

The influence of sensory marketing on the perception of value of potential consumers of a used bicycle: An experimental study

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ABSTRACT

This study aims to investigate the influence of sensory marketing on the perception of value of potential consumers of used bicycles. The research problem addresses whether visual context, including a "clean" versus a "polluted" scenario, impacts the perception of value of relatively savvy consumers in relation to pre-owned bicycles. The goal is to understand how visual elements, including context and layout, shape consumers' perceptions and influence their purchasing decisions. The literature review highlights relevant studies on the impact of layout on value perception and explores the connection between sensory marketing and purchasing decisions. The formulated hypotheses test the statistical difference in the value attributed to used bicycles based on different visual contexts, using the Mann-Whitney-Wilcoxon Test. The method adopted will be an experimental design between groups, using the Completely Randomized Designs (CRD) method, with online participant recruitment. The results demonstrate that the condition of the product, its history of use and disposable income of potential customers outweighed the influence of visual appeal in the formation of the perception of value of this product in the online environment.

Keywords: Sensory marketing, Value perception, Used bicycles, Visual context, Layout.

INTRODUCTION

This study aims to investigate whether even connoisseurs of the cycling universe, who self-declare themselves as connoisseurs of parts, technical details and prices, are susceptible to be influenced in the perception of value of a used bicycle based on the visual context and the background scenery (background) of the advertisement photographs.

The central objective is to understand how visual and presentation elements, including visual context and layout, shape consumers' perception, impacting or not their purchasing decisions and perception of monetary values attributed to used bicycles. The relevance of the research is intrinsically related to the importance of the market for used products, which covers several digital platforms, as well as websites and social networks that operate Marketplaces.

The market for used products, especially in the online context, is marked by visual ads that seek to attract attention and shape consumers' perception of value. This study aims to understand how sensory marketing, particularly visual context and layout, influences the

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perception of value of potential savvy buyers of used bikes. The research problem asks whether savvy consumers, self-declared connoisseurs of technical details and prices, are susceptible to this influence. The literature review highlights studies on the impact of layout on value perception and explores the connection between sensory marketing and purchasing decisions. The hypotheses formulated test the significant difference in the value attributed to used bicycles based on different visual contexts.

THEORETICAL FRAMEWORK

For the initial construction of the theoretical framework about the impact of the product presentation layout on the perception of value attributed by consumers, a Narrative Literature Review was carried out. With the help of the parsifal software, in the ResearchGate, Science@Direct and Scopus search databases, using the search command ("VALUE") AND ("PRODUCT") AND ("PERCEPTION)", thirty-three articles appeared, only two of which were considered to have some relevance to the theme. Given the scarcity of selected material, we continued with a free research on the subject, resulting in an article of interest. From the apprehension of the concept of "sensory marketing", a new search was carried out through the parsifal software, with the search command ("SENSORY MARKETING") AND ("VALUE"), resulting in fourteen articles. Prioritizing more recent articles (2021, 2022, and 2023), three articles were selected due to their relevant contribution to the hitherto incipient theoretical framework.

Studies on the influence of store design on purchase intention, the role of packaging in product valuation and the relationship between visual design factors and consumer purchase perception are highlighted. In addition, the review covers recent studies on sensory marketing, exploring how the five human senses influence purchase intention, as well as articles that deal with consumption decision factors. The synthesis of these studies highlights the relevance of sensory marketing in the formation of the perception of value. The selected material is summarized in the table below:

Chart 1 – Synthesis of the material used in the literature review

TITLE	AUTHOR	YEAR	PERIODIC
Mediated-moderated effects: High and low store image, brand awareness, perceived value from mini and supermarkets retail stores (1)	Graciola A.P.	2020	Journal of Retailing and Consumer Services
Value aggregation: How can the package contribute with the valuation of fish products? (2)	Polles J.	2019	Agri-food
Visual design factors and their influence on	Sampaio, C.	2009	Business



