CONSUMER BEHAVIOR AND THE INFLUENCE OF PERSONALIZED OFFERS IN SUPERMARKETS

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Abstract

During last decade, both scientists and companies began to create increasingly more models in order to analyze and predict consumer behavior. The goal of this paper is to identify the effects of offers on the purchase decision process (is the buying behavior changing according to the offers and do consumers buy products only according to their needs). For that a questionnaire was filled in by supermarket consumers. According to their answers, most of the consumers will not go to a specific supermarket driven by the offers they can find there (location and the products are more important factors), but they may pick a different product because of that. In conclusion, offers may change the buying behavior once the consumers are inside the supermarket, ultimately making them to choose products that they may not really need.

Keywords: *buying experience; consumer behavior; purchase decision process; supermarket*

1. Introduction

Consumer behavior has become in the last decade one of the most important aspects studied by companies and economists around the world. Most companies are now empowered by the final consumer who wants instant value, user-friendly services and mobile functionality. Today, the consumers are socially networked (according to a study made by Philippe Janot at the end of 2014, 53% of customers abandoned an in-store purchase due to negative online sentiment), more informed (57% of the buying process is completed before a first interaction with sales) and less loyal (59% of customers are willing to try a new brand to get better customer service) [1]. In conclusion, in the current environment the consumer behavior is difficult to analyze and predict, more and more tools being developed in order to solve this daily problem.

Companies have realized that keeping an already existing client is less expensive than attracting a new one and as a consequence on-line companies, like Amazon.com or eBay, began to use complex models, real-time data and the latest technologies in order to understand their consumer behavior and to create personalized offers for them. Over the years, they have developed a strong relationship with their clients by asking periodic feedback and providing maintenance services in order to understand and anticipate their behavior. Also, in order to create a complete image of the customer experience, companies realized that they need to have an integrated system that can record all the data regarding the buying activities: from just looking at a product, to putting it into the shopping cart, finally replacing, discarding or buying it. In this regard, on-line companies can record the entire online navigation of a customer: the viewed pages, the selected products, the comments, the shopping carts, so all the moves of an online consumer.

Another type of company that can do the same thing, and might actually create personalized offers for their customers, are the supermarkets. In the last decade, this indus-

try also began to access the online market by creating online groceries (for example AmazonFresh, Instacart, Epermarket, FreshDirect, Natures's Basket), but according to studies it seems that consumers prefer still going to the store than buying from online groceries. According to a survey from Nielsen, made in 2015, which polled 30.000 online volunteers from 60 countries, only a quarter of the respondents were buying online grocery, while 61% of the respondents reported that they still find grocery shopping at the store to be an "enjoyable and engaging experience" [2].

The grocery e-commerce market started in Romania in 2010 and in 2014 was already one of the most competitive grocery e-commerce markets in Central and Eastern Europe, after Poland. This market was shaped by retailers like Cora, Metro Cash&Carry and Carrefour. Although, Romanians still prefer brick and mortar stores, supermarket supply becoming a mandatory activity for them [3].

Although online companies can record more easily the buying process, supermarkets can also do that. They can register all the shopping carts of the customers (to see which products were bought and by who) and they can also extract additional information from the surveillance cameras (like identifying the discarded products or registering how the products are selected), observational research or experimental studies. By combining these information supermarkets can analyze the consumer behavior and create personalized offers.

Companies like Tesco or Sainsbury's made such analyzes in order to create sales promotions for targeted cutomers, but in Romania, supermarkets are still using general offers, available for all customers. For example, Tesco is using its Clubcard database to identify what a client is eating, and eventually offering him vouchers for salad and fruit, if the client's shopping cart usually contains unhealthy items. Sainsbury's discovered that a cereal brand called Grape-Nuts was worth stocking, despite it had weak sales, because the consumers who bought it were extremely loyal to Sainsbury's and often big spenders. Although Cora has also a Clubcard database like Tesco, it does not use it at its full power, clients still receiving general offers [4].

