Custom touch screen application used to study navigation in chimps

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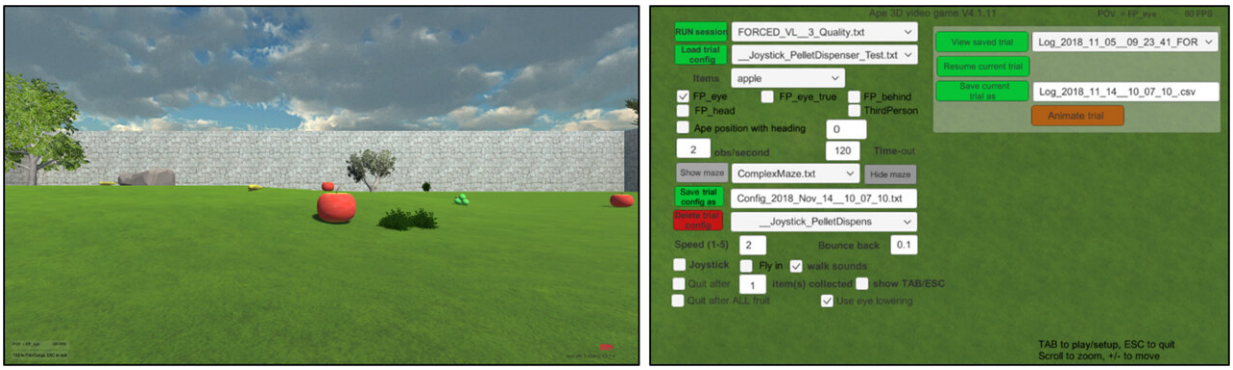

The APExplorer 3D app. (Left) Example of an exploration trial. (Right) Setup mode that allows the researcher to control different parameters, such as walking speed, perspective, head orientation, and others. Credit: *Science Advances* (2022). DOI: 10.1126/sciadv.abm4754

A small international team of researchers has found that it is possible to test navigation skills in chimpanzees using virtual reality technology. In their paper published in the journal *Science Advances,* the researchers describe the custom application they created and how well it worked when tested with captive chimps in a zoo.

Scientists have been attempting to test navigation skills in chimpanzees for many years. Such studies have typically involved trying to track the primates in their native habitat, which quite often means attempting

research in the jungle. Needless to say, such endeavors have not yielded much new information. Neither have efforts to follow captive chimps around in semi-natural environments. In this new effort, the researchers have tried a new approach—teaching captive chimps to use touch screen applications and then allowing them to move through simulated jungle scenes to collect a reward.

The work by the researchers in this new effort involved enlisting the voluntary assistance of six chimpanzees living at the Leipzig Zoo in Germany. Each was first taught to use a touch screen computer as a means for obtaining various real-world rewards. One of the applications the chimps learned was a video game that allowed them to gain an easy familiarity with the computers. The chimps were then invited to play another type of video game, one that entailed navigating through a virtual environment to reach a certain endpoint—in their case, a certain tree. When they did so, they were given fruit in the real world as a reward.

Each of the chimps was given the opportunity to play the game for ten-minute sessions and were allowed to play it multiple times. They were also given the option of refusing to play if they so desired.

To test their navigation skills, the researchers set up the virtual game several ways. In the first, the chimps always started from the same virtual spot and were encouraged to travel to the same desired tree. In another scenario, the chimps started from different virtual spots but were expected to arrive at the same tree. After several practice sessions, all of the chimps learned to make their way through the virtual jungle to reach their destination—and three of them improved on their path, making their trips more efficient.

The researchers suggest their experiments show that virtual reality applications can be used as an effective means for testing navigation in

chimpanzees, and perhaps other primates as well.

More information: Matthias Allritz et al, Chimpanzees (Pan troglodytes) navigate to find hidden fruit in a virtual environment, *Science Advances* (2022). DOI: 10.1126/sciadv.abm4754