Review of: "The Fallacy in the Paradox of Achilles and the Tortoise"

Eric A. Kincanon[1]

1 Gonzaga University

Potential competing interests: No potential competing interests to declare.

This paper gives a clear and thorough explanation of Zeno's paradox by showing how a convergent infinite series can have a finite sum. This does clear up the paradox if the paradox is understood as questioning how Achilles could catch the turtle if he undergoes an infinite number of steps. (The author also, briefly, considers the issue of Achilles completing a "supertask".)

Though technically correct, this discussion is not new in the long history of the debate around this paradox. An excellent discussion of this paradox, and its proposed resolutions, can be found in Whitrow's "The Natural Philosophy of Time." Whitrow discusses the approach presented in this paper but further argues that it misses what Zeno may have been after.

Whitrow argues that the problem is not the infinite number of steps or the problem of the supertask, but rather that there needs to be a transition. In the act of chasing the tortoise every step taken by Achilles is followed by another chasing step. This matches Achilles carrying out an infinite number of steps; In an infinite series every number is followed by another number. However, if Achilles catches the tortoise in a finite time there is some time in the future (say 1 minute) at which Achilles is not chasing the tortoise. So, Whitrow would say, here is the paradox. At any time greater than 1 minute Achilles has caught the tortoise, but every chasing step taken by Achilles is followed by another chasing step. In other words every act of chasing is followed by another act of chasing. How does Achilles transition from chasing to catching?

Whitrow clarifies this nicely by looking at an analogous paradox of a bouncing ball for which each bounce lasts half the time of the previous bounce. If the first bounce takes half a second the next takes one fourth a second etc. The ball then would complete the infinite number of bounces in exactly 1 second. So, at one and a half seconds the ball must not be bouncing. But, every bounce of the ball is followed by another bounce. How can every bounce be followed by another bounce and the ball not be bouncing at one and a half seconds?

As I understand it this is the heart of the paradox, not the issues readdressed in this paper.