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ADVANCING FRONTIERS IN FOOD SCIENCE



The Scent of Change: How congruent ambient scents in virtual environments affect ice cream tasting

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Introduction

- The olfactory system is closely linked to the limbic system, which governs emotions and memory.
- Olfactory cues can influence consumers by:
 - Biasing food and drink choices
 - Altering perception and hedonic response to food
 - Affecting the speed at which consumers eat (Spence, 2020)

Aim: To investigate the effect of ambient scent and visual context—both congruent and incongruent—on the sensory evaluation of three ice cream samples.

Results

- Sea breeze scent** had a predominantly negative effect, reducing engagement compared to both no-scent (control) and **Book scent** conditions (Fig 2).
- Involvement 2 & 3 and sensory awareness 1,2 & 4 were lower with the **Sea breeze scent** (Fig 2).

Materials & Method

- 121 participants tasted three ice-creams (two plant-based, one dairy) under three conditions: control (CLT) and two virtual contexts (**Beach** and **Library** – Fig 1).
- An ambient scent was released over each of 3 weeks: **week 1 Sea breeze scent**, **week 2 No-scent (control)**, and **week 3 Book scent**.
- Participants evaluated level of engagement within the digital immersion and sample liking on continuous scales (0-100).



Figure 1: Digital immersive room: beach context (left) and library context (right).

