Atmospherics in retail:

The effect of multisensory congruity between light and scent via multiple versus single sensory attributes on consumer reactions

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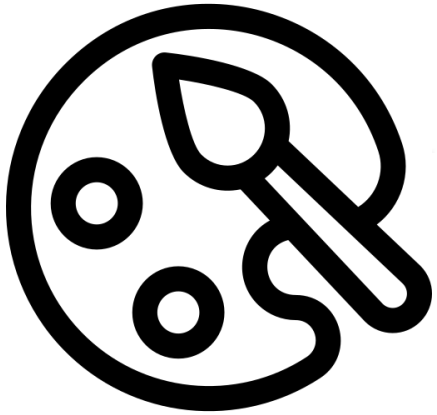
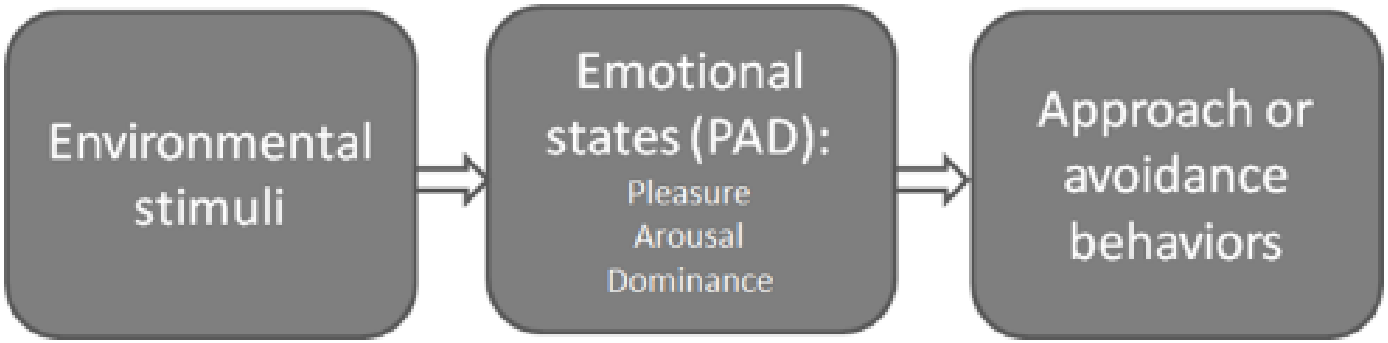
Introduction



Introduction



The stimulus–organism–response (S–O–R) paradigm
(Mehrabian & Russell, 1974)

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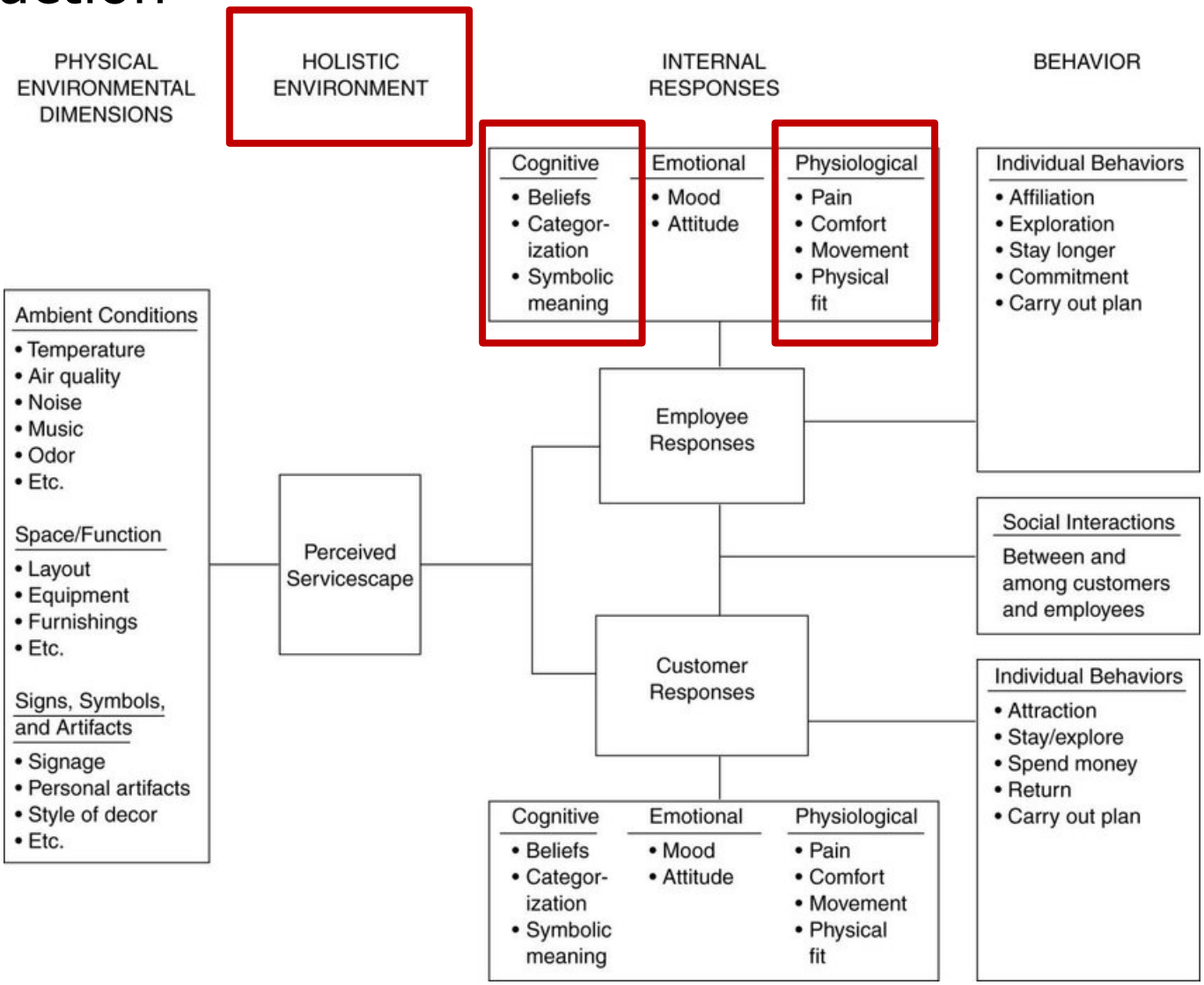

