Improvements in panelist product discrimination during sensory evaluations within personally relevant immersive environments

Society of Sensory Professionals Conference 2024
October 2-4
Pittsburgh, PA, USA

P-42

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Introduction

- There has been an increase in the use of immersive technologies in order to restore relevant context to sensory testing evaluations
- Previous studies have observed an increase in data reliability as a result of using these technologies[1]
- Personalizing contexts for individual panelists has led to improved panelist discriminability when using VR headsets[2]

Objective

- Determine if panelists have improved product discrimination when evaluating in a personally relevant immersive environment versus a virtual CLT using a video wall

Methods

- 26 panelists recruited; all were consumers of salty snacks within the product category tested
- 4 salty snack products of similar flavor profile but uniquely different textures used
- Panelists participated in two sensory evaluations where all 4 samples were evaluated
- Sensory evaluations were conducted at the OSU Immersive Technologies Lab where a video wall immersed panelists in a personally relevant environment (living room/kitchen/office) and a non-personally relevant environment [Central Location Test (CLT)]

Figure 1: Image of panelist in the middle of an evaluation session in the OSU Immersive Technologies Laboratory

Figure 2: Screen captures of the videos played on the video wall during evaluations to immerse panelists in a non-personally relevant environment (A: CLT Test) or a personally relevant environment (B: Living Room; C: Kitchen; D: Office)

- For each environment, ANOVA was used to assess product differences across 11 different liking and texture attributes; LSD post-hoc tests were conducted when appropriate

Results

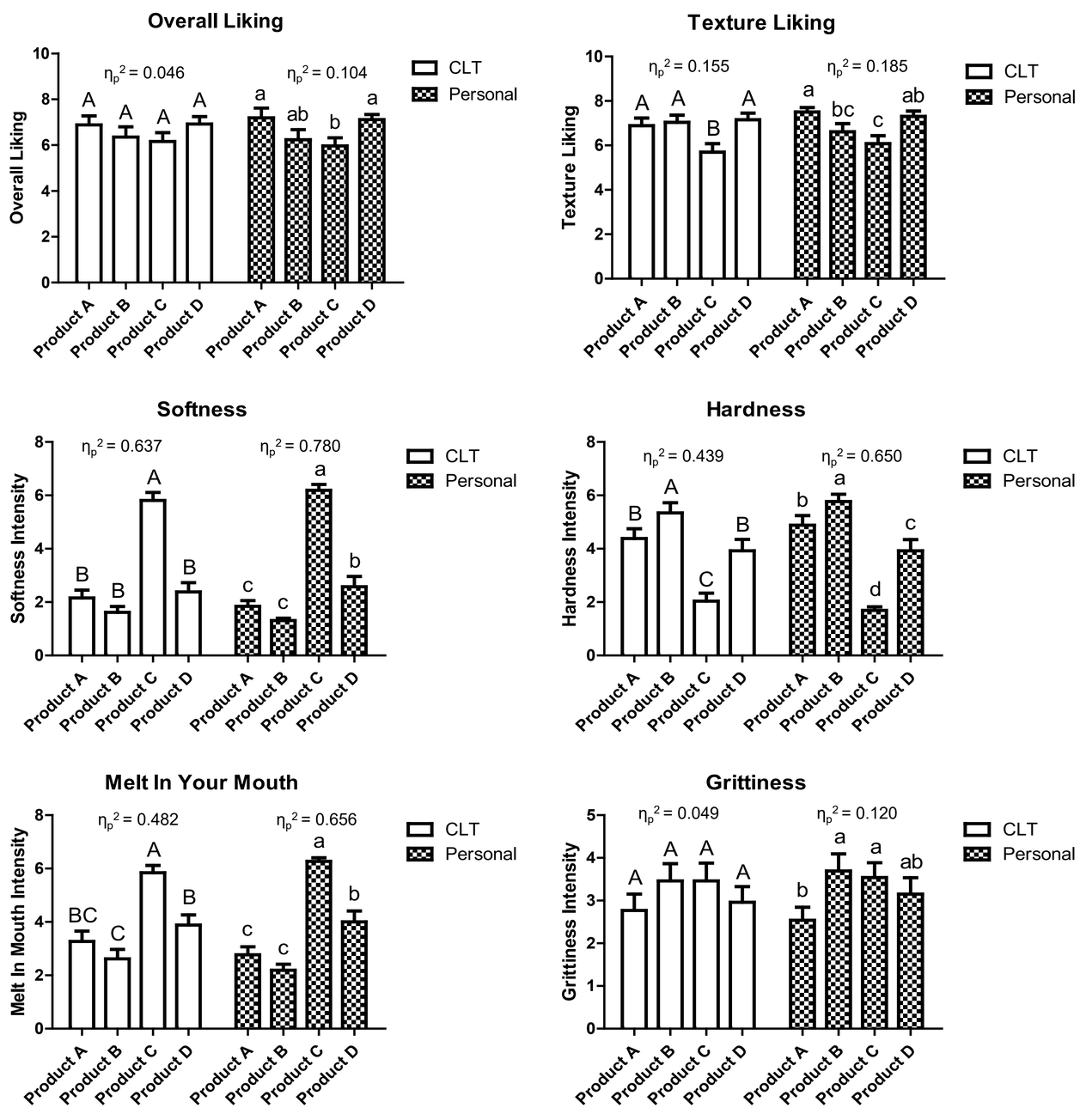

Figure 3: Bar graphs showing mean liking or intensity scores for 6 of 11 evaluated attributes. Error bars indicate standard error of the mean. Superscripts above bars indicate LSD post-hoc subgroups within each environment. The partial eta-squared (η_p^2) values shown above each product set in the panels indicate effect sizes associated with evaluating in either a virtual CLT or a personally-relevant environment

- Panelists were more discriminating between products as indicated by the increased number of LSD post-hoc subgroupings for 6 of 11 attributes (shown) in the personally-relevant environments
- Partial eta-squared (η_p^2) values are higher for all 11 attributes in the personally-relevant environment, indicating effect sizes are larger when products are evaluated in personally meaningful scenarios

Conclusion

- Panelists were able to better discriminate between products when evaluations were conducted in a more personally-relevant environment
- Consumers being more discriminating in personally relevant environments allows for easier decision making in new product development where it might be difficult to choose between similar prototypes

References

1. Schöniger, M. K. (2022). The role of immersive environments in the assessment of consumer perceptions and product acceptance: A systematic literature review. *Food Quality and Preference, 99, 104490.* https://doi.org/https://doi.org/10.1016/j.foodqual.2021.104490
2. Man, K., Patterson, J. A., & Simons, C. T. (2024). "That Looks Like My Kitchen!" – Personalized context by usage frequency and familiarity influences consumer perception and liking of chicken nuggets in VR. *Food Research International, 193, 114865. https://doi.org/https://doi.org/10.1016/j.foodres.2024.114865*

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