

Does the theory of relativity relativize existence?

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ABSTRACT

The paper pursues two aims. First, to show that the only way for presentism or three dimensionalism to avoid a direct contradiction with relativity is to regard the existence of the physical world as ontologically relativized. This is done by considering the dimensionality of objects involved in relativity of simultaneity and the time dilation effect. Second, to present arguments based on an analysis of the twin paradox which appear to exclude any possibility of a three-dimensional world and therefore any need to relativize existence.

1 introduction

2 relativity and dimensionality of the world

3 relativization of existence and the twin paradox

4 conclusions

1 Introduction

One of the most difficult problems that science has posed not only to philosophers but to any representatives of human kind, who want to have their world view in accordance with modern science, came from special relativity. The main question is whether the world is three-dimensional (3D) or four-dimensional (4D). It arises from the issue of the ontological status of Minkowski space-time which leads to a clear dilemma: whether Minkowski space-time should be regarded as nothing more than a mathematical space which represents an evolving in time 3D world (the present) or as a mathematical model of a timelessly existing 4D world with time entirely given as the fourth dimension.

The implication of a 4D world for a number of fundamental issues such as temporal becoming, flow of time, determinism, and free will are profound- in such a world (often called block universe) the whole histories in time of all physical objects are given as completed entities since all moments of time are not "getting actualized" one by one to become the moment "now", but from the fourth dimension of the world and therefore all are given at once. And if temporal becoming and flow of time are understood in the traditional¹ way- as involving 3D

objects and a 3D world that endure through time- there is no becoming, no flow of time, and no free will in a 4D world. It is these implications of relativity that have posed perhaps the greatest intellectual challenge human kind has ever faced.

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