



American Journal of Human Psychology (AJHP)

ISSN: 2994-8878 (ONLINE)

VOLUME 3 ISSUE 1 (2025)

PUBLISHED BY
E-PALLI PUBLISHERS, DELAWARE, USA

Hues to Cues: The Influence of Color Cues on Taste Perception

Alexa Reyna T. Raga¹, Krishna Nicole O. Tautho^{1*}, Ruby Jean M. Mahinay¹, Claire Lynn B. Culajara¹

Article Information

Received: December 09, 2024

Accepted: January 14, 2025

Published: February 06, 2025

Keywords

Color Cues, Random Assignment, True Experimental Research Design, Within-Subjects Design

ABSTRACT

This paper examines how color cues influence taste perception in order to know what is the sensory and psychological reason for preference for certain foods. The experiment used 22 female participants aged 18-25 years old from two academic programs; 16 students from the business-related academic program and 6 students from the English academic program coming from the UM Digos City, Davao del Sur, Philippines. This research used the within-subjects design; thus, each participant was exposed to both the experimental and control conditions. The different colors of hotcakes were evaluated against sensory attributes and hedonic enjoyment using hedonic rating scales. Results from the paired sample t-test showed no statistically significant differences in preferences and hedonic enjoyment between the colored food samples. For example, orange ($M = 6.61$, $SD = 1.06$) was only marginally preferred over violet ($M = 6.59$, $SD = 1.17$), but this was not statistically significant, $t(21) = -0.09$, $p = 0.926$, $d = -0.0201$. Similar non-significant results were found in comparisons between orange-green and orange-red samples. These results suggest that while orange was slightly higher in preference, the differences across all colors were negligible. The same pattern was observed for orange-green and orange-red comparisons. This result implied that the null hypothesis was accepted because even though orange was only slightly preferred over the other colors, the differences were not of statistical significance. It proves that color plays a very negligible role in preference and pleasure towards food consumption, although exogenous influences of culture, habits, and eating behavior can interfere. It reflects that in future research studies, there must be an enhancement in sample size as well as more profound focus on context and psychology. These implications apply to the field of marketing, design of the product, and practice in sensory evaluation.

INTRODUCTION

This study focuses on color cues and an individual's preferences for enjoyment and taste. People's perceptions of food and drink are influenced by color. In addition to creating expectations, it can have an impact on the overall enjoyment, taste, texture, and smell. Colors evoke specific psychological reactions in terms of psychological associations. According to Wood (2021), we all unintentionally link particular colors to particular flavors and tastes. In order to better understand how primary colors, affect memory retention in student gamers at Higher Education Institutions (HEIs), the current study was conducted (Genon & Saldua, 2024). Red is typically thought of as sweet, brown and black as bitter, yellow and green as sour, and white as salt. According to Spence's (2019) research, it is clear from the many empirical studies published in the past 80 years or so that the color and brightness of food and/or beverages often affect how multisensory flavor is perceived. The present study considers cultural differences in the cross-modal color-taste associations among respondents who are Taiwanese, Japanese, and Russian. The findings suggest that it is connected to the level of familiarity with specific foods and tastes, even though some cultural characteristics were also mentioned (Raevskiy *et al.*, 2022). Visual cues like color, shape, and texture have all been extensively studied in relation to food products, but color and shape have been the most frequently studied components.

Color indeed influences the food experience-the way food tastes, its texture, and aroma. But very few studies have looked at how such perceptions may vary across cultures and in actual real-world settings. That said, there is little current research into the ways the cultural contexts determine the linkage established between color cues and related tastivities. In fact, those two most common sensory stimuli remain largely underdeveloped-though they do represent more researched than perhaps any two others in sensory attributes-culture and psychological elements yet to be integrated. With these researches pointing to the fact that these visual attributes do play a major role in determining the preference and buying choices of customers, the research necessity for these impacts on sensory evaluation and appreciation would be even higher.

This study fills in gaps for the comprehension of the impacts of color cues on global and cultural taste perception. Previous studies have been undertaken to discuss contributions from visual elements in an experience, and color and taste are of lesser discussion regarding their contribution to a particular experience. Specifically, the paper investigates how color cues influence taste perception among various cultural groups, identifies psychological mediators in such a process, and draws practical implications for food industries worldwide. Focusing on such objectives, the study would make a much greater contribution toward understanding

¹ University of Mindanao Digos College, Philippines

* Corresponding author's e-mail: tauthonicole@gmail.com

sensory interactions and their cultural implications. Such findings would hold valuable applications in food marketing, product design, and consumer satisfaction.

