

ATTRACTIVENESS MODELING OF RETAIL ON EMOTIONAL FATIGUE OF CONSUMERS

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Abstract

Demand for high-quality shopping service has seen continuous growth in the recent years, allowing retail chains to achieve sustainable competitive advantage, increase number of loyal customers. This in-turn results in demand boosting and image of the firm. To analyze and achieve this emotional reactions of customers while shopping becomes important. The paper attempts to evaluate the effect of emotional fatigue on purchase process and uses neuromarketing tool – Galvanic skin reaction analysis to do so. Changes in the buyer emotional reaction of consumers was observed through more than 150 experiments at 15 different retailers. The results showed that retailer selection depended on emotional fatigue of the customer. Different types of retailers create different emotional fatigue which affects the footfall.

Keywords: consumer; emotion; purchase; Galvanic skin reaction (GSR); retailer

JEL classification: M31, M39, C93, D19, L69.

INTRODUCTION

Increased competition has been forcing retail companies to continuously brainstorm new methods and techniques to attract new customers, and the retain existing ones. However, more diverse the market based choices. Further, greater is the freedom of choice for consumers, the more informed and professional they are in terms of selecting a store and product (Hamstra 2012). The combination of the above mentioned tendencies has resulted in significant concentration of retail markets and contributed to a significant increase in competition within these market (Chekitan and Schultz 2005). The rapid increase in stores of different quality of shopping services and price ranges, conflicting information fields between them and the influence of other factors make the buyer pertinently question - "Where to go? What to buy?" The consistent questioning amidst the choices available, creates an environment where the buyer's brain

continuously processes selection and comparison of alternatives.

These trends have led to an increased complexity for customers and simultaneous innovation of methods of analysis to reduce these complexities, such as: analysis and forecasting of Customer Journey (Torres-Valencia et al. 2014), the application of Neuromarketing (Varan et al. 2015), GIS methods for placing retail stores (Paroli and Maraschin 2018), to cite a few. The combination and systematic use of these methods have allowed researchers to apply new approaches to assess the choice of the retailer and the services in it.

This paper attempts to estimate the probability of customer visiting a retailer based on emotional fatigue. The objective is to identify the influence of emotional fatigue upon choice of the retailer. We hypothesize that change in levels of emotional fatigue

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of the buyer will be observed while visiting various retailers in a certain shopping area. The method to understand the phenomenon comprises of multiple stages: in the first stage method of choosing a store, based on the estimation of emotional fatigue has been developed. In the second stage, experiment consisting of identification of the service area, shop visits, and measurements of output indicators was developed and conducted. At the final stage, the calculation of emotional shifts in different stores is calculated. Conclusions were drawn based on the attractiveness of the stores as per the proposed indicator.

2. BACKGROUND OF PROBLEM

2.1 Store-choice models

David L. Huff, in his work, described a model for determining the attractiveness of retailers, presenting the ratios that can be used to calculate: the probability of attracting customers to a retailers (Huff 1963); total consumer spending on a specific product category at a point of trade (Huff 1964); market share of the studied retailers in the product category (Huff 2003). To solve the problem of predicting the attendance of retailers, mathematical models were used, which determine the probability of a particular group of consumers selects the store. Within the framework of utility theory and decision theory, the probability that a decision maker chooses an action from the set of alternative (A) can be defined as the ratio of utility U of this action to the sum of the utility of all alternatives. Such methods include: Reilly (1931), Nakanishi and Cooper (1974), McFadden (1973), Fotheringham (1983), Rust and Donthu (1995), Hernandez and Biasiotto (2001). The attractiveness in the Multiplicative Interactive Choice (MCI) model is estimated using the multiplicative function defined on the values of the parameters of the perception of the store Nakanishi and Cooper (1974). Along with the numerical data, the model uses qualimetric indicators of service (Dummy variable) of service within the markets: the variety of assortment and quality of goods (Colomé and Serra 2000), the quality of service at the cash office (Colomé and Serra 2000; Oruc and Tihi 2012), any additional mass media advertising inside (Belch and Belch 2012), the tenant stores (Oruc and Tihi 2012); and beyond: access to the store by public transport (Colomé and Serra 2000), the convenience of working time (Colomé and Serra 2000), the way of getting to the store and back (Galkin et al. 2018) and other. Values of them are defined by survey, questionnaire and other indirect methods.

