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EXAMINATION OF CONSUMER PURCHASE DECISIONS VIA NEUROMARKETING METHODS: A SOCIAL PSYCHOLOGY APPROACH

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Abstract

The aim of the study is to determine the size and strength of consumers' attitudes towards brands and to observe the effect of marketing efforts on attitudes with the support of biometric data. Through this main purpose 406 people participated in the study to create a brand set, and 60 people participated in the experiment phase. The shopping processes were monitored via eye tracker, and the patterns based on groups were obtained.

It has been found out that sales promotion tools and social impact are the influential factors in the purchasing process, which is positioned as the main proposal of the study. According to the comparison made between parents and individuals not having any children, it has been discovered that the gender factor is not influential in the purchasing process while the brand related experience of parents is very effective in the process.

1. Introduction

According to "Digital in 2020 Report", there are approximately 4.53 billion internet users, corresponding to 59% of the world's population (wearesocial, 2020). These results show that with the transformative impact of technology, social media trends and the advantages of the online marketplace, online shopping is growing rapidly. And that seems to be ongoing for the next years. Over 75% of internet users report was made online purchases at least monthly (Clement- Statista, 2019). This explains the rapidly growing size of the e-commerce market, its increasing appeal to all consumer profiles, and the importance of taking a closer look at the digitized shopping experience.

With increased access to the Internet and diversified online applications, e-commerce can deliver products and services to consumers in nearly all segments. One of the most promising areas is infant products. The needs that parents seek over a period of time, changing and diversifying over time, lose their validity to the next baby as the child grows. Consequently, the search for consumers is restarting. Although there is a set of attitudes towards brands stemming from their previous experiences or existing reference framework, studies show that 70% of parents conducted an online research before buying baby care products (Grand View Research, 2020). The need for research, which is not so common across all product groups, stems from consumers' care and sensitivity to the topic.

Daniels (2009) therefore states that marketers should take initiatives to direct consumers to their particular brands. Surely, parents' satisfaction degree with the products they use and their trust in brands (Srivastava et al., 2015) serve as important shortcuts in their search for the information about a product. However, for consumers who do not yet have a product-oriented experience, the decision-making process can be shaped by many internal and external factors, from promotion components to trends, from the social impact of emotional content.

In this study, the resistance of the current attitude toward brands is studied through brand experience, promotional activities and social impact. In experimental design customized at the individual level, attention levels of the participants are considered as a scale to determine the weight of the factors in the decision-making process via eye-tracking method.

In the first part of the study, online purchasing behaviour, sales development efforts, eye tracking as a Neuromarketing instrument and the concept of social impact are detailed. In the next section, information is given about the experimental design, consisting of the preparation and implementation stages, and finally, the findings are discussed in detail in the last section of the manuscript.

The contributions of the research to literature are as follows:

- According to consumer profiles, the experiment set has been customized for each participant and evaluated on the basis of the group he/ she was included. Thus, the power of manipulation was increased and a unique search design was created.
- The importance of social impact in online shopping has been studied for a long time under the eWOM title. This study approaches the subject from a different perspective, revealing that the power of social impact has decreased considerably in the face of brand experience.
- In general, it is observed that studies of baby care products approach from a mother's point of view, as one of the potential caregivers (Pradeepa & Pandurangan, 2016). The results of our research indicate that there is no behavioral change related to gender among parents.

The contribution of the research for practitioners is as follows:

- The product review and the purchase decision were reviewed on an individual basis and behavioral patterns of this period were also determined. Thus, it can be predicted how attention can be created and directed if the data obtained and target audiences overlap.
- Our study shows that the experience for the brand has completely changed the whole shopping process. The considerably shorter shopping time and the extremely low level of attention to stimuli promise new clues about the ways to reach customers in this group.

2. Literature Review

2.1. Online Shopping and Sales Promotion Efforts

Sales promotions; is the whole of the activities conducted to increase the sales power of the company and its intermediaries. Sales promotion activities, which are usually planned in the short term, are not meant to change or create a long-term attitude. The focus is to encourage consumers to buy many different types of products or services in the planned period.

Due to the increasing competition in the market and the increasingly homogeneous production capabilities of businesses, it is becoming more and more difficult for consumers to make a choice between products and services or to distinguish between brands. Meanwhile, research shows that consumers are gradually losing brand loyalty, as in many other issues (Casteran, et al.,2019). In addition, researchers believe that approximately 80% of customer purchasing decisions occur in a store environment (Gorji and Siami, 2020). For this reason, efforts to stimulate and encourage consumers at the point of sale are becoming increasingly important every day.

Rising interest in online shopping sites has increased competition as well. Digital sales channels also take advantage of the power of the brands they sell and their sales promotion efforts to survive in this highly competitive environment. However, sales promotion activities cover a substantial proportion of the marketing budget.

For this reason, in order to follow an effective strategy, marketers should examine consumer behavior more closely, understand implicit triggers and make regulations that can address them (Yahya et al., 2019). This can be possible by understanding both the current attitudes of consumers towards brands and their behavioral patterns during shopping.

2.2. Brand Attitude

The concept of "attitude", one of the most fundamental elements of behavioural science, is defined as the tendency to shape a pattern of behavior towards any stimulus (Eagly ve Chaiken, 1993). The concept of attitude is one of the most studied subjects in the field of social psychology, which attaches great importance for the purposes of understanding, predicting and guiding human behavior (Petty et al.,1997).