The experiment was designed

1. To study the influence of the food color (violet, orange, red, green) on choosing.
2. The study the influence of the food colors on enjoyments.
3. To study if there is greater preference and enjoyment for eating orange-colored foods compared with violet, red, or green.
4. To study the aspect of the food in shaping preferences and enjoyment.
5. To analyze whether eating habits have more effects than preference on these two aspects

This study investigates the effects of color cues to taste and enjoyment perception that could contribute to sensory science and food psychology. The study’s findings could help to food industries by establishing and enhancing product design, branding, and packaging through color associations. The benefits of understanding color cues could lead to more effective marketing strategies based on sensory expectations. In conclusion, the findings of this study may be useful for future researchers as the foundation or support system of their study and other fields like psychology, food industry, and in business fields.

MATERIALS AND METHODS

Participants

The participants of the study consisted of 22 females (N=22), aged 18-25, enrolled in Marketing Management and BS English Programs at UM Digos City, Davao del Sur, Philippines. They were selected through convenience sampling based on their availability and willingness to participate. Each participant experienced both experimental and control conditions to gather comprehensive data for research.

Research Instruments

The researchers utilized materials and a questionnaire to evaluate participants’ sensory perception and enjoyment preferences. The materials included hotcake sample, served on plates with spoons provided to ensure consistency in presentation and sampling. The questionnaire includes 4 items, each based on 9-point hedonic rating scale, where participants rated their responses from 1(Dislike Extremely) to 9(Like Extremely). The questions focus on the hotcakes’ appearance, texture, taste, and smell, as well as how much the participants enjoyed them overall. Another questionnaire has been used to measure the participant’s enjoyment. A 4-item questionnaire is used to assess the enjoyment experience of the participants, each based on 7-point Hedonic Scale from 1(Extremely dislike) to 7 (Extremely enjoy).

Procedure and design

The participants were informed of the purpose of the

study and what was to be expected. The participants were made aware that they would experience both experimental and control conditions. In the experimental condition, facilitators began with a brief introduction to ensure the participants understood the procedure. Participants were then given four different colors of the same food, for example, hotcakes, and asked to examine and taste each color variation and focus on their sensory perceptions, such as appearance, taste, texture, and smell. After the experimental condition, participants went to the control condition where they tasted the food in its original color, concentrating only on their sensory experience and not the color differences.

Under both conditions, participants were asked to complete a post-test by answering a series of questions based on a 9-point Hedonic Scale, which assessed their sensory perceptions, including visual and taste evaluations. For overall enjoyment preference, participants also completed a 7-point Hedonic rating scale. After the study, participants were debriefed about the true purpose of the research and the significance of the findings.

The within-subjects design of this study means that each participant experienced both the experimental and control conditions. Each experimental conditions are compared to the control group. This aims to examine the difference of the control group and the experimental groups. This approach allowed participants to serve as their own controls, helping to minimize the influence of individual differences and making the comparison between conditions more accurate and meaningful.

Ethical Consideration

To make sure that all participants of this research are safe and their rights are not violated, certain ethical measures will be observed. Participants will be given a form that contains the details of the study, what they expect to do, and all the possible risks that be incurred. They will also be allowed to read through it and if they have any questions, they are free to ask. All the information gathered in this research will be confidential and at no time will be participants be identified, in order to protect their privacy. This means that it is voluntary to participate and any participant can decide to stop taking part at any time with no adverse consequences. After the study, there will be debriefing in which participants can ask questions and feedback. This way all participants are assured of the respect, information and support through the whole research process.

RESULTS AND DISCUSSIONS

Table 1: Normality Test- Hedonic Rating Scale

	W	p
Color Cues- Hedonic Rating Scale (Sensory Evaluation)	0.966	0.619

Note. A low p-value suggests a violation of the assumption of normality

Normality Interpretation

A Shapiro-Wilk test was conducted to assess the normality of the data. For the Sensory Evaluation, the results indicated no significant deviation from normality, $W = 0.966$, $p = 0.619$. These results suggest that the assumption of normality was not violated for this variable.

Table 2: Normality Test- Enjoyment Preference

	W	p
Color Cues- Enjoyment Preference	0.937	0.168

Note. A low p-value suggests a violation of the assumption of normality

Table 3: Paired Sample T-Test of Hedonic Rating Scale

			statistic	df	p	Mean difference	SE difference		Effect Size
Violet Hedonic Rating Scale	Orange Hedonic Rating Scale	Student's t	-0.0943	21.0	0.926	-0.0227	0.241	Cohen's d	-0.0201
Red Hedonic Rating Scale		Student's t	-0.5807	21.0	0.568	-0.1023	0.176	Cohen's d	-0.1238
Green Hedonic Rating Scale		Student's t	0.3416	21.0	0.736	0.0795	0.233	Cohen's d	0.0728

Note. $H_a \mu_{\text{Measure 1}} - \text{Measure 2} \neq 0$

Normality Interpretation

A Shapiro-Wilk test was conducted to assess the normality of the data. For Enjoyment Preference, the results indicated no significant deviation from normality, $W = 0.937$, $p = 0.168$. These results suggest that the assumption of normality was not violated for this variable.

