Multisensory Cues Effect: Do Visitors React Differently In a Traditional Versus an Immersive Exhibition?

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WHY?

Background

Sensory research trend → sensory museology

An effective strategic role in exhibition design

Visitor-exhibition interaction process: complex and dynamic

- **Impact:** Mehrabian and Russell's (1974) Stimulus – Organism – Response [SOR] model, i.e., approach or avoid behaviors
- **Factors:** Falk and Dierking (2018)'s Contextual Learning Model
- **Experience dimensionality:** Pine and Gilmore's (1999) four experience realms, i.e., aesthetics, education, entertainment, and escapism

Research objective

Exhibition type: traditional vs immersive

To examine the effect of sensory inputs (low vs high) on visitors' reactions

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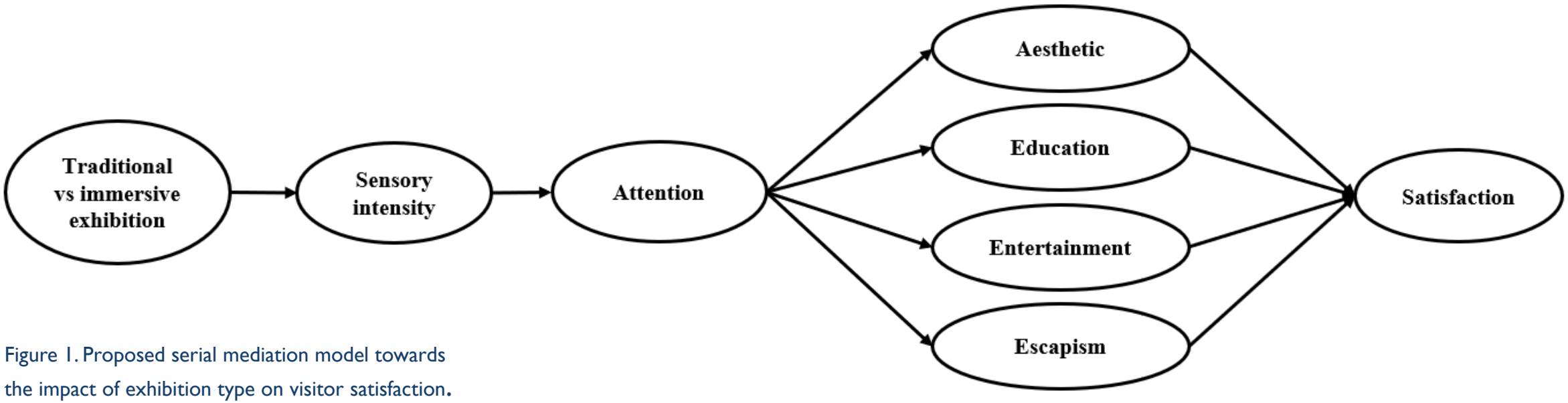
	The Bruegel Hall in Gent MSK Museum (traditional)	Meet the Masters in the Brussels Dynasty Building (immersive)
Content	Paintings from Bruegel and several other contemporary artists' artworks	Paintings from Jan Van Eyck, Bruegel, and Rubens
Forms	• Real artworks • Narrative audio guides	• Large-scale digital images on screens • An immersive room with 360° projections • First-person audio guides
Sensory inputs	Low	High

HYPOTHESES

H1. In the immersive exhibition, visitors will experience (a) higher sensory intensity, (b) higher attention levels, (c) higher aesthetic perception, (d) higher education, (e) higher entertainment, (f) higher escapism, and (g) higher satisfaction, than visitors in the traditional exhibition.

H2. The relationship between 'exhibition type' and 'satisfaction' is mediated by (a) sensory intensity, (b) visitor attention, and four experience dimensions of (c) aesthetic, (d) education, (e) entertainment, and (f) escapism.



- Figure 1. Proposed serial mediation model towards the impact of exhibition type on visitor satisfaction.