The Multi-nominal Logit Model (McFadden 1974), do not use human factor research methods also. The Competing Destinations Model (CDM) determines the attractiveness of the store for the consumer using the

so-called «degree of centralization» (Fotheringham 1983) and its applied versions for food retail market of the Japanese city of Kusatsu (Tomoki et al. 2007) based on actual spatial data on the choice of store by respondents through surveys and interviews, ignoring the psychophysiological characteristics of the person and the actual level of fatigue or other direct human factor research. Models give a certain degree of freedom, which is in the choice of significant factors in models. Also, based on the survey data, the values of the sensitivity of consumers to the values of the parameters of attractiveness to the regression models are determined, which may not reflect the actual feelings received from the service of a particular store. Craig, Ghosh and McLafferty (1984) classified store-choice models into three broad groups namely models based on normative assumptions regarding consumer behaviour, models that use revealed preference approach to calibrate “gravity” type of spatial choice models, and the models that use direct utility assessment (e.g., conjoint analysis). Although authors provide a brief overview of different models for store choice modelling, these models should be linked to the classification above (Craig et al. 1984).

In consequence, there are serious weaknesses among existing theory and practice, in consumer's feelings research inside of any shops. However, prior research works have not assessed the consumer fatigue in different types of stores using medical equipment. Limited or no research work take into account the influence of the fatigue resulting out of store choice. Few research works have focused upon consumers in real environment, thereby not providing a complete picture of human behavior inside the stores. Neuromarketing techniques can help to solve these issues. Taking the direct measurements of emotional fatigue in real purchase conditions and assessing it via medical equipment will provide necessary information and might fill the gaps in the conceptual and methodological problems of existing store-choice models.

2.2 The role of emotions in store choice

The problem of the quality of shopping services constantly worries buyers and sellers because of the natural causes. The growth of material well-being of people leads to the desire to buy quality products at higher levels of service. The quality of shopping services, is defined either as ‘minimal time spent on buying goods and comfortable service’ or as ‘services, which begins from the formation of needs in the product to the final preparation of consuming of it’ (Grönroos

1984) or as ‘cost optimization for customers and service sector’ (Crosby, Evans and Cowles 1990), but all these and many others used indirect methods of assessing quality of shopping services. Assessment based on Neuromarketing concept is been new direction of research and founding initial parameters.

Many factors influence on buyer in the shopping process (socio-cultural, personal, psychological factors, situational influence, marketing influence), each of which may have a decisive influence on the magnitude and timing of fatigue (Kotler and Kelle 2012) resulting in purchase or not. Consumer studies attempt to understand the decision-making processes (Kidwell, Hardesty and Childers 2008) and how emotions can affect them, impulse purchase (Khokhar et al. 2018), etc. (Lemon and Verhoef 2016). They also try to assess influences on the consumer from different groups such as family, friends, sports, reference groups, and society in general (Minton and Khale 2014). The questionnaire (Noseworthy, Di Muro and Murray 2014; Boucsein 2012) and modelling of consumer's behaviour (East 1997; Furaiji, Łatuszyńska, and Wawrzyniak 2012) methods were used for studying human reaction. But these methods provide partial information regarding consumer's feelings. Understanding the consumer in the process of making purchases requires new system approaches. The main content of neuromarketing is the research of involuntary human neurophysiological reactions to any communication attributes, for example, the name of the company or product, logo, colour combination, smells, audio signals, design solutions, etc., and their subsequent interpretation with the aim of applying the data obtained when organizing the promotion of goods and services (Meckl-Sloan 2015). Pulse, sweating, brain currents, pupil movements and other spontaneous human reactions are examined, using magnetic resonance brain scans, positron emission tomography, functional magnetic nuclear resonance, electro-and magnetic-encephalography for a deep study of the brain and its higher cognitive functions (Stipp 2015). Neuromarketing methods use brain scanning (Plassmann et. al. 2007) to study end-consumers. But this technique has a number of serious limitations that are highlighted by Varan et. al. (2015). Galvanic Skin Reaction (GSR), Beat per Minute (BPM) devices are sufficient to measure emotional fatigue, especially in «field» conditions (Braithwaite, Watson, Jones and Rowe 2013). Several studies have been conducted to measure the neural correlates associated with consumer decision making in order to investigate the basic processes governing purchasing (Ambler et. al. 2004). The study of emotional incentives in the real environment and the development of recommendations for improving

the activities of trade organizations by reducing the emotional fatigue on their basis is an actual topic of research that is not fully disclosed.

3. METHODOLOGY

3.1 Neuro-physiological measurement and store-choice model

Measuring the degree of emotional stress is determined by the magnitude of indicators that objectively records physiological changes (amplitude and duration of galvanic skin response). To assess the shift of level of buyer emotional reaction (ΔE), the dependence was used as shown in Halkin (2018). Resulting shift on back-to-back elements of purchase process shows emotional fatigue on it:

$$\Delta E_i^{GSR} = \frac{(GSR_{i-1} - GSR_i)}{GSR_i} \cdot 100\%, \quad (1)$$

where GSR_{i-1} – microsiemens value at previous element of purchase process, mSm;

GSR_i – microsiemens value at the current element of purchase process, mSm.