consumer purchase values (3)			Administration Journal
Do you feel it?: Sensory marketing in stores in northeast Mexico during COVID-19 (4)	Villegas-Garza A.S.	2023	Global Perspectives on the Strategic Role of Marketing Information Systems
The neuroconsumer: a narrative review of the literature in light of mental and emotional patterns (5)	Portela López J.L.	2023	Revista Latina de Comunicación Social
The role of live marketing and sensory marketing in the rock in Rio Brassil 2017 event from the perspective of stakeholder offer and the dynamics of the destination (6)	Machado A.F.	2021	Journal of Tourism and Development
The pattern of consumption and family behavior by gender in Brazil: an analysis using the 2008/2009 Household Budget Survey (7)	Galvão, M.C. Almeida, A.N.	2018	Planning and public policies
The role of sensory marketing in the consumption experience in gastronomic establishments (8)	KS da Cruz	2020	Trainers Magazine
Genders: perceived differences and influence strategies used in the purchase decision process (9)	JF de Medeiros, CH Sampaio, MG Perin	2011	Psico Magazine
Determining factors in the consumption decisions of families in the city of Curitiba (10)	R Chrestenzen, SE dos Santos	2018	PAIC Notebook
The effects of sensory marketing on the shopping experience of the Point-of-sale consumer (11)	C.R. Acevedo, VSL Fairbanks	2018	Interdisciplinary Journal of Marketing

Source: prepared by the authors

Different store designs can moderate the relationship between store image and purchase intent, influenced by brand awareness and perceived value. Store design positively impacts customers' purchase intentions, being considered an independent and essential element that raises perceived value. The image of the store is an important factor that influences buying behavior, with significant managerial implications in a mediated and moderated model.

The aspects observed by supermarket consumers when buying fish include characteristics of the packaging that give value to the product. Consumers who are willing to pay more for a preferred package also value the food safety offered by the wrapped compared to bulk fish. Elements such as color, practicality, transparency, ease of storage and flavor attributes influence the value of the packaging.

Consumer experiences in physical environments of service companies are impacted by visual design factors. In self-service retail, layout, signage, and lighting present in the environment shape customers' perception of value.

Technology and interconnectivity allow the purchase of global products, leading



consumers to consider criteria other than the utilitarian character. The five senses play an important role in purchase intent, with taste, sight, hearing, and touch significantly influencing satisfaction and purchase behavior.

The intersection of marketing and neuroscience reveals profound insights into consumer behavior. The behavior and emotions generated in the brain influence the purchase decision, highlighting the importance of brain dynamics and "hidden psychological traps" in the process of choosing products and services.

Live marketing and sensory marketing played key roles in the Rock in Rio Brasil 2017 event. Consumers reacted to the techniques and incentives offered by the sponsors, experiencing the event in an immersive way. Sensory marketing uses the five senses (sight, touch, smell, hearing, and taste) to influence consumers' choices and experiences.

Men and women allocate their income in different ways, guided by individual roles and preferences. Women's income tends to have a greater impact on spending on food, women's clothing, health and education, while men's income increases spending on transportation and men's clothing. The gender gap therefore plays a significant role in consumer responsibilities.

Sensory elements influence the construction of bonds between consumers and service providers. In today's consumer culture, emotional needs gain greater relevance in relation to the functionality of products. Sensory marketing aims to cater to these emotional desires by differentiating brands and generating an emotional connection with consumers. However, without an established sensory bond, sensory marketing can lose its effectiveness.

Differences and strategies of influence between men and women in the decision process of joint purchase of a property highlight that women associate the purchase with feelings of concern, while men relate it to the desire to choose. Women use emotion, while men use their knowledge on the subject to influence the decision.

Several factors influence consumption decisions, including utility, taste, preferences, and budget constraints, as suggested by neoclassical theory. Institutional theory also adds social, cognitive, and emotional factors, demonstrating how the distribution of income between needs and desires influences consumption choices.

Sensory marketing engages the consumer at the point of sale, providing a memorable shopping experience that differentiates brands and builds customer loyalty. Sensory stimuli at the point of sale provide an opportunity for brands to get closer to their consumers and stand out from the competition.

