Spatial Presence

From Theory to Measurement

Saskia Böcking[1], Andre Gysbers[2], Peter Vorderer[3], Werner Wirth[1], Tilo Hartmann[2], Christoph Klimmt[2], Holger Schramm[1], Ana Sacau[4], & Jari Laarni[5]

[1] University of Zurich, [2] Institute of Journalism and Communication Research, Hannover, [3] Annenberg School for Communication, University of Southern California, [4] University Fernando Pessoa, Porto, [5] Helsinki School of Economics

Overview

1. **Theoretical Background**

2. **Development of the MEC SPQ: Method**

3. **Results: Reliability and Validation**

4. **Conclusion**

1. Theoretical Background

Goal of questionnaire development

◆ **Inclusion of different media**

◆ **Inclusion of different stimuli**

◆ **Validation process**

◆ **Strong theoretical foundation of questionnaire**

◆ **Separation between feeling of being present and correlated concepts / constructs**

MEC model of Spatial Presence as a theoretical framework
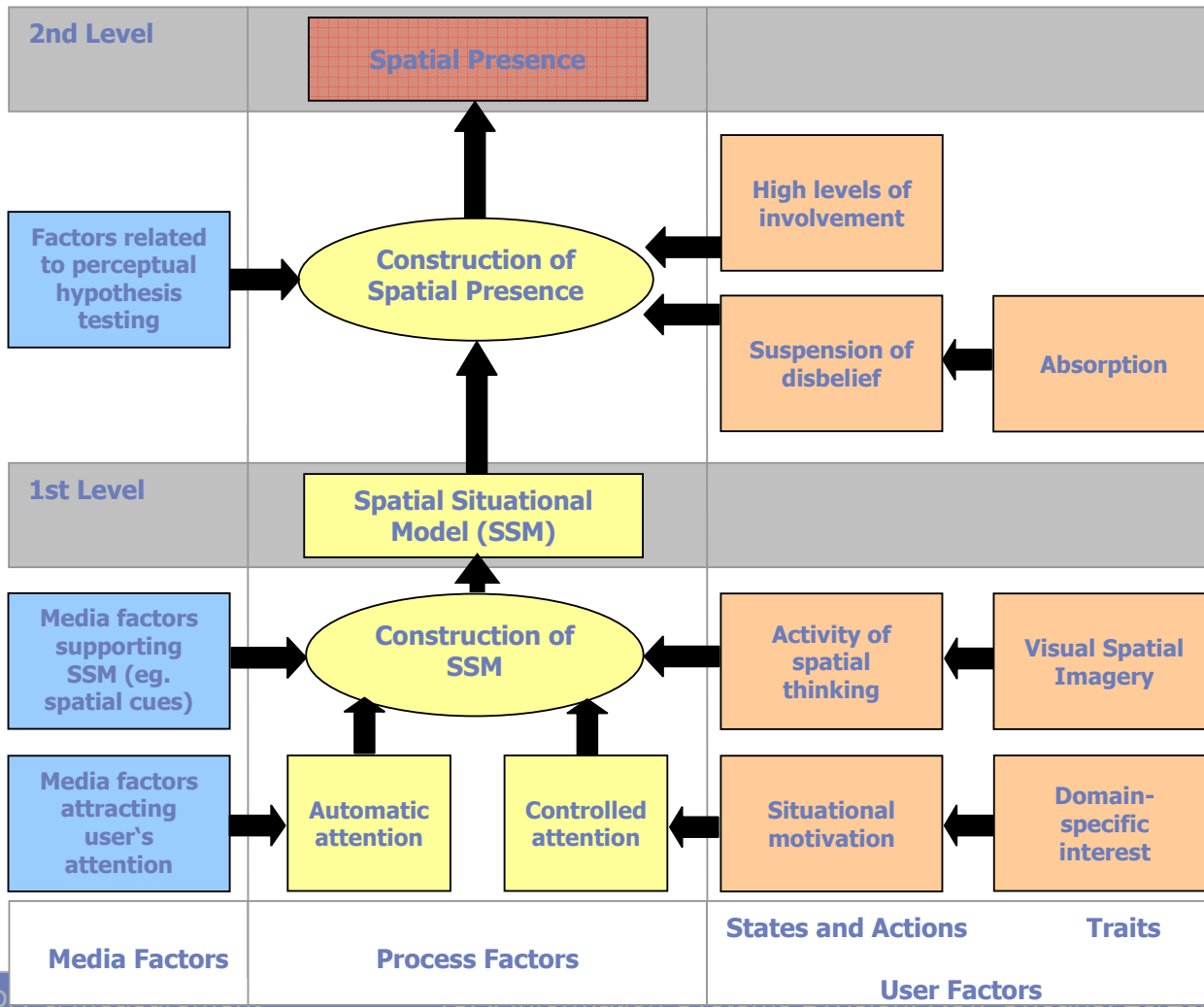
2. Development of the MEC-SPQ: Method