A trip to the store causes various losses, including emotional ones. This is especially true for daily purchases, which are repeated systematically and do not bring positive emotions, because people are forced to do them. Under such conditions, the choice of store will depend on emotional fatigue, which will accompany the purchasing process. Utility in this case will be a reciprocal function from the received fatigue:

$$U_{pj} = \frac{1}{\Delta E_{pj}^{GSR}}, \quad (2)$$

In this case, the probability of the distribution of demand in the area of service among stores can be found by the level of fatigue received in them:

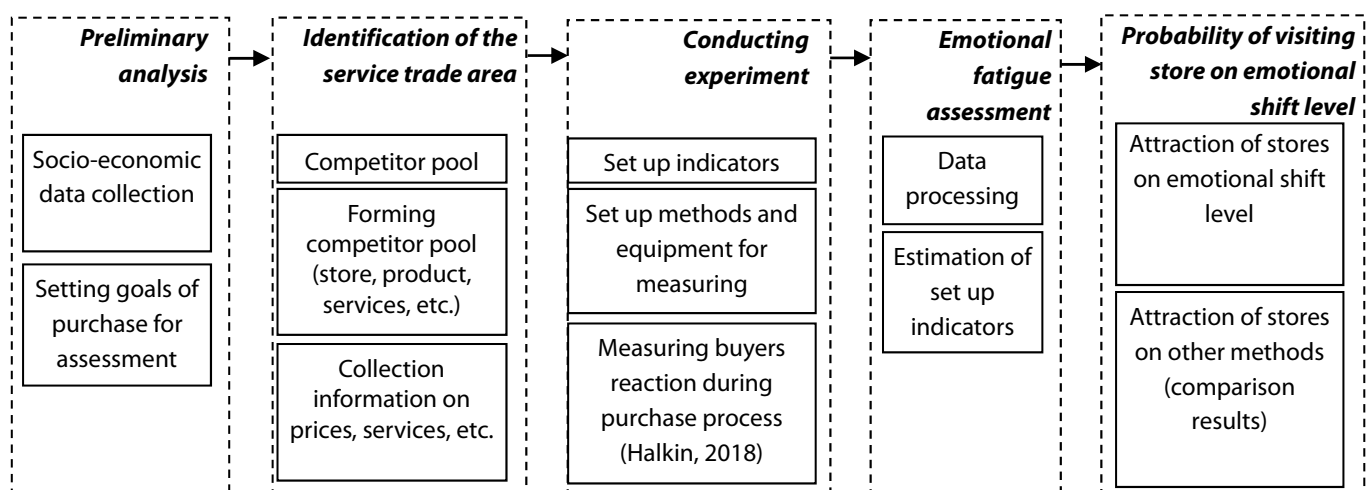
$$P_{pj}^{GSR} = \frac{U_{pj}}{\sum_{j=1}^K U_{pk}} \cdot 100\% = \frac{\frac{1}{\Delta E_{pj}^{GSR}}}{\sum_{k=1}^N \frac{1}{\Delta E_{pk}^{GSR}}}, \quad (3)$$

Where, n – the number of stores that are considered by the p -th buyer to visit ($k = 1, \dots, n$).

Dependence (2) shows that the probability depends on the usefulness of this or that variant of the TS for consumers. At the same time, from the dependence (3), it can be understood that the utility has a reciprocal effect from potential emotional losses when visiting a particular store. Lesser the emotional cost the consumer will incur after choosing, the more benefit he will bring to this choice, and the greater the likelihood of a visit to such a store (H1). Exhaustion does not contribute to visiting the store. If the buyers know in advance that the purchases will be exhausting, they will consider alternative options (if any). The question of choosing a store depending on fatigue in it requires detailed consideration. Therefore, it can be argued that there is a pattern of choosing a store for a particular buyer, in which he gets the slightest emotional tiredness.

For successful practical implementation of the ideas of sensory marketing, it is necessary to have appropriate, scientifically grounded communication technologies and tools for the study of the psycho-emotional reactions of a potential buyer to various stimuli and influences. We divided our method in 5 stages (Figure 1). Information obtained from the GSR sensor was analysed simultaneously with video

Figure 1: Conceptual framework of retail's attraction via emotional shift level



recording.

