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Comparison of Customers' Visual Attention in the Online Shopping Process of Sports Products with a Neuromarketing Approach

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ABSTRACT

Background: Websites are one of the important interfaces in human-computer interaction. Therefore, finding the optimal structure and content of a website to attract the visual attention of customers has become one of the basic challenges of researchers, neuromarketers, and sports marketers. However, few studies have investigated the visual attention of customers during the online shopping process from sports websites. Therefore, the current research, employing an eye tracker, aimed to compare the visual attention of customers in viewing images and descriptions of online sports products.

Methods: Visual attention data of 65 participants (33 women and 32 men) with the two factors of fixation count (FC) and total fixation duration (TFD) while visiting two content elements of the Merooj sportswear website, i.e. images (without/with human models) and product descriptions (product name, sizing information and product price) were extracted. In the next step, the extracted data were analyzed through paired sample t-test.

Results: The results showed that the customers' visual attention was more on the product images rather than on the description. In addition, there was no difference between customers' visual attention to images without human models and images with human models.

Conclusions: From the results and analysis of the findings, it can be suggested to the company owners and designers of sports websites to optimize the content of their websites by presenting attractive images or using famous human models. Additionally, utilizing virtual simulation technologies and artificial intelligence in clothing display images in online shopping can enhance the customer experience and help them make firmer decisions.

KEYWORDS

Eye tracking, Human models, Sports Consumer behavior, Sportswear, Website optimization.

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Introduction

The world is entering a new era of connected global commerce. Hence, digital technologies connect consumers with companies worldwide. Understanding consumer minds and behavior has become one of the most challenging issues in this connected environment [1]. Consumer behavior focuses on cognitive and behavioral responses that occur before, during, and after choosing and consuming a product or brand [2]. Meanwhile, sports consumption refers to the consumption behavior that people use money to buy a variety of goods and services related to sports [3]. Sports consumers seek to satisfy their needs and desires through sports-related experiences [4]. It is, therefore, expected that the income of the sports industry will reach more than 680 billion US dollars by 2028 with an upward trend [5].

In addition, neuroscience has been utilized to analyze and understand consumer behavior. The combination of neuroscience and marketing has created a relatively young field of neuromarketing [6]. Neuromarketing techniques are divided into two methods. 1) Methods that are directly measured by observing changes in the electric and magnetic fields of the brain, such as Electroencephalography (EEG), Magnetoencephalography (MEG), and Transcranial magnetic stimulation (TMS). 2) Techniques that are measured indirectly by recording metabolic signs, such as Positron emission tomography (PET), Functional magnetic resonance imaging (fMRI), and biometric methods (including measuring physiological processes and measuring eye movements) [7]. It is worth noting that the interest in using neuromarketing techniques has increased [8], since the investigation of consumers' desires, needs and mood relies on traditional self-reporting techniques such as questionnaires and interviews [9]. Also, a large gap has been identified between the data collected using these techniques and what is going on in the minds of consumers [10]. In addition, most human decisions are made at the subconscious level, and it is very difficult to detect unconscious mechanisms with classical techniques [11].

It is worth mentioning that the most modern neuromarketing technique is the measurement of eye movements, which is usually called eye tracking [12]. Meanwhile, the eye tracking method has been used to analyze people's visual attention at the actual point of sale, when displaying advertisements and visiting the website [13]. Using eye tracking, researchers can analyze the subjects' eye movements to know exactly which part the subject focused their visual attention on at any given moment [14]. Fixation Count (FC) and Total Fixation Duration (TFD) are the main metrics of eye tracking, which respectively show how many and how long customers' eyes stay focused on an Area of Interest (AOI) on a website page [15].

Nowadays, services such as searching for information and shopping on the web have become the most common interactions of users with information systems. Users analyze and process information received through information systems [16]. It should be mentioned that among the theories of cognitive science, the information processing theory of George A. Miller [17] describes how people focus on information and how information is encoded in memory. Also, the understanding of the surrounding stimuli, placing the understood items in the memory, and retrieving the learned items from the memory are examined in this theory [18]. In online shopping, buyers do not have direct contact with physical products and decide what to buy based on the text and images displayed on web pages [19]. As a result, the content of e-commerce websites plays an important role in online shopping [20]. Website content can include product images, product descriptions, product prices, customer

reviews, sales ratings, color information, videos, logos, payment methods, delivery methods, FAQs, and any other creative element on a website [21]. But these elements do not receive the same visual attention [22]. For example, among the three content elements, i.e. brand name, discount rate, and product image, the product image attracts more visual attention [23]. The effect of website content on visual attention has been the subject of several studies in marketing and neuromarketing research. For example, the research results of Bucko et al [24] revealed that price is one of the most important factors for users in online shopping. Also, product images and descriptions can be considered as one of the most important evaluation criteria in online shopping. The research results of Peker et al [23] also showed that among the three main content elements in online banner ads, i.e. brand name, discount rate, and product image, the product image is the most attractive area. In the research of Xia et al [25], the price and image of the product were defined as factors that had an impact on consumers' first impressions of their search results. The results of the research by Adhami [26] also showed that in the online shopping review stage, the participants spent more time looking at pictures and prices compared to descriptions and content. Cortinas et al.'s research results [27] also indicated that buyers pay attention to more areas of the website for website exploration (recognition) than to perform online shopping tasks and the most complicated and time-consuming task for buyers is evaluating purchase options.

