

Parkinson's disease patients may benefit from virtual-reality-based therapies

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In people with Parkinson's Disease (PD), the inability to make quick movements limits basic functioning in daily life. Movement can be improved by various cueing techniques, such as providing visual or auditory stimuli when movements are started. In a study scheduled for publication in the August issue of the *Archives of Physical Medicine and Rehabilitation*, researchers report that virtual reality (VR) and physical reality exercises can be used to provide effective stimuli to increase movement speeds in PD patients.

Investigators from the Departments of [Occupational Therapy](#), Neurology, and [Mechanical Engineering](#), the Institute of Education, and Allied Health Sciences, the National Cheng Kung University, Tainan, Taiwan, studied a group of 13 women and 16 men with PD who were age-matched against 14 women and 11 men without PD. Each participant was asked to reach for and grasp a stationary ball as quickly as possible. Then, moving balls were rolled down a ramp and the participants were asked to catch them when they reached a particular point on the ramp. When trying to catch the moving balls, the targets were visible for periods from 1.1 to 0.5 seconds. These trials were done in both normal physical reality and in a [virtual reality environment](#).

"This study contributes to the field of rehabilitation by providing evidence about how to manipulate task and environmental constraints to improve movement in persons with PD," commented lead investigator Hui-Ing Ma. "Specifically, this study shows how to manipulate VR scenarios to improve movement speed in persons with PD, while at the

same time depicting their movement characteristics in VR. Our study extends the previous findings of the [moving target](#) effect in physical reality to VR. Our findings suggest that with an appropriate choice of cueing speed, VR is a promising tool for offering [visual motion](#) stimuli to increase movement speed in persons with PD."

The authors highlight three main findings. First, in both VR and physical reality, the PD group had longer movement time and lower peak velocity than the control group when reaching for a stationary ball at a self-determined maximum speed. Second, for both VR and physical reality, movement time was significantly shorter and peak velocity was higher in the faster cueing conditions. Third, when moving targets were provided, the PD group showed more improvement than the control group in movement time and peak velocity, thus reaching a performance level similar to that of the control group.

More information: The article is "Comparison of Virtual Reality Versus Physical Reality on Movement Characteristics of Persons With Parkinson's Disease: Effects of Moving Targets" by Ching-Yi Wang, MS, OT, Wen-Juh Hwang, MD, Jing-Jing Fang, PhD, Ching-Fan Sheu, PhD, Iat-Fai Leong, PhD, and Hui-Ing Ma, ScD, OT. It will appear in *Archives of Physical Medicine and Rehabilitation*, Volume 92, Issue 8 (August 2011). [doi:10.1016/j.apmr.2011.03.014](https://doi.org/10.1016/j.apmr.2011.03.014)

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