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Neuromarketing Research of Decision-Making Process when Choosing Products in an Online Store: Gender Characteristics and Behavior Stereotypes

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Abstract. The expansion of the dialogue space and individual freedoms of consumers, due to the active development of digital technologies and their integration into all spheres of human activity, requires the study of gender characteristics in the «human-computer» communication process. Undoubtedly, the globalization of trade processes, the development of remote technologies, led to the integration of traditional and information society into a single digital space, which led to a change in behavioral mechanisms, a reorientation to new forms of social interaction in the Internet environment. Enterprises are forced to transfer business processes to the digital space, as a result of which there is an increasing amplification of omnichannel consumer behavior, there is less differentiation between “online” and “offline” shopping, and there are a number of features of consumer behavior in the virtual environment. This paper presents theoretical and applied research on gender consumer behavior features when choosing ready-to-eat meals on a virtual shelf. Using a set of neuromarketing techniques as the hypothesis of gender asymmetry of consumer visual perception in the choice of ready-to-eat meals was proved. The importance of taste preferences and the appearance of dishes was proved. The hypothesis that the price of goods on a virtual shelf is not the main factor in the choice was confirmed, thus, consumers seek to meet their needs, rather than to maximize the utility of decision-making process about the purchase of goods. The obtained results will enable expansion of the theoretical and applied research of effective product promotion in the online environment.

Keywords: gender-specific characteristics, information asymmetry, consumer, consumer behavior, virtual shelf, consumer choice, neuromarketing.

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Research area: economic sciences, neuromarketing.

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Нейромаркетинговое исследование процесса принятия решений при выборе еды в интернет-магазине: гендерные особенности и стереотипы поведения

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Аннотация. Расширение диалогового пространства и индивидуальных свобод потребителей, обусловленное активным развитием цифровых технологий и их интегрированием во все сферы жизнедеятельности человека, требует изучения гендерных особенностей в коммуникативном процессе «человек-компьютер». Бесспорно, глобализация торговых процессов, развитие дистанционных технологий обусловили интегрирование традиционного и информационного социума в единое цифровое пространство, что привело к изменению поведенческих механизмов, переориентаций на новые формы социального взаимодействия в интернет-среде. Предприятия вынуждены переводить бизнес-процессы в цифровое пространство, в результате чего наблюдается все большее усиление омниканального потребительского поведения, меньше разграничиваются онлайн- и офлайн-покупки, однако наблюдается ряд особенностей потребительского поведения в виртуальной среде. В статье представлены теоретические и прикладные исследования гендерных особенностей поведения потребителей при выборе готовых блюд на виртуальной полке. С помощью комплекса нейромаркетинговых методик доказана гипотеза о гендерной асимметрии потребительского визуального восприятия при выборе готовых блюд. Доказана значимость вкусовых предпочтений и внешнего вида блюд. Подтверждена гипотеза, что цена товаров на виртуальной полке не является основным фактором при выборе, вследствие чего потребители стремятся к удовлетворению своих потребностей, а не к максимизации полезности решений в процессе принятия решений о покупке товаров. Полученные результаты позволят расширить теоретические и прикладные исследования в области эффективного продвижения товаров в интернет-среде.

Ключевые слова: гендерные особенности, информационная асимметрия, потребитель, поведение потребителя, виртуальная полка, потребительский выбор, нейромаркетинг.

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Introduction

The e-commerce market both in Russia and other countries has undergone significant changes due to changes in consumer lifestyles caused by the coronavirus pandemic in general, and national lockdowns in particular. According to Digital 2020, the number of Internet users in Russia amounted to 118 million people, which accounts for 81 % Internet coverage of Russian population. The average user spends about 6 hours 43 minutes online every day according to analysts, which is more than 100 days per user per year, i.e. this means that users spend more than 40 % of their waking hours online. About three quarters of the world's internet users aged 16 to 64 shop online every month. According to Globalwebindex, the highest level of e-commerce penetration among the online audience is seen in Indonesia, Thailand and Poland, while in Russia online purchases were made by 60 % of online users in 2020. Globally, US \$ 1.63 billion was spent on food purchases over the Internet in 2020, which exceeds spending of US \$ 1.57 billion on Internet games. The Internet is a unique interactive environment in which it is possible to effectively, accurately and fully present any product or service for a specific target audience. In a virtual environment, unlike offline, it is possible to target the impact on the end consumer, while focusing can be carried out both according to the individual characteristics of the consumer: activity profile, place of residence, etc. behavioral: gender, time spent online, entering certain keywords, previous choice, etc.). As a result, online shopping has become a generally accepted way of purchasing goods, especially given the epidemiological constraints. Therefore, research of consumer behavior when choosing goods online becomes especially relevant.