Examining the effect of website content elements on attracting the visual attention of customers can help to find the optimal structure and content of a website [28]. Internet researchers and marketers have also sought to find the optimal structure and content of a website to attract the interest and preferences of users from the very beginning of the website launch [29]. However, the web and the web user are dynamic, and the current successful structure and content of a website is no guarantee of continued success even in the near future. Therefore, the website should always be continuously improved based on the needs and wishes of the users [30]. In this regard, the visual behavior of customers has been investigated in different types of news, job, tourism, and shopping websites [31-34]. However, few studies have investigated the visual behavior of customers on sports websites [35]. Also, considering the development of online sports stores and the increase in daily interaction of people with sports websites, it seems necessary to examine the structure and content of these websites [36].

Furthermore, investigating customers' visual attention to different types of online products has been the subject of several studies in neuromarketing research [37,15,38]. However, many challenges regarding the visual attention of customers to the images and descriptions of online sports products remain unanswered. Therefore, according to the arguments mentioned above, the present research seeks to answer the following question. Is the visual attention of customers different when viewing images and descriptions of online sports products?

Material and Methods

Participants

By distributing a survey form online and in person at Shahid Chamran University of Ahvaz, a total of 65 students, 33 women (50.8%) and 32 men (49.2%) were selected to participate in eye tracking experiments. This sample size can be considered sufficient for laboratory eye tracking studies, which are generally performed with a relatively small sample size of participants [23]. In this study, all the participants had a similar familiarity with the Merooj website and based on the results of the survey, they used to buy from this website between 1 and 3 times a year. In addition, all participants were screened to ensure they had normal vision, no color blindness, or any other eye diseases. Forty-six

participants were between 18 and 22 years old (70.8%), 15 participants were between 23 and 27 years old (23.1%), and 4 participants were between 28 and 32 years old (2.6%). Also, the majority of the sample consisted of 55 undergraduate students (84.6%), followed by 8 master's students (12.3%) and then 2 doctoral students (3.1%). It is worth noting that the participants expressed their consent and voluntary participation in writing before the onset of the experiment. Similar research studies have also shown that students are valid subjects for analyzing attention processes on websites [38,15,7].

Measuring tool

The experiment was carried out in a quiet and fully controlled room in terms of lighting and movement. The equipment prepared in this room included a pair of moving eye tracking glasses (Pupil Labs Core, Pupil Labs GmbH, Germany), a 42-inch TX-P42UT30B screen with a resolution of 1920 x 1080 pixels, and two laptops (launched on a version of Windows 10). These devices were connected employing two HDMI cables. The eye-tracking device had a sampling frequency of 60 Hz and an accuracy level of 0.6 degrees. Moreover, Pupil Capture software was used to record the gaze data of the subjects in the face of visual stimuli and calibrate the eye tracking device. Pupil Player software was also employed to analyze the participants' fixation behaviour.

Stimulus

Stimulating materials in this research were online sportswear ads that were selected from the Merooj[1] brand e-commerce website. This brand is one of the most famous and widely used sports brands in the Iranian sportswear market, being able to compete with foreign brands, as well [39]. It is worth noting that the data of customers' gaze while visiting online sportswear ads were collected using eye-tracking technology on the product review page (4 rows and 3 columns); however, in the current research, the focus was on two rows. The researchers had several reasons for choosing these two rows. 1) These two rows were the first row and the last row on the product review page and research has shown that products of any particular quality and popularity are more likely to be purchased if they are placed in the bottom and top rows rather than the middle rows [40]. 2) These two rows provided the characteristics considered by the researchers to analyze the customers' visual attention, i.e. having/not having human models. T-shirts were also selected from different categories of sports products; since, T-shirts are popular clothing of different age groups and people prefer to wear T-shirts in many sports and non-sport situations [37]. The content of the website considered in this study consists of two main parts. 1) Product image that includes an image of clothing without a human model or an image of clothing with a human model wearing the Merooj brand. 2) Product description, including the product name, sizing information, and the price of Merooj brand clothing. These features can be seen in Figure 1.

[1]. Merooj, Inc., which means ant in Luri language, is an Iranian sports producer and brand of athletic shoes, clothing, and accessories. Majid Saedifar established the company. The company has headquarters in Andimeshk, Khuzestan Province, Iran.

