Using Virtual Reality to Assess the Elderly: The Impact of Human-Computer Interfaces on Cognition

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Résumé en anglais	Prospective memory (PM) is defined be the capacity to remember to realize an intended action in the future. This is a very important cognitive function that permit to maximize autonomy in everyday life. Unfortunately, few assessment tool, valid, reliable and ecological is accessible for clinicians. To obtain a verisimilar and ecologically prospective memory assessment tool, virtual reality seems to be a promising way. A specific and sensible tool could help the clinician to detect subtle changes in the cognition of the elderly and, ideally detect pathological aging soon before the beginning of decline. Because older adults are not really at ease with technology, these (dis)abilities could be confounded with cognitive inefficacy and lead to false positives diagnostics. To avoid this, the psychometrician must consider the impact of human-computer interfaces (HMI) on cognition. This paper present three experiments that show the impact of HMI on stress, capacity to achieve a task and on cognitive load. The first pilot study shown that a “heavy to use” HMI generated stress and difficulty to achieve the task with healthy adults. The second pilot study revealed that VMT-2 is judged moderately challenging cognitively and it seems to be more for older participants. The third pilot study shown that a complex virtual environment (in terms of navigation and interaction) is more cognitively challenging than a simple virtual environment for older peoples compared to young participants. These results indicated the importance of considering HMI as a potential variable that could create bias in the cognitive measurement.
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