Indeed, to enhance sales, there should be certain aspirations, desires and the ability to buy goods from the consumer side. Thus, in a consumer society, the main problem lies not in the sales both in real and in virtual environments, but to a greater extent in studying consumer behavior peculiarities, as well as decision-making process while purchasing goods, with the aim of the maximum possible impact on everyone at all sales through a system of economic, psychological, marketing tools.

Theoretical framework

Research of consumer decision-making mechanisms is the basis for both goods marketing and strategies formation for choosing a target market. The study of the prevailing factors influencing consumer behavior does not fully resolve the issue of effective sales management. Although, it is rational to use marketing tools to influence consumer behavior.

Buyers may respond differently to information and stimuli that accompany their purchase and product choice. It highly depends on personal behavioral responses.

There are the following levels of behavioral reaction of consumers:

- cognitive reaction, linking the assimilated information with knowledge;
- emotional (affective) reaction associated with the attitude and the assessment system;
- behavioral reaction, which describes the action: not only the fact of the purchase, but also the behavior after the one.

Researchers believe (Frolov, 2018) that these levels are hierarchically linked and the buyer sequentially goes through all three stages in the following order: cognitive, emotional, and behavioral. This pattern is called the learning process and it occurs when the buyer places great value on the purchase. However, the experience of neuromarketing research (Berezina, Nazarenko, 2020) showed that there are other chains forming the reaction process, which take into account not only the degree of attraction, but also differences in the way people perceive the environment.

The works of Nobel laureate D. Kaneman (Kaneman, 2020) allowed to understand that the modes of human perception are associated with the implementation of two types of thinking. They were called terms introduced by psychologists K. Stanovich and R. West (Stanovich, West, 2020). System 1 is responsible for the emotional reactions of a person, it generates emotions and feelings, which are the main source of beliefs for System 2, which is responsible for logic, analysis and processing of facts. In the context of society digitalization, understanding how decisions are made by the consumer is at the center of attention of researchers. Thus, the influence of

Industry 4.0 on consumer behavior and business is considered in the works of G. I. Gumerova and E. I. Tatar (Gumerova, Tatar, 2020). Ershova E. Yu. studied consumer behavior in the context of neuromarketing (Ershova, 2020), and Stytsyuk R. Yu. (Stytsyuk, 2020) describes the theoretical aspects of the factors that determine consumer behavior in her work.

Scientists A. S. Adjaryan, V. A. Panova, E. A. (Ardzharyan, Panova, 2018) studied the influence of information technology on consumer behavior. The influence of emotions on consumer behavior was revealed in the articles of V. V. Zamorina and A. R. Rakhmatullina (Zamorina, Rahmatullina, 2018). Foreign researchers studied the influence of the unique characteristics of an online store, such as interactive decision-making tools and stimuli affecting the perception of goods in an online environment (Senecal, Nantel, 2004; Zhang, Krishnamurthi, 2004). Scientists also searched for differences between online and offline environments in terms of the influence of traditional marketing tools on purchasing decisions. For example, researchers (Andrews, Currim, 2004; Degeratu, Rangaswamy, & Wu, 2000; Lynch and Ariely, 2000) have identified changes in consumer response to price and brand name when shopping online. It should be noted that the visual attention of consumers in the process of choosing goods is focused on the arrangement of goods on the shelves of both a regular store and a virtual one. The presence of serious differences in the process of choosing goods in off- and online stores predetermines the need for additional research to find answers about the influence of the goods placement on the shelves in online stores on consumer choice. The relevance of this study is due to the following features:

- in online stores, when scrolling, usually one (less often several) virtual shelf is presented, the goods on which are placed “facing” the consumer, at regular intervals. In traditional stores, on the contrary, a denser and closer placement on shelves forms a complex perception and allows more efficient use of the principle of commodity neighborhood;

- when searching for goods online, the consumer can quickly explore the assortment, including various search filters, limiting the

assortment to fit his needs. In real stores, the consumer needs to look through the entire assortment on the shelf in order to find the required product;

- consumers save time online when choosing from grouped items, while in a regular store it is necessary to physically move around in order to view or compare products;

- in traditional stores, the majority of customers are women, as a result of which the majority of merchandising stimuli and tools are aimed at them. At the same time, it is not completely obvious how effective similar stimuli are in the online environment and whether there are gender differences in the process of choosing goods on virtual shelves;

- the virtual space in an online store is infinite, unlike the retail space in a physical store, however, the shelf space in both cases is limited: either by the screen size or by the actual size of the commercial equipment, as a result of which the number of products on the screen remains limited. In addition, due to the lack of physical space constraints, the online assortment is often quite large (Verhoef and Langerak, 2001), which requires more than one screen to display all products. As a result, consumers in virtual stores rarely browse products till the end, which is confirmed by the priming effect, according to which the earlier viewed items are more likely to be selected (Broere, Van Gensink and Van Oostrom, 1999). This effect was also confirmed by our previous studies when choosing products in a virtual store. (Yarosh O. B., Kalkova N. N., Reutov V. E., 2020).

Researchers (Menon and Kahn, 2002) believe that the factor of the product positioning on a virtual shelf does not significantly influence the decision to purchase the product. However, we believe that the items positioning, their arrangement can be one of the factors prompting the consumer to make a decision to purchase certain goods.

Statement of the problem

Based on the conducted controlled experiment to study consumer choice and subsequent purchases of meals in a virtual ready-to-eat food store, to propose a number of hypotheses:

Hypothesis 1 (H_1): There is gender asymmetry in the perception of ready-to-eat meals and analyzing information on virtual shelves.

Hypothesis 2 (H_2): Items seen before, i.e. those placed earlier on the virtual shelf will have a higher probability of being selected ("priming" effect).

Hypothesis 3 (H_3): The goods placement on virtual shelves is key when consumer is making a choice.

Hypothesis 4 (H_4): The price of goods on the virtual shelf is not the main factor for choice.

Hypothesis 5 (H_5): Consumers seek to satisfy their needs rather than maximize the usefulness of decisions in the decision-making process of purchasing.

Thus, we believe that when choosing a finished product on a virtual shelf, there is asymmetry in the perception of information that affects the decision-making process to purchase a product.

Methods

According to scientists (Wedel, Pieters, 2006), an important part of the analysis of consumer behavior is tracking eye movements, which makes it possible to measure visual interest corresponding to higher-order cognitive processes. It should be borne in mind that human vision is an active and dynamic process in which the consumer is constantly looking for a specific visual element necessary to maintain current cognitive and behavioral activity (Castelano, Mack, & Henderson, 2009).

Since eye tracking cameras register only eye movements, to interpret the results of eye tracking, it is necessary to use additional dimensions, which can be expressed in the number of fixations, which, as noted by the scientist A. Duchowski (Duchowski, 2007), are characterized by focusing the eyes on a specific object by stabilization of the focus of the retina on it, i.e. these are pauses in movement between saccades, which indicate interest and attention to the selected object. Studies show that these pauses are the most informative because they are associated with higher-order cognitive processes. In addition, eye tracking provides objective, unbiased and accurate data by pro-

viding real-time results by measuring customer reactions or behavior at the very moment they occur.

One of the main disadvantages of eye tracking technology is that not in all cases eyes can be tracked. For example, contact lenses, glasses and pupil color can affect the camera's ability to record eye movements, therefore, not all (usually 10–20 % of the sample) consumers can participate in a neuromarketing experiment (Jacob, Karn, 2003).

At the same time, when studying the oculomotor behavior of the subjects, it is possible to measure only visual attention to a particular object, and in order to obtain more reliable data, it is necessary to conduct a survey about consumer preferences with polygraphic support to obtain reliable independent indicators that allow assessing both verbal and non-verbal reactions and have a complete understanding of the mechanisms of operation of system 1 and system 2, which are responsible in their interaction for making purchasing decisions in the online environment.