Even if they operate online or not, companies, and thus supermarkets, are creating their own consumer behavior models in order to improve their sales. The final objective of every company is to sell more in order to have a bigger margin (having started in the USA, since 1925, the consumerism has spread all over the world and is still a social and economic norm). In order to do that, the main focus of a company is to simplify the buying process experience for its consumers. The question is, if the companies influence the consumer behavior, are the consumers buying what they need?

In order to find an answer a questionnaire with 21 single response questions was filled in by 188 supermarket consumers. According to the answers, shopping at the supermarkets has become a weekly necessity and consumers prefer to buy directly from supermarkets, depending on the products they want or need and the location of the store. Over 50% of the respondents go to supermarket to buy products on sale (15% go even for one product, while 37% go for at least 2-3 products), while the rest of them go to a supermarket because of the products that they can find there, and not because they are driven by offers. Although, once they are in a store, half of them choose the products that are on sale once they see them. In conclusion, most of the consumers will not go to a specific supermarket because of its offers, but they may pick a different product because of that, so the consumers sometimes buy according to the offers and not according to their needs.

This paper consists of 5 sections. Section 2 contains a specialty review regarding the correlation between the evolution of consumer behavior, market research and advertising. Section 3 presents the questionnaire that has been used in order to identify the effects

of offers in the purchase decision process. Section 4 present the results of the questionnaire and the main findings. Section 5 is the conclusion of this paper.

2. Literature survey – the correlation between the evolution of consumer behavior, market research and advertising

Consumer behavior is an emergent phenomenon that evolved along with human development. Thus, during the prehistoric age the human behavior occurred in a very limited way, people being grouped in small families with the only concern of surviving. Much later, people began to develop social skills that eventually led to the emergence of money, social status, wealth and ultimately to shaping consumer behavior. This evolution of consumers' psychology is carefully studied by *Geoffrey Miller*, one of the most famous contemporary psychologists who tried to surprise the causal chain that led to the current consumer behavior [5].

In 1960 economic behavior distinguished as an independent science [6]. Until then, consumers had a conservative behavior, with limited possibilities to satisfy their needs and to leave their community. After that, due to the demographic and social changes and technical evolution, people began to have more needs, more diverse. Starting with the development of consumerism, their behavior became an extensive one (people were buying a lot of products) until 2008, when the economic and financial crisis turned the behavior into a defensive one (comparing the prices and the characteristics of the products and services before buying them became mandatory in the decision process).

In order to study the decision in the buying process, theories were developed. The Neoclassical Economic Theory introduced two fundamental concepts: expected utility and marginal utility (*Daniel Bernoulli, 1783*), starting from the idea that rational economic agents are always maximizing their expected utility (strong contributions to this theory were also made by *John von Neumann* and *Oskar Morgenstern*). Yet, the overall goal of the utility maximization did not involve the psychological interpretation, which affected the basic idea of neoclassical economic theory. In this regard, a new theory was developed by *Tversky* and *Kahneman* in 1973: Prospect Theory. So, if in classical theory the consumers have stable, well defined preferences, based on which they always made rational choices, in behavioral economics and also prospect theory, this assumption is relaxed. This helped the companies to better understand their consumers and to make better prediction of their behavior [7], [8].

