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The Presence Construct: Issues in its Measurement

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iTc
Independent Television Commission

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Overview

- **Conceptual Issues:**
  - "mediated"/ "unmediated" - presence where
  - types of presence - a unified definition?

- **Determinants**
  - medium & user characteristics

- **Measurement issues - introducing today's papers**
  - subjective approaches
    - stability of measures
    - experimental design - between/ within groups
  - objective approaches
    - one objective measure?

- **Summary of discussion points**

new data

Conceptual Issues

- **Does presence require display media?**
  - "... the perceptual illusion of non-mediation" (Lombard & Ditton, 1997)
    - recent discussion on presence-l listserv
      - *what counts as mediation? "all experience is mediated..."*
  - "a sense of *being there* in a displayed environment" (Slater & Usoh, 1994)
- **Definition of a mediated (or displayed) environment:**
  - a representation of an environment distinct from the user's physical environment
  - "a world other than where their real bodies are located" (Slater & Usoh, 1994)
- **Even in a completely faithful representation of the environment - sensation vs. knowledge**

Types of Presence

- A unified construct?

  1 "(physical) presence" - a sense of being there in a displayed environment

  2 "social presence" - a sense of interacting with others

  1 & 2 together - Co-Presence - a sense of being co-located and interacting with others

- Different measures for different types of presence?

  - separate measures likely to best allow for the evaluation of separate components of a media experience

Determinants

■ **Media Characteristics**

    ■ extent and fidelity of sensory information

    ■ match between sensors and display   Media form

        ■ ability to position sensors, and

        ■ ability to manipulate content (Sheridan, 1992)

    ■ content factors

        ■ familiarity

        ■ naturalness   Content

        ■ interest

■ **User Characteristics**

    ■ trait (e.g., immersive tendencies), state (e.g., mood)   User

    ■ prior experience

Subjective Measurement

■ Simple post-test presence rating scales potentially unstable
(Freeman, Avons, Pearson, & IJsselsteijn, 1999)

■ Prior experience/ training can result in participants focusing on a specific aspect of the stimulus in providing presence ratings
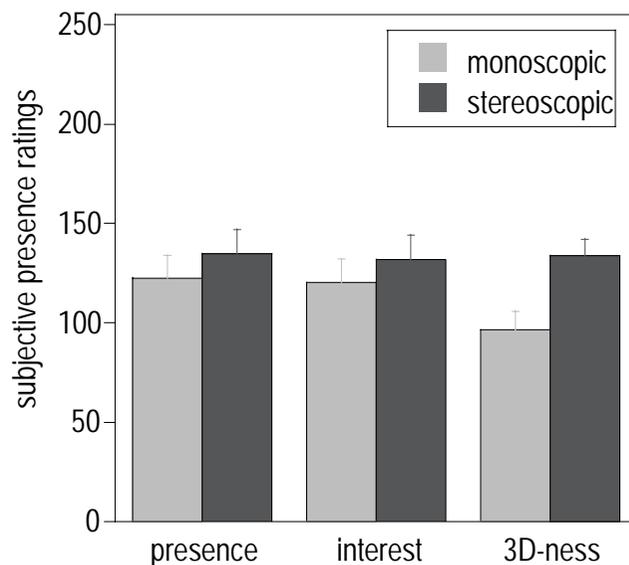
■ **Stability of simple scales?**

■ **Structure of Presence**

    – **Uni-dimensional?**

■ Questionnaires

Introducing Questionnaires...

- Previous questionnaire studies:
    - Witmer & Singer (1998)
    - Schubert, Friedmann, & Regenbrecht (1999)

- New questionnaire studies to be reported today:

    - Matthew Lombard & Theresa Ditton
        main focus on *social* aspects
    - Jane Lessiter, Jonathan Freeman, Ed Keogh & Jules Davidoff
        main focus on *spatial* aspects
    - Thomas Schubert, Holger Regenbrecht & Frank Friedmann
        experimental application of questionnaire from 2nd IWoP

- Towards standard measures for subjective assessment of presence?
    (i) physical
    (ii) social

Experimental Design

- **Repeated measures vs. independent groups designs**
  - repeated measures: increased sensitivity BUT stronger potential for bias
  - independent groups: less potential for bias BUT more subjects required
- **Recent study in our lab investigated the effect of order of stimulus presentation on presence ratings**
  - effect of order = problem for repeated measures designs
- **24 participants** (average age $27^{1/2}$, stereo-acuity <30 sec arc)
  - 12 saw mono then stereo stimulus, 12 stereo then mono on a 42 degree display (viewing distance approx. 1m)
  - presence rating after each stimulus, using
    - ITC SOPI (development to be presented by Jane shortly)
    - Slater, Usoh & Steed's (1994) 3 questions

Experimental Design

- ■ "An Afternoon On The River"
  - – stimulus was 100 seconds of continuous footage…..

- ■ No significant order effects for ITC-SOPI *or* for Slater, Usoh & Steed's 3 Questions
  - – repeated measures designs seem to be OK for spatial presence

Objective Corroboration

- Objective measures may be useful:
  - in the corroboration of subjective results
  - for the optimisation of display systems for specific goals (e.g., to create a sense of vection, arousal)

- Behavioural Realism
  - as display better approximates environment it represents, responses tend to those observable in the environment
  - derived from Sheridan (1992), Held and Durlach (1992)
  - similar to *Behavioural Isomorphism* (Kalawsky *et al.*, 1999)
  - issues: (i) awareness of exhibiting behaviour might enhance presence (Heeter, 1992), (ii) some observers can exhibit response, but report low presence (Slater *et al.*, 1998)

Today's Objective Measures...

- The effects of immersion on physiological measures of arousal
  - the relationship between physiological and subjective measures
    - Mike Meehan
      presenting an objective surrogate of presence
    - Cath Dillon, Ed Keogh, Jonathan Freeman & Jules ~~D~~
      presenting background to PhD rese~~ar~~ ~~sence~~ and
      psychophysiology, and its r~~el~~ ~~ar~~ousal and affect

  including hot off the press data!

- Postural Responses - large screen study
    - Wijnand IJsselsteijn, Jonathan Freeman, Huib de Ridder, Steve
      Avons & Don Pearson
- Discussion question: one objective measure?

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Summary of Discussion Points

- Different measures for different types of presence?
- Towards a standard (battery of) measure(s) for the subjective assessment of presence?
- Stronger focus required on user characteristics?
- One objective measure - realistic expectation, useful?
- In a completely faithful representation of an environment - full interactivity, consistent input to all senses, and capacity to change a "(remote) real environment" - there is still a conflict between sensation & knowledge
  - is presence the suspension of awareness of this conflict?