A complex and controlled laboratory experiment was carried out to study visual attention and interest in ready-made meals placed on a virtual shelf using a stationary eye-tracker VT 3mini with EventID software and Polygraph RIF. The neuromarketing experiment consisted of recording the positions of the pupil (fixation) and eye movement (saccade), as well as measuring visual attention on the proposed stimulus material. The psychophysiological study consisted in the synchronous registration on the RIF polygraph of the parameters of upper and lower breathing, cardiovascular activity (blood pressure (BP), photoplethysmogram (PPG)), galvanic skin response (GSR).

The neuromarketing experiment involved 28 people aged from 18 to 40 years: 14 men and 14 women, divided into 2 groups of subjects: experimental and control, the gender number of participants was the same. It should be noted that oculographic studies do not require large sample sizes. The test subjects had normal, uncorrected vision and signed an informed consent form to participate in the experiment.

Visual stimuli were projected onto a 24-inch monitor with a resolution of 1920x1080

pixels. The eye tracker was located at a distance of 600 mm from the subject, the correction angle did not exceed 0.5° , which corresponds to an error of 5 mm.

The detection algorithm for finding the center of the pupil has a reliability of 98 % with an accuracy of ± 1 mm. The results were processed using economic, mathematical and statistical methods of analysis, implemented in the SPSS environment and authors' calculations. The data obtained from the eye-tracker were recoded into visual significance maps in the OGAMA program, neurophysiological data obtained from the RIF polygraph were processed in the SHERIF M.

Stimulus material was alternately projected onto the screen for the test subjects by certain groups of finished products (14 groups in total): salads, first courses in cans, first courses of cream soup, three types of second courses, pizza, desserts in slices, desserts in cans, desserts-cakes.

The products were placed horizontally on a virtual shelf, each promotional material had 4 items of goods placed at the same distance from each other and in different price categories. During the experiment, in order to determine the number of fixations in the areas of interest (goods of interest), the test subjects were offered visual stimulus materials from 42 options of virtual shelves, the positioning of ready-to-eat meals on which was randomized. Depending on the goods placement, their position on the screen, the order of appearance and the proximity of the products, each of the 14 stimulus materials with a specific name of the finished product groups was presented in three options for the location of goods. The stimulus material was prepared on the basis of actually sold goods (finished products) on the websites of online stores of ready-made food in Simferopol.

To substantiate the proposed hypotheses, the experiment took place in several stages.

At the first stage, the control group of test subjects, for an unlimited period of time, alternately studied the proposed stimulus material. The participants in the experiment were notified that their choice of virtual goods was unlimited, as were the virtual financial resources

that they had. The main condition was the implementation of consumer choice on each slide. At the end of the experiment, the tests subjects were asked a question regarding the list of the most significant factors when choosing meals. The selection factors that were most important for the buyer were checked instrumentally using a computerized polygraph RIF.

At the second stage, the experimental group of subjects studied the same stimulus materials, under the same conditions of unlimited time and budget, however, they were not regulated in their choice and could carry it out at will, stopping at the preferred product, based on those choice factors that were the most important for them.

Discussion

In the course of the research, results were obtained on an array of 2.053 oculomotor behavior datasets. These materials indicate that, on average, female consumers spend less time (average fixation time by the experimental group – 5198 ms) studying meals on a virtual shelf than male consumers (average fixation time by the experimental group – 6331 ms, which is 21.8 % more than in the same group of women), which can be explained by their wider experience of product choice in retail chains while shopping, as a result of which their decision-making speed is higher than men's (Table 1).

The data in Table 1 indicate that when studying any of the 42 virtual shelves, women in the experimental research group spend less time choosing ready-to-eat meals than men in a similar group – the average fixation time per slide, as well as the average number of fixations by female test subjects, is less than by men, because women, being active customers, make decisions faster. This fact is confirmed in the work of S. Bakshi (2012), who indicates that gender characteristics affect the process of making a purchase decision, as well as it is confirmed in our own previously conducted research (Kalkova, Yarosh, Mitina, Khokhlov, 2020).