Paired Sample T-Test Interpretation

The purpose of this study was to determine whether the violet-colored food have a significant difference with orange colored food. The researchers employed a within-subjects design and used a paired sample t-test. According to the findings, there were significantly more people prefer orange colored food ($M = 6.61$, $SD = 1.06$) than violet colored food ($M = 6.59$, $SD = 1.17$) ($t(21) = -0.09$, $p = 0.926$, $d = 0.0227$). The null hypothesis, which proposed that there was no difference between the two-colored foods, was not rejected.

Finding out if there is a significant difference between orange and Red-colored food was the aim of this study. The researchers used a paired sample t-test and a within-subjects design. Compared to red-colored food ($M = 6.51$, $SD = 1.04$), a marginally higher number of people

preferred orange-colored food ($M = 6.61$, $SD = 1.06$) ($t(21) = -0.58$, $p = 0.0568$, $d = -0.0201$). These findings demonstrated the null hypothesis, which postulated and generated by the two-colored foods has no significant difference.

The purpose of this study was to determine whether orange and green foods differed significantly from one another. The researchers employed a within-subjects design and a paired sample t-test. A significantly greater proportion of respondents preferred green-colored food ($M = 6.69$, $SD = 1.13$) than orange-colored food ($M = 6.61$, $SD = 1.06$; $t(21) = 0.3416$, $p = 0.736$, $d = 0.0728$). These results supported the null hypothesis, according to which the two-colored foods have no significant difference.

Overall, no significant differences between any color are indicated by p-values greater than 0.05. According to Cohen's D values, the observed variations in hedonic ratings are small and probably not significant. This suggests that there is no discernible difference between participants' assessments of how pleasant or enjoyable these colors are.

Table 4: Paired Sample T-Test of Enjoyment Preference

			statistic	df	p	Mean difference	SE difference		Effect Size
Violet Enjoyment Preference	Orange Enjoyment Preference	Student's t	-0.283	21.0	0.780	-0.0455	0.161	Cohen's d	-0.0602
Red Enjoyment Preference		Student's t	-1.218	21.0	0.237	-0.1932	0.159	Cohen's d	-0.2597
Green Enjoyment Preference		Student's t	-1.311	21.0	0.204	-0.2159	0.165	Cohen's d	-0.2794

Note. $H_a \mu_{\text{Measure 1}} - \text{Measure 2} \neq 0$

Paired Sample T-Test Interpretation

Finding out if there is a significant difference between orange and violet-colored food in terms of enjoyment preference was the aim of this study. The researchers used a paired sample t-test and a within-subjects design. Compared to violet-colored food ($M = 5.10$, $SD = 1.08$), a significantly higher number of people preferred orange-colored food ($M = 5.15$, $SD = 1.04$) ($t(21) = -0.283$, $p = 0.780$, $d = -0.0602$). These findings demonstrated the null hypothesis, which stated that there was no difference between the two-colored foods, was not rejected. There was no significant difference between the preference for orange and violet-colored foods.

Assessing whether there is a discernible difference in the preferences for enjoyment between foods that are orange and red in color was the study's objective. A within-subjects design and a paired sample t-test were employed by the researchers. Orange-colored food was preferred by a significantly larger percentage of respondents ($M = 5.15$, $SD = 1.04$) than red-colored food ($M = 4.95$, $SD = 1.10$; $t(21) = -1.218$, $p = 0.237$, $d = -0.2597$). These findings demonstrated the null hypothesis, which stated that there was no difference between the two-colored foods, was not rejected. There was no significant difference between the preference for orange and red-colored foods.

Determining whether the preferences for orange and green-colored foods differ significantly was this study's goal. The researchers employed a within-subjects design and paired sample t-test. Significantly more people preferred orange-colored food ($M = 5.15$, $SD = 1.04$) than green-colored food ($M = 4.93$, $SD = 1.07$) ($t(21) = -1.311$, $p = 0.204$, $d = -0.2794$). These findings demonstrated the null hypothesis, which stated that there was no difference between the two-colored foods, was not rejected. There was no significant difference between the preference for orange and green-colored foods.

The paired sample t-test results showed no statistically significant differences in preferences between any of color pairs (green-orange, red-orange, and violet-orange) have statistically significant differences in their preferences for enjoyment. According to the study of Fürtjes *et al.* (2020), contextual cues frequently set off eating behavior, which is then dictated by automaticities and habits. Therefore, the orange-colored hotcake as our control group suggests that people choose the color of the foods they normally see every day than colors they rarely see as an alternative.