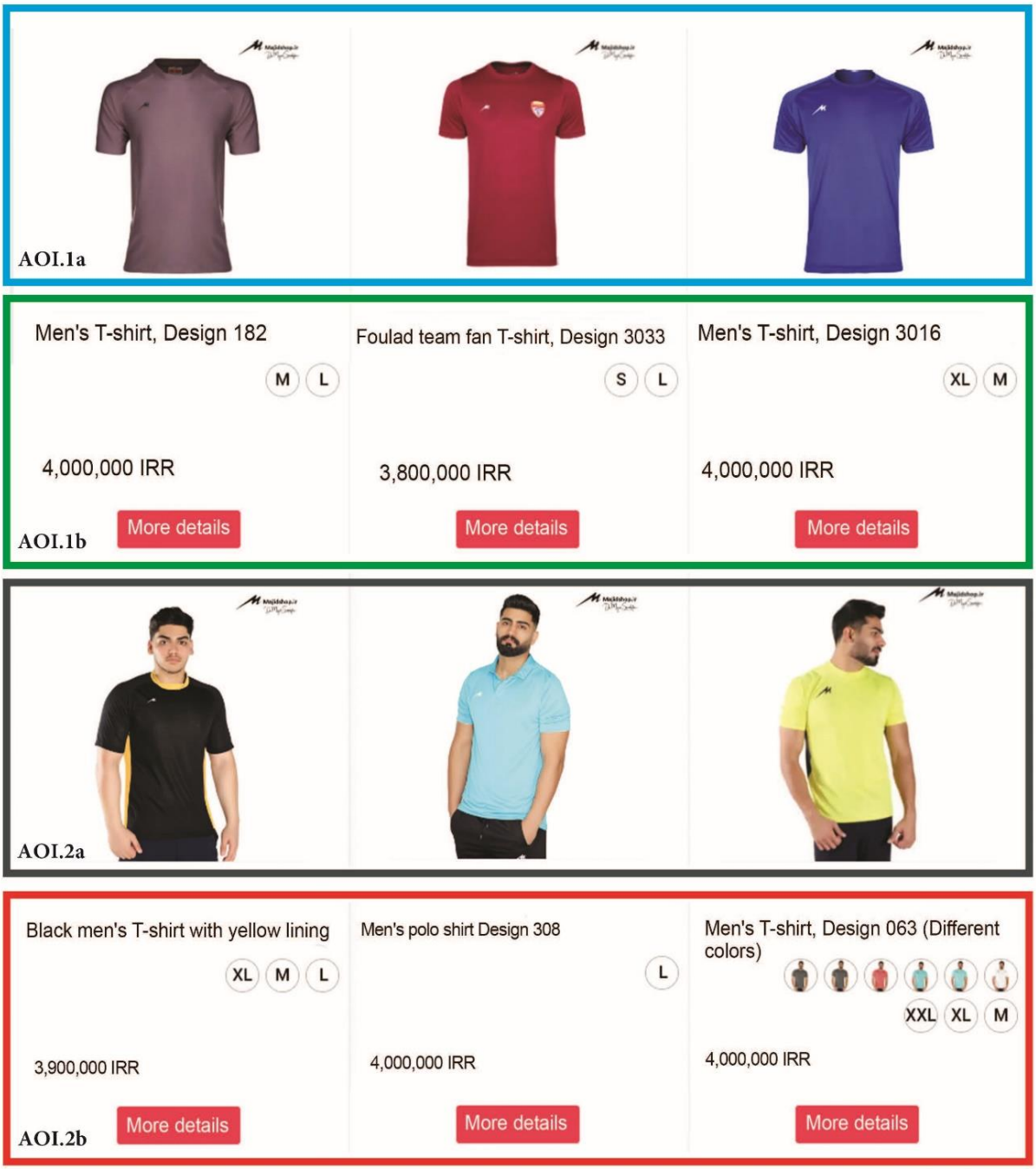

Figure 1. Images of Merooj sportswear. The areas marked in blue indicate images without a human model (AOI.1a). The green areas represent descriptions related to these images (AOI.1b). Images featuring a human model are marked in black (AOI.2a), and the descriptions associated with these images are displayed in red (AOI.2b).

Research implementation method

To compare the amount of customers' visual attention to the images and descriptions of online sportswear ads, experiments were designed using eye-tracking technology while customers visited online sportswear ads. The ethical principles of this study were approved by receiving code IR.SCU.REC.1403.002 from Iran's National Ethics Committee in Biomedical Research. Also, prior to the official tests, a pilot study was conducted with four participants in order to evaluate the tasks, environment, and test conditions. Then, a decision was made about the research tasks and the duration of each person's visit to the website page. The only difference between the pilot study and the formal

trials was that the researchers did not set any time limits in the formal trials, because according to the opinion of Meißner and Oll [41] and Boardman et al [42], it seemed that the concern created about time (time pressure) affected the customers' gaze behavior. Moreover, to ensure the natural fixation behavior of people on the presented website page, the real purpose of the experiment was hidden from the participants, and if necessary, according to the opinion of Modi and Singh [28], they were told that this experiment is condcuted to measure Pupil center dimensions. After completing the experiment, the participants were informed about the main purpose.

The eye-tracking experiments consisted of several steps. First, after each participant entered the test room, explanations about the test method and the eye-tracking device were provided. Participants were then seated in a height-adjustable chair about 157 cm in front of a 42-inch screen, their sitting position adjusted so that their eyes were directly facing the center of the screen. Next, the eye tracking device was placed on the eyes of the participants. Also, a five-point calibration process was performed for all participants to ensure that the eye tracker accurately records the participants' eye movements. When the calibration results were acceptable, the participants were exposed to visual marketing stimuli. It should be noted that to prevent the participants from initial fixation on a certain point of sportswear advertisements, the calibration process was performed on a separate internet page (e.g. a Google page).

In addition, according to Menon et al.'s [43] research, participants were asked to imagine that they were buying a T-shirt online (Research task). Thus, the participants searched for their favorite T-shirt by scrolling freely on the website page and add it to their shopping cart. While the participants were browsing the products online, their gaze coordinates were recorded. After participants finished visiting the website page, they were asked to complete a demographic profile form.