One of the generally accepted issues about attitudes is that they have affective, cognitive and behavioral dimensions (Petty et al., 1997; Bagozzi ve Burnkrant, 1979; Rosenberg ve Hovland, 1960). These dimensions are attitudinal dimensions that ensure succession and cause psychological stress if they are not compatible (Festinger, 1962). However, not all attitudes may have these three dimensions at the same time, or all dimensions of an attitude may not have the same strength (Krosnick and Smith, 1994). Krosnick and Smith (1994) mention ten dimensions (extremity, intensity, certainty, importance, knowledge, accessibility, direct experience, evaluate-cognitive consistency,

latitude of rejection and noncommitment and interest in attitude-relevant information) in their study. Knowing which dimensions of attitudes are strong is essential in developing strategies for persuasion for attitudinal change. For this reason, marketers need to take into account the power of their target audience's attitudes and the resistance to change created by this power in their communication strategies that aim to change or reinforce an attitude.

2.3. Online Social Impact

In addition to the attitudes that shape the behavior of consumers at the individual level, their social interactions with the society they live in can also cause immediate and powerful changes (Amblee and Bui, 2011). One of the most distinguishing characteristics of human beings is being social. According to Durkheim (2014), human beings, who are thought to live in communities in order to survive, have found and even diversified ways to communicate with their own species thanks to this need. The relationship of the individual with the society he/ she lives in is accepted as a two-way communication method. The flow from society to individual has a great impact on individual behavior. Social impact, which is the basic dynamics of social psychology is defined by Aronson et al. (2012) as "the effect of what other people say, actions or just their presence has on our thoughts, feelings, attitudes or behaviors". The concept of social impact that social psychology tries to make sense of; it is fed by many human motivations such as compliance, social acceptance, social cognition (the need to be right), social communication, and self-esteem. In this study, the social impact type, which is examined under the title of eWOM (Electronic Word of Mouth) and has an important determinant in online purchasing behavior, was investigated and evaluated in line with the "perceived information effect" factor.

The information effect, at the heart of which is the need to be sure of people's own feelings and thoughts; is an effect that comes into play when the uncertainty is at a high level or when people act indecisive due to social conflict. According to Hogg and Vaughan (2009), the effect of knowledge will cause real cognitive change because it is not an effect that one fears, hesitates or adapts to others in order not to be seen in the society, but because it is an effect that is valuable and internalized because it is voluntary. Since sales development efforts are aimed at changing attitudes in this way, the determinant of the social impact on online consumer behavior becomes even more important.

2.4. Neuromarketing

The consumer concept, which is the focal point of today's marketing approach, is beyond the definition of Bennett et al. (2010) “Homo Economicus” definition (an individual who has full knowledge, can think of the future and act accordingly, can form rational and unbiased ideas and act rationally in the face of product presentations). The new consumer is a profile that performs emotional and cognitive processes, shapes behaviours accordingly, and frequently makes decisions that cannot be considered rational. This change in the rational consumer pre acceptance directly affects the marketing field in a number of ways. Indeed, the comprehension, interpretation and prediction of consumer behaviour require knowledge of the consumer at an almost individual level, given the cognitive processes underlying the behaviour. This difference between the actual results of marketing strategies and the desired effect on the consumer; gives the impression that we should examine consumer behavior in the light of the cognitive and physiological processes of the human brain more closely.

Neuromarketing, that first applications date back to the 1960s (Solnais et al., 2013), but as a term, which was introduced to the field in 2002 by Ale Smidts (2002), promises great hope of achieving the stated goals. It is believed that this approach enables the researcher to collect data independently of the self-report of the individual and can provide significant benefits in enlightening consumer behaviour. Neurophysiological methods utilized under the title of Neuromarketing; are used for detecting many cognitive processes such as emotion recognition, cognitive load, attention, arousal, learning, and memory. One of the most widely used methods in the area of Neuromarketing is eye-tracking systems. Eye-tracking systems are used to investigate the phenomena such as; attention (Mañas Viniegra et al., 2020), the cognitive load (Wang et al., 2014), engagement and avoidance (Bercea, 2012), and emotional arousal (Lim et al., 2020). These devices have gained an important place in the field of Neuromarketing, with their more affordable costs compared to other devices, and the ability to measure and interpret simultaneously.

3. Current Study

The purpose of the study is to identify the strengths of attitudes and to be able to observe the influence of sales promotion factors and social impact on current attitudes. The objective is to look closely at the factors that influence consumer decision-making processes. Attention levels towards stimuli were analyzed via an eye-tracking system, one of the Neuromarketing methods, in order to reflect the experience during the shopping, to investigate different patterns belonging to the groups, and to make an evaluation free from the statements of the participants. Research; consists of pre-study, pre-test and experimental stages. Preliminary work is called "preparation" as it is about the creation of sets of brands to be used in the experiment, and "application" as the pre-test and experiment are the processes applied together. Since more than one method of research is used in the preparation

and application steps, the steps will be detailed one by one in that direction.

3.1. Pre study

The eye-tracking method can provide more effective results in designs with higher emotional valence (Maughan et al., 2006). For this reason, baby care products, which can be perceived as a "positive image" for the participants in widespread, were determined as the area for the brand set. In order for the participants to have an attitude towards the brand, the brands to be used in the research must be known by all the participants who will be involved in the experimental phase, that is, the cognitive dimension of their attitudes must be present. For this reason, a preliminary study was carried out in order to select the brands with the highest awareness in the categories to be specified and to create a brand set in this direction. The questionnaire, entitled "Baby products brand awareness study" and containing only one statement, was developed and distributed in the digital environment. The study, with 406 participants, identified a total of 18 brands across 6 product categories (Table 1).