From the literature review, it is possible to construct the theoretical framework. Sensory marketing plays a key role in shaping a product's perception of value to consumers, from stimuli



to creating meaningful emotional and psychological experiences. By tapping into the human senses – sight, touch, smell, hearing and taste – sensory marketing triggers emotional and cognitive responses. However, for it to work in a meaningful way, it is necessary to create a bond, a sense of belonging or an experience on the part of consumers.

Sensory marketing is often associated with physical experiences where consumers can feel, smell, and try on products.

Family income and gender seem to be the main factors regarding the differentiation of consumption decisions relevant to the theme in question.

METHOD

To investigate the influence of visual context on value perception, an experimental design will be adopted between groups using the "Completely Randomized Designs" (CRD) method. The survey will be conducted online, recruiting cyclist participants who are knowledgeable in technical aspects. Participants will be randomly assigned to two groups exposed to different visual contexts. The Single Blind technique will be employed to mitigate research bias. The inclusion and exclusion criteria will ensure the participation of potential buyers of used bicycles. The procedure involves online recruitment, randomization of participants, presentation of images and collection of data on the perception of negotiation value of a used bicycle.

HYPOTHESES

Null Hypothesis (H0): There is no significant difference in the value attributed to a used bicycle due exclusively to different visual contexts of the background (layout).

Alternative Hypothesis (H1): There is a significant difference in the value attributed to a used bicycle due exclusively to different visual contexts of the background (layout).

SURVEY DESIGN

Experimental design between groups will be adopted using the "Completely Randomized Designs" (CRD) method to investigate the influence of visual context on consumers' perception of value in the amount to be paid for a used bicycle. Participants will be randomly assigned to two distinct groups: one group exposed to a "clean" background and the other to an unpleasant background containing subtle visual pollution. This method allows the comparison of the perception of value between the groups, through statistical principles for comparison of means, through the Mann-Whitney-Wilcoxon Test, providing insights into how the aesthetics of the scenario can affect purchasing decisions in relation to used bicycles.



The type of research design will be "between-groups", since it is intended to compare different independent groups, each group receiving different treatment, since the objective is to compare the results between two groups to determine if there is a statistically significant difference between them.

In order to mitigate research bias, the Single Blind technique will be used. In this way, participants will not know which treatment or experimental condition they will be receiving, but only the researchers. It is expected, therefore, that the participants will not be influenced by their own prejudices, expectations or desires, also ruling out the possibility that the most attentive respondents will perceive the intention of the research, if they had access to the two images, thus preventing them from not collaborating with their most genuine answers.

INCLUSION CRITERIA

- Potential bicycle buyers who declare themselves knowledgeable about technical or market aspects of the cycling universe; and
- Absence of visual impairments that may affect the perception of the visual context.

EXCLUSION CRITERIA

- Respondents who declare themselves laymen in relation to the cycling universe; and
- People who declare some type of visual impairment.

PROCEDURE

Recruitment of participants through online dissemination on social networks with communities focused on the cycling area through google forms with predetermined questionnaires.

Randomization of the participants into two groups: one exposed to images of the bicycle with a pleasant background and the other with an unpleasant background. Participants will be randomly separated, opting for only one of the two available forms.

The ads will be identical, with only the background image being changed, which gives a robust guarantee that the influence of the image on the value attributed to the product will be investigated. The text product description alone is robust and detailed enough to attribute value.

Data on the perception of the value paid for this bicycle will be collected using measurement scales.

Statistical analysis (Mann-Whitney-Wilcoxon test) will be performed to compare the means of value attribution between the two groups.

RESULTS AND DISCUSSION

A total of 257 responses were obtained. After disregarding those who did not declare themselves knowledgeable or who indicated some type of visual impairment, 136 respondents were distributed as follows:

Scenario 1 – 99 respondents. "Clean" scenario. It refers to an environment that is visually uncluttered, organized, and free of unnecessary distractions. From the perspective of sensory marketing, a "clean" scenario is characterized by a simplified and aesthetically pleasing presentation, focusing on clarity and highlighting the positive attributes of the product. In the context of online ads for used bikes, a "clean" scenario could involve images of the bike in a well-lit space with no visual elements that could compete or distract from the potential buyer, providing a direct and pleasant visual experience.

