

Re: Twin paradox revisited II

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- *From:* bill <cosmosco@xxxxxxxxxxxxxxxxxx>
 - *Date:* Mon, 23 Jul 2007 18:55:35 -0700
-

On Jul 23, 11:03 am, "N:dlzc D:aol T:com \(\dlzc\)" <d...@xxxxxxx>
wrote:

Dear bill:

"bill" <cosmo...@xxxxxxxxxxxxxxxxxx> wrote in message

news:1185150277.116510.125670@xx

On Jul 21, 11:53 am, "N:dlzc D:aol T:com \(\dlzc\)"
<d...@xxxxxxx>
wrote:

Dear bill:

"bill" <cosmo...@xxxxxxxxxxxxxxxxxx> wrote in message

news:1184981064.527191.20310@xx

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

...

That is really two questions.
On the basis of the
best measurements he can
make, and allowing
for all effects that he can

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think of, the traveller
calculates that the other
twin's clock is running
more slowly than his own
during the cruise phase.
I 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".

On the basis that 'observation creates reality' – that
what one 'measures' (or 'observes' or 'determines')
is reality why would a person – who *believes* that
observation creates reality – having determined
something then insist that he does not believe what
he is seeing?

It is a common practice here. You must be new. ;>)

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.

And aren't those observations (determinations)
nothing more than visual illusions generated by
the red shift and blue shift of the light from the
planet?

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Problem is, if you total up the number of such full orbits, it will agree with the stay-at-home's age, and not the traveller's age.

The original posting was that because the astronaut sees the light from earth as being intensely blue shifted he then believes (determines) that his twin is physically aging at a faster rate than he is.

For that matter, he should insist that his stay-at-home twin is being bathed in X-ray and gamma radiation from his Sun... it's surface temperature is now too high to allow life on a planet as close as Earth.

My question is – on the basis that the astronaut sees 'the earth take millions of years to orbit the sun once' does he truly believe that whilst he is moving away from us that the earth's orbital velocity *physically* reduces to a mere 1K-s and, as he returns and sees it moving 'like a bat out of h*ll' does he really believe (determine) that the earth's rate of travel has increased to an impossible near light speed?

He can measure and assume he is a "virgin", and infer that all those changes are "physically happening". He can make those measurements, and assume he is a devotee of classical Doppler, and infer what he sees as much better, but still not agree with the stay-at-home twin. Or he can make those measurements, and use relativity, and determine exactly what the stay-at-home is measuring for him/herself.

In other words, when he applies his knowledge of relativity he realises that what appears to be taking place is nothing more than a visual illusion created by his rate of travel relatively to the earth and that the earth is not physically orbiting the sun at faster or slower rates than it was when he was on the planet as it appears to be doing?

It is not only that "he can make those measurements, and use relativity, and determine exactly *what the stay-at-home is measuring for him/herself.*" he can also determine exactly what is *physically* taking place back at the solar system.

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It is not a question of what he is measuring. The question is what can he do to make sense of it?

Thank you, my point entirely.

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'.

By 'physically' I mean the concept that the earth is 'really' orbiting the sun at 1m-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.

My point exactly.

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

So if you measure that the earth is orbiting the sun at 1K-s are you of the opinion that it is *physically* orbiting at that velocity?

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If it was, it would be pulled into the sun.

Not at all. If you were entirely clueless, and assumed you knew nothing about the physics of the Sun–Earth system, you would still be able to make that system work. The mass of the Sun and Earth would have the same proportion as the stay–at–home twin would say it was, but the total mass would decrease to make that orbit "work out".

He 'sees' (determines) that the sun's mass has increased or decreased by a gamma factor of round 30,000 yet is of the belief that this tremendous variation of the sun's energy output has no affect on the earth which is still, from his point of view, at the same distance from the sun?

It isn't "physically" anything. If you insist on ignoring everything you know, you can make the physics work.

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

Yes, for the traveller.

So he *really* believes that the earth is
physically
orbiting the sun at 1m–s?

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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.

So he sees (determines, measures) the planet moving at *physically impossible* orbital velocities

... physically *possible* ...

The earth orbiting the sun at close to, or beyond (if we apply the maximum attained GF of 40,000), the speed of light is 'possible' from the traveler's point of view?

but then applies relativity and concludes that the earth is *not* moving at those velocities *in its own reference frame*

... in fact is moving no differently than it was when he lived there.

Thank you, my point precisely.

ergo he must realise that what he *sees* is nothing more than a visual illusion created by his relative rate of travel.

Given that the traveller comes back younger than the stay-at-home, yes that is correct.

The original posting was to the effect that from the traveler's point of view, the earth *is physically* moving at those impossible velocities.

Which is both true and false, and ultimately leads to your confusion.

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I'm sorry, but the comment that it is both true and false also contributes to my confusion.

My argument was that the traveler would *presumably* have some sort of education *in* physics including relativity thus that he should, as Confucius suggested, *apply* (not forget) that knowledge.

