Morality and the Fundamental Structure of the Universe

by

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Cause and effect relationships are cornerstone to the existence of morality. One cannot conceive of morality without a feature common to all philosophies of morality: that moral decisions and subsequent actions have consequences.

In physical terms, we denote these: cause and effect relationships.

This article addresses the following question:

If cause-effect relationships are so fundamental to the existence of morality, can one conceive of a scenario, where a cause-effect relationship is viewed differently by two observers? In other words: Can two observers view a certain cause-effect relationship in reverse orders due to their different positions, relative to the two events comprising this relationship?

As an example, suppose that in a planned experiment, two cars are driven into each other (the cause), and the result is two destroyed cars (the effect). Can we conceive of a scenario where an observer sees the destroyed cars prior to seeing the impact that caused the cars' destruction?

If the answer to this question is affirmative, then morality cannot be universal and justice cannot be absolute. And science cannot exist.

In this article we show that due to a fundamental property inherent in the very fabric of the universe, as revealed by science, a scenario where cause-effect relationships are relative (viewed differently by two observers) cannot exist; and therefore we have to conclude that the universe is to be construed as allowing morality to exist and justice to be viewed equally to all.

To understand the argument, let us engage in a thought exercise. An observer stands on the platform in a railway station and is told that two balls will be thrown at her from two moving trains and that the ball that would have arrived first would trigger the throw of the ball, which would have arrived last. Since the observer does not see the actual throwing of the balls we denote measurements of the "arrival times" of the two balls "secondary evidence" (indirect evidence for existence of cause-effect relationship between the throws of the two balls).

Assume that the two trains are moving at a speed of 50 miles per hour (m/h), one approaching the observer on her left and another receding on the right. While both trains are at equal distances from the station, a ball is thrown towards the observer, simultaneously from both trains, at a speed of 100 m/h (relative to the thrower of the ball). The ball thrown from the approaching train travels towards the observer at speed of 150 m/h (the speed of the throw is added to the speed of the train), while the ball thrown from the receding train travels at speed of 50 m/h (speed of the receding train is subtracted from the speed of the throw). The two trains being at equal distances from the station, the ball from the approaching train will arrive first at the observer's location and she will deduce (erroneously, but in compliance with what she had been told in advance) that this ball is the cause for the throw of the ball that has arrived last.

Suppose now that the two balls are thrown again, only this time we take a photograph of the throws of the two balls and record in our camera the exact times of the two events. The recorded times constitutes direct evidence of when the two events have happened and therefore we relate to them as "primary evidence".

If propagation of light obeyed the same law of nature as govern the motion of the two balls (namely, the law of the additivity of speeds), then obviously the throw from the approaching train will be recorded at an earlier time (then the second) and we will deduce that there is a cause-effect relationship between the two events (the two ball throws).

However, this is not what modern physics teaches us. An experiment conducted near the end of the nineteenth century (the Michelson-Morley experiment, 1887) has shown that the speed of light is constant, irrespective of the relative speeds of the measuring device and of the light source. The constancy of the speed of light had provided basic impetus to the later development of Einstein's theory of special relativity and his famous: $E=MC^2$ equation.

Given the constancy of the speed of light, our observer at the railway station will observe the two balls being thrown simultaneously and therefore will conclude (rightly) that no cause-effect relationship exists between the two.

We have thus learned that the constancy of the speed of light, a necessary requirement for the possibility of an *objective* study of nature, is also cornerstone for the possibility of morality. This fundamental property of nature alone enables verification of a cause-effect relationship which is absolute, namely: It is not dependent on the relative positions (speeds) of the observer and the light source that provides evidence to the existence of a cause-effect relationship.

Let us be clear: We are aware of special relativity effects exercised on measurements of time and physical dimensions. We are also aware that synchronicity in one coordinate system may not be so observed in another. These effects are well known and may be anticipated by special relativity theory. But one cannot conceive, within this theory, a scenario where the roles of cause and effect are interchanged. Special relativity effects cannot predict circumstances where cause-effect relationship is reversed; A cause-effect relationship remains the same for all measurement coordinate systems.

Conclusion:

Existence of morality is intertwined with the possibility of science; and both are consequences of a most basic property of nature, interwoven into the very fabric of the cosmos: The constancy of the speed of light.

One may realize, on deeper thought, that “it ain’t necessarily be so”. And the constancy of the speed of light, like the existence of all laws of nature, remains an inexplicable mystery.