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Study on the Influence of Virtual Contexts on Food Sensory Perception and Consumer Acceptance

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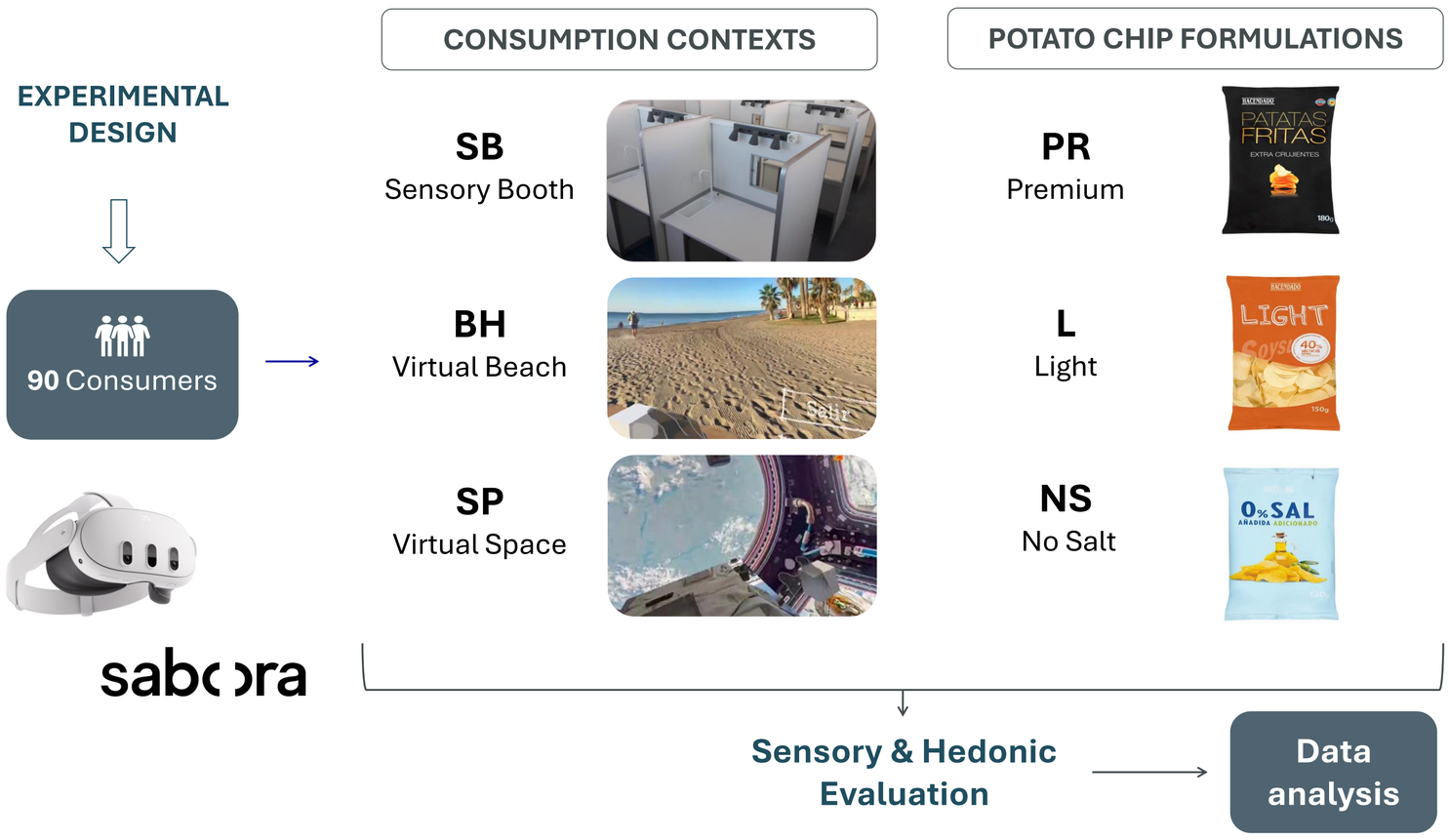
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Abstract: *Virtual Reality (VR) offers new opportunities to evaluate food perception in immersive yet controlled environments. This study investigated the effect of three consumption contexts (sensory booth, virtual beach, and virtual space) on the sensory perception and acceptance of premium, light, and no-salt potato chips. Ninety consumers participated in sensory evaluations. Results indicated that product formulation had the greatest impact on overall acceptance, while VR environments significantly influenced perceived crunchiness. Consumer segmentation revealed two distinct preference profiles. The findings support the use of VR as a complementary tool for sensory and consumer research.*