Table 1. Product Categories and Brands

Infant formula	Bebelac	Aptamil	SMA
Baby care and safety products	Weewell	Philips Avent	Braun
Diapers	Huggies	Prima	Molfix
Toys	Disney	Fisher Price	Kanz
Baby feeding products	Wee Baby	Bebedor	Philips Avent
Shampoos	Sebamed	Johnson's baby	Dalin

In order to test the differences between the dimensions of current attitudes (cognitive, emotional and behavioral), the sample was selected to include two different groups. The first group consists of individuals who have children at the age of 10 years at most (due to the decrease in strength of attitudes over time) and the second group consists of individuals who do not have children. Within the scope of the research, it is the assumption of the research that the effect of sales promotion efforts for the first group and the information effect and social impact of the second group will be more important and the attention levels of the individuals will improve in this direction.

3.2. Design of the Online Shopping Website

In order to give the participants a sense of reality, the contents of the online shopping sites were examined and the identified structures were included in the website created for the study. Using www.wix.com, a free personal or commercial website creation platform, a suitable design for baby products was selected from ready-made templates. As can be seen in Figure 1, a special logo study was made for the site to increase credibility, social media accounts were opened, a review mode was added products, and product categories and contents (Figure 2) were prepared. No time constraints or budgets were defined in present study. Considering credit cards and similar alternatives, it is not possible to talk of strict limits for each purchasing process in everyday life. For this reason, such a determinant was not used in the study to avoid impeding emotional and impulse purchases by consumers. In addition, since it was foreseen that the budgets that would be perceived at low or high levels would direct the participant to the price without examining the product, no guidance was given to the participants in this respect.

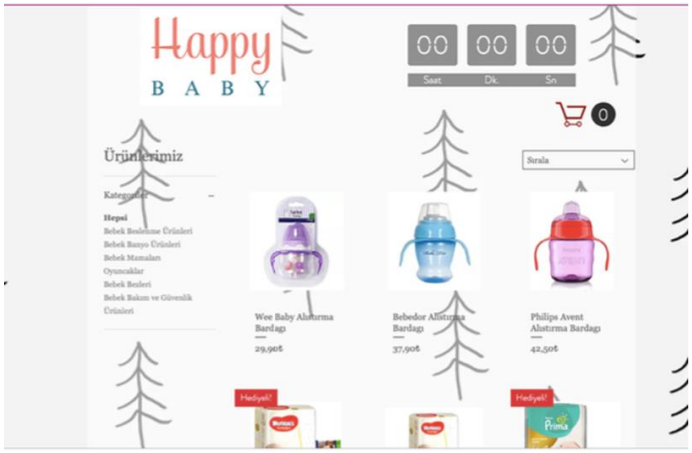

Figure 1. Happy Baby Main Page

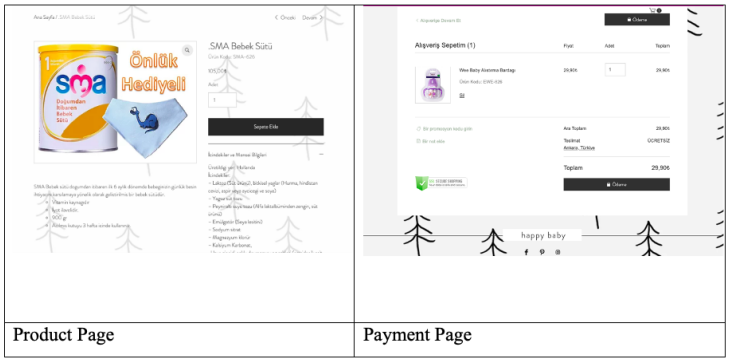

Figure 2. Happy Baby Product Page and Payment Page

4. Method

Sales promotion tools in the study include gifts and discounts. At this stage, the critical issue for research is the distribution of individual products to different products in order to measure the effectiveness of the indicated stimuli on the purchasing decision. For example; In the pre-test phase, the stimuli were distributed in the opposite direction for the participant who listed his favorite diaper brands as Prima (1), Huggies (2), Molfix (3), sales improvement tools or user comments were randomly selected from pools of positive and negative comments to encourage them to buy Molfix.

Figure 3. Representation of Target Stimuli and Hiding Other Alternatives

Adobe Photoshop package program was used in the editing of all selected images at 1920x 1080 resolution. All product visuals were rearranged to not contain a message that would have any effect other than the stimuli determined within the scope of the study. Examples of the arrangements made to neutralize the images are given in Image 4. Afterwards, sales promotion elements (gifts and discounts) were positioned on the images (Figure 5).