Visual data analysis

Customers' visual attention to AOIs was extracted based on data related to eye movements, i.e. fixation count (FC) and total fixation duration (TFD). FC represents the number of fixations in a particular AOI, and the higher the FC, the more eye-catching that area is for customers. TFD also indicates the total fixation duration, and its longer duration (based on milliseconds) means paying more attention to a region [23]. Also, AOIs are geometric areas, each of which has its own content, and are usually designed by drawing geometric shapes on visual stimuli before performing the experiment [44]. The AOIs defined in this study are displayed in Table 1.

Table1. AOIs defined in the product search page on the Merooj sportswear website

AOI	stimulus
AOI.1a	Images without human models
AOI.1b	Description of products without a human model (product name, size, and price)
AOI.2a	Images with human models
AOI.2b	Description of products with human models (product name, size and price)

Statistical Methods

Data related to people's visual attention (FC and TFD indices) were analyzed using IBM SPSS statistics v.24 statistical software. Paired sample t-test were utilized in order to compare the visual attention of customers to the images and descriptions of online sports products. Additionally, the alpha level was set at 0.05 for all analyses. Normality and homogeneity of variances were checked with Shapiro-Wilk, and Levene test, respectively.

RESULTS

The visual data of the participants were analyzed in the AOIs relevant to the images and descriptions of the products. As shown in Table 2, the average visual attention of customers (FC, TFD) in these areas is different from each other.

Table2. Descriptive indicators (mean (standard deviation)) related to the amount of visual attention of customers

Variable	VA	Female	Male	Total
AOI.1a	FC	6.73 (4.61)	9.50 (4.64)	8.09 (4.80)
	TFD (ms)	3078.35 (2164.85)	4444.54 (2437.32)	3750.94 (2386.32)
AOI.1b	FC	2.67 (2.56)	4.28 (2.58)	3.46 (2.68)
	TFD (ms)	1303.97 (1295.22)	1892.78 (1189.34)	1593.85 (1269.63)
AOI.2a	FC	7.33 (4.77)	8.91 (4.47)	8.11 (4.66)
	TFD (ms)	3826.50 (2836.23)	4276.73 (2340.67)	4048.15 (2593.71)
AOI.2b	FC	3.42 (3.49)	4.09 (3.56)	3.75 (3.51)
	TFD (ms)	1166.15 (1029.00)	1358.30 (936.84)	1260.75 (981.79)

FC= Fixation Count, TFD= Total Fixation Duration, VA= Visual Attention

To compare the average visual attention of customers (statistically) in the defined AOIs, the paired sample t-test was used. As shown in Table 3. The average FC and TFD of customers in the area of images without models were 4.63 and 2157.09 respectively higher than the average FC and TFD of customers in the area of descriptions of images without models, and this difference is statistically significant (FC: t (64) = 9.31, p-value<0.05, TFD: t (64) = 8.44, p-value<0.05). In the area of images with human models, the average FC and TFD of customers were 4.35 and 2787.41 respectively higher than the average FC and TFD of customers in the description area of images with human models, and this difference is statistically significant (p-value<0.05, TFD: t (64) = 9.15, p-value<0.05 FC: t (64) = 7.42). From these two findings, it can be concluded that customers pay more attention to product images (with and without human models) than product descriptions. It should be noted that no statistically significant difference was found between the visual attention (FC and TFD) of customers to images without human models and images with human models (FC, TFD: p-value>0.05).

Table3. The results of the dependent t-test related to the comparison of customers' visual attention

Variable	VA	Mean (Std. Deviation)	t	df	sig
AOI1a-AOI1b	FC	4.63 (4.01)	9.31	64	0.00
	TFD (ms)	2157.09 (2061.27)	8.44	64	0.00
AOI2a-AOI2b	FC	4.35 (4.73)	7.42	64	0.00
	TFD (ms)	2787.41 (2456.88)	9.15	64	0.00
AOI1a-AOI2a	FC	-0.02 (5.86)	-0.02	64	0.98
	TFD (ms)	-297.22 (3084.61)	-0.78	64	0.44
AOI1b-AOI2b	FC	-0.29 (3.74)	-0.63	64	0.53
	TFD (ms)	333.10 (1291.14)	2.08	64	0.04

FC= Fixation Count, TFD= Total Fixation Duration, VA= Visual Attention, *p < .05

Discussion

The current research aimed to compare the visual attention of customers in viewing images and descriptions of online sports products with the approach of neuromarketing. The results of the current research revealed that customers paid more attention to product image (with and without human models) rather than to product descriptions. This finding is in line with the results of Peker et al.'s [23] research that product images were the most attractive area for customers. In Xia et al.'s [25] research, consumers deciding to buy men's clothing were influenced by product images. However,

this finding was inconsistent with the research results of Hernández-Méndez and Muñoz-Leiva [33] in which travelers paid more attention to the text than images when booking hotels online. One of the possible reasons for this disparity is the effect of product type on visual attention processes [45], since studies have shown that the focus of attention of online consumers during online shopping may differ based on the types of products [46]. The type of product in the mentioned research is a service type and an experience product, while in the present research, the search product, i.e. sportswear, is used. It is also worth noting that online products are usually intangible and perceived through the visual system. Therefore, the visual aspect of the product and information related to its features are better conveyed through images, and the images provide a more comprehensive understanding of the product brand [47]. Thus, we concluded that customers paid more attention to product images than to product descriptions.

