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The Role of Product Involvement Level in Consumer Tendency toward Online Review

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***Abstract*—**The paper aims to clarify the relationship between product involvement level and consumer tendency toward online review. It proposes the products in two classes and examines the level of user attention and significant difference between attribute-based areas and experience-based areas in each category. It uses an eye-tracking experiment to simulate the experience of online shopping behavior in order to view the consumers' shopping behavior. Thus, a scenario was designed, and 23 participants were asked step by step to purchase some products and add them to their shopping cart. The fixation durations are used to examine the amount of visual attention of the user in each area of interest (AOI) determined considering two classes of high involvement and low involvement products, and paired sample T-test was used to examine the effect of the product's types on the online review content. The study results explained that users of high involvement products consider the attribute-based points more highly than the experience-based points.

***Keywords*—**High-involvement products, low-involvement products, attribute-based review, experience-based review, eye tracking, fixation duration.

I. Introduction

THE Internet, technologies and applications related to it changed the operations of the people's business and also changed the way of supporting the processes by the information systems, decision makings and competitive advantages of the business. Hence, many businesses are currently using business processes in web and creating creative applications in E-business [1].

One of the most well-known kinds of e-business includes the activities of selling the products and services to customers. Business to consumer (b2c) includes the highest number of entrants to the electronic business and this category includes the most successful activists in the international economic area, such as amazon.com, e-bay.com and friendsreunited.com in the international field and also digikala.com inside the country. Also e-bay.com and friendsrunited.com are active in the consumer to consumer (c2c) fields that collect the consumers together to meet the specific objectives [2].

Increasing number of computers, communications, transportation, and other technologies affects significantly the profit methods to customers and especially end consumers. Currently, all people have access to each other and to near and far things more than before and it shows the importance of the internet and internet marketing more than ever. Technical and technological advances have created new methods in order to recognize and keep track of customers and also to produce the goods and services according to the secondary needs of each one [3].

Luan et al. explore the users' online shopping behavior to purchase a few special products [4]. According to the type of products in the online environment, consumer's review is different. For example, if the product is a search product, its online review is attributing based and if the product is an experience product, its online review will be experience based. These types of online reviews include the positive or negative points provided by the consumers, the documents related to their feelings after the shopping and their experiences of different products. They can be classified into two categories; attribute-based reviews and experience-based reviews due to the nature of these types of reviews [5], [6]. Generally, an attribute-based review focuses on the reports of product's features and an experience-based review focuses on the reports of overall, emotional and mental assessments of products. Park et al. realized that the attribute-based reviews are more evoking than experience-based reviews, since attribute-based reviews provide more special and clear information to the costumers while the experience of a product may be different among people [7].

Mantel and Kardess believed that motivation and opportunity play a significant role in the information processing to determine the attribute-based or experience-based assessments in a certain condition. Product type is another factor that may be effective in this assessment [8]. Products are classified into two main categories based on the users who use them: consumer products and industrial products. Consumer products are those ones that consumer uses them for the final consume and marketers usually classify these goods into four categories based on how consumers decide to purchase them: comfortable, comparable, specific, and unfamiliar products. Consumer products in the online environment are classified into two categories: search-based and experience-based products. Paradigm classification of products into two categories of search based and experience based is one of the effective ways to show the internet as a marketing channel. Nelson believed that the first objective of the search-based/experience-based products is emphasized on the principle that whether consumers can compare the products or their features before purchasing them or not [9]. If you can realize the product features before purchasing it, it will be the search-based [10]. If you cannot realize the product features before buying it or after buying or consuming it, the product will be the experience-based [10]. Also, if a consumer concludes that emotions are enough to

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measure a product, the product will be then experience-based. Also, Day defines involvement as "the level of public interest in an object, or the centrality of an object in the consciousness of a person." Subjective involvement returns to the consumer's perceptions according to the needs, values and inherent interests in the product [11], [12].

Eye movements may show the psychological states and cognitive processes; therefore, an interface was used to record the other dimension of the user experience. This research planned to examine the visual behavior of the user to understand the type of online reviews of high involvement and low involvement products through the eye tracker. It is possible to examine the amount of attention and focus of each user on his interested areas in different parts of the websites using this device. These areas are called areas of interests (AOI). One can interpret the results easier by the eye-tracking raw data, such as data-related thermal maps [13].

II. Theoretical Backgrounds and Hypotheses

Different tools are used in order to examine the amount of consumer's subjective involvement in the various products. For example, Bloch has offered a scale to measure the amount of consumer's subjective involvement considering the cars [14]. Traylor and Joseph presented a general scale to be used in measuring the mental involvement in various classifications but it received some criticisms [15], [16]. Zaichkowsky suggested a 20 items scale which was mainly used. After a few years, her designed scale was reduced to 10 items [17].