Method

◆ **103 items (english), 10-12 items per scale, 5-point Likert scale**

◆ **Test of item pool with four different media:**

- Linear text: extract out of „The pillars of the earth" by Ken Follett
- Hypertext: „The Art of Singing" (2-D virtual academy of song)
- Film: sequence from „Das Boot – Director's Cut"
- VE: Musée d'Orsy in Paris (exhibition of art of the 19th century)

◆ **290 students from the U.S., Portugal, and Finland**

- Linear text: n = 80; Hypertext: n = 80; Film: n = 81; VE: n = 49
- Age: $\underline{M}$ = 21.4 years ($\underline{SD}$ = 5.2)

◆ **Implementation of dual-task paradigm (validation of scales' sensitivity + production of different intensities of presence experiences)**

Basic principles for item analysis and item selection

◆ **Iterative approach for elimination of items**

◆ **Aim: 8-item version for each scale**

◆ **Principal Component Analyses (PCA) for each scale separately, exception Spatial Presence Scales (PCA with varimax rotation)**

◆ **Item difficulty: acceptable range .20 to .80**

◆ **Cronbach's Alpha: at least .70**

◆ **Item-remainder coefficients (corrected item-total correlation; item-scale correlation): as high as possible, but not below .30, correlations with other scales should be lower than item-total correlation**

◆ **Item homogeneity (average inter-item correlation): if high, items assess similar information**

3. Results: Reliability and Validation

Statistical values of the 8-item-scales

Scale	Statistical values of 8-item scale[a]			
	Factors suggested by PCA (screeplot)	Cronbach's Alpha	M	SD
Attention Allocation	1	.93	3.45	.94
Spatial Situation Model	1	.90	2.88	.88
Spatial Presence	2			
Self Location		.94	2.38	.91
Possible Actions		.88	2.32	.81
Cognitive Involvement	1	.78	2.85	.76
Suspension of Disbelief	1	.83	3.24	.85
Domain Specific Interest	1	.93	2.32	.97
Visual Spatial Imagery	1	.82	3.56	.70
Absorption	1	.83	3.42	.69

[a] N = 290

Scales' sensitivity to secondary-task

◆ **Process factors**

  ● are sensitive to the secondary-task

  ● Validation of the theoretical model (construct validity)

  ● Scales can be used to measure different intensities of Presence

◆ **Trait variables**

  ● No significant differences between the experimental groups

  ● Temporally constant, not influenced by situational factors

◆ **Similar results for all 4 media**

➢ **Confirmation of scales' sensitivity for distraction**

Inter-scale correlation

Scale [a]	1	2	3	4	5	6	7	8	9
1. Attention	-	.404**	.487**	.442**	.514**	-.125*	.260**	.163**	.154**
2. SSM [b]		-	.485**	.431**	.489**	-.159**	.236**	.376**	.229**
3. SPSL [c]			-	.758**	.378**	-.102	.236**	.226**	.216**
4. SPPA [d]				-	.447**	-.119*	.305**	.218**	.201**
5. Involvement					-	-.371**	.429**	.324**	.345**
6. SoD [e]						-	-.134*	-.117	-.245**
7. DSI [f]							-	.276**	.265**
8. VSI [g]								-	.391**
9. Absorption									-

* p<.05   ** p<.01   [a] N = 290   [b] Spatial Situation Model   [c] Spatial Presence Self Location   [d] Spatial Presence Possible Actions   [e] Suspension of Disbelief   [f] Domain Specific Interest   [g] Visual Spatial Imagery

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◆ **Positive and encouraging results:**

  ● Very satisfactory reliability estimates

  ● Dual-task manipulation and inter-scale-correlation indicate the scales' validity, thus confirming the MEC model of Spatial Presence

◆ **Applicable to different media and different content**

◆ **Flexibility in terms of length of subscales: 6- and 4-item versions available**

◆ **Limitations of MEC-SPQ:**

  ● No measure of temporal variations in presence

  ● Restricted to conscious effects

Thanks for your attention!

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