In addition, the results of this research showed that there is no difference between customers' visual attention to images with and without human models, while studies have shown that models are the product presentation features attracting the most attention on clothing websites [37,48,49]. This finding indicated that the human models of Merooj sports brand did not perform well in attracting the visual attention of customers. Additionally, the results of other studies have shown that human models can enhance the visual appeal of clothing images; however, they do not necessarily have a positive impact on customers' visual attention or their purchase intention [50]. This suggests that the presence of models may distract customers from the clothing itself and reduce focus on the product features [51].

What is more, advancements in virtual examination technologies have facilitated the simulation of clothing display on various body types without the need for a human model. In this regard, research by Momin et al [50] and Ghodhbani et al [51] indicated that advancements in artificial intelligence, particularly in deep learning and computer vision, have created realistic images of individuals wearing different garments. This technology allows customers, online retailers, and fashion designers to visualize how clothing look without the necessity of physical try-ons, providing a more engaging experience than static images. Furthermore, clothing selection systems enable users to virtually try on high-quality garments reducing reliance on human models and enhancing the online shopping experience. Consequently, these innovations not only increase the appeal of online shopping but also assist users in making better purchasing decisions.

Research indicate that consumers generally prioritize fit and functionality over the visual appeal presented by models [52]. Moreover, issues such as body diversity (various sizes and shapes) and the unrealistic portrayal of models can lead to feelings of alienation among potential customers [53]. In other words, when consumers perceive that models do not represent them or do not align with their physical characteristics, they may establish a weaker connection with the images. This sense of disconnection can negatively affect their interaction with the brand and influence their purchasing decisions [52]. Ultimately, while the presence of human models in images can enhance customer attention and improve the online shopping experience, this effect is not always positive. Various factors, including the model's appearance, physical attractiveness, and the model's relevance to the product depicted in the images can significantly impact on customer attention and their purchase intention [54].

Conclusion

The present research using the new method of eye tracking and by comparing the visual attention of online customers to the content of sportswear websites, helps to the literature of e-commerce, neuromarketing and sports marketing. Also, the results of this study revealed that on the product

review page and when evaluating purchase options, customers' visual attention is drawn more towards product images (with/without human models). These findings provide significant implications for company owners, website designers, and online store developers. For example, they can design their website according to the interests and preferences of users by presenting attractive images or using famous human models. This contributes to the beauty of the visual effects of the website and as a result attracts the visual attention of the customers. Ultimately, we recommend to utilize virtual simulation technologies and artificial intelligence in clothing display images to increment the shopping experience for customers and provide a more realistic feel for the products.

Limitations and Future Research

This study had several limitations that can be the basis for further research in the future. First, in the current research, only two content elements of the sportswear website, i.e. images and product descriptions, were examined. The study of other content elements such as product color, product location, customer reviews, brand logo, price, and discount rates can be investigated in future research. Secondly, the sports clothes of this study were selected from the first and last rows of the product review page of Merooj brand. It is, therefore, suggested to examine the visual behavior of customers in other brands, rows, and pages of the website. In addition, customers' visual attention in this study was only measured with indicators related to fixation behavior, i.e. FC and TFD. It is suggested that in the future, other indicators such as the sequence of changing eye movements from one area to another (saccades), time to the first fixation in an AOI, pupil diameter, and blink rate should be investigated. It is worth mentioning that the use of other neuromarketing tools as well as the use of other research methods in combination with neuroscience methods can help better understand the behavior of sports consumers.

Ethical Considerations:

Compliance with ethical guidelines

The author commits to adhering to ethical guidelines.

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Conflict of Interest

The authors declare no potential conflicts of interest.

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References

1. Sung B, Wilson NJ, Yun JH, Lee EJ. What can neuroscience offer marketing research? Asia Pacific Journal of Marketing and Logistics. 2020;32(5):1089-111. https://doi.org/10.1108/APJML-04-2019-0227

2. Funk DC, Alexandris K, McDonald H. Introduction to sport consumer behaviour. Sport Consumer Behaviour: Routledge; 2022;3-18. https://www.taylorfrancis.com/chapters/edit/10.4324/9781003092537-2/introduction-sport-consumer-behaviour-daniel-funk-kostas-alexandris-heath-mcdonald

3. Wang F, Zhou J, Fan C. Exploring the factors influencing public intention for spectator sports consumption based on grounded theory. Scientific Reports. 2024;14(1):8221. https://doi.org/10.1038/s41598-024-59049-9

4. Funk D, Lock D, Karg A, Pritchard M. Sport consumer behavior research: Improving our game. Journal of Sport Management. 2016;30(2):113-6. https://doi.org/10.1123/jsm.2016-0028

5. Statista. Sports industry revenue worldwide in 2022, with a forecast for 2028 [Internet]. 2024. Available from: https://www.statista.com/statistics/370560/worldwide-sports-market-revenue/#:~:text=In%202022%2C%20the%20industry's%20revenue,over%20680%20billion%20U.S.%20dollars.