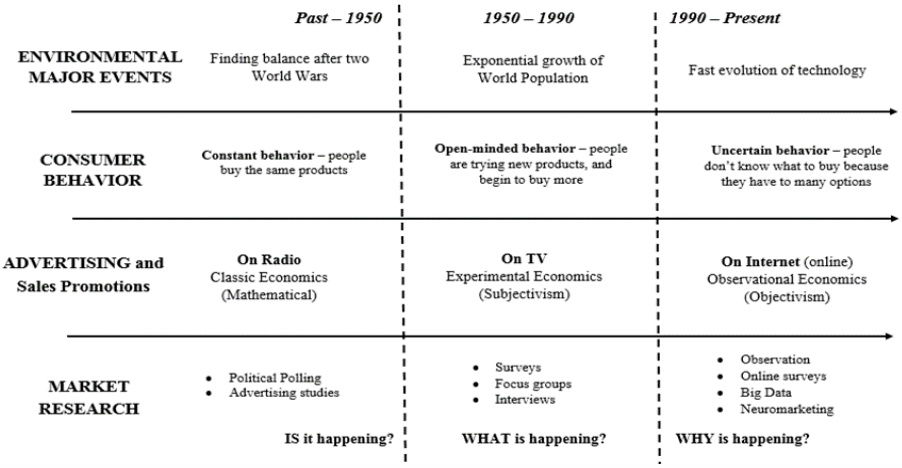

Figure 1. Correlation between evolution of consumer behavior, market research and advertising

Source: author's creation

An overview on the evolution of consumer behavior reported to the economic and social environment and evolution of technology (this includes advertising and market research techniques), is represented in Figure 1.

In the last century, two of the most important moments that changed the world were the two World Wars. Before them, people were trying to find a balance in their life, consumer behavior being relatively constant. The market research tools were also pretty limited (political pooling and advertising studies), their main goal being to identify if a certain marketing strategy may have an effect: IS it happening? Marketing strategy, does it have any effect on consumer behavior?

After the middle of XVIII century, consumers started to have an open-minded behavior, trying new products and buying more. The main factors were the demographic changes (exponential growth of population on global scale and the growth of life expectancy from an average of 35 to 70 years) and the evolution of technology (travel became available on large scale, people experiencing different life styles; people became more connected and more informed due to the internet). Marketers tried to adapt by implementing more complex models in order to study this extensive behavior: surveys, focus groups, interviews. By using these new techniques they were trying to create a complete image of their consumers behavior: WHAT is happening? Are the consumers going to buy a certain product?

Today customers want instant value, mobile functionality and user-friendly services. Market research is trying to adapt to these latest changes by implementing new tools (observation, online surveys, Big Data, neuromarketing) in order to identify WHY is it happening?

One of the instruments which is now frequently used by multinational companies is Big Data. This instrument does not involve only the analysis of a lot of data. It is a complex process that can extract new information in order to understand the background of the industry in which a company operates, to assess the specific factors that apply to a company and to familiarize a company with a great number of analytical instruments. Big Data is also an instrument used to present the new information extracted from data so that managers can understand and use it in business decisions.

Using Big Data a lot of information about consumer behavior that can improve their buying experience can be extracted by making different analyzes: customer migration, customer approach, promotion analysis, acquisition analysis, priority analysis, sales according season, customer loyalty, cross sales, customer segmentation, channel of communication and media analysis, channel of distribution analysis, basket analysis, customer gain and loss analysis (churn).

For example, by making a seasonality analysis companies can discover how the buying profile changes during the year and therefor they can create seasonal patterns in products or services that will shape the business strategy. A priority analysis will determine if there is a particular order in which customers prefer to buy products, while target marketing and niche market determination will identify if there are segments that have specific buying patterns. For example, Tesco made a study combining different strategies and discovered that customers who start buying Pampers, also start buying more beers. The explanation for this particular behavior, which seems strange at first site, is that fathers of toddlers do not have time anymore to go to the pub, so instead they drink beer at home [4].

The most popular analyzes made through Big Data are basket analysis and cross-selling analysis. They determine the associations between products within the shopping bas-

ket of a consumer, increasing both the quantity of products from the same category and from complementary or even totally different categories.

In conclusion, Big Data is the perfect instrument to study today's consumer behavior, the succession of Big Data analytics and business decisions becoming an infinite single loop. Data are analyzed using this instrument influencing the business strategy which generates new data that are going to be again analyzed. By using information generated by Big Data managers will adjust the business strategy of the company, helping it to survive in the current unpredictable economic environment.

According to J. Taylor, advertising is at the front of delivering the proper message to customers and prospective customers. The purpose of advertising is to convince customers that a company's services or products are the best, enhance the image of the company, point out and create a need for products or services, demonstrate new uses for established products, announce new products and programs, reinforce the salespeople's individual messages, draw customers to the business, and to hold existing customers [9].

