

RunTheLine: An infinite runner serious game to train comprehension of societally relevant large numbers

Thijs van Den Hout

Radboud University Nijmegen: Donders Institute for Brain, Cognition and Behavior, Nijmegen, Netherlands

Hanna Schraffenberger

Radboud University, Nijmegen, Netherlands

Florian Krauze

Radboud University Nijmegen: Donders Institute for Brain, Cognition and Behavior, Nijmegen, Netherlands

Tibor Bosse

Radboud University, Nijmegen, Netherlands

Frank Leone

Radboud University: Donders Institute for Brain, Cognition and Behavior, Nijmegen, Netherlands

Abstract

Large numbers play a significant role in personal and political financial choices and the understanding of exponential growth. Large numbers are also often misjudged, showing a logarithmic number understanding. Small numbers are however represented in a linear fashion, due to direct experience on for example number lines. Earlier, it was shown that large number comprehension can be trained, influencing societally relevant choices. We trained large number comprehension using a serious game (RunTheLine): an infinite runner game where an avatar runs on a number line ranging till one billion. Due to the game mechanics, the players walk the number line at both small and large numbers in small steps, making them aware of the continuity of the number line. Pre-post test differences show a change in economic judgments compared to a control group. This offers a scientific manipulation of behavioral and cortical number line representations and potential educational applications.