6. Cherubino P, Martinez-Levy AC, Caratù M, Cartocci G, Di Flumeri G, Modica E, et al. Consumer behaviour through the eyes of neurophysiological measures: State-of-the-art and future trends. Computational intelligence and neuroscience. 2019;2019(1):1976847. https://doi.org/10.1155/2019/1976847

7. Bočková K, Škrabánková J, Hanák M. Theory and practice of neuromarketing: Analyzing human behavior in relation to markets. Emerging Science Journal. 2021;5(1):44-56. https://pdfs.semanticscholar.org/fa3f/7a4db8addb81c5feb4ea56674b7d357a392f.pdf

8. Peša A, Valčić M, Smokrović AM, Laura I. Overview of the Use of Eye-Tracking Technology for Monitoring Consumer Views. Naše gospodarstvo/Our economy. 2024;70(1):61-70. https://intapi.sciendo.com/pdf/10.2478/ngoe-2024-0006

9. Kant S, Yadete FD. Neuro-marketing in understanding consumer behavior: Systematic literature review. Radinka Journal of Science and Systematic Literature Review. 2023;1(1):1-13. https://doi.org/10.56778/rjslr.v1i1.86

10. Lombard W. Comparison of the importance of beef price labelling aspects: An eye-tracking approach. Heliyon. 2022;8(7). https://www.cell.com/heliyon/fulltext/S2405-8440(22)01071-4

11. Mansor AA, Isa SM. Fundamentals of neuromarketing: what is it all about? Neuroscience Research Notes. 2020;3(4):22-8. https://doi.org/10.31117/neuroscirn.v3i4.58

12. Scott N, Zhang R, Le D, Moyle B. A review of eye-tracking research in tourism. Current Issues in Tourism. 2019;22(10):1244-61. https://doi.org/10.1080/13683500.2017.1367367

13. Popa L, Selejan O, Scott A, Mureşanu DF, Balea M, Rafila A. Reading beyond the glance: eye tracking in neurosciences. Neurological Sciences. 2015;36(5):683-8. https://doi.org/10.1007/s10072-015-2076-6

14. Wang Y, Yu S, Ma N, Wang J, Hu Z, Liu Z, et al. Prediction of product design decision Making: An investigation of eye movements and EEG features. Advanced Engineering Informatics. 2020;45:101095. https://doi.org/10.1016/j.aei.2020.101095

15. Hwang YM, Lee KC. Using an eye-tracking approach to explore gender differences in visual attention and shopping attitudes in an online shopping environment. International Journal of Human–Computer Interaction. 2018;34(1):15-24.

https://doi.org/10.1080/10447318.2017.1314611

16. Zahedi Nooghabi M, Fattahi R, Salehi Fadardi J, Nowkarizi M. Analysis of usersâ Eye movementes and their capabilitiesâ role during Interaction with Website Interfaces. Iranian Journal of Information Processing and Management. 2022;37(3):979-1010.

https://jipm.irandoc.ac.ir/article_699691_en.html?lang=en

17. Miller, GA., A history of psychology in autobiography. 1nd ed. 1989, Stanford University Press. 8:390-418. https://doi.org/10.1037/11347-011

18. Çeliköz N, Erişen Y, Şahin M. Cognitive learning theories with emphasis on latent learning, gestalt and information processing theories. Journal of Educational and Instructional Studies in the World. 2019;9(3).

https://avesis.yildiz.edu.tr/yayin/b7a5a4ef-a206-40a3-9d57-24891a62903c/cognitive-learning-theories-with-emphasis-on-latentlearning-gestalt-and-information-processing-theories

19. Kim M, Lennon S. The effects of visual and verbal information on attitudes and purchase intentions in internet shopping. Psychology & Marketing. 2008;25(2):146-78.

https://doi.org/10.1002/mar.20204

20. Pallant JI, Danaher PJ, Sands SJ, Danaher TS. An empirical analysis of factors that influence retail website visit types. Journal of Retailing and Consumer Services. 2017;39:62-70.

https://doi.org/10.1016/j.jretconser.2017.07.003

21. Song J, Zahedi FM. A theoretical approach to web design in e-commerce: A belief reinforcement model. Management science. 2005;51(8):1219-35. https://doi.org/10.1287/mnsc.1050.0427

22. Wang Q, Xu Z, Cui X, Wang L, Ouyang C. Does a big Duchenne smile really matter on e-commerce websites? An eye-tracking study in China. Electronic Commerce Research. 2017;17:609-26. https://doi.org/10.1007/s10660-016-9237-4

23. Peker S, Menekse Dalveren GG, İnal Y. The effects of the content elements of online banner ads on visual attention: evidence from an-eye-tracking study. Future Internet. 2021;13(1):18. https://doi.org/10.3390/fi13010018

24. Bucko J, Kakalejčík L, Ferencová M. Online shopping: Factors that affect consumer purchasing behaviour. Cogent Business & Management. 2018;5(1):1535751.

https://doi.org/10.1080/23311975.2018.1535751

25. Xia H, Pan X, Zhou Y, Zhang ZJ. Creating the best first impression: Designing online product photos to increase sales. Decision Support Systems. 2020;131:113235. https://doi.org/10.1016/j.dss.2019.113235

26. Adhami M. Using neuromarketing to discover how we really feel about apps. International journal of mobile marketing. 2013;8(1):95-103.