Analysis of statistical differences in gender preferences showed a very high correlation in the mean values of the total number of fix-

Table 1. The average amount of time spent by consumers on the review of virtual stalls with ready-to-eat meals, in ms, for men and women of both groups

Stimulus material number	Males			Females		
	Experimental	Control	Deviation +/-, %	Experimental	Control	Deviation +/-, %
	Average fixation time per slide, ms	Average fixation time per slide, ms		Average fixation time per slide, ms	Average fixation time per slide, ms	
1	44192	28548	-35.4	35640	19320	-45.8
2	9099	12352	35.8	9325	10730	15.1
3	7552	11646	54.2	6773	8400	24.0
4	5710	11296	97.8	6285	6793	8.1
5	6070	13361	120.1	6485	14176	118.6
6	6533	11092	69.8	4601	7231	57.2
7	6839	7197	5.2	4079	8696	113.2
8	5952	7194	20.9	4509	8132	80.4
9	7587	8862	16.8	6640	10810	62.8
10	6089	11931	95.9	5358	12259	128.8
11	6679	14028	110.0	5336	19940	273.7
12	5487	8880	61.8	4613	8529	84.9
13	5648	8191	45.0	5830	11954	105.0
14	4082	6504	59.3	4003	6442	60.9
15	7326	7884	7.6	4596	10212	122.2
16	7076	7707	8.9	5443	11750	115.9
17	5372	5606	4.4	4222	5270	24.8
18	5247	4768	-9.1	4289	9166	113.7
19	4140	6396	54.5	3918	5473	39.7
20	5050	5961	18.0	4341	4987	14.9
21	5165	6780	31.3	3992	7627	91.1
22	5345	7211	34.9	4970	6550	31.8
23	7771	6605	-15.0	3747	7895	110.7
24	3837	4932	28.5	3207	5048	57.4
25	4703	6102	29.7	5239	6527	24.6
26	4822	6485	34.5	4618	6877	48.9
27	4088	5517	35.0	3122	5541	77.5
28	2920	4841	65.8	2886	5954	106.3
29	3774	5336	41.4	4535	3681	-18.8
30	3656	8748	139.3	5420	9186	69.5
31	3903	5126	31.3	3767	4688	24.4
32	5036	5057	0.4	2569	4165	62.1
33	5767	8598	49.1	4329	6224	43.8
34	5081	9428	85.6	3427	5056	47.5
35	5010	5573	11.2	3896	8067	107.1
36	4186	4630	10.6	3057	5220	70.8
37	5334	5705	7.0	3904	6557	68.0
38	6135	6281	2.4	4011	5662	41.2
39	4376	4504	2.9	2933	6163	110.1
40	4417	5527	25.1	2687	5795	115.7
41	4715	5931	25.8	2108	6305	199.1
42	4124	5100	23.7	3609	4010	11.1
Average	6331	7939	25.4	5198	7930	52.6

ations of men and women in the experimental group, and high in the control group (Table 1). To confirm the similarity of the studied groups, the t-test for paired samples was calculated, which turned out to be higher for the experimental group than the tabular values of the Student's t-test, and therefore, it can be admitted that the results of the experimental group for men and women are similar and do not show statistically significant differences. Hence, with the regulation of the task and the absence of strict conditions for the need to make a choice on each slide, the choice was made by men and women without thinking too much, in a random way. Moreover, this behavior pattern does not differ in the context of gender groups.

The opposite results were shown by the control group, in which the indicators for men and women are statistically different. Since the significance is at the level (Sig. = 0.021), it can be concluded that the hypothesis of equality of the mean values of the studied groups should not be accepted, since it is less than 0.05. Indicators of cumulative fixations on stimuli in the control group are statistically different for men and women. We verified these ratios by calculating the t-test for paired samples of the experimental and control groups of men. The data show a high Pearson correlation coefficient of 0.85. The calculation for the experimental and control groups of women also demonstrates the average correlation level of 0.61. However, the t-test shows that the data of the samples are different, the mean values do not show any statistically significant similarities. Hence, it can be concluded that gender differences in making choices in the studied groups are obvious. Men and women make decisions differently, guid-

ed by different preferences, and, therefore, in conditions of free choice, their indicators are different.