Products are classified in to two groups in terms of subjective involvements: high involvement products and low involvement products. Products that are purchased only after many careful considerations are known as high involvement products. For example, we can point to the expensive products that were previously mentioned. Low involvement products are those which are purchased continuously by low attempt and thought since they have no deep effect on the user's lifestyle [18].

Many researchers consider the effect of product type as a mediating variable, in order to understand the process of product's online review by consumers. In the past ten years, researches have been famous in the field of understanding the behavior of consumers in online review [19], because this behavior is one of the main components to measure the products by the consumer and it can affect significantly the consumer's decision to purchase. Therefore, the several features of the online reviews of products such as the period of review [20], the amount of the review [19], the quantity of reviews [21] and the quality of the reviews were examined, so that online review by the consumer could be understood by them. But few studies were conducted on the field of the nature of the review. The nature of the review indicates the way that the consumer presents his idea through it. If the consumer describes the product, then the nature of the review will be objective and if he presents his experience about the product, the nature of his review will be subjective. In fact, the attribute-based review requires using knowledge and reviewing special features during the review of the products, and also comparing the brands features with each other. On the other hand, attitude-based review points to the use of public attitudes, public perceptions, overall assessments and almost few compares of the products with each other.

In recent years, neuromarketing has been changed into application of the neuroimaging techniques to sell the products [22]. Several companies are evolved to solve the problems of commercial marketing through providing the neuroimaging (especially through Functional Magnetic Resonance Image (FMRI)). Among these companies, we can name Brighthouse in the USA, Neurosense and Neuroco in the United Kingdom.

Participation in neurology methods can help to understand the behavior of consumer in the marketing area. Advantages of physiological measures in the last two decades have been considered [23]. For example, we can point to self-assessment measures conducted in the marketing research that totally depends on the ability and tendency of respondents to accurate report of the individual's attitudes and former behaviors [24]. Despite the vast potentials of neuromarketing, the first applications of the neuroimaging in the marketing literature merely focus on the brand and the consumer's behavior. For example, EGG was used in order to show the reactions of a person towards television advertisements. Young examined this question that whether specific times in advertising can help to develop the brand and pay attention to the brand or not [25]. Information and memory processing were the other fields of interest that Rossiter examined by EEG and showed specific visual emotions and also indicated that the fastest activation in the layers of frontal cortices in the left part of the brain can be diagnosed easier. The other tool that mainly used in the neuromarketing is the eye tracker that helps to understand the visual search of the people [26].

When searching a web page, one thing can be considered just at a certain time. This means that the behavior of the search naturally creates a hierarchy or sequence [27]. When users look at the web pages, they tend to look at the upper and left side of the screen. This search pattern is known as the Golden Triangle, or the f Shape Pattern. This pattern expresses that when browsing a website, the information included in the right side of the page is not noted. Also, data obtained from eye tracking have shown that users do not look at the bottom of a web page [27].

Eye tracking is a methodology that helps researchers to understand the visual attention. By eye tracking, you can get that where the users look at in a particular moment; also, you can identify the path that their eyes follow. Eye tracking involves several areas such as human factors, cognitive psychology, marketing and a wide range of human-computer interactions. In user experience research, eye tracking can help users to understand completely the user experience, even in situations that they cannot describe their experience.

Eye tracker is a tool that enables the user experience (UX) researchers to observe the position of the eye to understand where a person looks at. The unique capability of eye tracker to record and follow the eye while looking at stimulus provides a better understanding of how the visual system of humans operates. An eye tracker can be an effective tool which provides a detailed explanation and understanding of the eye movement

behavior of the person [27].

Considering the contents provided in this research, since consumers prefer to examine contents that can be compared with the product, they stare on certain points that can be observed by eye tracker. In conclusion, the hypotheses of this research are:

H1. There is a significant difference between the fixation duration of attribute-based areas and the experience-based areas of high involvement products in online research.

H2. There is a significant difference between the fixation duration of attribute-based areas and the experience-based areas of low involvement products in online research.

III. Methodology

An eye tracker was used in this research to examine the hypotheses. Some products were selected before the experiment in order to review the type of user's behavior in high involvement products. Martin classified the products into two groups of high involvement and low involvement products using Zaichkowsky's scale [28]. Part of the products is provided Table I.

