Chalmers' Argument from Relativity

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Abstract

David Chalmers has recently argued that Relativity Theory supports the notion that shapes are Twin-Earthable. In this paper this argument is challenged. I reconstruct the argument in five steps where the last step is the conclusion. I proceed to argue that one step in the argument can be interpreted in two different ways. The problem is that on the first interpretation of the step, the conclusion does not follow. And on the second interpretation of the step, it contradicts a previous step in the argument. I conclude that Relativity Theory does not entail that phenomenal and functional twins could represent different shapes.

1 Introduction

Chalmers (2019) has recently argued that Relativity Theory supports the notion that shapes are Twin-Earthable. In this paper I argue that the argument fails. Whatever the merits of the notion that shapes can be Twin-Earthable, there is no support to be found for the idea in Relativity Theory.

Before we engage with Chalmers' argument, we should examine the notion of Twin-Earthability. What is it for an entity to be Twin-Earthable? Here is how Chalmers presents the idea:

Let us say that a word is Twin-Earthable if there is a Putnam-style Twin Earth case involving that expression: that is, if there is a possible speaker using the term (nondeferentially) with one referent and there is a possible duplicate speaker using a corresponding term with a different referent. (Chalmers 2019: 112).

It is important to note that on Chalmers' account, semantic Twin-Earthability for shapes is closely connected to perceptual Twin-Earthability for shapes. For on his account the "relevant concept of shape is a concept of whatever normally causes the relevant shape experiences." (Chalmers 2019: 127).

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By implication, words cannot be Twin-Earthable unless experiences are Twin-Earthable. Semantic Twin-Earthability is, as it were, dependent on Perceptual Twin-Earthability. In order for shapes to be Twin-Earthable it must consequently be possible for shape-experiences to be “normally caused” by different shapes in different scenarios. Or, as I will put it, shape-experiences must be able to reliably track different shapes in different scenarios in order for shapes to be Twin-Earthable.

In section two of the argument, I reconstruct Chalmers’ argument in five steps. In section three I criticize the argument. I suggest that the fourth step affords two different interpretations. On the first interpretation, the conclusion does not follow. On the second interpretation, the conclusion does indeed follow, but the step contradicts a previous step in the argument. The paper is concluded in the fourth section.

2 The Argument

In order to present his argument, Chalmers introduces us to a planet called Lorentz Earth. Lorentz Earth is a physical duplicate of Earth, and is consequently populated by our “twins”. Lorentz Earth however, travels at 0.87 times the speed of light relative to us. (Chalmers 2019: 125).

According to the Special Theory of Relativity, objects contract in the direction in which they are travelling. When travelling at 0.87 times the speed of light, an object contracts with 50% in the direction it travels. So the shape of an object that is travelling at that speed is changed. An object that is square when it is at rest, will have some other shape if it is travelling at 0.87 times the speed of light.

According to Relativity Theory, there is no privileged frame of reference for speed. While Earth is at rest in one inertial frame, Lorentz Earth is at rest in a different inertial frame. Relative to the inertial frame in which Earth is at rest in, Lorentz Earth is travelling at 0.87 times the speed of light. Relative to the inertial frame in which Lorentz Earth is at rest however, it is Earth which is travelling at 0.87 times the speed of light. In the inertial frame in which Earth is at rest, it is the objects on Lorentz Earth which contracts. But relative to the inertial frame in which Lorentz Earth is at rest, it is the objects on Earth which contracts.

The first step of the argument is thus the proposition expressed by (i):

- (i) Shapes depend upon inertial frames and are extrinsic properties of objects.

The proposition expressed by (i) means that the shape of an object depends on inertial frames, and that an object can have different shapes in different inertial frames. Chalmers does not use the concept of an extrinsic property, but it is useful in order to describe the argument. The concept of extrinsicity that is used in the formulation above is borrowed from Lewis (2001: 390). On that account, a property is intrinsic if and only if all duplicates have the same property and extrinsic if this is not the case. Since the same object have different shapes in different inertial frames, shapes qualify as extrinsic properties.