Despite the speed of decision-making by women in the experimental group, there is a significant gap with the control group result, i.e. in cases where it was necessary to make decisions on each slide, female subjects in the control group spent on average 52.6 % more time on it than women in the experimental group, and twice the average time spent by male subjects, thus. we can say that hypothesis 1 (H1) was confirmed and that there is gender asymmetry in the process of analyzing information and choosing products on virtual shelves. Several patterns should also be pointed out: in the course of the experiment, with almost every subsequent projected stimulus material, the time spent on making a decision was reduced, since the cognitive load began to affect the search behavior, which was increasing in the course of the experiment. As a result, the test subjects wanted to simplify the selection process, reducing the time decision making. (Morales et al, 2005)

Another feature revealed is the differences in the selection process by the test subjects in the experimental and control groups. It should be noted the average increase in the duration of the analysis of each stimulus material in the control group, associated with the need to choose ready-to-eat meals on each slide. At the same time, the average time spent on choosing goods in the control group of both men and women is different and there are differences in the choice on some slides. However, it should be emphasized that this experimental condition was controlled in laboratory conditions, but in

Table 2. Statistics of paired samples between the experimental and control groups

Group	Average	Standard deviation	Correlation	Root mean squared error	Paired Samples Criterion			
					95 % confidence interval for the difference		t	Significance (two-sided)
					Lower	Upper		
Experimental – males	6330.84	6053.907	0.97	923.212	643.935	1621.600	4.676	0.0
Experimental – females	5198.07	4937.218		752.919				
Control – males	7938.60	4089.260	0.78	623.606	-783.872	800.710	0.021	0.983
Control – females	7930.19	3555.397		542.193				

reality, consumers tend to spend less neural resources. The large assortment and the need to choose several dishes complicated the cognitive load, as a result of which consumers chose ready-to-eat meals that had been encountered earlier, i.e. located earlier on the virtual shelf (the “priming” effect) and did not change their choice in the process of further review of the virtual shelves, which confirms hypothesis 2 (H2). Indeed, the meals found on the later slides received much less attention: consumers settled on a specific product and simply skimmed through subsequent products to justify their choice. In this regard, the time spent on studying the stimulus material gradually decreased with each subsequent slide. The likelihood that an item will be selected thus depends on the initial location of the item.

In order to test Hypothesis 3 and to identify determinant factors affecting consumer behavior when choosing ready-to-eat meals, after a neuromarketing experiment, the test subjects were interviewed for the most significant factors in making their choice, and then after 2 weeks the subjects were tested on a polygraph in order to clarify these factors and check conscious and unconscious triggers affecting their behavior.

The data obtained from the survey that was conducted after the neuromarketing experiment revealed the prevailing factors that the consumer believes are important for him when making a choice. They are shown in Figure 1.

The data presented in Figure 1 indicate that for the majority of respondents (45.5%), the determinant factors when choosing meals were their taste preferences, 18.2% of respondents paid their attention to the meal design and its location on the virtual shelf, and for 9.1% of potential consumers, the appearance and popularity of the dish were decisive. It should be noted that such factors as “price”, “religious restrictions”, “calorie content”, “discounts”, “weight”, “composition”, “try something new” did not have sufficient significance when choosing meals on the virtual shelves.

Figure 2 shows the main factors that are subconsciously significant for the respondent and affect consumer behavior when choosing ready-to-eat meals; these indicators were obtained using the analysis of the polygram of the test subjects. In particular, the most significant reactions of blood pressure, PPG and GSR were evaluated in a series of questions about which criteria are important.

