Next-Gen Virtual Reality: A Comparative Study of Immersive Tendency and Differential Presence

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Poster

Advancement in Virtual Reality (VR) interface technology in recent years has grown exponentially, resulting in the design and modification of a great number of devices to bring the experience of virtual environments (VE) to the user in ways only barely conceivable just two decades ago, for a variety of applications ranging from gaming to education to simulation-based training (SBT). Our study examines how the experience of being in one environment when one is physically situated in another (known as presence) is measured in current virtual reality interfaces against standard interface systems, both available as a conglomerate of commercial off-the-shelf (COTS) devices.

Statistical analyses will be conducted to determine the quality of the relationship between reported scores of immersive tendency – the affinity of an individual to become absorbed by a fictitious environment – and reported presence in the virtual environment. Individual immersive tendency will be measured with the Immersive Tendencies Questionnaire (ITQ) developed by Witmer & Singer (1998) and presence by the Temple Presence Inventory (TPI) developed by Lombard, Ditton, & Weinstein (2009). Results of this experiment will answer the following two research questions: "Is an individual's presence in a virtual environment significantly increased via the use of the virtual reality interface as compared to a standard interface?" and, if a significant difference is found, "What is the quality of the relationship between one's immersive tendency and the difference in presence scores between the interfaces?"

The virtual environment to be used in this experiment is that of ARMA III, a commercial game created by the same developers of the Virtual Battlespace series commonly used in military-grade simulation-based training. This is to retain eternal validity of our experiment for the application of our research for military training and to enhance the significance of our experiment in virtual environments research.

Furthermore, a Simulation Sickness Questionnaire (SSQ) will be used to assess a baseline score of cyber-simulation sickness for use of this generation of combined commercial-off-the-shelf virtual reality interface systems. This study among future investigations with these VR systems will have a profound impact across the domains of training psychology, human factors, education, and human-computer integration.