According to the table provided by Martin products such as cell phone, sport shoes, wristwatch and sunglasses were selected as high involvement products for the consumer and toothpaste and hand washing liquid were selected as low involvement products [28].

TABLE I
Classification of Products Based on the Level of Involvement

Product	Books and magazines	Camera	Shoe	Jacket	CDs, albums and cassettes	Computer	Glasses
Level of involvement	Low	High	High	High	High	High	High
Product	Detergents and cleaning stuff	Jewelry	Watch	Letters and cards	Sports equipment	Musical instruments	Office Supplies
Level of involvement	Low	High	High	High	Low	High	Low

30 students were selected randomly from Shahid Beheshti University and participated in the process of the experiment. Due to unpredicted circumstances, including eye diversion of some of the participants, 23 students (14 males and 9 females) were diagnosed physically healthy. All of the 23 people were members of the studied website. They knew the web environment and had normal visual behavior. A 500000 Rials gift card was allocated to each of 30 participated users. Also, the age range of these people was 25 to 35 and all of them were post graduate students.

An eye-tracking experiment was designed to simulate the experience of online shopping behavior in order to view better and also record the behavior of consumers' shopping behavior. Thus, a scenario was designed, and the participants were asked step by step to purchase some products in the same price range and add them to their shopping card. Duration of the time considered to perform the steps of the scenario was dynamic and was different from 20 to 50 minutes.

In this research, the fixation durations are used in order to examine the amount of visual attention of the user in each AOIs determined (attribute-based and attitude-based) considering two classes of high involvement and low involvement products; it can be said that more fixation duration on each of the AOIs shows more attention amount in that AOI.

An eye tracking experiment in terms of the neurology perspective was conducted at the Institute of Cognitive Science and Brain of Shahid Beheshti University, in order to measure the visual behavior of users considering the type of products review in the online environment.

In this research, the experiment was conducted through a 20-inch monitor with a 768*1024 resolution. The brightness amount of the screen was 45 degrees, and the contrast was set to 20 degrees. The distance of the user from the monitor was 70 cm, the user was asked to sit comfortably on the chair.

Before starting the experiment, the main process of calibration was done through the eye tracker and then the user entered in the main process of the experiment. The eye tracker SMI RED250 was used to track and record the eye movements of the participants. This device is used in order to record the visual behavior and also to measure the amount of people's visual attention; the stimulus is provided on the monitor screen, and the recipient of infrared waves records the movements of the eyes at the time of watching the page at a speed of 250 Hz on the S. The Experiment Suit Scientific Premium software was used in order to design the experiment and provide the stimulus (fixed image, text, video, and web pages), IView was used to record the eye movements, and BeGaze was used in order to analyze the primary data. In this application, the amount of the viewer's attention towards different areas can be measured and compared by defined AOIs. Finally, the device provides some numerical outputs that can be analyzed using software such as SPSS.

This experiment was conducted in a room in the presence of the researcher and each user separately. The important point in this experiment is the absence of participants' control during the experiment. The researcher, after a brief explanation about the high involvement and low involvement products and the type of reviews about them, also ensuring the user's understanding of the concepts by the user, informed the user step by step in order to avoid misunderstanding.

IV. Data Analysis and Results

Before quantitative analysis of the data, Figs. 1 and 2 show the obtained heat maps in order to show the quality of the consumer's reaction to the types of review (attribute-based and experience-based) in the two categories of high involvement products and low involvement products.

Fig. 1 shows the heat map of the attribute-based points (high) and the experienced-based points (lower) of the category of high involvement products. As the figure shows, the red and yellow colors in the attribute-based points of this category of products are much higher than the same colors in experience-

based points. Therefore, it can be concluded from the heat map of this type of products that in high involvement products, the consumers are more possibly to consider the attribute-based points; as a result, the type of the online survey for the high involvement products will be attribute based.

