

(12) Characterization of three immersive Virtual Reality platforms for the use in rehabilitation

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Virtual Reality (VR) has been demonstrated to be an effective intervention tool for a variety of neurological conditions. However, not enough is known about the characteristics of different VR platforms in relation to the therapeutic goals one wishes to achieve. The purpose of this paper is to describe the results of a study of healthy subjects (N=89) using three different VR platforms in order to compare the sense of presence, incidence of side effects, perceived exertion and performance. Methods: Three VR Platforms were used: (1) The *Gesture Xtreme (GX)-monitor* is a projected, video-capture VR system in which the participant sees himself on a large monitor in a virtual environment. (2) *GX and a head mounted display (HMD) (GX-HMD)* - is a combined VR system in which the GX environment is projected to the miniature monitors that are placed within an HMD. (3) *HMD* –This helmet like devise isolates the participant from the real world since he sees the virtual world on two miniature screens that are placed in the HMD. The participants experienced (A) three virtual games (N=40) on the GX-monitor and on the GX-HMD or (B) the Virtual Office environment (N=49 from two age groups: 16-35 and 60-75 years) on the GX-monitor and on the HMD platform. After the two experiences questionnaires were filled out. Results: Study A: The GX-monitor provided participants with a higher sense of presence and smaller chance of experiencing side effects. The performance within each game differed between the platforms but was also influenced by gender. Study B: The older group felt a higher sense of presence especially in the HMD. The performance was higher for the young group in both platforms however within the groups it was higher in the GX-monitor. Conclusions: When seeking a suitable VR therapeutic application, the user's characteristics as well as the attributes of the VR platform must be taken into consideration. Keywords: Virtual reality, Rehabilitation, Health