Introduction

The environment in which food is consumed can influence sensory perception and consumer responses. While traditional sensory tests are commonly performed in controlled booths, Virtual Reality (VR) allows the simulation of realistic consumption contexts under controlled conditions. This study investigated the effect of three consumption environments (sensory booth, virtual beach, and virtual space) on the sensory perception and consumer acceptance of potato chips with different formulations.

Material and method



Results and discussion

As shown in **Fig. 1**, product formulation exerted a greater influence on overall liking than the consumption context did, with Premium chips **(PR)** consistently achieving the highest acceptance scores.

Fig. 2 suggests that immersive environments **(BH and SP)** altered texture perception, reducing crunchiness scores compared with the sensory booth, particularly for reformulated products.

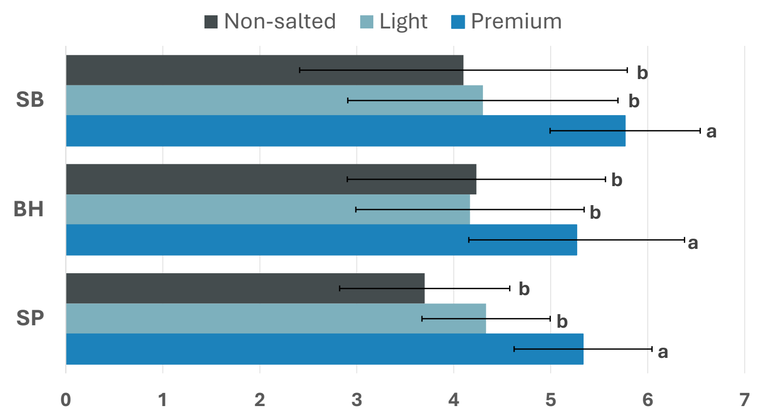


Figure 1. Overall acceptance scores of potato chip formulations under different consumption contexts.

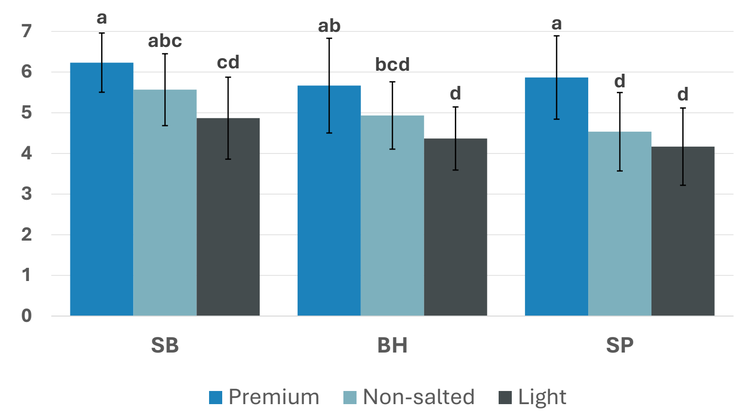


Figure 2. Perceived crunchiness of potato chip formulations under different consumption contexts.