The overall conceptual model was described in 5 stages:

1. The preliminary analysis stage consists of choosing targets for purchases to assess and collect the socio-economic data of residents. At the first stage, the goal of the experiment is set and socio-economic data is collected and analyzed in this area of research.
2. Determining consumers and service areas for retailers is the second stage. Collection of information about competitors (shops, products, brands, services) in this area determines the possible options for purchases. Formed database gives the range of variation for the results obtained further.
3. The organization of the experiment. Indicators of efficiency – emotional fatigue of customers should be installed. Methods and equipment should be defined to evaluate these indicators. We conducted an experiment in accordance with the previously developed experimental methodology (Halkin 2018). To assess the emotional fatigue of consumers during the buying process, a sampling was made before leaving the house and returning home. The change between these two values indicates the level of consumer emotional fatigue. Other biometric characteristics can also be used

- to assess emotional fatigue (R-R-interval analysis, brain waves (Afanasieva, Halkin 2018), etc.).
4. Further, an assessment of emotional fatigue based on a GSR measurement was used to measure the level of consumer emotional response (equation 1). As a result of data processing, an emotional shift map has been developed for retail stores in this area.
5. At the last stage, probability of visiting store on emotional shift level was made. For this, data for all stores and all subjects are collected in groups in which the average value of the emotional shift level is found. Further, using formula (3), the attractiveness of visiting each of the analyzed stores is found.

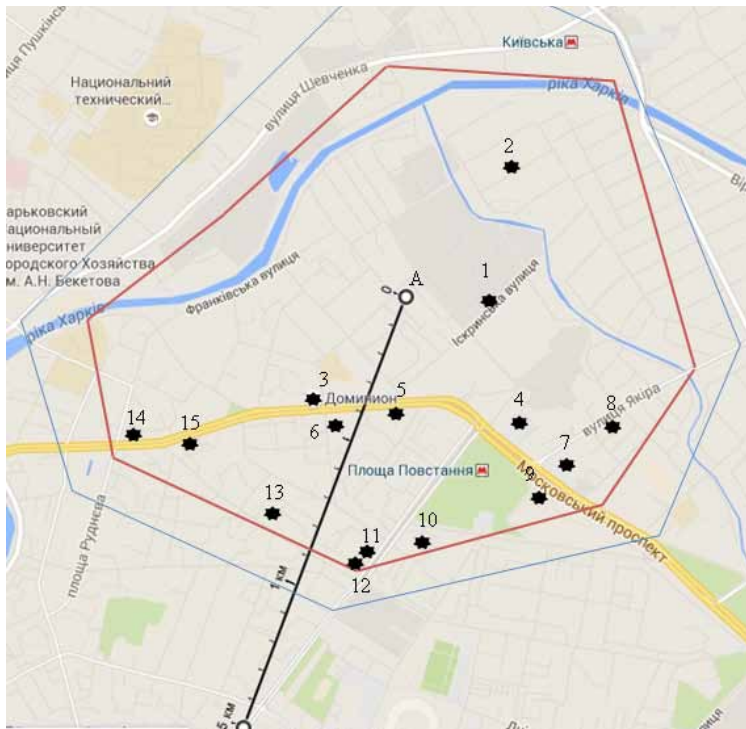
In this case two Hypotheses can be assumed:

Hypothesis 1: The choice of the retail store depends on emotional fatigue [H_1]

Hypotheses 2: Different types of retail stores create different incentives for buyers [H_2].

It was established different stores create different incentives, but at the same time the issue of identical types of stores such as Counter Store, Supermarket, Market place (Bazar), Discounter supermarket, etc. was not considered. An important question is how the type of retailer influences on the probability of its choice and emotional fatigue in it.

Figure 2: Shopping service area with adjustments:



Residents of a certain house (A); –Retailers (1-15).

3.2 Data collection

The path of the buyer begins in front of the store (the first interaction, possibly with the advertisement of this enterprise and / or its exterior). The next contact occurs at the storefront. Then the buyer enters the store and decides whether to go further or not. The entrance zone creates an emotional environment that makes an impression on a potential buyer due to interesting and attractive signs, convenient navigation, beautifully decorated in-store windows, POS materials at points of sale, display of goods, tastings, properly placed information, competently organized service.

The participants were asked to go to the store, and purchase products from consumer basket (Lissovlik 2003), overall 43 products. There were no limitations (budget, time, etc.) for those purchases. All people have been in all stores previously, they are not new for them and they know the location of the goods in the store. One of the residential areas of Kharkiv was selected for the study, Figure 2. All shops were within walking distance, Table 1.

Table 1: Information on stores in Research area

| Retail Store | Name of the store | Type of store | Distance (Ly, in km.) | Average time movement to the retailer (ty, in min.) | Size of store (m2) |
|--------------|-------------------|------------------------|-----------------------|---|--------------------|
| 1 | Grocery 1 | Counter store | 0,4 | 6 | 16 |
| 2 | Grocery 2 | Counter store | 1,2 | 17 | 22 |
| 3 | Arbuz | Supermarket | 0,65 | 8 | 20 |
| 4 | Grocery 3 | Counter store | 0,6 | 8 | 60 |
| 5 | Brusnichka | Discounter supermarket | 0,6 | 7 | 150 |
| 6 | Grocery 4 | Counter store | 1,1 | 14 | 12 |
| 7 | Chudo | Supermarket | 1,3 | 21 | 180 |
| 8 | Grocery 5 | Counter store | 1,2 | 18 | 11 |
| 9 | Grocery 6 | Counter store | 1,2 | 16 | 60 |
| 10 | No name | Market place (Bazar) | 1,0 | 13 | 1000 |
| 11 | ATB | Discounter supermarket | 1,1 | 14 | 150 |
| 12 | Silpo | Supermarket | 1,45 | 24 | 50 |
| 13 | Grocery 7 | Counter store | 1,3 | 20 | 8 |
| 14 | Posad | Supermarket | 1,2 | 18 | 70 |
| 15 | Grocery 8 | Counter store | 1 | 13 | 25 |