Chalmers now introduces us to Albert, who live here on Earth, and Twin-Albert, a resident of Lorentz Earth. They are functional and phenomenal duplicates of each other. Chalmers asks us to ponder a scenario in which Albert is visually perceiving an object which is a square relative to the inertial frame in which Earth is at rest, but which is oblong (a non-square rectangle) relative to the inertial frame in which Lorentz Earth is at rest. Twin-Albert however is perceiving an object which is a square relative to the inertial frame in which Lorentz Earth is at rest, but oblong relative to the inertial frame in which Earth is at rest. (Chalmers 2019: 125).

Since shapes are extrinsic properties of objects, it follows that Albert and Twin-Albert are perceiving shapes qua extrinsic properties. Albert and Twin-Albert are in other words not perceiving any intrinsic properties. And since the shape of an object varies between inertial frames, they are perceiving different extrinsic properties.

The shapes that we represent is according to Chalmers the shapes that objects have in the inertial frame in which the perceiver is at rest, but not the shapes they have in other inertial frames. Chalmers contemplates the possibility of there being an "absolute reference frame", which is ontologically privileged with respect to other frames, but claims that even if this was the case, we would still represent squareness relative to our inertial frame, and not to the supposedly absolute frame. (Chalmers 2019:126). This is the second step of the argument.

- (ii) Shape experiences represent the shapes objects have in the inertial frame in which the perceiver is at rest.

As far as I understand Chalmers' argument, shape experiences do not represent more than one extrinsic property. So we perceive the shapes objects have in the inertial frame in which we as perceivers are at rest, but not the shapes they have in other inertial frames.

There are in any case good reasons for Chalmers for holding that shape-experiences cannot represent more than one type of shape. If shape-experiences are representing all shapes that the object of perception exemplifies, Albert and Twin-Albert would have the same representational contents. For, the object Albert is seeing exemplifies the same shape-properties that the object Twin-Albert is seeing, albeit in different inertial frames. A rejection of (ii) would consequently entail that Relativity Theory does not offer an argument to the effect that shapes are Twin-Earthable.

It is important to bear in mind that in the case at hand, this means that that neither Albert nor Twin-Albert has an illusion. (Chalmers 2019: 125) So even though Albert and Twin-Albert are at rest in different inertial frames, they will nevertheless both have veridical experiences.

Chalmers' third contention is that shape-experiences represent the shapes that are normally causing them: "All this tends to support shape functionalism: shapes such as squareness are picked out in virtue of their role in causing our experiences of shape." (Chalmers 2019: 127) So (iii) would also be true:

- (iii) Shape-experiences represent the properties that they reliably track.

Squarish experiences consequently represent squares because squarish experiences reliably track squares.

I basically agree with (i)–(iii). Chalmers argues that these provide strong support for the notion that shapes are Twin-Earthable. Here is Chalmers:

This is already enough to suggest that ‘square’ is Twin-Earthable. Albert uses ‘square’ to pick out (what we call) squares. Twin Albert uses ‘square’ to pick out (what we call) 2:1 rectangles. The rectangle that Twin Albert is seeing is in the extension of his word ‘square’, but it is not in the extension of Albert’s word ‘square’. (Chalmers 2019: 125).

It is to be noted that Chalmers is here discussing semantic Twin-Earthability. But, as we have seen, semantic Twin-Earthability presupposes perceptual Twin-Earthability.

The fourth step is thus:

- (iv) Albert and Twin-Albert have the same experiences but Albert represent squares while Twin-Albert represent 2:1 rectangles.

It might seem that (iv) offers us a description of a Twin Earth scenario, and judging by the quote above Chalmers’ does indeed seem to be of that opinion. So, the last step of the argument seems to be that (iv) entails (v):

- (v) Shapes are Twin-Earthable.