The results obtained using the polygram analysis indicate that 27.3% of the test sub-

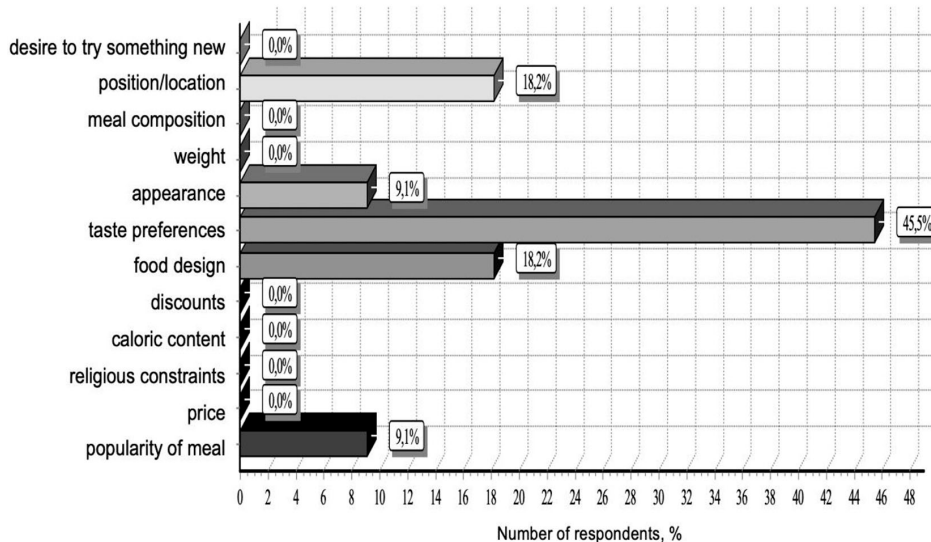


Fig. 1. The main factors influencing the consumers choice according to the survey conducted after the completion of the neuromarketing experiment

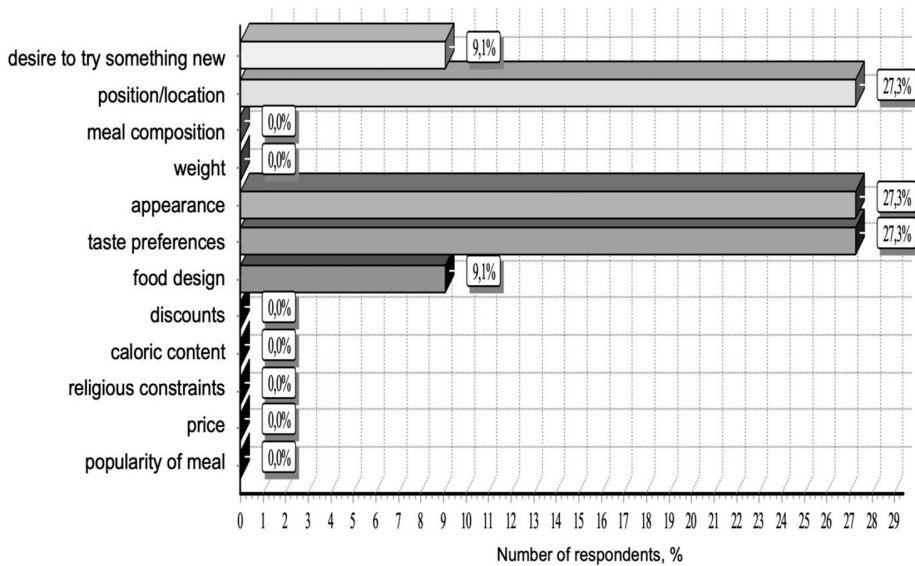


Fig. 2. The main factors influencing the consumer choice, refined using a polygraph

jects, when choosing ready-to-eat meals, pay attention to the location, appearance and their taste preferences, and for 9.1 % of the respondents, it is important to design the dish, as well as the desire to try what something new. Under the conditions of the experiment, such factors as “popularity of the dish”, “price”, “religious restrictions”, “calorie content”, “discounts”, “weight” and “sucking” do not have any significance. Hypothesis 3 (H3) was partially confirmed with the help of two applied software products, since the location of goods on virtual shelves is one of the three main factors, along with taste preferences and the appearance of a dish, but not a key factor. It should also be noted that in the process of confirming the determinant factors noted by the subjects using a polygraph, discrepancies were revealed. Thus, the subjects named the popularity of a meal as one of the main factors in their choice, however, this factor was not revealed in the analysis on a polygraph. It should be noted that hypothesis 4 (H4) was fully confirmed, since the study revealed that the price of goods on a virtual shelf is not the main factor in choosing ready-to-eat meals. In this regard, hypothesis 5 (H5) can be formulated as follows: consumers seek to satisfy their needs, and not to maximize the usefulness of decisions in the decision-making