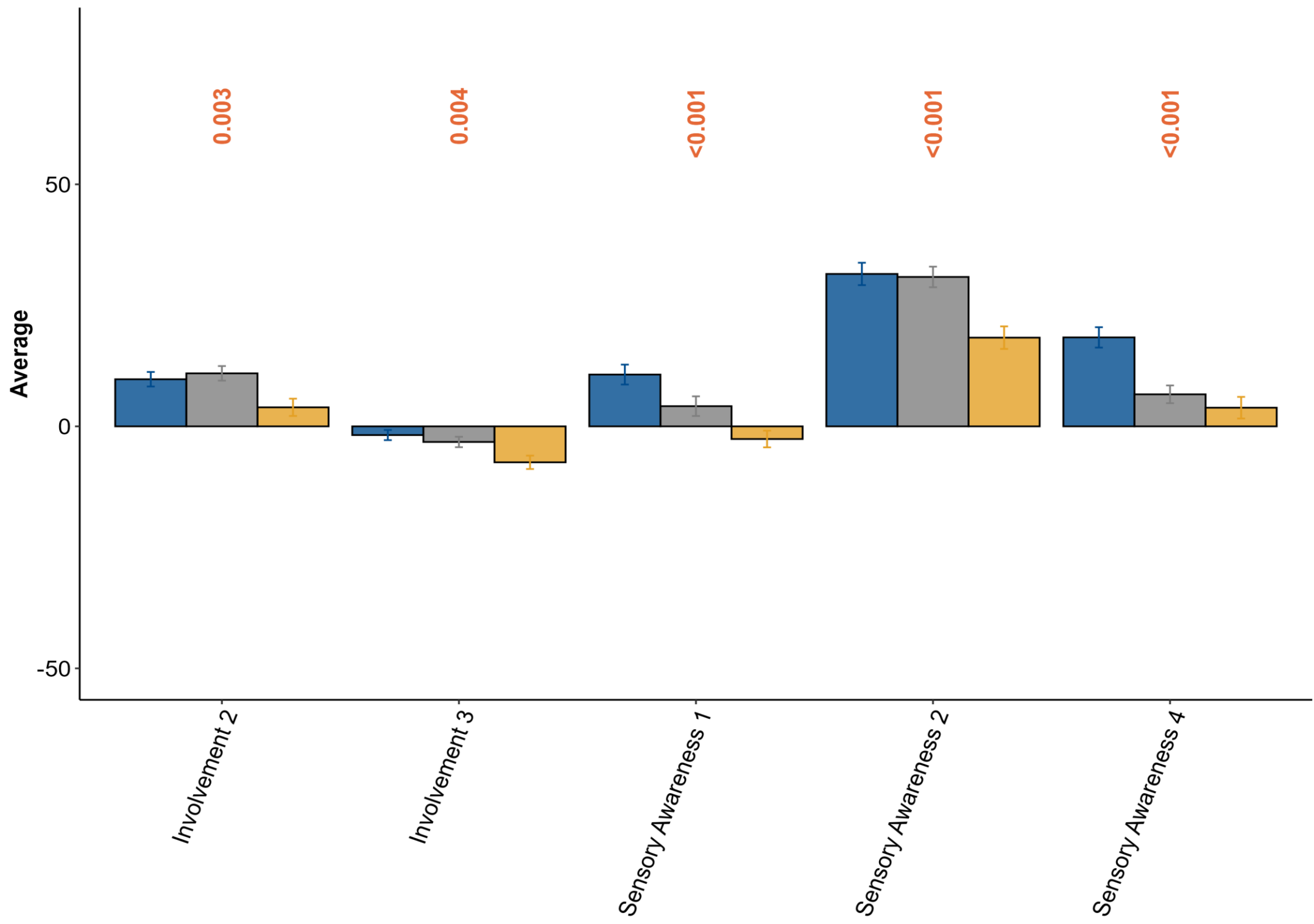


Figure 2: Significant Engagement variables for the Aroma factor

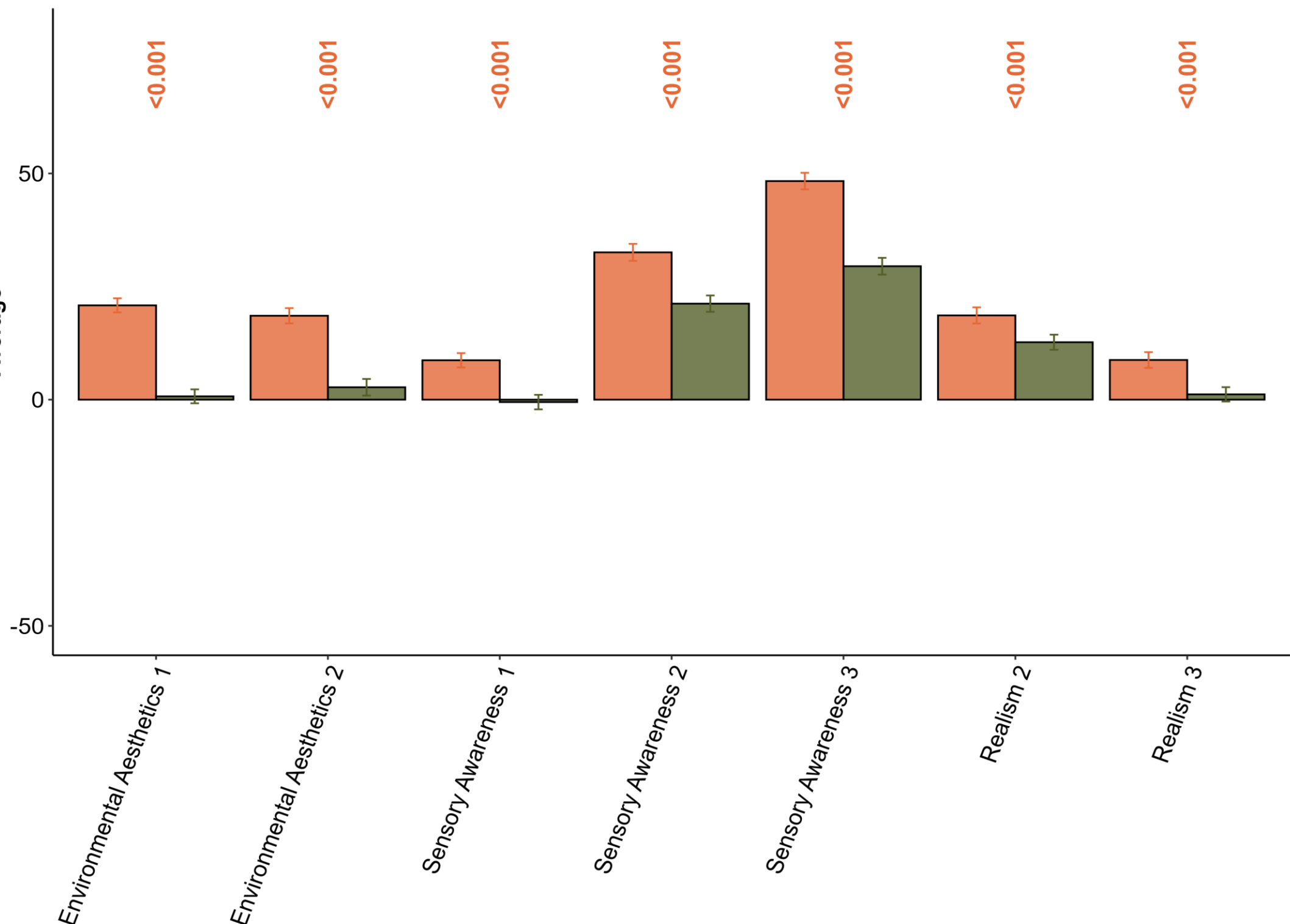


Figure 3: Significant Engagement variables for the Context factor

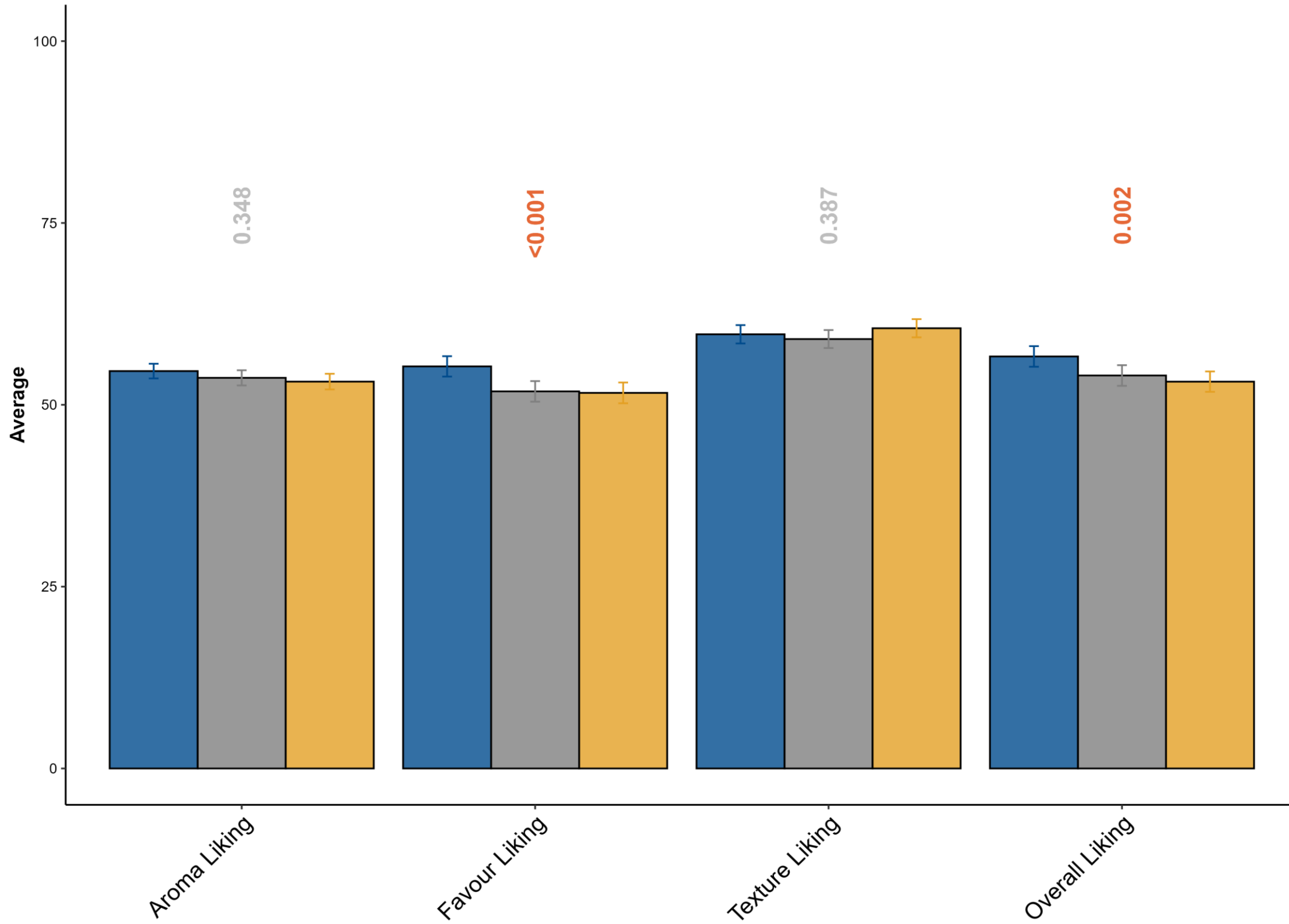


Figure 4: Liking – Beach - VE

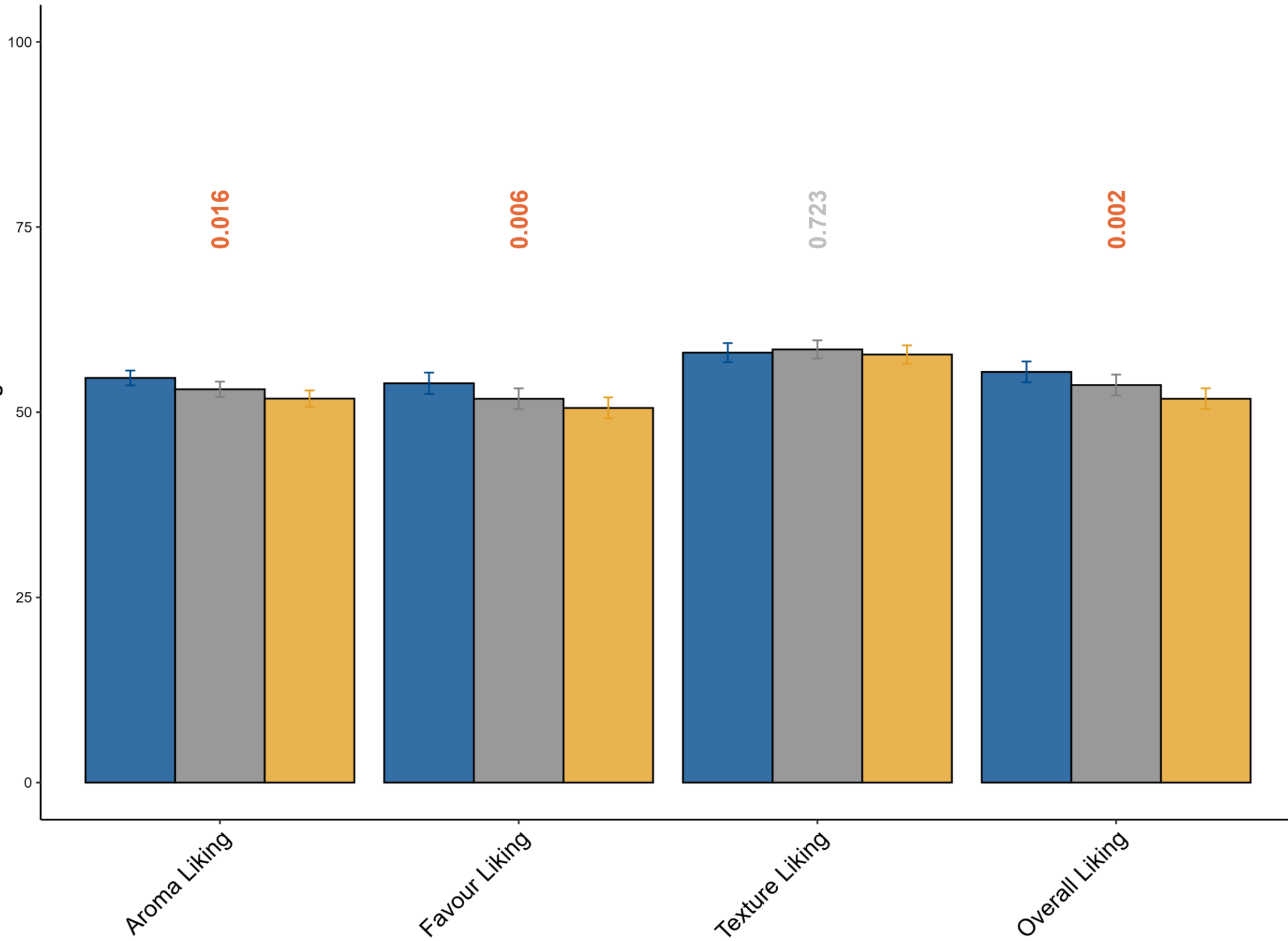


Figure 5: Liking – Library - VE

Beach context was the most engaging for ice cream consumption, compared to **Library** context (Fig 3). Environmental Aesthetic 1 & 2, sensory awareness 1-3 and realism 1-3 ratings indicated participants felt more engaged and immersed in the **Beach** context than in **Library** context (Fig 3). In the Beach context (Fig 4), **Sea breeze scent** significantly reduced product flavour liking and overall liking compared to **No scent** or **Book scent**. A similar negative effect was observed in the Library context (Fig 5), with product aroma, flavour, and overall liking significantly decreased with **Sea breeze scent**.

Conclusions

- Contrary to expectation, congruent aroma, sea breeze reduced engagement within virtual environment and liking score compared to the book aroma.
- The findings demonstrate that ambient scent significantly modulates engagement and overall liking, highlighting the potential of strategically applied ambient scents to optimise ecological validity and modify consumer behaviour.

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References

Spence, C. (2020). Atmospheric Effects on Eating and Drinking: A Review. In: Meiselman, H. (eds) Handbook of Eating and Drinking. Springer, Cham. https://doi.org/10.1007/978-3-030-14504-0_119