(Bitner, 1992)

Holistic environment

- Multisensory interaction effects between atmospheric cues

  - Congruent cues >> Incongruent cues

    (e.g., Mattila & Wirtz, 2001; Michon & Chebat, 2004)

    - Processing fluency

      (e.g., Schwarz, 2004; Winkielman et al., 2003)

Holistic environment

- Multisensory interaction effects between atmospheric cues
  - Focus previous research:
    - Interaction scent and music
    - Comparison of existing versus non-existing congruity in terms of the sharing of one specific characteristic or semantic association (e.g., warmth, softness, arousal)
    - Congruity effects on store-related (vs. product-related) consumer reactions

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Aim

- Study an unexamined combination of **ambient lighting and scent**
- Investigate whether a **partial fit** between these atmospheric cues is sufficient to trigger favorable consumer responses,
- Understand the **hierarchy of the effects** by investigating the relationship between evaluations on store level, evaluations on product level, and approach behavior

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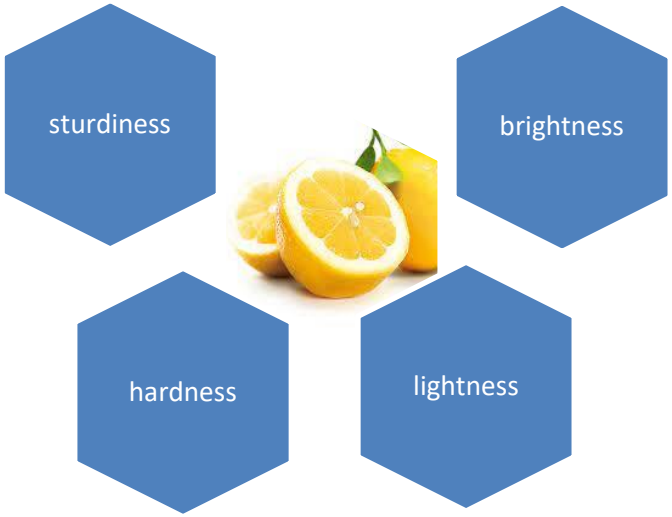
Partial fit between atmospheric cues

- Atmospheric cues associated with diverse sensory characteristics (e.g., brightness, lightness, softness, warmth)



- Congruity continuum:
  - high congruent cues (i.e., a fit on multiple associations)
  - partial congruent cues (i.e., a fit on one association)
  - low congruent cues (i.e., no fit)

Partial fit

- Fit of only one (vs. two) product-related sensory cue(s) with a product's primary function is enough to lead to favorable product evaluations
  - Cooling pad

- Is partial congruity between the multiple elicited associations of different ambient cues also sufficient to trigger positive consumer reactions?