Sales promotions are a way to advertise. Sales promotions or offers are double purposed because they are used to gather information about what type of customers one draws in and where they are, and to jump start sales. Sales promotions include things like contests and games, sweepstakes, product giveaways, samples coupons, loyalty programs, and discounts. The ultimate goal of sales promotions is to stimulate potential customers to action [10].

One of the instruments through which advertising is made are commercials. In the last decades the commercial has drastically changed, switching from conscious to unconscious. In 1940, the presentation of a product was very simple and straight forward: "Buy this wonder pot to start cooking faster. It also has a valve and a safety system". So, the commercial activated the conscious and rational part of human brain: the consumer received the message, analyzed if the characteristics of the product were justifying its price and decided if he should buy the product. Today, the commercials are more about what is not directly said, like smiles, suggestive shapes, surroundings, colors, music, with other words emotions. In most of them the product is slightly mentioned or even not mentioned at all. For example, in insurance commercials old people, orphans or fast cars are presented, the name of the company appearing only at the end, after the strong emotional impact. The free will of the consumer is gradually removed by using audiovisual formats that were studied in detail [10].

The evolution of commercial was driven by the consumerism phenomenon. In 1930, most companies from the USA were at the point of stopping their production because they had a lot of products stuck at the end of their production chain. So they focused on finding new ways to make consumers buy their products. So, if people didn't "rationally" need a specific product, they definitely "affectively" need it, commercials starting to focus on one of the most powerful feeling: envy. So the commercials switched from "The new car is more comfortable and safer" to "You must have this new car. Did you check if your neighbor already has it?". The format of the information contained in an offer can determine the fail or the success of it.

Expressions like "hot offer", or "don't miss it" or "limited time offer", instead of "10% off", activate the emotional part of human brain, people becoming less rational in their buying decisions [11].

In conclusion, there is a strong correlation between the evolution of advertising and consumer behavior, commercials being adapted over the years to increase sales by influencing the emotional part of consumers.

During the last decade a lot of researches were made regarding the consumer behavior and the effects of offers in supermarkets. Today, surveillance cameras are strategically placed in these stores and records all customers moves. Using this data, analysts can identify if an offer attracts more consumers than others, how rapidly an offer is spotted, if the products are correctly placed and easily accessible, which products are often given up by consumers (so they can be removed from the store), or if a product is out of stock too quick and a refill is needed more often.

According to a study made by AMRCR (Association of Big Commercial Networks in Romania), during August – September 2015, the supermarket was the favorite place for shopping for 83.6% of respondents, while the price continued to be the main criterion in choosing a particular one (for 75.2% of respondents price is a defining criterion in choosing supermarket, while for 65.1% of them representative is the quality of products and for 58% the distance from home). Most respondents (71.5%) considered that supermarkets are selling cheaper products than small stores or markets, and 84.1% answered that supermarkets have more products at lower prices than other stores. These are the two main reasons why weekly supply from supermarkets has become a habit in Romania. The national data sample, derived from 4 regional samples (Muntenia-Oltenia-Dobrogea, Banat-Crisana-Maramures, Transilvania, Moldova-Bucovina) included 1,220 people aged over 18 [12].

According to an article from Ziarul Financiar written by Cristina Rosca during the same period (July 2015), the share of supermarkets in total FMCG trade (fast moving consumer goods) is about 31% in Romania (the source is Planet Retail), competing the markets of Russia and France (in France, supermarket dominance is justified by the fact that here was born the first hypermarket in Europa after about half a century). Supermarkets in Romania attracts more and more customers due to their location on the main roads and the wide range of products that they offer (up to 60,000 different articles). In Romania, people consider that shopping in supermarkets is an opportunity for "recreation and socialization" [13].

In conclusion, there is a strong correlation between the evolution of consumer behavior, marketing research and advertising. Today, supermarkets' marketing analysts are trying to integrate this 3 elements, using the latest instrument in advertising to influence consumer behavior and the latest tools from marketing research to create a complex image of the consumer experience.

