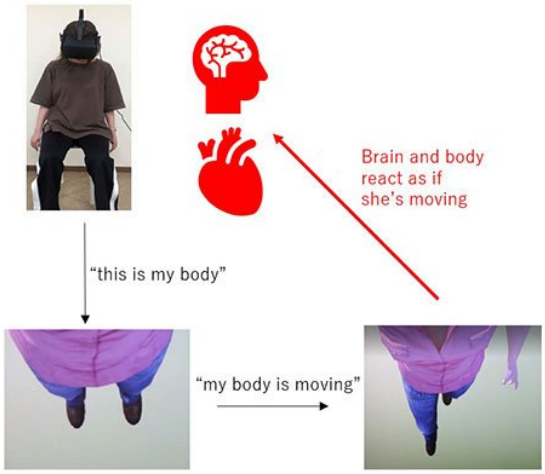
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ASIA EDITION

Japan uses virtual reality to improve physical, cognitive functions

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The results showed that participants improved their cognitive performance with the use of immersive virtual reality (IVR)



Researchers at the Smart-Aging Research Center (IDAC) at Tohoku University have developed an innovative training protocol that, utilizing immersive virtual reality (IVR), leads to real physical and cognitive benefits.

The protocol aims to assist patients suffering or recovering from long-term diseases whose physical activities is not always possible. IVR, allows the creation of a realistic virtual body and can help solve problems. It sounds unreal, but the illusion is so effective that even with the person sitting and the virtual body walking, the person thinks he/she is moving - it even generates comparable physiological reactions.

Professor Ryuta Kawashima, director of IDAC, led the team of researchers to explore whether or not virtual training can have similar benefits on cognitive functions as physical exercise. Healthy, young participants underwent the virtual training protocol. Wearing an IVR headset while sitting, they saw a virtual body (also called an avatar) displayed in the first-person perspective. This created the illusory feeling of being the avatar itself. The virtual body alternated between 30 seconds of walking and 30 seconds of running for 8 minutes.

Researchers found that participants' heart rate increased coherently with the virtual movements, despite the fact that subjects were completely still; more importantly, cognitive functions (specifically, executive functions) and their neural basis were tested before and after the virtual training. The results showed that participants improved their cognitive performance (specifically, they were faster), as also confirmed by the increased activation of the brain-related areas (specifically, the left dorsolateral prefrontal cortex).

Professor Dalila Burin, who developed and conducted the experiment says. "training protocols in IVR can be useful for people with motor impairments to have comparable benefits to real physical activity." By introducing the virtual reality technology in the cognitive neuroscience field.

Image Caption: A schematic theoretical interpretation of the virtual illusion, leading to measurable physiological effects on the person's body