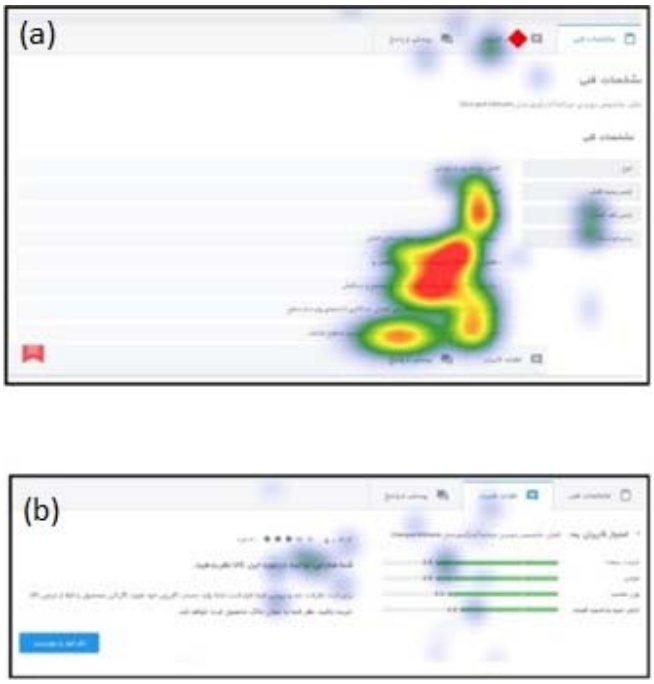

Fig. 1 Comparing the heat map of the attribute-based points (a) and the experienced-based points (b) of a high involvement product

Fig. 2 shows the heat map of the attribute-based points (high) and the experienced-based points (lower) of the category of low involvement products. As the figure shows, the red and yellow colors in the attribute-based points of this category of products are slightly more than the same colors in the experienced-based points.

Paired sample T-test was used to acknowledge the effect of the product's types on the review content. The results of the test of 23 contributors when purchasing the high involvement products showed that there is a significant difference between the fixation duration in the attribute based and experienced based points (t (22) = 9.344, sig = 0.000, M = 17193, SD = 8824). Also, considering the significant difference between the average fixation duration in the attribute-based points (M = 18990) and the fixation duration in the experienced based points (M = 1797), it was proved that the users pay more attention to the attribute-based points of the high involvement products and the first hypothesis of this study was confirmed. In other words, when the users search for high involvement products, it is possible to observe a significant difference between the fixation duration of the high involvement points and the low involvement points.

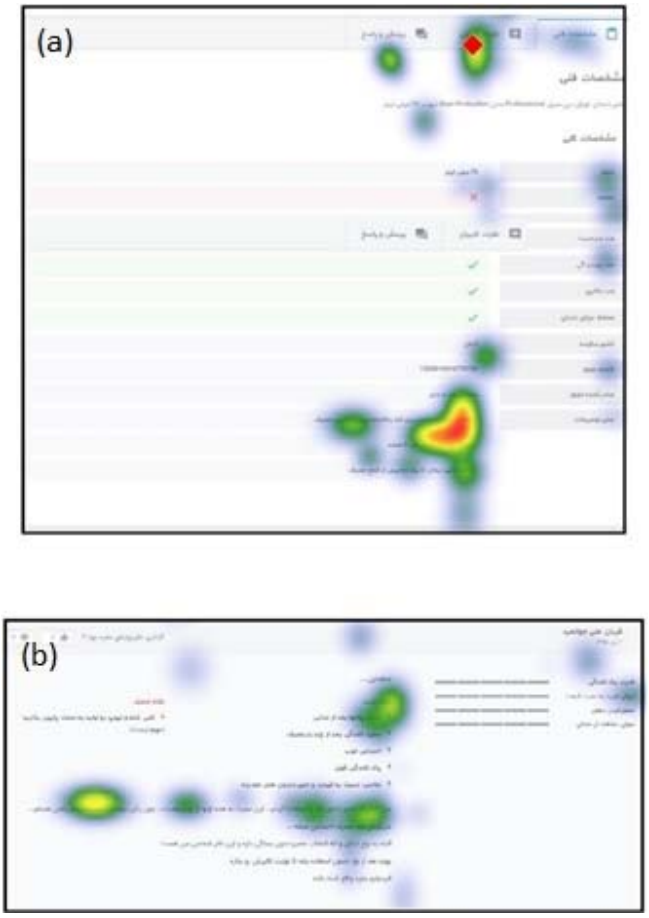

Fig. 2 Comparing the heat map of the attribute-based points (a) and the experienced-based points (b) of a low involvement product

The Paired Sample T-test was used to determine the significant difference between the fixation duration in the attribute based and the experienced based points for the low involvement products. After examining the results (t (22) = 1.195, sig = 0.245, M = 14291, SD = 57362), there was no significant difference in the obtained results. Therefore, the second hypothesis of this study is not approved. Also, a significant difference between the high involvement goods as an independent variable and the fixation duration of the attribute-based points and the experience-based points as the dependent variables were examined and the gender variable (men) was considered as a moderating variable. According to the data (M = 18151, SD = 9735, sig = 0.000, t (13) = 6976), there is a significant difference between the fixation duration of the attribute-based points and the experience-based points of high involvement goods in males, and the mean fixation duration in the attribute-based points of this category of goods in males is more than the mean fixation duration in their experience-based points. On the other hand, a significant difference between the high involvement goods as an independent variable and the fixation duration of the attribute-based points and the experience-based points as the dependent variables was examined and the gender variable (women) was considered as a moderating variable. According to the data (M

= 15704, SD = 7487, sig = 0.000, t (7) = 6292), there is a significant difference between the fixation duration of the attribute-based points and the experience-based points of high involvement goods in females, and the mean fixation duration in the attribute-based points of this category of goods in females is higher than the mean fixation duration in their experience-based points.