3. Methodology – exploratory research in the study of supermarkets' consumer behavior

During the last decade studies were made regarding the consumer behavior in supermarkets using both experimental economics and observational research. Today, surveillance cameras are strategically placed in these stores to record all moves of the customers, while clients are filling surveys regarding their buying experience. Using this data, analysts can identify if an offer is preferred by specific consumer types, how rapidly an offer is spotted, if the products are correctly placed and accessible, which products are often given up by consumers, or if a product is out of stock too quick and a refill is needed more often.

Observational economy has a lot of advantages: a better anticipation of needs and desires of consumers, identification of engagement and friction points in the buying process, improvement of consumer experience and measuring consumer satisfaction. According to studies made by Burke Raymond, 85% of the products bought by a certain client does not change from one week to another, so people have usually stable preferences and a conservative behavior on short term. Burke Raymond's research also showed that when shopping from supermarkets, people scan horizontally the space, at a height of approximately 4 feet, observing the strategic placed messages (like the offers from the main entrance) or the shelves decorated according to a specific event (like Easter, Christmas or Valentine's Day). Consumers are spending more time reading and processing these messages than looking at the other shelves around. The situation changes if the consumer has a certain list of products that he wants to buy. In this case, his attention is focused on those products so other messages or offers can be passed over easily [14].

So the way products are placed on shelves and the way they are presented may influence the consumer buying behavior. But how much can offers influence the consumer behavior? In order to identify the effects of offers on purchase decision process a questionnaire with 21 single response questions, written in Romanian, was developed. The questionnaire was filled by 188 respondents (152 respondents chose the online version which can be found by accessing http://www.isondaje.ro, while 36 chose the printed version). The questionnaire is structured in 4 main sections (the questionnaire was not visibly split in the sections in order to influence as less as possible the consumer):

- *general information about consumers* (the first 7 questions): these questions focus on identifying correlations between certain consumers features and their consumption behavior;
- *frequency of shopping in supermarkets* (questions 8, 9, 10 and 11);
- *consumer behavior related to products from supermarkets* (questions 12, 13 and 14): shopping cart;
- *consumer behavior related to offers from supermarkets* (last 7 questions): the last questions are trying to identify the differences between what consumers do an what they say regarding to offers.

Because the survey is made out of 21 single answer questions, the results contain only qualitative data (the value of a variable is the number of the chosen variant and not a quantitative value). The study is an exploratory research, given the subjects selected and the sample size. In order to analyze the data I made basic statistics (descriptive statistics and correlation matrix) and advanced statistics (principal components analysis and cluster analysis) using R program. This program is a statistical and graphical programming language created by Ross Ihaka and Robert Gentleman. R is distributed for free under the GNU General Public Licence (development and distribution are in the care of several statisticians known under the generic name of R Development Core Team). The program was chosen due to its increased usability and the wide range of analysis that can be made with (linear and nonlinear modeling, time-series analysis, classical statistical tests, classification or clustering) [15].

The advanced statistics made with R program are Principal Component Analysis which synthesizes the information and eliminates the redundancy and Cluster Analysis which

I used for customer segmentation. Principal Component Analysis is focused on analyzing the variables and reduce their number, while Cluster Analysis is focused on analyzing the observations and group them into clusters (the initial space, N variables and T observations, is reduced on both dimensions, M principal components and K clusters).

The Principal Components eliminate the overlap of the information due to the fact that they are all correlated. In order to also reduce the amount of the data, their number must be reduced. For that several methods can be used: Kaiser criterion (all principal components that have the standard deviation bigger than 1 should be selected), acceptance percentage criterion (the number of principal components is set according to the cumulative proportion) or level slope curvature (in the scree plot, the cut should be made so that the remaining portion of the chart is parallel with OX axis). The Cluster Analysis uses the principle of minimizing the variability within clusters and maximizing the variability between clusters. In order to maintain this principle the Ward method will be applied during the following analyze [16].

