

Individual differences in user experience of head mounted displays: personality and visuo-spatial attention effects

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Abstract

This study examines the relationships between different psychological factors that may influence the ease of use of head-mounted display systems. Participants were exposed to a standard virtual display stimulus and completed a battery of spatial ability, personality and sickness history assessments. Differences in assessment scores were evaluated as a function of individual spatial attention during immersion, self-reported difficulty of the virtual task, sense of presence and the occurrence of negative side-effects. Findings indicated clear differences existed between users in spatial attention performance as a function of personality type (neuroticism) and as a function of the symptoms of sickness experienced, although the influence of individual spatial ability on attentional performance was more complex. Whilst recent advances in the technology used to produce virtual environments have been impressive, it is argued that for virtual reality systems to become a practical reality for everyday service users, the psychological aspects required for effective use need to be fully examined.

Introduction

Virtual reality is a perceptual experience, achieved using technology (Carr & England, 1995). An understanding of human perceptual abilities which mediate user experiences of virtual environments (VE) is therefore fundamental to those seeking to develop VE applications. VE interfaces may create distortions in the perception of object locations and the perception of one's own location. Such perceptual biases may result from restrictions in the field of view or from differences in system gain, time delays or coupling between user movement and display changes compared to real-world perceptual experiences (e.g., Wickens & Baker, 1995; Kennedy & Stanney, 1996; Duh et al., 2002).

The motion sickness-like symptoms which may arise as a result of various forms of VE immersion are well known (e.g., McCauley & Sharkey, 1992; Stanney & Salvendy, 1998; Nichols & Patel, 2002). The occurrence of symptoms has been related to the direction and speed of scene motion (e.g., Lo & So, 2001; So et al.,

In D. de Waard, K.A. Brookhuis, S.M. Sommer, and W.B. Verwey (2003), *Human Factors in the Age of Virtual Reality* (pp. 33 - 44). Maastricht, the Netherlands: Shaker Publishing.