(Fürst et al., 2021)

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Partial fit between atmospheric cues

- H1. **High congruity** between ambient light and scent (i.e., a fit on multiple associations) will have a **positive effect** on (a) evaluation of the store environment, (b) evaluation of the store, (c) evaluation of the products, and (d) approach behavior, compared to **low congruity** (i.e., no fit) and compared to the presence of only one atmospheric cue.

- H2. **High congruity** between ambient light and scent (i.e., a fit on multiple associations) will have a **positive effect** on (a) evaluation of the store environment, (b) evaluation of the store, (c) evaluation of the products, and (d) approach behavior compared to **partial congruity** conditions (i.e., a fit on one association).

- No differences between partial and low congruity

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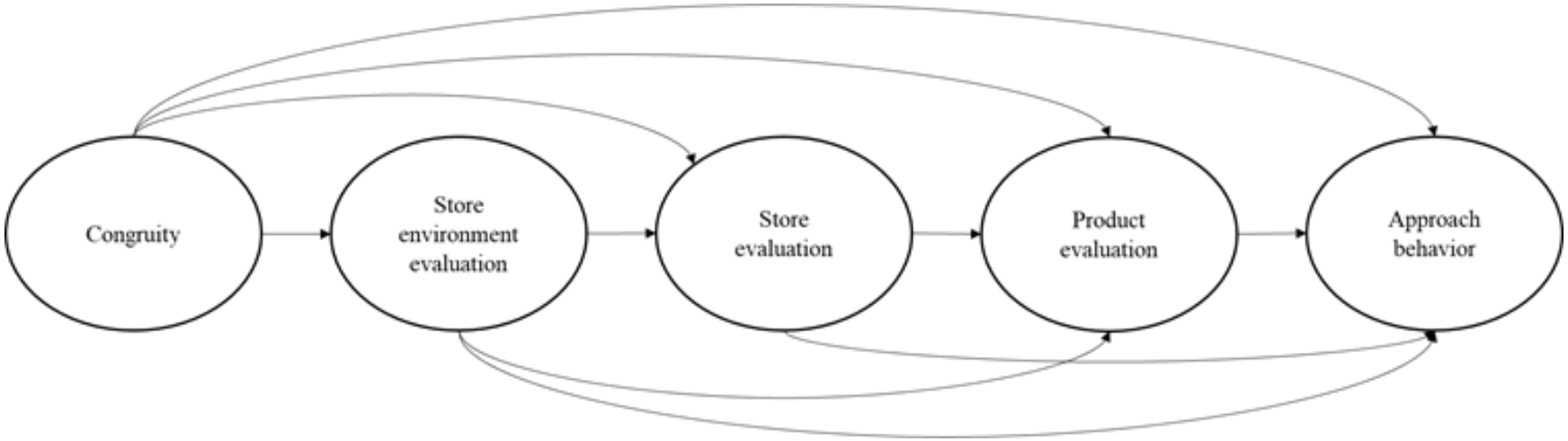
Hierarchy of effects



H3. There is a serial mediation such that consumers will respond to high congruity with a more positive evaluation of the store environment, the store, and the products, which drives approach behavior.

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Study 1

- High vs. low congruity
  - via two cue characteristics:
    - perceived (color) temperature
    - illuminance level
  - 2 (warm, dim light versus cold, bright light) x 3 (no scent versus warm, dim scent versus cold, bright scent) full factorial between-subjects design
    - Warm, dim: coffee scent – 3000 K / 415 lux
    - Cold, bright: Mint scent – 4000 K / 657 lux
  - 6 Conditions: 40 respondents per condition
    - 94 men and 146 women
    - Aged between 22 -79 years

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Study 1

- Simulated grocery store
- Shopping task:
  - Go shopping for lunch for the next day with a budget of 20 credits (a fictive monetary unit)
- Dependent variables

  (a) evaluation of the store environment

  (b) evaluation of the store

  (c) evaluation of the products

  (d) approach behavior

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Study 1 - Results

Dependent variables	Model		Light		Scent		Light x scent interaction	
	$F(5, 234)$	p	$F(1, 234)$	p	$F(2, 234)$	p	$F(2, 234)$	p
Store environment evaluation	6.58	< .001	.21	.65	2.23	.11	14.11	< .001
Store evaluation	7.06	< .001	1.24	.27	2.08	.13	14.94	< .001
Product evaluation	4.75	< .001	.003	.95	.75	.47	11.11	< .001
Approach behavior	4.64	< .001	.37	.54	1.03	.36	10.39	< .001