Figure 4. Editing Process

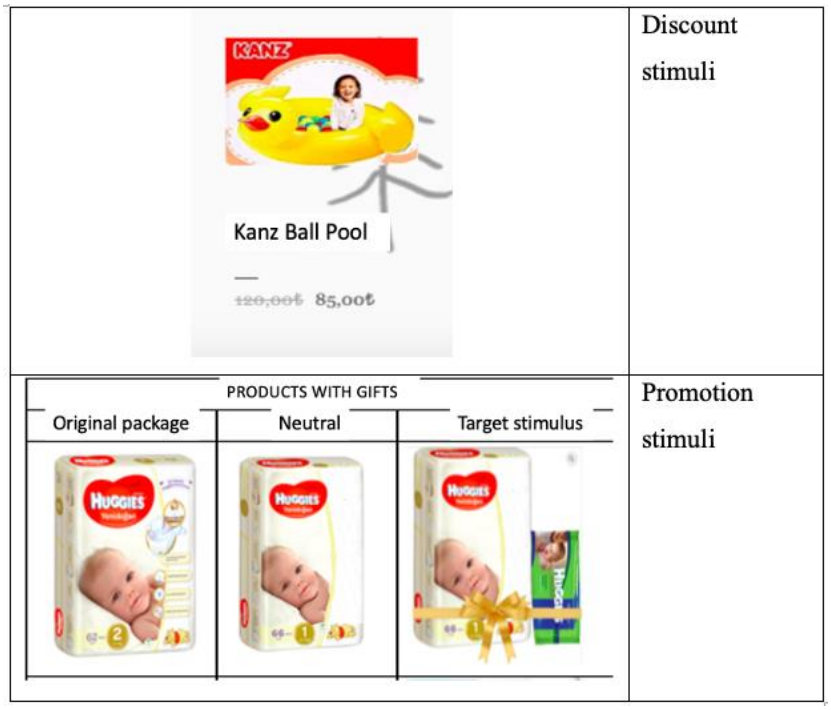

Figure 5. Sales Promotion Stimuli Distribution Example

For another stimulus, social impact, real consumer reviews of brands have been compiled from national complaint sites. In order to contribute to the realism of the process, the spelling mistakes made in the user comments were used without correction.

Table 2. Social Impact Stimuli Examples

Braun	Positive Comments: - I didn't think it would be that right, but it really measures it right. (name) - Really good. (name) - I would definitely recommend it to families with children. You know, they get sick often, especially when they start school. The biggest problem with non-contact thermometers is measurement errors. God forbid a wrong measurement can also lead to wrong treatment. So don't worry about the price, buy Braun, the brand we have trusted for years. (name)	Negative Comments: - Braun thermometer error! It broke down on its own! It was in the drawer I haven't even used it yet. The service is not available in any way. The global website redirects you to nonsense places. No interlocutor, disgrace! (name) - Total regret! Do not buy it. (name) - The product has been out of calibration since the first time I used it. It never measures right. Unprecedented product quality from Braun. When we have to measure, we add another 1.5 degrees and then we understand the real value! My neighbour also bought it, he has the same problem. I definitely do not recommend it, it is a pity for your money. (name)

Finally, the products were associated with their product categories and the areas of interest (AOI) was determined. The order of the products was randomly created by the system in each experiment so that the order of viewing the products would not be affected by the participant's familiarity with the brand's logo.

4.1. Pre-Test

According to Krosnick (1993), the resistance of the attitude to change will be the higher the dimensions that constitute the strength of the attitude. Based on these data, the strength of the emotional dimension of the attitude in the study; was evaluated in terms of "extremity" and "direct experience". In this context, a pre-test was applied to each of the participants before the experiment. The pre-test consists of two statements to measure the specified power dimensions. First, it is the issue of the extent of the extremity that is asked to participants using an ordinal scale. The brands were presented with their logos and participants were asked to rank the most preferred brands amongst the least liked. The second statement is about the other power dimension, experience. The same brands were given again with their logos and the participants were asked to mark the products they have purchased or used before. The stimuli used in the experiment were positioned specifically for the participant in accordance with the pre-test results, and it was investigated whether the stimuli given and attitude could be changed.

4.2. Experiment Phase

The answers given by the participant to the pretest were quickly resolved by the researchers. It was updated with the products on the website and the stimuli to be used for each participant. The distribution of the stimuli was carried out in accordance with the matrix shown in Table 3.

In the table; the most liked brand by the participant was indicated as "1" and the least liked brand as "3". Fields marked with neutral indicate situations where no stimulus was used. The fields marked with positive indicate the use of a positive stimulus (gift, discount or positive user comment), while the fields defined as negative indicate negative user comments. In order to assess the effects of stimuli in the process separately, a positive stimulus was preferred in some products, and two positive stimuli were preferred other products. Again for the same purpose; two kinds of stimuli were used together for diapers and formula. While there were gifts in the number 1 and 2 brands of the diapers, there were no gifts in the number 3, which was the least favorite brand of the participant. However, the only positive comment was for number 3. Within this category, it was aimed to compare the impact of the sales promotion tool with the social impact. In the last category (infant formula), there were gifts for all brands, but only in number 3 (the least preferred), positive user comments were given. This positioning was designed to monitor the attention paid to positive user comments and determine their impact on the decision. Based on the explained matrix, it was ensured that the combined and distinct effects of the stimuli used were observed.

Table 3. Stimulus Distribution Matrix

	Categories	1	2	3	Stimulus Type
1	Toys	Neutral	Neutral	Positive	Discount
2	Shampoos	Neutral	Positive	Positive	Gift
3	Baby care and safety products	Negative	Neutral	Positive	Social Impact
4	Baby feeding products	Negative	Positive	Positive	Social Impact
5	Diapers	Positive	Positive	Negative	Gift
		Negative	Negative	Positive	Social Impact
6	Infant formula	Positive	Positive	Positive	Gift
		Negative	Negative	Positive	Social Impact

After the products and stimuli on the website were updated, the participant was taken to the room where the experiment conducted. In order to minimize environmental impact, the room temperature was kept constant and no noise was allowed to distract the participant. Since the device used in the experiment was a wired eye tracker, the participants were positioned at a distance of 45 cm from the computer screen, by asking them to avoid body movements as much as possible. In order to prevent the eye tracker from being affected by ambient light, ground lighting was preferred in the room where the experiment was conducted. The eye tracking device used in the experiment was the 150 Hz Gazepoint GP3 HD Eye Tracker system. Before starting the experiment, a calibration process was carried out for each participant and in this way, the performance of the device was kept under control. Before the experiment started, the participants were asked to buy a product from each category, and no other guidance was given regarding the process. For each participant, the experiment ended as soon as he received the final product. The data collected with the eye tracker were analyzed in different analysis types using the device software. Eye movements of all participants; focus times, gaze maps, gaze sequences and saccades were collected to be analyzed. The viewing times and sequences of the determined research areas (AOI) were again taken by the software of the device and classified on an individual basis for statistical analysis. Eye movements of the participants in groups (with and without children) and gender level were analyzed with heat maps.