It might seem that (v) follows quite readily from (iv). But there is unfortunately a problem. As I will argue in the next section, (iv) admits of two quite different interpretations. On the first interpretation, (v) is not entailed by (iv). On the second interpretation however, (iv) contradicts (ii) and is false.

3 A Critique of the Argument

I see two plausible interpretations of step (iv) in Chalmers argument. None of them establishes that shapes are Twin-Earthable.

On the first reading, Chalmers is claiming that the *object* that Twin-Albert is seeing is not a square in the inertial frame in which Albert is at rest. So Albert and Twin-Albert have identical experiences, but Twin-Albert is unlike Albert not representing an object that is a square in the inertial frame in which *Albert* is at rest. Albert’s experience represents an object that is a square in the inertial frame in which Albert is at rest, whereas Twin-Albert’s experience represents an object that is oblong in the same inertial frame. I think that this is the intended reading of (iv) as Chalmers is emphasizing that Twin-Albert is representing an object that is square in Albert’s inertial frame.

If this is the intended reading of the argument however, (iv) does not entail (v). For in order for shapes to be Twin-Earthable, squarish experiences must represent the *property* of being square and not the *object* that exemplifies this property. We

must in other words distinguish between the shape-property that is represented on the one hand, and the object that exemplifies the property on the other hand. Shape-experiences will only represent the shape-property and not the object exemplifying the property—the latter is presumably represented by other vehicles of representation than the vehicle for representing shapes.

It is true that Twin-Albert is unlike Albert representing *an object that is oblong* in the inertial frame in which Albert is at rest. But his shape-experience is not representing *that the object instantiates the property of being oblong*. Twin Albert's shape-experience is not at all representing the shape of the object in the inertial frame in which Albert is at rest.

Twin-Albert's shape experience is according to (ii) representing the extrinsic property of being square in the inertial frame in which the perceiver (in this case Twin Albert) is at rest. But that is precisely what Albert's experience is also representing. While Albert and Twin-Albert are representing properties in different inertial frames, the properties they represent are the same. They both represent the shapes the objects have in the inertial frame in which they are at rest, namely the property of being square. So on the first reading, Chalmers does not establish that Albert and Twin-Albert perceive different properties. *A fortiori*, (iv) does not entail (v).¹

There is a second possible reading of the argument. Perhaps Chalmers is suggesting that Twin-Albert is perceiving the extrinsic *property* of being oblong in the inertial frame in which Albert is at rest. But if this is the argument, the argument violates (ii). For Twin-Albert is per (ii) representing the inertial frame that he is in himself. But the object is clearly not oblong in his inertial frame. It is a square in his inertial frame. So on such an intended reading, the fifth step is not entailed by the fourth step.

I conclude that on no plausible interpretation does Chalmers' argument from Relativity Theory support the notion that shapes are Twin-Earthable.

4 Concluding Words

I have suggested, pace Chalmers, that Relativity Theory does not support the notion that shapes are Twin-Earthable. There are of course other ways to argue to the effect that shapes are Twin-Earthable and Chalmers (cf Chalmers 2012, 2018) has indeed in other contexts suggested other arguments to that effect. While I believe that those

¹ An anonymous referee points out that it is not even true that all objects which exemplify 2:1 rectangles in the inertial frame in which Twin-Albert is at rest will exemplify squares in the inertial frame in which Albert is at rest. "Twin-Albert's experience of a square cannot be thought to represent the property of being a 2:1 rectangle in Albert's frame since not every 2:1 rectangle in Albert's frame will produce that experience in Twin Albert. It depends on how the 2:1 rectangle (as judged in Albert's frame) is oriented with respect to the direction of relative motion. Some such rectangles (relative to Albert's frame) will appear to Twin Albert as 4:1 rectangles.

In fact, if Twin Albert spins a co-moving square it will not appear to him to change shape, just orientation. In Albert's frame it is changing shape. So Twin Albert cannot be understood to be perceiving any shape property defined with respect to Albert's frame."

arguments are indeed no more successful than the argument from Relativity, they fall outside the scope of the argument in this paper.

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