process when purchasing goods, not choosing discounted meals and less expensive meals, but forming an assortment of several acceptable meals to the subject (in taste or location / appearance). The findings are supported by the work of a scientist (Hoyer, 1984), who pointed out that when consumers are not very involved in the purchasing decision process, they experience time constraints and / or are faced with complex shopping sessions (large shopping carts), they will often strive more for meeting their needs, and not less costly options in terms of financial, information, analytical resources.

In order to establish connection between the results obtained with the help of different neuromarketing tools, we calculated the Pearson correlation coefficient between the factors that influenced the choice according to the eye tracking data and according to the polygraph indicators (Figure 3).

To interpret the obtained value, we used the Pearson scale of critical values (Nasledov, 2012), which characterizes the level of relationship between the variables. So, the calculated correlation coefficient, based on the data obtained during the experiment, is equal to 0.469. This indicates an average positive relationship between the factors influencing the choice of consumers when choosing ready-to-

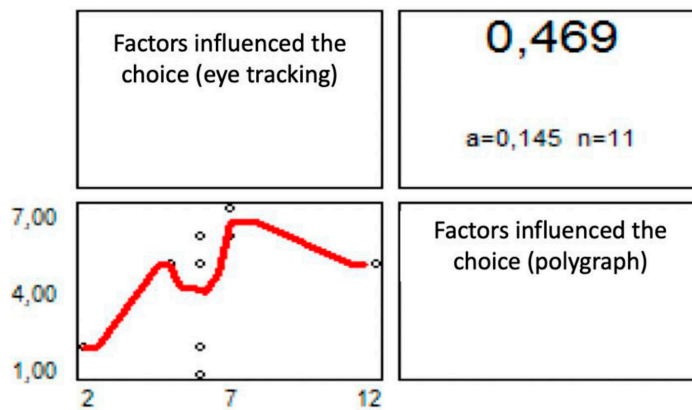


Fig. 3. Correlation between significant factors that influenced the choice according to the polygraph and eye tracker data

eat meals, identified using eye-tracking data and polygraph research.

Conclusion / Results

As a result of the experiment, the following conclusions can be drawn.

1. Gender asymmetry was confirmed in the process of perception of food (ready meals) in an online store and analysis of information on virtual shelves. This is confirmed by the fact that the speed of information perception and decision-making is gender-different in the experimental and control groups. At the same time, the analysis of statistical differences by the t-test for paired samples showed significant differences in oculomotor behavior under conditions of free choice of the experimental group;

2. The hypothesis investigating priming is confirmed. Products that have already been viewed are perceived with greater cognitive ease, and, therefore, they will have a higher likelihood of being selected.

3. There was partially confirmed the hypothesis that location is key when choosing ready-to-eat food. Within the framework of the study, using a set of methods, the three most significant factors in the choice of ready-to-eat food were identified: taste preferences, appearance of the dish and its positioning;

4. The hypothesis that the price is a trigger when choosing ready-to-eat meals was refuted, since experimentally, based on the results of eye-tracking and polygraphic research, this factor was not identified as a key factor in the experimental and control groups;

5. It has been proven that for consumers it is crucial to satisfy their own needs through a comprehensive choice of meals, while in the decision-making process, the test subjects did not limit themselves financially;

The results of the experiment can be used by companies to improve the promotion of ready-to-eat meals online, the presentation of product assortment on web pages by gender groups, which, in our opinion, will increase turnover and attract new customers.

In conclusion, high interactivity of the content presented online makes it necessary to carry out targeted promotion of consumer goods, to enhance the individualization of sales offers depending on the individual characteristics of potential customers based on the analysis of brand loyalty, taste preferences determined by the structure of queries in semantic search.

The interactivity online makes it possible to further assess the perceived quality of the product based on information substitutes, which include expert opinions, impressions of the product, data on its quality, the presence of

an undistorted description online to reduce information asymmetry that occurs when the ordered product is received in a real environment.

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