5. Findings

5.1. Pre-Test Results and Characteristics of the Sample

The pre-test was applied to all participants to take part in the experience. In the study, in which a total of 60 people participated, those who had children were named as the "first group" and those who did not have children as the "second group". The average age of 30 people in the first group is 35. The youngest of the participants in this group is 24 years old and the oldest is 45 years old. This group consists of 17 women and 13 men. In the second group, the youngest participant is 18 years old and the oldest participant is 45 years old. The average age of this group is 25. This group consists of 14 women and 16 men. Participants whose demographic characteristics were specified were asked to rank the brands in the experimental set according to the ones they liked most, within the scope of the pre-test conducted before the experiment. The data obtained as a result of the frequency analysis performed are given in Table 4. Unlike the second group, the participants in the first group were also asked about their experiences with brands. The results of these expressions are also given in Table 4.

Table 4. Brand Valuation and Brand Experience Frequencies

	Group No 1				Group No 2				Brand Experience	
	Brands	1	2	3	Brands	1	2	3	Brands	Frequency
1	**Prima**	20	3	7	**Prima**	23	2	5	Prima *	24
2	Molfix	3	13	14	Molfix	5	20	5	Molfix	15
3	Huggies	7	14	9	Huggies	2	8	20	Huggies	23
4	**SMA**	15	8	7	SMA	6	8	16	SMA	20
5	Aptamil	13	5	12	**Aptamil**	13	15	2	Aptamil *	28
6	Bebelac	2	17	11	Bebelac	11	7	12	Bebelac	11
7	Disney	4	10	16	Disney	10	10	10	Disney	25
8	Kanz	7	12	11	Kanz	1	14	15	Kanz	27
9	**Fisher Price**	19	8	3	**Fisher Price**	19	6	5	Fisher Price *	30
10	Johnson's Baby	7	17	6	Johnson's Baby	8	15	7	Johnson's Baby	20
11	Dalin	8	9	13	Dalin	11	5	14	Dalin	18
12	**Sebamed**	15	4	11	**Sebamed**	12	9	9	Sebamed *	23
13	**Philips Avent**	20	4	6	**Philips Avent**	22	4	4	Philips Avent	27
14	Weebaby	6	14	10	Weebaby	1	17	12	Weebaby	17
15	Bebedor	4	12	14	Bebedor	7	9	14	Bebedor	12
16	**Philips**	14	11	5	**Philips**	17	11	2	Philps *	28
17	Braun	9	11	10	Braun	11	15	4	Braun	22
18	Weewell	7	8	15	Weewell	2	4	24	Weewell	15

It is seen that the participants' experiences with brands are largely compatible with the emotional dimension of their attitudes towards the brand. All pre-test data, whose frequencies were given at the level of groups, were also created on a participant basis in order to analyze whether a change occurred at the end of the experiment.

5.2. Experiment Results

5.2.1. Experiment Time

Since the biometric data used in neuromarketing studies are highly specialized data and do not have standard ranges, the data do not conform to the normal distribution in most studies. McKillup (2012) reports that the Kolmogorov-Smirnov test is appropriate if the sample size is greater than 35 for the analysis of normality assumption. The data of 60 participants were subjected to the Kolmogorov-Smirnov test in this direction. As a result of the analysis; experiment times ($p = 0.023$) were not found to be normally distributed. Group 1 and Group 2 participants had a mean completion time of 3 minutes 46 seconds. The shortest time for the experiment is 1 minute 28 seconds and the longest time is 9 minutes 18 seconds. The Mann-Whitney U test was applied to the duration of the experiment in order to determine whether the viewing periods differ by group and gender. When the time to complete the experiment is examined at the gender level; It was determined that women completed the study in an average of 3,144 minutes and men completed an average of 3,816 minutes. The results differed statistically significantly between the two groups ($U = 285,500$; $p = 0.015$; $p < 0.05$). The time to complete the experiment significantly differed between the two groups with and without children ($U = 195,500$; $p = 0,000$; $p < 0.05$). The average time to complete the experiment for the No. 1 group consisting of parents is 2,888 minutes, while the average time to complete the experiment for the No. 2 group consisting of the participants without children is 4,050 minutes.

5.2.2. Products

Products are positioned on the homepage so that they can be viewed under the 6 categories they belong to. Clicking on a product opens the product pages where more detailed information is available.