https://www.mmaglobal.com/files/vol8no1/IJMM-Summer-2013.pdf#page=96

27. Cortinas M, Cabeza R, Chocarro R, Villanueva A. Attention to online channels across the path to purchase: An eye-tracking study. Electronic Commerce Research and Applications. 2019;36:100864.

https://doi.org/10.1016/j.elerap.2019.100864

28. Modi N, Singh J. Understanding online consumer behavior at e-commerce portals using eye-gaze tracking. International Journal of Human–Computer Interaction. 2023;39(4):721-42.

https://doi.org/10.1080/10447318.2022.2047318

29. Velásquez JD, Weber R, Yasuda H, Aoki T. Acquisition and maintenance of knowledge for online navigation suggestions. IEICE Transactions on Information and Systems. 2005;88(5):993-1003.

https://search.ieice.org/bin/summary.php?id=e88-d_5_993

30. Slanzi G, Balazs JA, Velásquez JD. Combining eye tracking, pupil dilation and EEG analysis for predicting web users click intention. Information Fusion. 2017;35:51-7.

https://doi.org/10.1016/j.inffus.2016.09.003

31. Simonov A, Valletti TM, Veiga A. Attention Spillovers from News to Ads: Evidence from an Eye-Tracking Experiment. Available at SSRN 3836531. 2023. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3836531

32. Mičík M, Kunešová H. Using an eye tracker to optimise career websites as a communication channel with Generation Y. Economic research-Ekonomska istraživanja. 2021;34(1):66-89.

https://hrcak.srce.hr/file/432972

33. Hernández-Méndez J, Muñoz-Leiva F. What type of online advertising is most effective for eTourism 2.0? An eye tracking study based on the characteristics of tourists. Computers in human Behavior. 2015;50:618-25. https://doi.org/10.1016/j.chb.2015.03.017

34. Beşer A, Sengewald J, Lackes R, editors. Drawing Attention on (Visually) Competitive Online Shopping Platforms–An Eye-Tracking Study Analysing the Effects of Visual Cues on the Amazon Marketplace. International Conference on Business Informatics Research; 2022: Springer.

https://link.springer.com/chapter/10.1007/978-3-031-16947-2_11

35. Green BC, Murray N, Warner S. Understanding website useability: An eye-tracking study of the Vancouver 2010 Olympic Games website. International Journal of Sport Management and Marketing. 2011;10(3-4):257-71. https://doi.org/10.1504/IJSMM.2011.044793

36. Goree S, Doosti B, Crandall D, Su NM, editors. Investigating the homogenization of web design: A mixed-methods approach. Proceedings of the 2021 CHI Conference on Human Factors in Computing Systems; 2021. https://doi.org/10.1145/3411764.3445156

37. Schröter I, Grillo NR, Limpak MK, Mestiri B, Osthold B, Sebti F, et al. Webcam eye tracking for monitoring visual attention in hypothetical online shopping tasks. Applied Sciences. 2021;11(19):9281.

https://doi.org/10.3390/app11199281

38. Li H, Che D, Yuan X, Li Y. Research on book shopping website interface based on the eye tracker. International Journal of Information Technology and Management. 2018;17(3):197-216.

https://doi.org/10.1504/IJITM.2018.092886

39. Moghadas M, Kalateh Seyfari M. Analysis of the impact of media on consumer attitudes toward the brand and purchaseintention (Case study: Sports apparel Manufacturer Majid). Communication Management in Sport Media. 2017;5(1):63-72.

https://journals.pnu.ac.ir/article_4433_25e6e9327393e4d632e5df397d29618b.pdf

40. Gidlöf K, Anikin A, Lingonblad M, Wallin A. Looking is buying. How visual attention and choice are affected by consumer preferences and properties of the supermarket shelf. Appetite. 2017;116:29-38.

https://doi.org/10.1016/j.appet.2017.04.020

41. Meißner M, Oll J. The promise of eye-tracking methodology in organizational research: A taxonomy, review, and future avenues. Organizational Research Methods. 2019;22(2):590-617.

https://doi.org/10.1177/1094428117744882

42. Boardman R, McCormick H, Henninger CE. Exploring attention on a retailer's homepage: an eye-tracking & qualitative research study. Behaviour & Information Technology. 2023;42(8):1064-80.

https://doi.org/10.1080/0144929X.2022.2059396

43. Menon RV, Sigurdsson V, Larsen NM, Fagerstrøm A, Foxall GR. Consumer attention to price in social commerce: Eye tracking patterns in retail clothing. Journal of Business Research. 2016;69(11):5008-13. https://doi.org/10.1016/j.jbusres.2016.04.072

44. Meißner M, Pfeiffer J, Pfeiffer T, Oppewal H. Combining virtual reality and mobile eye tracking to provide a naturalistic experimental environment for shopper research. Journal of Business Research. 2019;100:445-58. https://doi.org/10.1016/j.jbusres.2017.09.028

45. Luan J, Yao Z, Zhao F, Liu H. Search product and experience product online reviews: An eye-tracking study on consumers' review search behavior. Computers in Human Behavior. 2016;65:420-30.

https://doi.org/10.1016/j.chb.2016.08.037

46. Lee D, Hosanagar K. How do product attributes and reviews moderate the impact of recommender systems through purchase stages? Management Science. 2021;67(1):524-46.