Discussion

The following results aimed to investigate whether foods with different colors such as violet, orange, red, green affect an individual's preferences and differed significantly in terms of desirability and enjoyment. The researchers used paired sample t-test to assess the differences between colors. Orange as the control group, it would be compared with each color with violet being the first to be compared with. According to the result, there was no significant difference in preference ($t(21) =$

-0.09 , $p = 0.926$), this indicates that the color had a little impact on preference. In comparison with orange and red, orange was slightly preferred over red ($M = 6.61$ vs. $M = 6.51$), however, the difference was not significant ($t(21) = -0.58$), this suggests that the null hypothesis must be accepted. The comparison between orange and green shows also no significant difference in terms in preference ($t(21) = 0.3416$, $p = 0.736$), indicating that green food may be just appealing as orange. In terms of enjoyment, orange was compared to violet, the result shows that orange are preferred than violet ($M = 5.15$ vs. $M = 5.10$), however, the difference was not significant ($t(21) = -0.283$, $p = 0.780$). Similarly to orange and red, orange was preferred more ($M = 5.15$ vs. $M = 4.95$), but no significant difference ($t(21) = -1.218$, $p = 0.237$). Finally, orange was preferred slightly over green ($M = 5.15$ vs. $M = 4.93$), however, no significant difference was found ($t(21) = -1.311$, $p = 0.204$). Comprehensively, the results across all comparisons shows no significant differences, this indicates that the null hypothesis must be accepted. Suggesting color does not influence the preference and enjoyment of food. It could be affected by numerous factors, contextual cues set off eating behaviors, which then dictated by automaticities and habits (Fürtjes *et al.* 2020). Lifelong eating habits are formed during adolescence, and the school food environment has a big influence on how these habits are formed (Kezelee *et al.*, 2024).

CONCLUSION

In conclusion, the study shows no significant differences in food preferences and enjoyment based on colors, this suggests that accepting the null hypothesis is right. However, the outcome could be affected with various factors such as the sample size, cultural differences, eating behaviors, norms, and past experiences. Future studies could explore on how the automaticities, habits, as well as bigger sample size to record larger statistical differences might reveal more meaningful patterns in food preferences and enjoyment.

Acknowledgements

The researchers would like to express their sincere gratitude to all individuals who contributed to the completion of this study. Their support and guidance played a significant role in shaping the research and ensuring its success.

First and foremost, the researchers extend their deepest appreciation to their instructor for her unwavering support and guidance throughout the research process. Her expertise and insightful feedback were invaluable in refining and strengthening this study.

The researchers are also profoundly grateful to those who provided continuous support and assistance. Their willingness to offer help and share valuable insights during data collection and analysis greatly contributed to the success of this research.

Special thanks are extended to the participants who voluntarily took part in this study. Their cooperation,

time, and honest feedback were essential to achieving the study's objectives, and their contributions are deeply appreciated.

Lastly, the researchers acknowledge their own perseverance, dedication, and hard work. The countless hours devoted to brainstorming, collaboration, and problem-solving reflect their commitment to academic excellence and personal growth.

REFERENCES

- Genon, K. A., & Saldua, M. I. (2024). Influence of Primary Colors on Memory Retention of Student Gamers. *American Journal of Multidisciplinary Research and Innovation*, 3(2), 35–40. <https://doi.org/10.54536/ajmri.v3i2.2609>
- Kezelee, W., George, J., Mulbah, M. M., Bendoe, F. N., Yelegon, Z. N., Kwiyarhe, D. T. B., Lormie, J., Kollie, G. T., Gweemei, J., & Solon, E. (2024). Impact of the school food environment on dietary choices and body mass index among adolescents: A case study of secondary schools in Suakoko District, Bong County, Liberia. *Deleted Journal*, 2(2), 33–42. <https://doi.org/10.54536/ajds.v2i2.3709>
- Motoki, K., Spence, C., & Velasco, C. (2023). *When visual cues Influences taste/flavour Perception: A Systematic review*. ScienceDirect. <https://www.sciencedirect.com/science/article/abs/pii/S0950329323001908>
- Raevskiy, A., Bubnov, I., Chen, Y., & Sakai, N. (2022). Differences in color Representations of Tastes: Cross-cultural study among Japanese, Russian and Taiwanese. In *Lecture notes in computer science* (pp. 378–395). https://doi.org/10.1007/978-3-031-06038-0_28
- Spence, C. (2019). On the Relationship(s) Between Color and Taste/Flavor. *Experimental Psychology (Formerly Zeitschrift Für Experimentelle Psychologie)*, 66(2), 99–111. <https://doi.org/10.1027/1618-3169/a000439>
- Wood, C. (2024). How Does Colour Affect The Way We Eat? Foodunfolded. <https://www.foodunfolded.com/article/how-does-colour-affect-the-way-we-eat#:~:text=All%20of%20us%20subconsciously%20associate,brown%20and%20black%20with%20bitterness.>