Scenario 2 – 37 respondents. Subtly polluted scenery. It refers to a visual environment that incorporates additional elements in a moderate way, without significantly detracting from the overall aesthetic. In the context of sensory marketing for online advertisements for used bikes, a subtly polluted setting could present the bike in an environment where there are some additional visual elements, such as an uncondusive, disorganized environment, or slightly bustling backgrounds. The intention is to create an atmosphere that, although it contains secondary elements, does not compromise the viewer's attention to the bike itself. This approach aims to make the visual experience more complex, providing a context that could negatively influence the perception and interest of the potential buyer.

Photo 1 – Scenario 1



Source - prepared by the authors

Photo 2 – Scenario 2

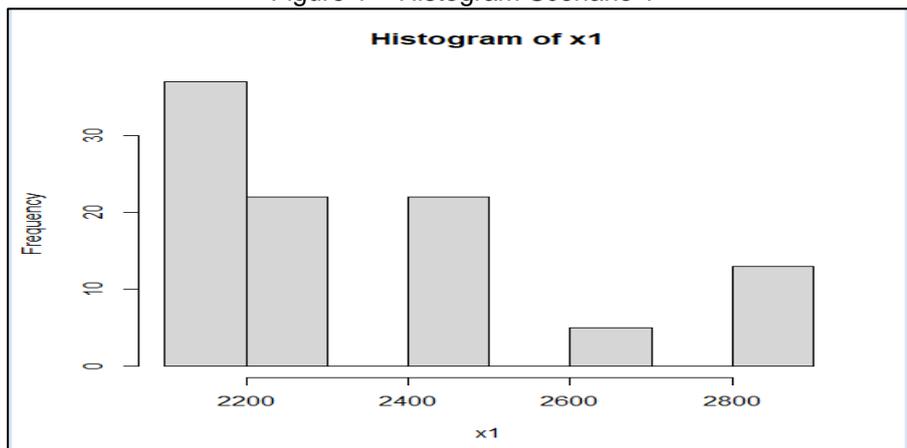


Source - prepared by the authors

VERIFICATION OF THE NORMALITY OF DISTRIBUTIONS

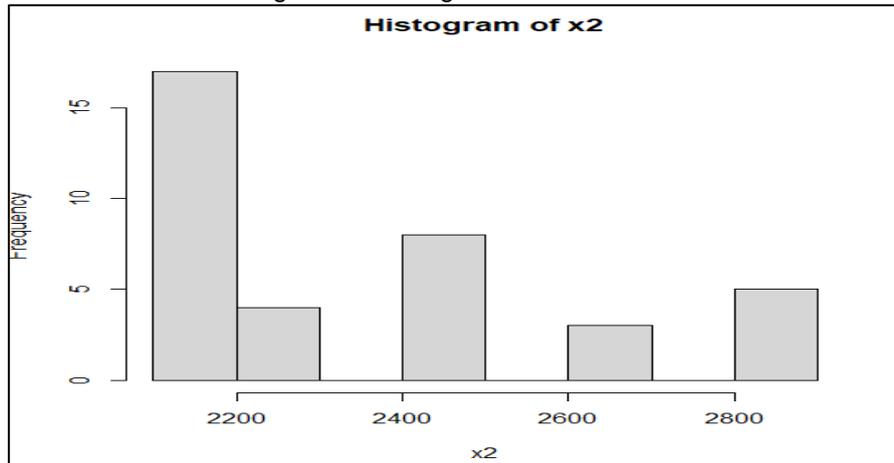
After the question "Assuming that the bicycle in the image above has an average market price (secondary/second-hand) between 2 thousand and 3 thousand reais, answer: how much do you believe this bicycle would be sold for?", 5 value ranges were assigned: between R\$ 2,000.00 and R\$ 2,200.00, between R\$ 2,201.00 and R\$ 2,400.00, between R\$ 2,401.00 and R\$ 2,600.00, between R\$ 2,601.00 and R\$ 2,800.00 and between R\$ 2,801.00 and R\$ 3,000.00. The mean value of the range was assigned for each answer provided.