The variables that were used in the advanced statistics analyze are (each question was mapped in a variable):

- control variables: age, sex marital status, number of children, degree, work program, income;
- experimental variables: shopping frequency, variation of supermarkets, choosing a supermarket, online shopping frequency, diversification of shopping cart, consistency of consumer behavior, offers, offers influence, offers frequency, personalized offers, Black Friday shopping.

4. Results – do I buy what I need?

After mapping and saving the data in a CSV file (Supermarket consumer experience.csv), the file was imported in R program using the following syntax:

```
mydata<-read.table("SMK consumer experience.csv",header=TRUE,sep=",")
```

The descriptive statistics are not relevant for this survey because all the data are qualitative and not quantitative (the 21 variables have values in the range [1 – 5], depending on the number of answers each question have; for example question 2 has the range [1 – 2], while question 11 has the range [1 – 5]), so the average and the median don't suggest the homogeneity of the data sample.

Although, the covariance matrix or the correlation matrix suggest some links between the variables. Due to the fact that the correlation matrix is more suggestive and it can be interpreted more easily I used the following instruction to generate it in R (values are set to 2 decimals):

```
round(cor(mydata), 2)
```

	Age	Sex	Marital.status	Nb.of.children	Degree	Work.program	Income	Shopping.frequency	Variation.of.supermarkets	Choosing.a.supermarket	Online.shopping.frequency	Diversification.of.shopping.cart
Age	1.00	-0.10	0.69	0.68	0.06	0.27	-0.03	-0.19	-0.14	0.26	0.10	-0.06
Sex	-0.10	1.00	0.03	-0.02	0.11	-0.16	-0.08	0.01	0.10	0.01	0.02	0.10
Marital.status	0.69	0.03	1.00	0.71	-0.06	0.26	-0.13	-0.20	-0.06	0.26	0.09	-0.09
Nb.of.children	0.68	-0.02	0.71	1.00	-0.19	0.20	-0.20	-0.16	-0.09	0.28	0.11	-0.15
Degree	0.06	0.11	-0.06	-0.19	1.00	0.27	0.59	0.12	0.00	-0.18	-0.01	0.02
Work.program	0.27	-0.16	0.26	0.20	0.27	1.00	0.30	0.00	0.03	-0.05	-0.10	0.08
Income	-0.03	-0.08	-0.13	-0.20	0.59	0.30	1.00	0.15	-0.06	-0.22	-0.10	0.01
Shopping.frequency	-0.19	0.01	-0.20	-0.16	0.12	0.00	0.15	1.00	0.08	-0.09	-0.04	0.03
Variation.of.supermarkets	-0.14	0.10	-0.06	-0.09	0.00	0.03	-0.06	0.08	1.00	0.08	-0.07	0.23
Choosing.a.supermarket	0.26	0.01	0.26	0.28	-0.18	-0.05	-0.22	-0.09	0.08	1.00	0.10	0.11
Online.shopping.frequency	0.10	0.02	0.09	0.11	-0.01	-0.10	-0.10	-0.04	-0.07	0.10	1.00	-0.08
Diversification.of.shopping.cart	-0.06	0.10	-0.09	-0.15	0.02	0.08	0.01	0.03	0.23	0.11	-0.08	1.00
Consistency.of.consumer.behavior.1	0.02	0.12	-0.07	-0.07	0.09	-0.01	0.05	0.07	0.21	-0.10	0.02	0.27
Consistency.of.consumer.behavior.2	-0.12	0.15	-0.12	-0.06	0.16	0.01	0.15	0.18	0.10	-0.09	0.03	0.17
Offers	-0.04	0.22	0.02	0.07	-0.05	-0.07	-0.17	0.03	0.20	0.09	-0.13	0.11
Offers.influence.1	0.06	-0.18	0.07	0.08	0.01	0.12	0.11	-0.01	-0.08	-0.02	0.07	0.07
Offers.frequency	-0.03	0.15	0.01	0.06	-0.07	-0.02	-0.19	0.26	0.31	0.21	-0.11	0.11
Offers.influence.2	-0.22	0.13	-0.11	-0.03	-0.04	-0.05	-0.05	0.11	0.28	0.09	-0.05	0.15
Personalized.offers	0.09	-0.18	0.05	0.01	0.08	0.12	0.12	-0.19	-0.14	-0.09	0.08	0.01
Offers.influence.3	-0.06	0.13	-0.13	0.02	-0.10	-0.14	-0.07	0.09	0.05	0.13	-0.06	0.08
Black.Friday	-0.08	0.01	-0.10	-0.07	0.03	0.12	0.02	0.08	0.06	-0.01	-0.16	0.03