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Study 1 - Results

Dependent variables	*M* (*SD*) Warm, dim light			*M* (*SD*) Cool, bright light		
	No scent (n = 40)	Warm, dim scent[b] (n = 40)	Cool, bright scent[c] (n = 40)	No scent[d] (n = 40)	Warm, dim scent[e] (n = 40)	Cool, bright scent[f] (n = 40)
Store environment evaluation	3.60*bf* (1.20)	4.39*acde* (1.37)	3.25**bf** (1.29)	3.52*bf* (1.21)	3.53*bf* (1.03)	4.40*acde* (1.09)
Store evaluation	3.35**bf** (1.20)	4.48**acde** (1.51)	3.07**bf** (1.51)	3.71bf (1.34)	3.44**bf** (1.20)	4.34*acde* (1.29)
Product evaluation	4.27*bf* (.93)	5.04*acde* (1.06)	4.23*bf* (1.31)	4.52b (1.10)	4.13 **bf** (1.14)	4.92*ace* (1.05)
Approach behavior	4.08*bf* (.99)	4.76*acde* (1.18)	3.94**bf** (1.27)	4.08*bf* (.86)	3.87 **bf** (1.01)	4.58acde (1.04)

Superscripts indicate a significant difference at $p < .05$ (in italic when $p < .01$ and in bold when $p < .001$) with the mean of the respective column (LSD post hoc tests).

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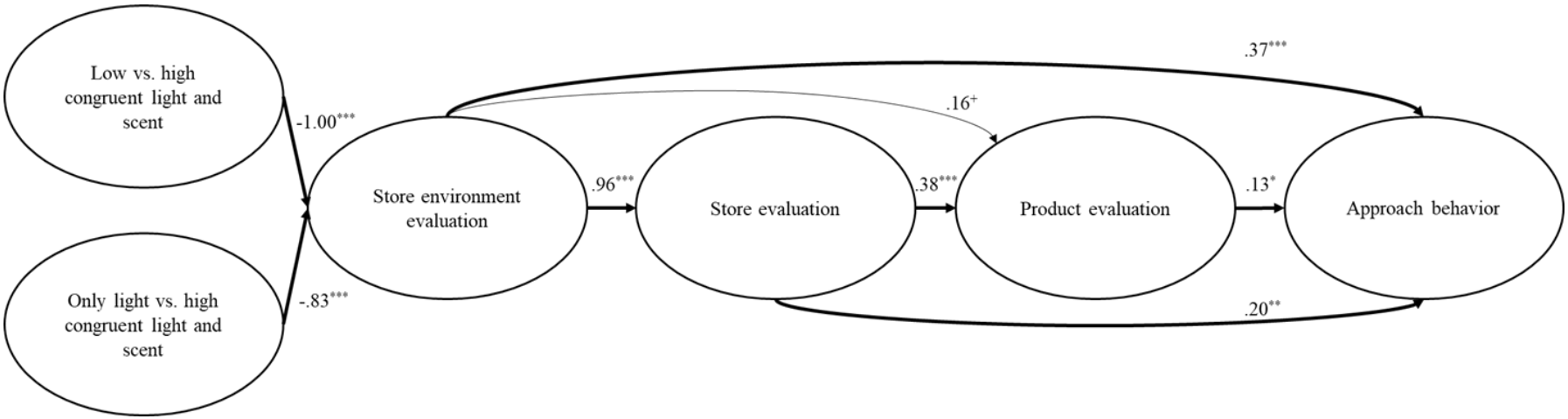
Study 1 - Results



Figures represent unstandardized beta coefficients of the significant direct effects.+ $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$. Arrows in bold indicate mediation (95% CI). High congruent light and scent as reference group.

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Study 2

- High vs. partial vs. low congruity
  - via two cue characteristics:
    - perceived (color) temperature
    - illuminance level
  - 4 x 1 between-subjects design
    - high congruent cues (i.e., fit on two associations: warm, dim scent – warm, dim light): Coffee – 3000 K + 415 lux
    - low congruent cues (i.e., no fit: cool, bright scent - warm, dim light): Mint – 3000K + 415 lux
    - partial congruent cues via a match in temperature (i.e., fit on one association: cool, bright scent - cool, dim light): Mint – 4000K + 415 lux
    - partial congruent cues via a match in illuminance (i.e., fit on one association: warm, dim scent - cool, dim light): Coffee – 4000K + 415 lux
- 120 undergraduate students
  - 53 men and 67 women