Source: own research

Consumers aged between 25-35 years were examined and the research was conducted in the evening time period from 20.00 to 23.00. A total of 150 experiments were conducted on 10 people and 15 different retail networks. Galvanic Skin Reaction (G.S.R.) sensor was attached on the left hand on the index and ring fingers (Halkin et al. 2018). The video recording began together with the start of sensors. We used Kotler's scheme of the consumer's decision-making process on buying a product (Kotler and Keller 2012). Proceeding from it, «the road to the store» and «shopping service» was considered.

4. RESULTS

4.1 Attraction of retailer via emotional shift level

The data obtained after experiments are shown in Table 2. For calculation of shift of level of buyer emotional reaction the eq. 1 was used.

The calculations of relative attractiveness for the buyer of 15 adjacent retailers are performed according to the dependence (3). The results are shown in Figure 3. An auxiliary calculation of dependence (2) was made before determining the average attractiveness of each option.

Based on the data obtained, it is clear that Arbuz supermarket has a clear preference – the emotional

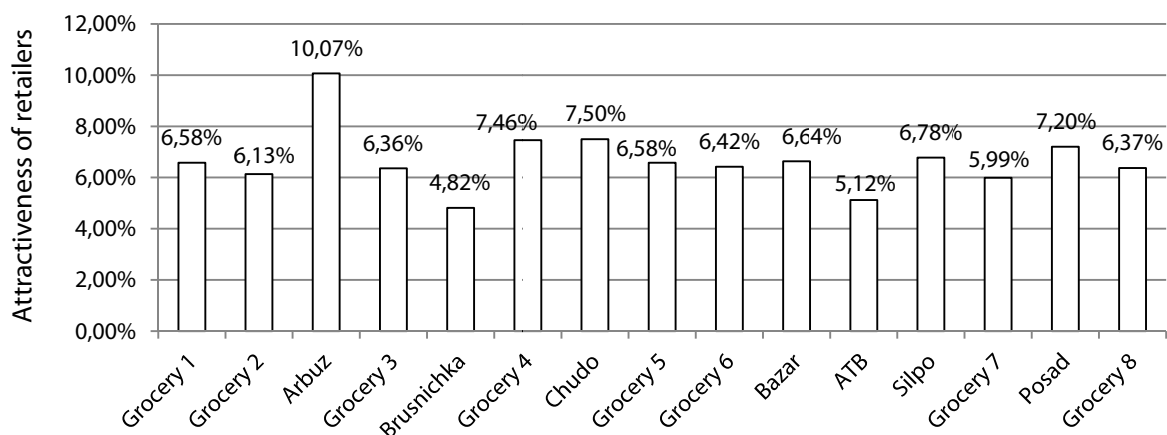
Figure 3: Probability of choosing a retailer