Figure 1 – Histogram Scenario 1



Source – prepared by the authors

Figure 2 – Histogram of Scenario 2



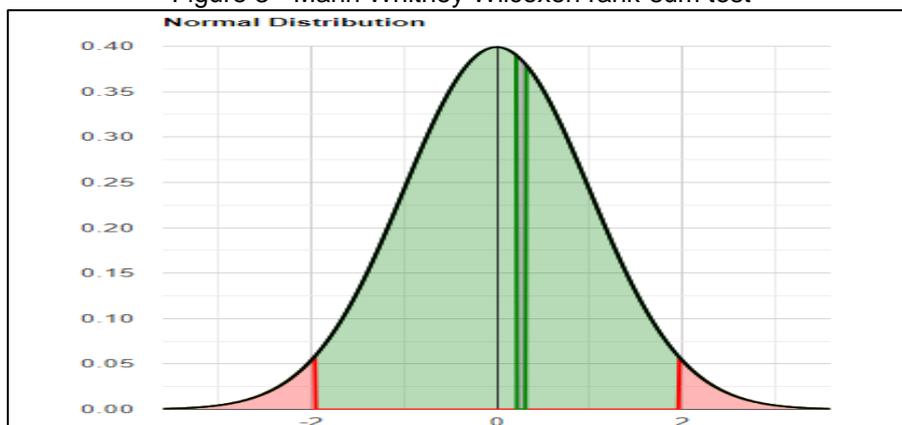
Source – prepared by the authors

In parametric statistical approaches, the analysis rests on samples whose distribution is close to normality, exemplified by the T and ANOVA tests. In contexts where this premise is not met, non-parametric alternatives are suggested, such as the Welch, Kruskal-Wallis and Mann-Whitney-Wilcoxon (MWW) test. This last procedure is based on the equalization of two independent data sets, of different sizes, through their independent classification, regardless of the set to which they belong. (SCHLEGER et al, 2021)

Both distributions have positive asymmetry, with "Skewnes" of 0.74 and 0.67, respectively, not meeting the normal conditions for performing a parametric test. We will opt for the use of the MWW test.

APPLICATION OF THE MWW TEST

Figure 3 - Mann Whitney Wilcoxon rank-sum test



Source – prepared by the authors

The p-value is equal to 0.7906. Given that the p-value is greater than the significance level ($\alpha = 0.05$), it is not possible to reject the null hypothesis (H_0). It is assumed that the



randomly selected value of the Group 1 population is equal to the randomly selected value of the Group 2 population. In other words, the difference between the randomly selected value of Group 1 and the randomly selected value of Group 2 is not large enough to be statistically significant. $U=1883.5$, within the acceptance region of H_0 . (1447.6424 : 2215.3576).

Effect size: The observed effect size is small (0.023). This indicates that the magnitude of the difference between the Group 1 value and the Group 2 value is small. The probability that a random value of Group 1 is greater than a random value of Group 2 is 0.51.

The survey results indicate that, among consumers with some experience, the visual layout used in online advertisements for used bicycles had a limited impact on the perception of value. Statistical analysis revealed that there was no significant difference in the evaluation of value between the different visual layouts tested. The respondents predominantly highlighted terms such as "used product", "second-hand" and "disposable income" in their justifications, indicating that factors related to the condition of the product and economic considerations prevailed over the elements of sensory marketing.

This finding suggests that, for this specific audience, in a virtual environment, the emphasis on tangible characteristics, such as the condition of the product and its history of use, surpassed the influence of visual appeal in the formation of the perception of value. Therefore, when targeting marketing strategies to savvy consumers, it is crucial to consider these practical elements that resonate most strongly with their concerns and expectations, as well as recognizing that in certain contexts, factors associated with usability and product history can play a significant role in the purchase decision.

Additional research can deepen this topic, including other market segments.

