

# Re: Twin paradox revisited II

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- *From:* "N:dlzc D:aol T:com \(\dlzc\)" <dlzc@xxxxxxx>
  - *Date:* Fri, 20 Jul 2007 18:53:09 -0700
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Dear bill:

"bill" <cosmosco@xxxxxxxxxxxxxxxx> wrote in message  
[news:1184981064.527191.20310@xx](mailto:news:1184981064.527191.20310@xx)

On Jul 20, 7:11 pm, "Martin Hogbin"  
<goatREMOVETHIS...@xxxxxxxxxxx>  
wrote:

....

That is really two questions. On the basis of the best measurements he can make, and allowing for all effects that he can think of, the traveller calculates that the other twin's clock is running more slowly than his own during the cruise phase. In such circumstances I would believe that this is what is 'really' happening. Would you come to the same conclusion?

No I would not. I cannot accept that the traveler \*really\* believes that the earth is orbiting the sun at around 1m-s nor do I believe that this is what would 'really' be happening.

It is not about "believe" but about "measure". You can go outbound fast enough that you could see the Earth take millions of years to orbit the Sun once. But it will move like a bat out of h\*ll on your return journey.

During the acceleration the situation is much more complicated but the answer is essentially the same.

As regards whether it is 'physically' happening, I cannot answer this question unless you define exactly what you mean 'physically'.

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By 'physically' I mean the concept that the earth is 'really' orbiting the sun at  $1\text{m-s}$  as distinct from 'apparently' as determined by the traveller.

One expects that the Earth really could care less how fast the traveller is moving.

But relativity is about what you measure, and what you can correctly infer about what another frame might measure (based on your own measurements).

It has nothing whatsoever to do with what \*we\*, as stay at home observers think but what is claimed the \*traveler\* determines is reality.

Yes, for the traveller.

So he \*really\* believes that the earth is \*physicaly\* orbiting the sun at  $1\text{m-s}$ ?

If that is what he measures \*in his own frame\*. If he forgets to use relativity to calculate how fast the Earthlings would calculate it was moving.

....

Other than what one 'could argue' I fully agree with those comments but I cannot agree, as expressed above, that the stay at home \*physically\* ages at the faster rate thus that the traveler could obliterate all life on earth by taking his foot off the gas pedal.

You need to define 'physically'.

That the traveler destroys all life on the planet. When he returns home he learns – hopefully – that this has not \*physically\* taken place.

It physically \*has\* taken place. And the traveller had squat to do with the stay-at-home aging, only to do with his own "lack" of aging... with his "gas pedal".

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The fact that the traveler finds on his return that everything is 'normal' back here – that life continues – should indicate to him that the earth had \*not\* been orbiting the sun at near light speed, that what he saw or determined was nothing more than a visual illusion generated by his rate of travel.

No, it indicates that the passage of time is not universal. Of course, on his return, the traveller will be aware that, from the earthbound twin's point of view, nothing unusual has happened.

Having 'believed' that all life on the planet has been obliterated it would not only be 'from the earthbound twin's point of view, nothing unusual has happened' but also from the \*traveler's\* point of view.

Except that the traveller is younger than the stay-at-home.

The bit you have not grasped is that the passage of time is not universal. This is very counterintuitive but it is the inescapable conclusion of experiment.

Or rather, in the \*interpretations\* of those experiments. As far as I am aware there has been no experiment which proved that from the traveler's point of view it is his twin that ages at the faster rate than himself.

Yes, exactly that has been experimentally determined. Slow particles with short lifespans age more rapidly than faster ones. And it has nothing to do with "acceleration" or "accelerators" or "magnetic fields" or "new and unexplained physics".

The length of a journey between any two points depends on the path you take. This applies equally well if the "points" are elapsed time on a clock, and relative motion provides the different path between start and end of journey.

David A. Smith

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