Considering the review content that is the experienced-based or the attribute-based review, the hypothesis of Schema Congruity Theory is that when the structured input information is matched with a brain storing pattern in a product, cognitive fitness will be created [30]. In this situation, the processing of schema-based information occurs and it can create the desired behavioral outcomes of the people. Therefore, it was assumed that consumers would review the attribute-based information when purchasing the high involvement products, and they will review the experienced based information when buying the low involvement products.

Traditional empirical methodologies such as self-report researches can hardly achieve an accurate answer from the consumer. But using mechanical tools, such as the eye trackers, can lead to get much more accurate information compared to other researches. These trackers provide accurate information about the points that the audience's eyes focus on and the fixation duration at these points. Therefore, the amount of user's attention to each point can be understood.

In this paper, an eye tracking device is used to testify the assumptions of the type of the product's review. The product type has a significant interactive effect on the type of reviews, which explains that the type of products can affect the behavior of consumer's search. In this research, we realized that at the time of purchasing low involvement products, either in experience-based information or in attribute-based information, the consumers tend to get more information in order to facilitate their assessment of such products. As a result, there is no significant fixation difference between the experienced based points and the attribute-based points of this type of products. When they are purchasing high involvement products, there is a significant difference between the fixation duration of the high involvement points and the low involvement points.

Considering the given reasons and the nature of the high involvement products and the attribute-based search, measuring the high involvement products through attribute-based search is easier for the user and it provides more information for the user to decide, as a result there will be more involvement and fixation. Thus, it can be concluded by assuming the Review-Product Congruity Proposition that: 1.The findings of the eye tracking data explain that the nature of the review contents affects the behavior of consumer's online searches. 2. The products and their type of reviews have a significant difference in salient effect. 3. Consumers of high involvement products tend to search the attributes of the products in order to measure the products and to make decisions; the eye-tracking data approved these all three points. 4. When reviewing the behavior of consumers of the low-involvement products, the type of review could not be determined according to the sample and the type of selected products. This conclusion can be considered as a result of the nature of the low involvement products. The exact answer requires more extensive researches.

The discovery of online consumer' search behavior through the effect of the type of the products has created a perspective for the researchers and the students. It showed that measuring and testifying the variables related to consumer's perception, both emotional and cognitive, may be difficult through empirical research, as unconscious activities may occur in the consumer's mind. The use of neurological, neuropsychological and neurotic methods will deepen on the perceptions toward the consumer's complex behavior. Thus, e-commerce managers can focus on defining the high involvement products, the low involvement products and their type of review on the online environment considering the high involvement products and their attribute-based review and also the low involvement products and complexity of understanding their type of review. Also, it is possible to provide attribute-based information with higher quality in order to manage the information better and to help the user in high involvement products.

The type of the products used in this research is subject to the limitations of this study. The other types of low involvement products could be used due to the disapproval of the second hypothesis. Two categories of products (high involvement products and low involvement products) were examined in this study. In the wider researches, the products can be categorized in other categories, such as social products and private products. On the other hand, it is recommended to classify the users into two beginner and expert categories and examine these categories. A questionnaire can also be provided for the products of this research and the user's behavior; its results can be compared with the results of this study. This study focuses on the examination of the user's behavior on the online retail e-commerce websites, and also reviewing the user's behavior on service websites as well as wholesaler websites.

V. Discussion and Conclusion

An e-commerce website aims at providing a flow of purchasing transactions. About 67% of e-commerce transactions are never done completely [29], and 60% of all users go to the liquidation process and they leave the transaction before completing it. The process and the tools used to make the transaction in order to improve the e-transactions, the web pages should be designed in such a way to help the users effectively in the process of purchasing. Unfortunately, only 36% of the customers are satisfied with their transactions on the Web. The rest will try to get better service through alternative channels such as the call centers, catalogues and the other online stores. As this information explains, the existence of extensive and accurate marketing research on these websites, categorization of the products available on these websites, as well as their types of review are very important.

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