## (31) The thematic baseline technique as a means of improving the sensitivity of presence self-report scales

David Nunez & Edwin H. Blake

Collaborative Visual Computing Laboratory

University of Cape Town

Cape Town, South Africa

Email: dave@cs.uct.ac.za

## Abstract

Self-report presence scales have received considerable criticism. In our use, we have found that presence scales are insensitive to differences in situations where, according to the literature, presence differences should exist. We believe that one reason why scales lack sensitivity is that many presence scale items require subjects to compare between the VE experience and some standard "real" experience, and then to assign a value indicating degree of match between them. However, the standard experience against which the subjects are to compare against is not well defined. Subjects thus make the comparison on some idiosyncratic basis, which invariably leads to an increase in the error variance of the scale. The sensitivity of self-report scales could thus be improved by providing a semi-standard baseline against which subjects could compare. Finding such a baseline is problematic; for instance, explicit baselines based on system parameters can lead to a blurring of the boundaries between immersion and presence. We suggest using subjects' natural expectations of the VE as a baseline. By priming a subject with materials thematically related to the VE, relevant schemata and scripts will become active, effectively providing a subjective and consistent baseline against which subjects can compare. We tested our idea using a 2x2 factorial ANOVA design (n=103). The factors were *stimulus quality of VE display* x *thematic priming*. Thematic priming was manipulated by activating relevant schemata in our subjects by having them examine booklets containing descriptive text and images. We measured presence with two scales - the Slater, Usoh & Steed (1995) questionnaire (SUS) and the Witmer & Singer (1998) Presence Questionnaire (PQ). The SUS showed a significant interaction effect ($F_{(1,99)} = 10.18$; $p < 0.0019$) and a significant main effect on stimulus quality ($F_{(1,99)} = 9.64$; $p < 0.002$). The PQ showed a significant interaction effect ($F_{(1,99)} = 4.23$; $p < 0.05$) and a significant main effect on stimulus quality ($F_{(1,99)} = 5.99$ $p < 0.02$). Post-hoc examination showed (in both scales) a significant difference in mean presence scores between the high and low stimulus quality conditions, but only when subjects were primed with material thematically related to the VE. This suggests that providing a suitable cognitive context can increase the sensitivity of self-report scales; it also provides empirical evidence that presence is partly determined by higher-level conceptual states.