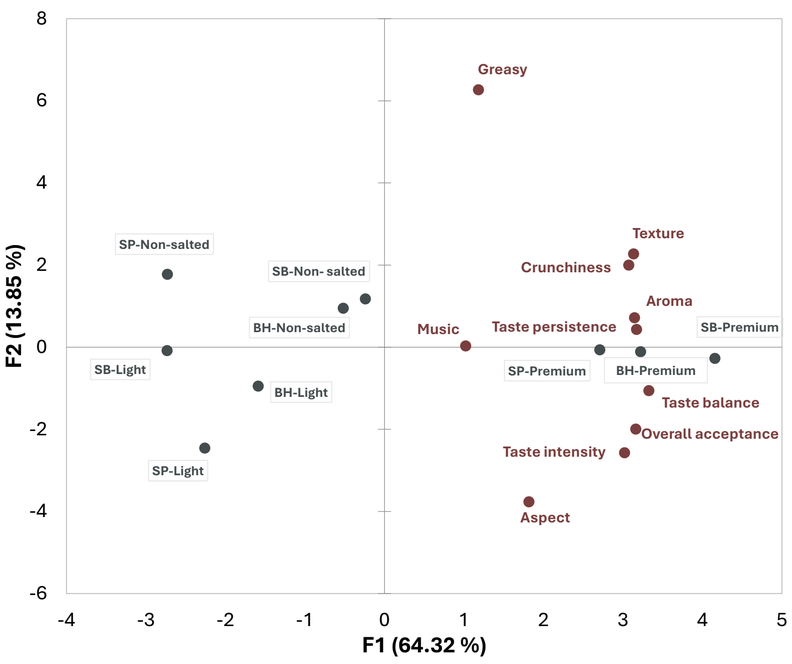


Figure 3. Sensory PCA showing the relationship between formulations and sensory attributes.

The sensory map **(Fig. 3)** revealed a clear separation of Premium **(PR)** samples from Light **(L)** and Non-salted **(NS)** formulations along PC1, highlighting the role of **texture-, aroma-, and liking-related** attributes in sample discrimination.

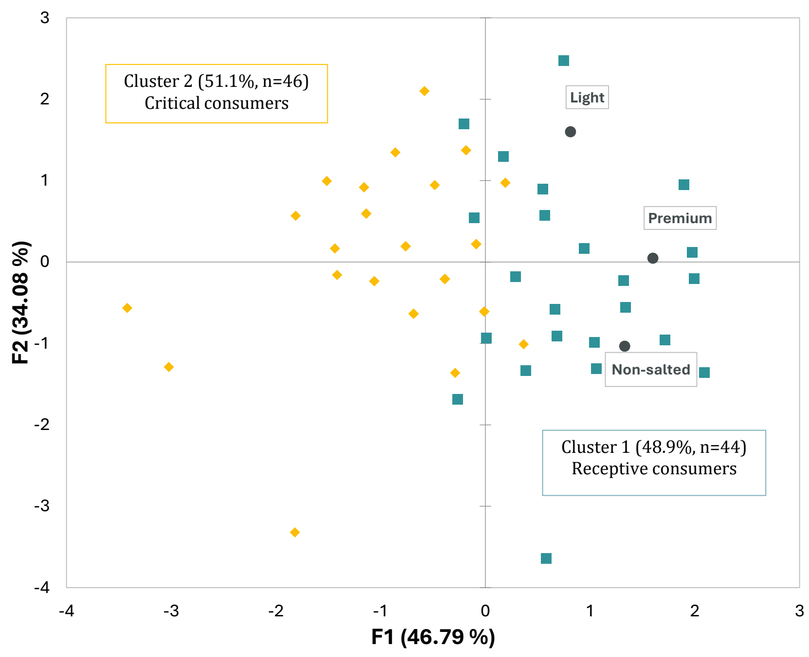


Figure 4. Consumer preference map obtained by HCA and visualised by PCA.

Fig. 4. HCA identified two consumer segments according to overall liking scores. Their projection onto the PCA map revealed **receptive consumers**, associated with all formulations, and **critical consumers**, characterised by lower product acceptance.

Conclusions

- Product formulation was the main driver of consumer acceptance.
- VR environments reduced perceived crunchiness.
- Premium chips were associated with positive sensory attributes and liking.
- Two consumer segments were identified: receptive and critical consumers.

Acknowledgement

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