictly speaking, a relativization is involved. Perhaps the properties standing and sitting are really relations between a person and a place. Or, maybe, the *having* of these properties is really a relation between a person, a property, and a place. Or, maybe again, these properties themselves are spatially indexed; they might really be the properties of sitting here and standing there. Or, maybe again, sitting and standing might really be a matter of sitting here and standing there.

3. It is not perfectly clear whether Keller and Nelson mean to employ Lewis's notion of personal time.

When they first use the terminology, they say that we are allowed “to *construct* [my emphasis] a notion of the time-traveler’s personal time” (339), but say little more about it other than to describe it as time experienced by the time traveler (339-340). They also say in their Footnote 13 that they are following Lewis, but it is not crystal clear whether they are following Lewis just in terms of constructing a notion of personal time or also in terms of the notion constructed.

4. There will be a parallel indiscriminate use of the word *time* to contrast with traveler time. For a discussion focusing exclusively on relativizing to personal time, the appropriate contrast would be external time, which Lewis seemed for the most part to treat in a classical/Newtonian way. For a discussion of relativizing to proper time, the appropriate contrast would be some notion of *observer time*, time from the observer’s frame of reference. These differences will not be important.

5. Thanks to Joe Campbell, Randy Carter, Ned Markosian, Michael Pendlebury, John Roberts and an anonymous referee for helpful correspondence on self visitation. I have also benefitted enormously from discussions about the self-visitation paradox with some of my excellent students, especially Allyson Hutchinson on the compulsory appeal to non-contradiction.