https://doi.org/10.1287/mnsc.2019.3546

47. Wang Q, Yang Y, Wang Q, Ma Q. The effect of human image in B2C website design: an eye-tracking study. Enterprise Information Systems. 2014;8(5):582-605.

https://doi.org/10.1080/17517575.2014.925585

48. Boardman R, Mccormick H. The impact of product presentation on decision-making and purchasing. Qualitative Market Research: An International Journal. 2019;22(3):365-80.

https://doi.org/10.1108/QMR-09-2017-0124

49. Huang Y-T. The female gaze: Content composition and slot position in personalized banner ads, and how they influence visual attention in online shoppers. Computers in Human Behavior. 2018;82:1-15.

https://doi.org/10.1016/j.chb.2017.12.038

50. Momin S, Sinha RR, Rani R. Virtual Attempt On Human Body Utilizing Single Picture For Clothes. Journal of Survey in Fisheries Sciences. 2023;10(1S):6239-46.

https://doi.org/10.53555/sfs.v10i1S.2255

51. Ghodhbani H, Neji M, Qahtani AM, Almutiry O, Dhahri H, Alimi AM. Dress-up: deep neural framework for image-based human appearance transfer. Multimedia tools and applications. 2023;82(15):23151-78. https://doi.org/10.1007/s11042-022-14127-w

52. Zhu S, Mok PY. Predicting realistic and precise human body models under clothing based on orthogonal-view photos. Procedia Manufacturing. 2015; 3:3812-9.

https://doi.org/10.1016/j.promfg.2015.07.884

53. Minar MR, Tuan TT, Ahn H, Rosin P, Lai YK. 3D reconstruction of clothes using a human body model and its application to image-based virtual try-on. InProc. IEEE/CVF Conf. Comput. Vis. Pattern Recognit.(CVPR) Workshops 2020 Jun.
https://scholar.google.com/scholar?hl=en&as_sdt=0%2C5&q=53.%09Minar+MR%2C+Tuan+TT%2C+Ahn+H%2C+Rosin+P%2C+Lai+YK.+3D+reconstruction+of+clothes+using+a+human+body+model+and+its+application+to+image-based+virtual+tryon.+InProc.+IEEE%2FCVF+Conf.+Comput.+Vis.+Pattern+Recognit.%28CVPR%29+Workshops+2020+Jun.&btnG=

54. Tanner RJ, Maeng A. A tiger and a president: Imperceptible celebrity facial cues influence trust and preference. Journal of Consumer Research. 2012;39(4):769-83.

https://doi.org/10.1086/665412

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مقایسه توجه دیداری مشتریان در فرآیند خرید آنلاین محصولات ورزشی: با رویکرد بازاریابی عصبی

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چکیده

هدف: وب‌سایت‌ها یکی از رابطهای مهم در تعامل انسان و کامپیوتر هستند. بنابراین، یافتن ساختار و محتوای بهینه یک وب‌سایت برای جلب توجه دیداری مشتریان به یکی از چالش‌های اساسی محققان، بازاریابان عصبی و بازاریابان ورزشی تبدیل شده است. با این حال، مطالعات کمی به بررسی توجه دیداری مشتریان در فرآیند خرید آنلاین از وب‌سایت‌های ورزشی پرداخته‌اند. بنابراین، تحقیق حاضر با استفاده از ردیاب چشم، به مقایسه توجه دیداری مشتریان در مشاهده تصاویر و توضیحات محصولات ورزشی آنلاین پرداخت.

روش شناسی: داده‌های توجه دیداری ۶۵ شرکت‌کننده (۳۳ زن و ۳۲ مرد) با دو فاکتور تعداد تثبیت (FC) و مدت زمان تثبیت کل (TFD) در حین بازدید از دو عنصر محتوایی وب‌سایت پوشاک ورزشی مروژ، یعنی تصاویر (بدون/با مدل‌های انسانی) و توضیحات محصولات (نام محصول، اطلاعات سایزبندی و قیمت محصول) استخراج شد. در مرحله بعد، داده‌های استخراج‌شده از طریق آزمون t نمونه‌های زوجی تحلیل شدند.

نتایج: نتایج نشان داد که توجه دیداری مشتریان بیشتر بر روی تصاویر محصولات نسبت به توضیحات متمرکز بود. علاوه بر این، تفاوتی بین توجه دیداری مشتریان به تصاویر بدون مدل انسانی و تصاویر با مدل انسانی وجود نداشت.

نتیجه گیری: از نتایج و تحلیل یافته‌ها می‌توان پیشنهاد کرد که صاحبان شرکت‌ها و طراحان وب‌سایت‌های ورزشی محتوای وب‌سایت‌های خود را با ارائه تصاویر جذاب یا استفاده از مدل‌های انسانی مشهور بهینه کنند. علاوه بر این، استفاده از فناوری‌های شبیه‌سازی مجازی و هوش مصنوعی در نمایش نحوه پوشیدن لباس‌ها در خرید آنلاین می‌تواند تجربه مشتری را بهبود بخشد و به آن‌ها در اتخاذ تصمیمات قاطع‌تر کمک کند.

واژه‌های کلیدی
بهینه‌سازی وب‌سایت، پوشاک ورزشی، ردیابی چشم، رفتار مصرف‌کننده ورزشی، مدل‌های انسانی

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