Table 2: The Experiments list

| Name of the store | Type of store | The Shift of level of buyer emotional reaction | | | | | | | | | | | Attractiveness of retail store (Eq.3) |
|-------------------|------------------------|--|------------|------------|------------|------------|------------|------------|------------|------------|-------------|---------|---------------------------------------|
| | | Consumer 1 | Consumer 2 | Consumer 3 | Consumer 4 | Consumer 5 | Consumer 6 | Consumer 7 | Consumer 8 | Consumer 9 | Consumer 10 | Average | |
| Grocery 1 | Counter store | 50,0 | 47,0 | 47,0 | 37,0 | 62,0 | 38,0 | 32,0 | 29,2 | 19,8 | 67,5 | 42,95 | 0,026 |
| Grocery 2 | Counter store | 47,0 | 72,0 | 33,0 | 31,0 | 56,0 | 80,0 | 38,0 | 61,4 | 25,2 | 28,7 | 47,23 | 0,025 |
| Arbuz | Supermarket | 61,4 | 73,1 | 18,3 | 17,5 | 41,2 | 14,5 | 14,2 | 50,0 | 26,0 | 26,1 | 34,22 | 0,040 |
| Grocery 3 | Counter store | 47,0 | 32,0 | 48,0 | 39,0 | 66,0 | 78,0 | 49,0 | 46,0 | 18,0 | 34,0 | 45,70 | 0,025 |
| Brusnichka | Discounter supermarket | 43,0 | 59,0 | 55,0 | 35,0 | 70,0 | 29,0 | 67,0 | 85,0 | 72,0 | 61,8 | 57,68 | 0,019 |
| Grocery 4 | Counter store | 50,0 | 17,0 | 47,0 | 37,0 | 12,0 | 28,0 | 32,0 | 31,0 | 25,0 | 79,0 | 35,80 | 0,036 |
| Chudo | Supermarket | 47,0 | 54,0 | 33,0 | 42,0 | 42,0 | 34,0 | 58,0 | 15,0 | 35,1 | 24,9 | 38,02 | 0,030 |
| Grocery 5 | Counter store | 52,0 | 28,0 | 22,0 | 29,0 | 36,0 | 40,0 | 70,6 | 78,9 | 26,5 | 94,1 | 47,71 | 0,026 |
| Grocery 6 | Counter store | 19,8 | 25,0 | 48,0 | 49,5 | 66,0 | 59,0 | 52,0 | 66,0 | 25,0 | 53,4 | 46,37 | 0,026 |
| No name | Market place (Bazar) | 48,0 | 45,0 | 37,0 | 29,0 | 62,0 | 43,0 | 49,0 | 28,0 | 28,0 | 34,0 | 40,30 | 0,027 |
| ATB | Discounter supermarket | 66,0 | 41,5 | 50,0 | 55,0 | 48,0 | 51,0 | 57,0 | 37,0 | 46,0 | 49,0 | 50,05 | 0,020 |
| Silpo | Supermarket | 38,0 | 32,0 | 37,0 | 41,5 | 50,0 | 35,0 | 59,0 | 25,0 | 38,0 | 33,0 | 38,85 | 0,027 |
| Grocery 7 | Counter store | 37,0 | 70,0 | 27,0 | 47,0 | 32,0 | 50,0 | 42,0 | 39,0 | 39,0 | 66,0 | 44,90 | 0,024 |
| Posad | Supermarket | 36,0 | 44,0 | 41,0 | 29,0 | 28,0 | 40,0 | 37,8 | 30,0 | 36,0 | 33,0 | 35,48 | 0,029 |
| Grocery 8 | Counter store | 47,0 | 52,0 | 62,0 | 50,0 | 37,0 | 47,0 | 36,0 | 30,0 | 28,0 | 30,5 | 41,95 | 0,025 |

atmosphere in this store is most favourable for visitors. Next come the shops with a probability of visiting more than 7%, namely: Chudo, Posad and Grocery 4 (No Name brand shop). Next, is the largest number of stores, the probability of visiting, of which, according to the cut-rate, ranges from 7% to 6%; in general, 8 stores – this is more than 50% of the possible options. The least attractive group consists of 3 stores: Brusnichka, ATB and Grocery 7 (No Name brand shop).

The last retailer was the smallest (only 8 m²) – the kiosk. Consumers were on the street when they were buying something and the surrounding directly influenced their emotional state at that time. The low level of the indicator states that these retailers are visited rarely by the residents. Brusnichka, ATB are discounter supermarkets, and they were overcrowded for the whole time of the experiment. As a result, a greater shift in the level of the emotional shift of the buyer compared with other stores was recorded there. Arbuz, Chudo, Posad have a higher level of service, as a result of which lower levels of consumer fatigue were obtained.

Results on the probability of choosing the type of retailer for the selected indicator (H_2) are shown in

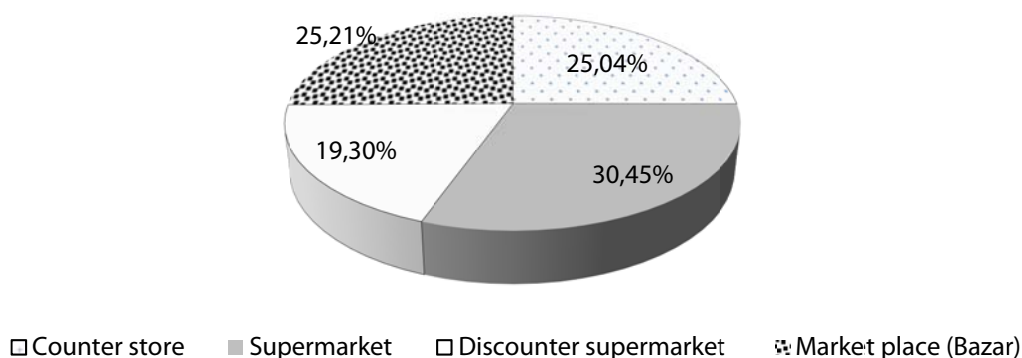
Figure 4.

The results of the conducted experiments indicate a different value of the probability of selecting retailers of different types. Thus, buyers often choose supermarkets for purchases – 30,5%. Stores and bazar shops are chosen by almost the same probability – 25%, only 50% of all possible choices. Discounter stores, on average, are chosen less frequently than others for purchases due to the greatest emotional shift in them.

