



# Influence of individual factors on presence

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## Abstract

The present paper is a review of the role of individual factors in Spatial Presence. If Spatial Presence is a subjective mental phenomenon psychological factors must have an important role on it. Our review shows that, even though many authors claim about the need for a better understanding about this relation, empirical evidence is still very limited. Personality-related factors as absorption, and the capability to be immersed show to have an influence on the sense of Presence. Additional evidence is needed for the role of such factors as extraversion/introversion. Evidence of the impact of cognitive abilities on Presence in complex media environments is greatly indirect, and based on studies investigating the effect of those cognitive abilities on situation awareness and task performance. The role of practice and demographic factors is also considered.

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## 1. Introduction

Media technology is able to evoke experiences so vivid and concrete that the user or onlooker may temporarily become oblivious to their mediated origin. Sometimes readers

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of suspenseful drama clearly imagine the depicted worlds in their minds and almost feel lost in the scenes depicted (Andringa, 1996), and movie audiences get caught up while watching a film and start to react towards media characters as if they could encounter them face to face (Horton & Wohl, 1956). Thus, users of different media sometimes tend to think, feel and behave as if they were not in a media-bound but rather in a non-mediated situation. It seems as though users are sometimes, at least temporarily, unaware of the fact that they are engaged in mediated situations. In reference to the users' lack of awareness of the mediated nature of their sensations, related situational, cognitive and/or affective states during media reception have been addressed as experiences of non-mediation (cf. International Society for Presence Research, 2000; Lombard & Ditton, 1997).

### 1.1. The role of individual factors on Spatial Presence

Among all phenomena of non-mediation, one of the most prominent concepts is probably the construct of “*Spatial Presence*” (also called “*Telepresence*”, Steuer, 1992; or “*Virtual Presence*”, Sheridan, 1992; see Hartmann et al., in press, for an overview). Spatial Presence can be defined as the subjective experience of a user or onlooker as being physically located in a mediated space (although this is just an illusion; for reviews, see Barfield, Zeltzer, Sheridan, & Slater, 1995; Draper, Kaber, & Usher, 1998; Lee, 2004; Riva, Davide, & IJsselsteijn, 2003; Wirth et al., 2007). In recent decades, the phenomenon has evolved into one of the central concepts within VR research. Today, studies on Spatial Presence guide the improvement of new media applications in such diverse areas as tele-medicine, automobile design, architecture and therapy. Originally, Spatial Presence experiences were discussed in the context of interactive tele-working, focusing on the teleoperator's ability to perform a task while feeling more or less spatially present in a remote space (Minsky, 1980). However, with researchers from other fields becoming aware of the concept, the notion of the term changed from strictly technology-oriented definitions (i.e., Spatial Presence is defined by aspects of media technology; cf. Zeltzer, 1992) to a more psychological understanding. Consequently, Presence is now conceptualized as a psychological state, and the qualities of the media are regarded as determinants of Spatial Presence, rather than inherent properties of the experience. As a result, researchers have also begun to acknowledge the role of individual factors in the formation of Spatial Presence.

The experience of Presence is multidimensional including a physical or perceptual dimension and a social dimension. Physical dimension refers to the sense of being physically located in a mediated space (Lombard & Ditton, 1997). Social dimension is based on the perceived existence of others and the perceived possibility of interaction. Research interest in Presence is associated to the advance of technologies of communication, training, simulation, and entertainment. The aim of several research programs in this field is to optimize the user experience. The more real and the more engaging first-person experiences on virtual environments are, the greater the efficacy of training and education technologies.

Thus, most authors assume that performance is related with presence and task performance measures could be used as corroborative assessments of the subjective experience of presence (Barfield & Weghorst, 1993). However, there is no clear evidence about the nature of this relation between presence and performance (Welch, 1999). In a recent study, Ma and Kaber (2006) did not find any relation between objective presence and performance. Furthermore, this relation can only be possible when the experience of being in

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