Figure 6. AOI Samples Positioned on the Product Page

The area represented by 1 is the area where the images of all the products used in the experiment are displayed. Product images consist of product package photos. Gifts, used as a sales promotion incentive, were also made available to participants in this area. Finally, 711 data were gathered from this AOI. Based on the descriptive statistics, the shortest viewing time for the images was determined to be 0.01 seconds and the longest time was 23.360 seconds. As a result of the Kolmogorov-Smirnov analysis applied to the data set, it was seen that the data were not normally distributed ($p = 0.000$; $p < 0.05$) and the non-parametric alternative of the student t test, Mann-Whitney U was preferred to determine whether there was a difference between the visual viewing times at the level of the groups. 348 of the 711 data in the series came from group No.1 and 363 from group No.2. The average viewing time for the visuals of the No.1 group was 1,955 seconds (standard deviation: 1.776), while the average viewing time of the No.2 group was found to be 3,820 seconds (standard deviation: 3,973). It was observed that there was a statistically significant difference between the groups ($U = 47123,500$; $p = 0,000$; $p < 0.05$). While the average view of the product images by women was 3,259 seconds (standard deviation: 3,651), it was 2,614 seconds for men (standard deviation: 2,813). No significant difference was found between the time to view visuals at gender level ($U = 58215,000$; $p = 0.103$; $p > 0.05$). The Kruskal Wallis test was applied to determine whether the time to view the visuals changed at the product level, and a statistically significant result was found between the categories ($p = 0.000$; $p < 0.05$). Considering the arithmetic average of the viewing time; it is seen that the longest viewed image belongs to the category of infant formula with an average of 4,765 seconds.

5.2.3. Introduction Text

The area is shown with 2 in figure 6 is the area where the promotional information of the products used in the experiment was located. Introductory texts were written by the producer company. It also provides information on how to use the product. An example of promotional texts prepared on a product basis is given in Table 5.

Table 5. Introduction Text

- If breast milk is insufficient, you can consult to your doctor and use it until the end of the 6th month after birth.
- Aptamil 1 is a infant formula supplemented with Aptamil (FOS / GOS) prebiotic fibre, nucleotide and LCP.
- You can continue with Aptamil 2 at the end of the 6th month unless your doctor recommends oppositely.

There is promotional text in all categories except the diapers category. At the end of the experiment, 566 data were detected in the AOI located in this area. The shortest viewing time for promotional texts is 0 seconds and the longest is 17,850 seconds. As a result of Kolmogorov-Smirnov analysis, it was seen that the data did not meet the normal distribution conditions ($p = 0.000$; $p < 0.05$). For this reason, Mann-Whitney U, the non-parametric alternative of the student t test, was preferred to determine whether there was a difference between the viewing times of the introduction texts at the group level. 283 of the 565 data in the series came from group No. 1 and 282 from group No. 2. While the average viewing time of No 1 group's introduction texts was 1,016 seconds (standard deviation: 1,320), it was determined that the average viewing time of No 2 group's promotional texts was 2,734 seconds (standard deviation: 3,677). It was observed that there was a statistically significant difference between the groups ($U = 27290,000$; $p = 0,000$; $p < 0.05$). While the average view of women on product promotion texts was 1.851 seconds (standard deviation: 2.851), it was determined that men were 1.893 seconds (standard deviation: 2.926). There was no significant difference between the times of looking at introduction texts at gender level ($U = 38790.500$; $p = 0.593$; $p > 0.05$). The Kruskal Wallis test was applied to analyze whether the duration of viewing promotional texts changed at the level of product categories, and a statistically significant result was found between the categories ($p = 0.000$; $p < 0.05$). Considering the arithmetic mean of the durations at the category level; It was seen that the introduction text that has been viewed for the longest time belongs to the category of infant formula with an average of 4,725 seconds.

5.2.4. Price

The field indicated with 3 is the area where the prices of all products used in the experiment were indicated. Price discounts, which were used as sales promotion stimuli, were offered to participants in this area, as well as on the home page. An example of the price representation is given in Figure 7.

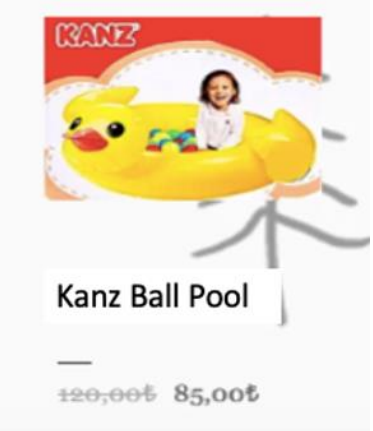

Figure 7. Discount Example

At the end of the experiment, 710 data were detected in the AOI located in this area. As a result of the descriptive statistics, the shortest viewing time for the price was 0 seconds, and the longest was 16,600 seconds. As a result of Kolmogorov-Smirnov analysis, it was seen that the data did not meet the normal distribution conditions ($p = 0.000$; $p < 0.05$). For this reason, the Mann-Whitney U test, which is a non-parametric alternative to the Student T test, was applied to determine whether there was a difference between the time to view prices at the level of groups. 347 of the 710 data in the series came from group No. 1 and 363 from group No. 2. While the average time of looking at the price of group No. 1 was 1,071 seconds (standard deviation: 1,279), it was determined that group No. 2 had an average viewing time of 2,311 seconds (standard deviation: 3,228). It was observed that there was no statistically significant difference between the groups ($U = 55463{,}000$; $p = 0.006$; $p > 0.05$). While the average time for women to view prices was 1,914 seconds (standard deviation: 2,952), it was determined as 1,525 seconds (standard deviation: 2,133) for men. There was no significant difference between the time to view price at gender level ($U = 62422.00$; $p = 0.987$; $p > 0.05$). The Kruskal Wallis test was applied to analyze whether the time to view prices changed at the level of product categories, and a statistically significant result was found between categories ($p = 0.000$; $p < 0.05$). According to the results; The product with the longest focus time on price was in the baby food category with an average of 3,662 seconds.

5.2.5. Product Information

The area indicated by 4 is the area in which information on all products used in the experiment was provided. In this area; the origin and content information are provided objectively and there is no statement to direct the consumer to purchase. Figure 8 provides an example of product information. Product information exists for all categories except toys.