4.2 Attraction of retailers via other methods

The results of the calculation of the probability of visiting the retailer by dependence (3) in the service area are shown in Table. 3. Calculations by the Huff method (Huff 1964) show that the most attractive in terms of fatigue in them are the following stores: «1», «3», «5», «7», «10», «12», «14».

Calculations by the Huff method (Huff 1964) indicate that the most probable place for purchases were the stores «5», «7» – discount stores and «10» – local market (Table 3). The probability of visiting stores «1», «11», is 5,31% and 4,86% respectively. The obtained results are based on the close location of the

Figure 4: Probability of choosing a retailer type

commercial object «1» – 0,4 m; and the insufficient area of the commercial object «11» with its considerable distance. All other stores are estimated to be below the 3,5% level, which suggests that these shopping facilities are not visited by the residents of the house or are rarely visited.

DISCUSSION

Existing retailer selection methods rarely explore online monitoring of reactions to purchases and have never used emotional fatigue as a rating criterion. The Huff model (1963) underlies this study. The ability to use the inverse level of emotional shift, as a utility, presents new opportunities to apply Huff models. The

improved model (eq. 3) leaves quite a lot of freedom to describe utility. The scheme does not prohibit the use fatigue as an average estimate, or its total value for all residents of the zone. Often, the utility refers to the distribution of visits or distribution of retail outlets by the criterion of maximum importance for the consumer. Application of the method allows to assess the probability of visiting store according to emotional shift level. According to the obtained results, the choice of shop by a particular buyer is based on the emotional tiredness of the buyers. The greater the emotional shift, lesser is the probability of a repeat visit, the smaller is the emotional shift – the bigger is the probability of a repeat visit (H1). The proposed parameter and the mechanism for determining it can be

Table 3: The results of the probability of visiting stores

| Route | Name of the store | Type of store | Probability of visiting store based on emotional shift | Indicator of the relative privilege of the store at a distance (Huff 1964) | Indicator of the relative privilege of the store at a time (Huff 1964) |
|-------|-------------------|------------------------|--|--|--|
| A-1 | Grocer 1 | Counter store | 12,9 % | 5,57 % | 5,31 % |
| A-2 | Grocer 2 | Counter store | 4,5 % | 0,31 % | 0,34 % |
| A-3 | Arbuz | Supermarket | 12 % | 2,64 % | 3,39 % |
| A-4 | Grocer 3 | Counter store | 3,9 % | 1,98 % | 1,72 % |
| A-5 | Brusnichka | Discounter supermarket | 8,6 % | 23,21 % | 25,40 % |
| A-6 | Grocer 4 | Counter store | 2,4 % | 0,55 % | 0,59 % |
| A-7 | Chudo | Supermarket | 9,9 % | 26,30 % | 28,79 % |
| A-8 | Grocer 5 | Counter store | 2,9 % | 0,43 % | 0,41 % |
| A-9 | Grocer 6 | Counter store | 3,3 % | 2,32 % | 2,21 % |
| A-10 | No name | Market place (Bazar) | 9,2 % | 24,75 % | 22,98 % |
| A-11 | ATB | Discounter supermarket | 5,9 % | 5,80 % | 4,86 % |
| A-12 | Silpo | Supermarket | 8,5 % | 1,32 % | 1,28 % |
| A-13 | Grocer 7 | Counter store | 2,1 % | 0,73 % | 0,71 % |
| A-14 | Posad | Supermarket | 9,1 % | 2,71 % | 2,01 % |
| A-15 | Grocer 8 | Counter store | 4,8 % | 1,39 % | 1,44 % |
| Sum | - | - | 100,00 % | 100,00 % | 100 % |

used to calculate MCI, MDM and other models as one of the variables. The buyer compensates for the low value of one factor (attribute) by a higher value of another. The proposed method of finding utility for the consumer can be used to calculate the models (MCI) Nakanishi and Cooper (1974) or McFadden (1973). Previously, the quality of service parameter was determined in them by surveys, interviews, etc. Using real-time monitoring of customer reaction provides greater opportunities for assessing the level of quality of shopping services and more accurate results.

The obtained results indicate the opposite values in the proposed method and the existing ones. The impact of the store and the services they represent is significant for buyers. For example, the presence of a separate parking lot, carts, entertainment zones, many cash desks, beautiful showcases and counters, modern shopping equipment, their location and subjective convenience, courtesy of staff, a system of discounts and delays in payments, shares, one way or another, will affect their choice. The data of subjective factors are expressed in the model due to the shift in the buyer's level of fatigue. Subjective interest or its absence can be caused by previous experience, stereotypes (it is expensive or boring there), mood, emotions, about the store. Separately, the assortment should be highlighted, as with all other positive characteristics, the lack of the desired product will not help to buy it.