PARTICIPANTS

1. Total = 356 respondents

$N_{traditional}$ = 177, $N_{immersive}$ = 181

2. Gender

60.3% female, M_{age} = 37.7 years, SD_{age} = 16.4, range: 18-83

3. Nationality

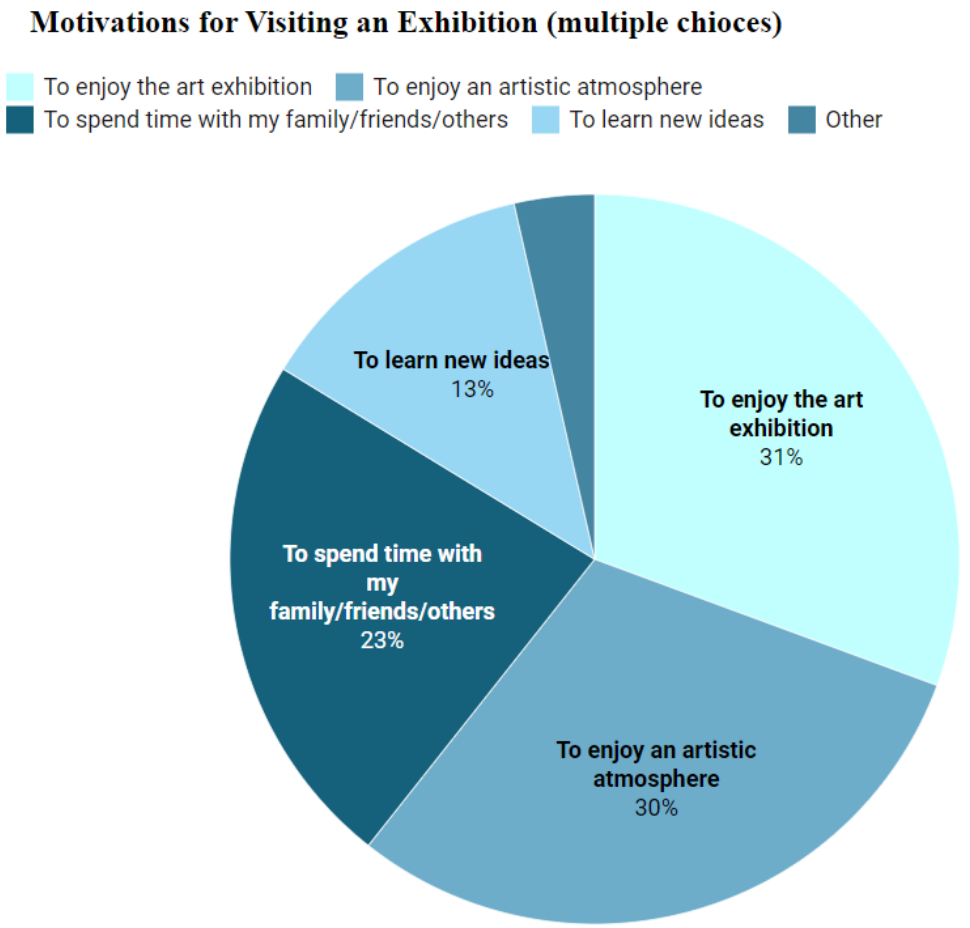
Belgians (53.1%), followed by French (8.9%) and Dutch (6.4%

4. Degree

More than half held a bachelor's degree or above

- (31.1% Bachelor's degree, 37.4% Master's degree)

5. Motivations



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Measurements

Seven-point Likert scales (total 20 items, 1= strongly disagree, 7=strongly agree)

- Sensory intensity ($\alpha = .74$)
- Attention level ($\alpha = .85$)
- Experience Dimensions
  - Aesthetic ($\alpha = .85$)
  - Education ($\alpha = .60$)
  - Entertainment ($\alpha = .77$)
  - Escapism
- Satisfaction ($\alpha = .92$)

1. Do visitors react differently in a traditional versus an immersive exhibition?

Dependent measures	T	P[b]	Cohen's d	M(SD)	
				Immersive exhibition(N=181)	Traditional exhibition (N=177)
Sensory intensity [a]	7.38	<.001	1.14	5.81 (1.10)	4.92 (1.19)
Attention	6.86	<.001	1.05	5.81 (1.04)	5.05 (1.07)
Aesthetic	2.82	.005	1.12	5.77 (1.19)	5.44 (1.04)
Education	3.50	<.001	1.35	5.08 (1.31)	4.58 (1.40)
Entertainment	2.84	.005	1.02	5.99 (1.04)	5.68 (.99)
Escapism [a]	-1.53	.13	1.66	2.86 (1.72)	3.13 (1.60)
Satisfaction	2.69	.007	1.17	5.86 (1.26)	5.52 (1.08)

H1. In the immersive exhibition (vs traditional exhibition), visitors will experience:

(a) higher sensory intensity,

(b) higher attention levels,

(c) higher aesthetic perception,

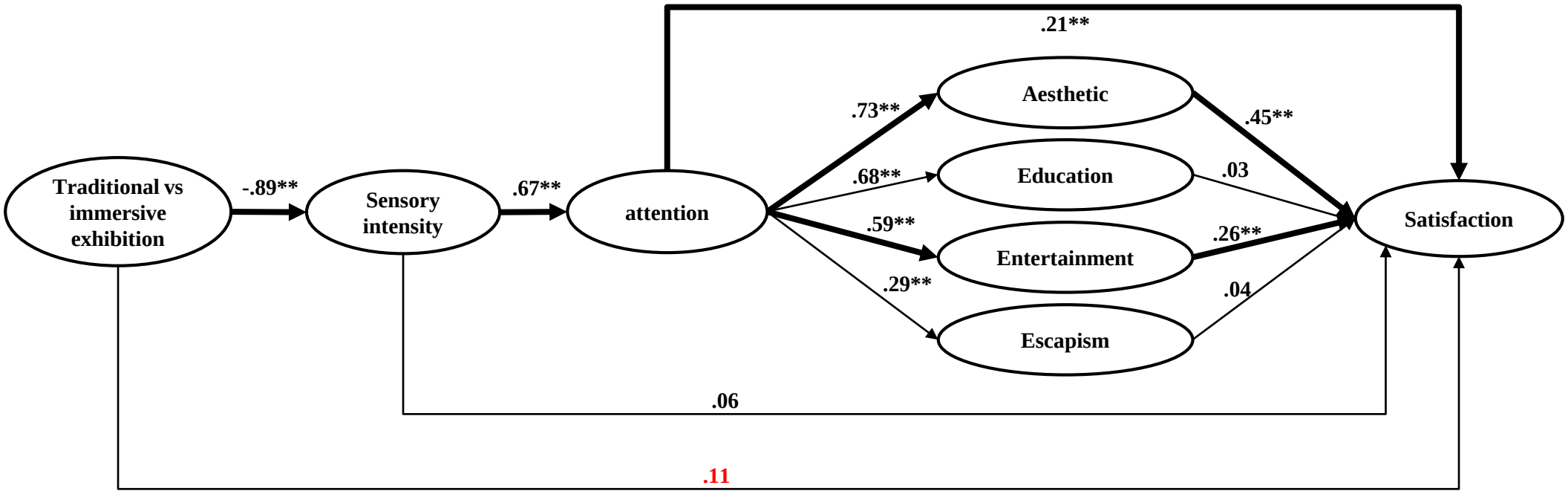
(d) higher education,

(e) higher entertainment,

~~(f) higher escapism,~~

(g) and higher satisfaction

2. How to understand the relationship between exhibition type and visitor satisfaction?



** : P < .001
Numbers: Unstandardized coefficients
Arrows in bold: Mediation (95% confidence interval)

2. How to understand the relationship between exhibition type and visitor satisfaction?

Indirect effects on visitor satisfaction through	Coeff. (SE)	CL_{Low}	CI_{Up}
Sensory intensity → attention*	-.12 (.05)	-.22	-.04
Sensory intensity → attention → aesthetic*	-.20 (.04)	-.28	-.12
Sensory intensity → attention → education	-.01 (.01)	-.04	.02
Sensory intensity → attention → entertainment*	-.09 (.02)	-.14	-.05
Sensory intensity → attention → escapism	-.006 (.004)	-.02	.0009

Note: The indirect effect is the effect of exhibition type on visitor satisfaction through sensory intensity, attention, aesthetic, education, entertainment, and escapism. A serial and parallel mediation model was estimated. A bootstrapping analysis with 10.000 samples and a 95% confidence interval was conducted. If the confidence interval does not include zero, mediation then occurred. Coeff. = unstandardized regression coefficients; SE = standard errors; CL_{Low} = Lower limit confidence interval; CI_{Up} = Upper limit confidence interval. Superscript * indicates mediation.

H2. The relationship between 'exhibition type' and 'satisfaction' is mediated by

(a) sensory intensity,

(b) visitor attention,

(c) aesthetic experience,

~~(d) education experience,~~

(e) entertainment experience,

~~(f) escapism experience.~~

Theoretical implications

- Sensory cues effect in different exhibition types

A sensory-enriched environment encourages more positive visitor reactions

Escapism experience (insignificant): similar content; no VR application

- The relationship between 'exhibition type' and 'visitor satisfaction'

Mediated by sensory intensity, attention, aesthetics and entertainment (not escapism and education)

Managerial implications

- Audio-visual arts

Technology adoption and sensory-enriched design for museum practitioners

- Underlying mechanism

Sensory intensity and individual's attention control system

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Limitations

- Other underlying mechanisms

mental imagery, congruency effects (senses/other atmospheric cues)

- Long-term multisensory cues effect
- Education

self-reported statements → objective measurement of knowledge gain

- Group segmentation

novice vs expert; duration; individual differences

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