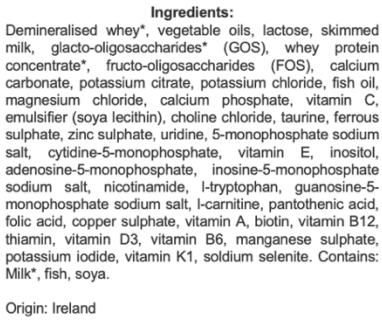

Figure 8. Product Information Text Example

At the end of the experiment, 611 data were detected in the AOI located in this area. The shortest time to view product information is 0 seconds, and the longest is 14,210 seconds. As a result of Kolmogorov-Smirnov analysis, it was seen that the data did not meet the normal distribution conditions ($p = 0.000$; $p < 0.05$). For this reason, the Mann-Whitney U test, which is a non-parametric alternative to the student's t test, was applied to determine whether there was a difference between the time to view product information at the level of groups. 291 of 611 data in the series came from group No. 1 and 320 from group No. 2. While the

average viewing time of the product information of the No.1 group was 1,352 seconds (standard deviation: 1,750), it was determined that the average time to view the product information of the No. 2 group was 2,494 seconds (standard deviation: 2,636). A statistically significant difference was found between the groups (U = 31203,500; p = 0.000; p <0.05). While the average time for women to view product information was 2.175 seconds (standard deviation: 2.746), it was determined as 1.763 seconds (standard deviation: 1.889) for men. No significant difference was found between the time to view product information at gender level (U = 46222,000; p = 0.986; p> 0.05). To analyze whether the time to view product information changes at the level of product categories, the Kruskal Wallis test was applied and a statistically significant result was found between the categories (p = 0.000; p <0.05). According to the arithmetic averages of product information viewing times at the level of product categories; the longest focus belongs to the infant formula information text with an average of 2,732 seconds.

5.2.6. Social Impact

The area indicated with 5 is the area (Image 6) where user comments about the products used in the experiment are given. In this area, negative comments to the brand that the participant stated that he liked in the pre-test and positive comments to the others were positioned in order to create social impact. User comments were used in all categories except toys and baby bath products. At the end of the experiment, 525 data were collected in the AOI located in this area. As a result of the descriptive statistics, the shortest focus time for the comments was 1.08 seconds and the longest was 14,520 seconds. As a result of Kolmogorov-Smirnov analysis, it was seen that the data did not meet the normal distribution conditions (p = 0.000; p <0.05). For this reason, the non-parametric alternative of the student's t test, the Mann-Whitney U test, was applied to determine whether there was a difference between the times of viewing user comments at the group level. 240 of the 525 data in the series came from group No. 1 and 285 from group No. 2. The average viewing time for the comments of the No.1 group was 1.619 seconds (standard deviation: 2.210), while the average viewing time of the No.2 group to the comments was found to be 3.428 (standard deviation: 3.215). A statistically significant difference was found between the groups (U = 20462,000; p = 0,000; p <0.05). It was determined that the average time that women viewed comments was 2,661 seconds (standard deviation: 3,129), while men were 2,549 seconds (standard deviation: 2,772). No significant difference was found between the duration of viewing comments at gender level (U = 34036.00; p = 0.923; p> 0.05). The Kruskal Wallis test was applied to analyze whether the duration of viewing comments changed at the level of product categories and it was found that there was a statistically significant difference between the categories (p = 0.000; p <0.05). Considering the arithmetic averages of focus times at the level of product categories; The longest-viewed comments belong to the category of infant formula with an average of 3,320 seconds.

5.2.7. Brand Choice

The brands listed by the participants in the pre-test were compared with the brands they purchased at the end of the experiment, and in case of a change, which stimulus was used was examined on an individual basis. As a result of the analysis, as indicated in Table 6, the group number 1 (consisting of parents) changed their brand preference at the purchasing stage for a total of 67 products, while the group number 2 (consisting of individuals without children) preferred different brands for a total of 140 products.

The biggest change in brand preference for the No.1 group was for the ball pools offered in the toys category. Group number 2 changed their brand preferences for feeding bottles, which were offered in the category of baby feeding products at the purchasing stage. Aimed at encouraging change in products where the No.1 group changed their brand preference; there were 25 positive comments, 14 gifts, 18 price discounts.

Table 6. The Changes in The Brand Preference of the First Group and the Stimulus Types

Group No	Category	Number of Changed Brands	Change Caused by Stimuli	Random Changes	Stimuli Type and Stimuli Amount
1	Baby care and safety products	17	8	9	Positive user comment (8)
1	Baby feeding products	10	10	0	Positive user comment (10)
1	Shampoos	10	10	0	Gift (1)
1	Toys	19	18	1	Price discount (1)
1	Infant Formula	3	3	0	Positive user comment (3)
1	Diapers	8	8	0	Positive user comment (4) + Gift (4)

In the preferences of group number 2; there were 82 positive comments, 23 gifts, 16 price discounts. However, not all changes in brand preference were directly related to stimuli. In the choice of 10 brands in the first group and 19 brands in the second group, the participants neither preferred the brand they stated in the pre-test nor the brand promoted by stimuli. Such purchases awere defined as "random changes" in Table 6 and 7.