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Study 2 - Results

Dependent variables	F (3, 116)	p	M (SD)			
			Warm, dim scent & warm, dim light – High congruity[a] (n=30)	Cool, bright scent & warm, dim light – Low congruity[b] (n=30)	Warm, dim scent & cool, dim light – Partially congruity via illuminance[c] (n=30)	Cool, bright scent & cool, dim light – Partially congruity via temperature[d] (n=30)
Store environment evaluation	2.98	.03	4.38[*bcd*] (1.06)	3.92[*a*] (.92)	3.74[a] (.98)	3.73[a] (.89)
Store evaluation	3.11	.03	4.56[bcd] (1.11)	3.95[a] (.93)	3.87[a] (1.24)	3.84[a] (.92)
Product evaluation	.94	.42	4.79 (1.02)	4.53 (.84)	4.46 (1.03)	4.42 (.79)
Approach behavior	1.50	.22	4.47 (1.08)	4.01 (.88)	4.05 (.97)	4.18 (.78)

Superscripts indicate a significant difference at $p < .05$ (and in italics when $p < .10$) with the mean of the respective column (LSD post hoc tests).

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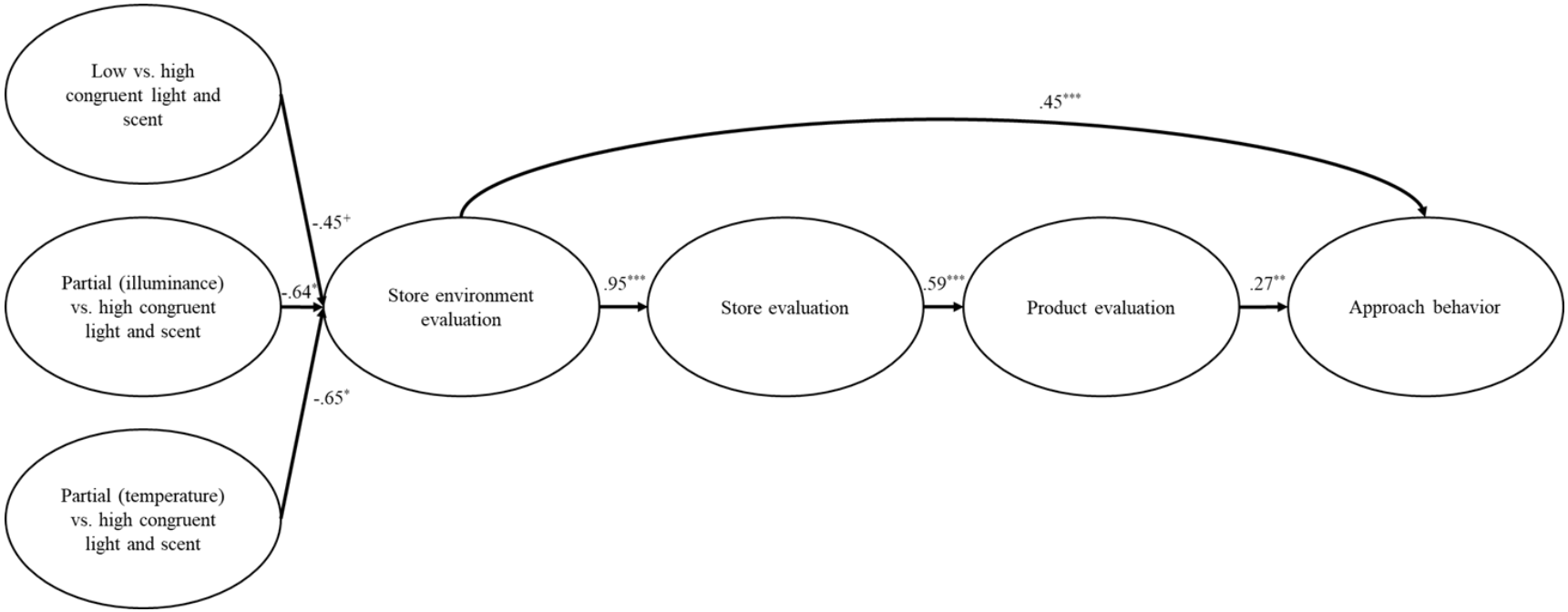
Study 2 - Results



Figures represent unstandardized beta coefficients of the significant direct effects.+ $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$. Arrows in bold indicate mediation (95% CI, expect for low congruent vs. high congruent light and scent: 90% CI). High congruent light and scent as reference group.

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Conclusion

- Does partial congruity between the multiple elicited associations of different ambient cues also suffice to trigger positive consumer reactions?
  - No!
    - High congruity >> partial congruity/low congruity
    - Partial congruity = low congruity
  - Different sensory associations should be taken into account when selecting atmospheric cues in the retail environment

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Thank you for your attention!

Questions/Suggestions?

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