TESTING THE ROBUSTNESS OF THE T-TEST UNDER CONDITIONS OF NON-NORMALITY AND VARIABLE SAMPLES

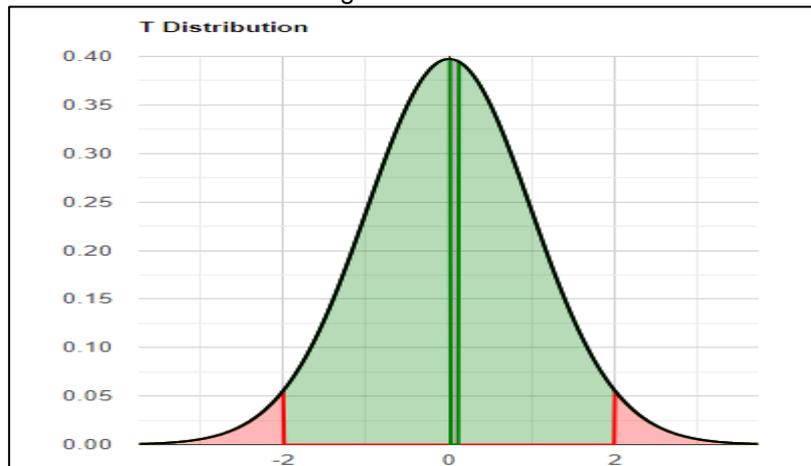
Carrasco and Lemes (2019) conducted a simulation study using the Monte Carlo method to verify the influence of sample size, level of test significance, data variability on size, and power of the hypothesis test for the mean with variance of the unknown population, known as the Student's t-test. Samples of six different sizes were generated and six different values were used for the mean, three different values for the variance and three different values for the level of significance of the test. Samples of sizes $n = 5, 10, 30, 50, 200$ and $1,000$ were used. The choice of these values was due to the fact that small, moderate and large samples were considered. The significance levels of the test were set at 0.01; 0.05 and 0.10, the most common in the statistical literature. The sample size did not influence the result, since even for smaller

samples, the sizes of the tests remained close to α . These results are observed for both the bilateral test and the unilateral right and left tests, concluding that the test size is close to the level of significance of the test for different sample sizes.

In the same way, Barros and Mazucheli (2005) observed that the values of the type I error rates of the Student's t-test and Wilcoxon behave in a similar way and are always close to nominal significance levels ($\alpha = 5\%$ and $\alpha = 1\%$), regardless of the sample size.

We will test the robustness of the T-test with the same parameters used in the MWW test.

Figure 4 – T-test



Source – prepared by the authors

The p-value is equal to 0.9455. Given that the p-value is greater than the significance level ($\alpha = 0.05$), it is not possible to reject the null hypothesis (H_0). The mean population of Group 1 is considered equal to the mean population of Group 2. In other words, the difference between the mean sample of Group 1 and Group 2 is not large enough to be statistically significant. T test = 0.06858.

Effect size: The observed effect size is small (0.014). This indicates that the magnitude of the difference between the means is small.

Under these specific conditions, the T-test presented results similar to those of the MWW test, indicating that it can maintain its integrity even under conditions of non-normality and sample size that may be inadequate to the required level of significance.

FINAL CONSIDERATIONS

This study explored the influence of sensory marketing on the perception of value of consumers of used bicycles in an online environment. The research revealed that while sensory marketing can play a significant role in shaping the perception of value, other factors such as



product condition and economic considerations can have a greater impact, especially among savvy consumers.

The results indicate that the emphasis on tangible characteristics, such as the condition of the product and its history of use, outweighed the influence of visual appeal in the formation of the perception of value. This suggests that when developing marketing strategies for savvy consumers, it's crucial to consider these practical elements that resonate most strongly with their concerns and expectations.

In addition, the results suggest that, in certain contexts, factors associated with usability and product history can have a significant weight in the purchase decision. This highlights the importance of a balanced approach to marketing, which takes into account both the sensory elements and the practical aspects of the product.

However, it is important to note that this study focused on a specific market segment - consumers of pre-owned bicycles. Therefore, additional research is needed to explore whether these findings apply to other market segments and different types of products, as well as to confirm the results presented here.

Finally, this study sought to contribute to the existing literature on sensory marketing, providing insights into how different factors can influence consumers' perception of value in an online environment. It is hoped that these findings can contribute to the formation of more effective and consumer-oriented marketing strategies.

The following IT tools were used to prepare this work: "R" software, available in <https://www.R-project.org>; and statistical calculator "statskingdom", available at <https://www.statskingdom.com>.



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