Table 7. The Changes in The Brand Preference of the First Group and the Stimulus Types

Group No	Category	Number of Changed Brands	Change Caused by Stimuli	Random Changes	Stimuli Type
2	Baby care and safety products	24	13	11	Positive user comment (13)
2	Baby feeding products	27	25	2	Positive user comment (25)
2	Shampoos	20	20	0	Gift (20)
2	Toys	20	16	4	Price discount (16)
2	Infant Formula	24	22	2	Positive user comment (22)
2	Diapers	25	25	0	Positive user comment (22) + Gift (3)

5. Conclusions and General Discussion

When the results are considered in general, it is seen that the group of the participants is more determinant than gender. The No.1 group, selected from individuals whose children are at most 10 years old, completed the purchasing process much faster than the group without children due to their experience and habits regarding the products. As well, their attention to stimuli was less than that of the other group. Having an existing brand in their mind minimized the need to search for product information in the purchasing process and made it easier for them to choose. While the attention of the No.1 group to the user comments aimed to create a social impact was extremely low, the No.2 group examined the comments for the longest time after the product image. The cognitive dimension of their attitudes about products and brands is limited to awareness towards the brand, and the group number 2 needed to examine the product in detail and to obtain information from user comments. In the research conducted by Young in 2004, it was reported that only 10-25% of the mothers who participated in the study read the label containing the information on the back of the product. Moreover, not all participants viewed the product packages for more than 5 seconds. The findings of the mentioned research have been substantially confirmed within the scope of this study. Although the number of participants reading the product information is higher than the rate stated by Young, the average time of viewing visuals in which the product package of the No.1 group is presented did not exceed 3 seconds. It was found that most participants in Group 1 chose the product they would purchase directly without looking at the three products in the same category. The group, which is thought to perform routine purchasing behavior, did not even need to open the competitive products pages and do a detailed review. For the reasons outlined, sales promotion tools and social impact incentives are not as effective in this group as in the other. In the study of Chae and Lee in 2012 it has been determined that the place where consumers look the longest is not the most conspicuous point, but the point that provides information and helps to make the current choice. In this direction, viewing time makes it possible to

determine the stimulus that has the greatest impact on the purchasing decision. In line with the relevant literature, the participants in group No. 2 generally tended to examine all products in a category. The attention level of the group to AOIs is higher than the No.1 group in the whole experiment. This shows that they are seeking comprehensive knowledge to prefer products and brands that they do not have direct experience with. It is observed that the group is also more open to the effect of sales promotion tools than the No.2 group. As a result, in the two groups where the same experimental design was applied, while the No.1 group changed their preferences in 67 brands, this number reached 140 in the No.2 group. In the No.1 group, the toys with the highest decision change were applied to the price discount. In the group number 2, the highest change occurred in the feeding bottles presented in the category of baby feeding products, where positive and negative user comments were positioned. In this direction, it can be thought that the price sensitivity of the No.1 group is higher, while the No.2 group is more open to social impact in decision-making processes.

Rayner's (2008) study shows that when consumers were asked whether they like an advertisement, they mostly looked at visuals, and when asked whether they were considering purchasing the product, they mostly looked at written texts. The relevance of Group 2 for user comments may also be associated with the findings of the study.

Within the scope of the experiment, it is seen that infant formula is the category in which attention is most concentrated in both groups. All DOIs in this category received greater attention than those in other categories. It is thought that this is due to the fact that it is a product to be consumed directly by the baby, and thus the participants show a greater sensitivity. When the behavioral patterns of both groups are examined, it is seen that the shopping process has reached the targeted realism. After the majority of participants selected the products, they rechecked the shopping cart and proceeded to the payment page.

In summary, the existence of the dimensions of the attitude towards the product, including cognitive, emotional and behavioral, directly affects the buying processes. The stronger the attitudinal components, the weaker the impact of the stimuli prepared for change. For this reason, the No.1 group completed its decision-making processes in a much shorter time and remained more loyal to the brands reported in the pre-test compared to the other group. However, the No.2 group went through a decision-making process that is more open to both sales promotion tools and social impact, since the components that make up their attitude towards the brand do not have sufficient power. Although personalized experiment design contributes to the original aspect of the study, heat maps were not seen as a suitable analysis method, as it allowed the participants to complete the experiment at different times and without guidance. If a standard experimental design is created in the next study, it may be possible to create heat maps as well as quantitative data on eye movements obtained in this study.

5.1. Limitations & Future Research

Another constraint regarding the sample is related to the demographic characteristics of the participants. In addition to the care given to the equal distribution of the individuals in the sample at the level of gender, the age of the child was also used as a criterion in individuals with children. While determining the participants that make up the parent group, care has been taken to ensure that their children are at most 10 years old. The reason for this restriction is, they are invited to have recent experience with the products in question and keep their attitude up to date. Another constraint is the internet usage and online shopping experience that apply to all participants. All of the sample reported that they actively use the internet and have purchased products or services online at least once in the last month. In accordance with the operating principles of the eye tracker, pupil motions are followed by an infrared ray. During the pilot study, it was determined that the use of some optical devices such as lenses or prescription glasses negatively affected the results and made the calibration of the device difficult. Because of this, participants were selected from those who had no visual field disturbance. There are no interventional items in the study. In addition, all participants were informed about the purpose of the study, the technique and equipment to be used before the study, and their consent for participation was signed with an informed consent form. The data obtained contain important clues for real life applications. However, another critical issue that may be considered in future studies should be the persistence of attitude changes triggered by social impact and sales promotion tools. Since the strength of the components that make up the attitude is inversely proportional to the permanence of the attitude change, sales promotion tools that are intended to have an effect in the short term may not provide a long-term and permanent change. Similarly, the social impact may not be as efficient in the product groups with which the person already has experience. In this regard, it is believed that the study of relevant stimuli in different participant profiles and product groups will contribute to the literature.

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