Some of the postings in this discussion imply that the traveler is *incapable* of applying knowledge and makes his decisions on the basis of a purely solipsist, philosophical attitude.

The Galilean 'Principle of Relativity insists that the traveller cannot know if his ship is moving with uniform velocity or is at rest *without reference to an external point* i.e. he cannot *see* the universe 'rushing past him' at near light speed.

Or the Sun–Earth system.

The original posting

... in this context, I think you mean "the original poster", or OP for short ...

insisted that the faster aging rate of the earth twin *only* takes place during acceleration following turn around and that it does *not* apply when the ship stops accelerating. In other words, at the very instant that the traveler takes his foot of the gas the earth's rate of travel around the sun reverts from near light speed to 30K–s *instantaneously*.

That is incorrect. The values of acceleration are unimportant *in SR*. And are really outside the scope of SR, except in some very limited cases. It is "velocity history", essentially "how fast" for "how long" that matters.

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I **know** that it is incorrect. I'm referring to what the OP **wrote** and my intention is to **show** that this solipsist nonsense **is** incorrect or more to the point absolute nonsense.

The traveler must **know** that this cannot possibly occur in reality thus must conclude that what he **saw** (or measured or determined) was **not** reality either in his reference frame or the earth's reference frame.

It **was** reality for him, because that is what he measured.

You wrote that when he applies relativity he concludes that the earth is **not** moving at those velocities **in its own reference frame**. For him to then conclude that this is **reality** is contradicting his own logic.

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.

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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".

Are you suggesting that the traveler returns, given the respective factors, that he actually finds that all life on the planet *has* been obliterated?

I still don't see how you achieve "obliteration". If you mean "his twin has aged more than him, including the possibility of death and meeting his own grand-kin", yes.

No, that's *not* what I'm talking about. Having accelerated to almost the maximum attained velocity (at which *instant* the earth 'is' orbiting the sun at near light speed) he takes his foot off the gas and 'sees', according to the OP, the earth's orbital velocity *instantaneously* revert from near light speed to its more mundane 30K–s (repeat) "at that very instant*!

Alternatively, his ship is fitted with an anti-gravity device that allows him to accelerate at 1,000g. At the very *instant* that he pushes down on the accelerator he 'sees' the planet accelerating toward him at 1,000g.

Knowing that the planet is not fitted with anti-gravity devices does he conclude that this is *physically* taking place OR does he – as Confucius suggested – apply his knowledge and conclude that what *appears* to be taking place is nothing more than a visual illusion created by *his* relative rate of travel?

If the traveler is of the opinion that he has not aged at the slower rate

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Nothing in his frame will seem slower to him. Only on comparison of his clock to the Universe will come surprises.

If he applies the aspect of Einstein's 1918 article that it is the twin who has experienced time dilation he must conclude that *his* is the moving clock thus that whilst his clock seems to be ticking over at the rate as it was before he left home it is *actually* ticking over at a slower rate than the earth clocks, that it is *not* the earth clocks that are ticking over at the *faster* rate even though this *appears* to be taking place.

but that his twin ages at the faster rate he is denying Einstein's 1981

He died in 1955, what did you mean?

I apologise for that typo I meant, of course, 1918.

insistence that it is the clock (the twin) who experiences the force of acceleration which is the one that *physically* ticks over (ages more slowly).

The twin paradox can be performed with 3 clocks (3 people if you like), and no acceleration within the period of the experiment (departure to final arrival). The acceleration is just part of the gedanken, and not a requirement (unless you insist on seeing the same twin arrive and meet his older twin).

The OP to which my present postings refer only stipulated two clocks so it is only adding to the confusion to introduce another clock. I prefer to stick to the subject on hand.

The fact
that the
traveler
finds on his
return that
everything
is 'normal'
back here –

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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.

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Irrelevant to the specific topic , merely a reiteration.

I guess that depends on what you mean by "obliterate" then.

Destroys, see above.

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".

Those experiments have shown that accelerated particles

... no, "fast moving" ...

In order to *become* fast moving the electrons *must* have been *accelerated* or are you implying that the time dilation effect does *not* take place whilst the particles are being accelerated?

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age more slowly than slower moving particles but they do *not* prove that the latter, and the universe, ages more rapidly.

Compared to the fast moving particle, who can insist *nothing* changed for him, the Universe ages more rapidly.

However, as you point out, if the traveler (equivalent to the fast moving particle) applies his knowledge as above he should realise that what appears to be taking place is *not* reality – that the universe has *not* been made to accelerate to, and travel, at near light speed.

The concept that the stationary particle ages at a faster rate than the accelerated particle should be sufficient for physicists to stop all of those experiments which cause them to age at a faster rate than would otherwise occur.

This is a joke, right?

I certainly *hope* so!

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.

That has nothing to do with the original posting which insisted that the stay at home twin physically ages at the faster rate and *only* during the traveler's period of acceleration following turn around.

Which is in part incorrect.

It is *totally* incorrect! It is an absolute nonsense.

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David A. Smith

Bill

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