The study is a continuation of the previous research by Halkin (2018) and Halkin et. al. (2019). We have previously described few shopping scenarios, which do not provide full information on emotional fatigue in particular type of stores. The current study describes emotional fatigue during 150 experiments, which is currently easily among the widest in this area. A large sample of data allowed us to establish different attractiveness depending on the type of store [H₂]. But, at the same time, the strength of the emotional shift of the buyer in the process of experiments in different types of stores was also constantly changing, which requires further consideration.

The trip-based approach is considered in the work, when the buyer visits only one store per visit (Torres-Valencia et al. 2014). The received results testify to the significant influence of small discounters on the buyer. The emotional shift in them is the greatest. This opens up opportunities for improving emotional fatigue in them. Thus, for discount stores, the number of incentives acting on the buyer at the same time should be limited. Appeal to the buyer inside such a store is more effective when it is «restrained» and does not attract much attention.

The main problems which we faced in the process of analysing the experimental data were the buyer's

lack of response to stimuli, or the delay of the response. Studies that have been conducted during the evening hours (8-11 pm) were not included in the article due to the absence of any reaction to stimuli. It can be explained by the human biorhythms (low biological activity during these hours, fatigue, drowsiness, etc.). In this state, a person makes purchases «without emotions» and the effect of any of the stimuli (advertisements, special offers, etc.) is useless for him. That is why they are not included in this study because significant results were not obtained. More data collection leading to extending the variation range might provide deeper concrete insights. Further, conducting the experiment during different time of the day will provide more information as well as intra-day variations. Also, the experiment can be conducted to find benchmark of emotional fatigue of different types of retail stores. As a result, it could predict the patterns of buyers reaction on particular shop type (with known parameters) with some assumptions and boundaries.

On the other hand, in some cases, it was hard to evaluate the response to the purchase immediately. Such delays can be explained by the fact that some time is needed for the purchase awareness and reaction on it (Swan and Combs, 1976). Also this reaction has known as post-decision dissonance (MacInnis, Pieters and Hoyer, 2014). Feeling of anxiety or wrong decisions of buyer are part of his emotional reaction (Belch and Belch, 2012).

To assess fatigue, other neuromarketing methods such as heart rate, ECG, EEG and others can be used. The results obtained from them may differ from those obtained by us in this study. Also the proposed model (1) and the parameters in it can be replaced depending on the purpose of the research.

Obtained data is forming a variation range and limitations of the study. Extending the variation range could provide better results on understanding behaviour of consumers. The trip based approach is also provide some limitation to the work. Visiting one retailer per one trip not always provide clear results. Subject can visit several retailers on the same trip, or performing purchase on the way to or from work (home), etc. This information can be initial data for further research in consumer's marketing issue.

CONCLUSIONS

Theoretical value of research: a method has been developed for assessing fatigue in stores on the basis of GSR data, which determines their consumer attractiveness and predicted attendance. This method differs from the well-known methods that require

human factors as input by directly taking into account the state of the subject in the real environment rather than in an experiment or simulated environment. The data obtained in this way, with higher accuracy, determines the parameters of the service of the retailer, and as a result, give a more accurate forecast of its attendance. We conducted more than 150 experiments which gives opportunity to make particular conclusions on influence of type of store on the consumer behaviour in particular conditions. The experimental method was designed to assess store type attractiveness on emotional fatigue of the consumer, which was established by the collected data i.e. store attractiveness is dependent on store typology [H2]. Regarding validation of two hypotheses [H1] and [H2], we found that different trading zones, environment conditions (atmosphere) in the store, state of consumer, etc. influence the emotional fatigue differently. Thereby, allowing us to state that measuring environmental conditions via direct measures for consumer fatigue provides an extension to the neuromarketing theory and practice, as well as models of store choice.

Practical value of research: a model that is able to predict the retailer's choice and can be used to effectively plan activities to attract additional visitors in order to preserve and develop the competitive advantages of commercial real estate.

An approach from the position of the buyer's emotional fatigue is an important factor in consumer analysis and impact on it. Therefore, in conditions of modern fierce competition, the maximum effect will have the sales object or network that can manage the emotional tiredness of its customers. Creating an emotional, provocative purchase, the atmosphere in the store is a science and an art. Formation of emotions of the buyer directly at the point of sale by influencing him with both visual and other signals is one of the most important factors influencing the target buyer and his behavior. It should be noted that a person forms a holistic view of the world around him mainly through the visual channel of perception, in this case, this is visual information about the product and the store in which the promoted product is sold. The result can improve the quality of shopping service by creating conditions conducive to a more favourable environment for shopping, planning sales areas, shops, sales analysis, advertising campaigns and analysis of the buyer's behaviour.

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