	Consistency.of.consumer.behavior.1	Consistency.of.consumer.behavior.2	Offers	Offers.influence.1	Offers.frequency	Offers.influence.2	Personalized.offers	Offers.influence.3	Black.Friday
Age	0.02	-0.12	-0.04	0.06	-0.03	-0.22	0.09	-0.06	-0.08
Sex	0.12	0.15	0.22	-0.18	0.15	0.13	-0.18	0.13	0.01
Marital.status	-0.07	-0.12	0.02	0.07	0.01	-0.11	0.05	-0.13	-0.10
Nb.of.children	-0.07	-0.06	0.07	0.08	0.06	-0.03	0.01	0.02	-0.07
Degree	0.09	0.16	-0.05	0.01	-0.07	-0.04	0.08	-0.10	0.03
Work.program	-0.01	0.01	-0.07	0.12	-0.02	-0.05	0.12	-0.14	0.12
Income	0.05	0.15	-0.17	0.11	-0.19	-0.05	0.12	-0.07	0.02
Shopping.frequency	0.07	0.18	0.03	-0.01	0.26	0.11	-0.19	0.09	0.08
Variation.of.supermarkets	0.21	0.10	0.20	-0.08	0.31	0.28	-0.14	0.05	0.06
Choosing.a.supermarket	-0.10	-0.09	0.09	-0.02	0.21	0.09	-0.09	0.13	-0.01
Online.shopping.frequency	0.02	0.03	-0.13	0.07	-0.11	-0.05	0.08	-0.06	-0.16
Diversification.of.shopping.cart	0.27	0.17	0.11	0.07	0.11	0.15	0.01	0.08	0.03
Consistency.of.consumer.behavior.1	1.00	0.21	0.05	0.03	-0.02	0.03	0.07	0.09	-0.15
Consistency.of.consumer.behavior.2	0.21	1.00	0.19	-0.20	0.17	0.20	-0.15	0.03	-0.04
Offers	0.05	0.19	1.00	-0.94	0.36	0.36	-0.94	0.09	-0.02
Offers.influence.1	0.03	-0.20	-0.94	1.00	-0.23	-0.29	0.30	0.13	0.04
Offers.frequency	-0.02	0.17	0.36	-0.23	1.00	0.53	-0.39	0.13	0.09
Offers.influence.2	0.03	0.20	0.36	-0.29	0.53	1.00	-0.38	0.10	0.13
Personalized.offers	0.07	-0.15	-0.94	0.30	-0.39	-0.38	1.00	-0.13	-0.06
Offers.influence.3	0.09	0.03	0.09	0.13	0.13	0.10	-0.13	1.00	0.00
Black.Friday	-0.15	-0.04	-0.02	0.04	0.09	0.13	-0.06	0.00	1.00

Figure 2. Correlation matrix for the 21 variables
Source: author's creation

The majority of the values are closed to zero which would suggest that there are no correlation between the 21 variables. One explanation for these results is the limited range of the data values. Strong correlations are between the variables that describe the data sample (age, marital status and number of children): an older person has a greater probability to be married and to have more children. Other interesting results based on this matrix are that the income seems to not influence the consumer behavior, but the offers seems to influence the shopping frequency. Also, personalized offers are preferred by those that prefer offers in general, which means that they address to the same segment of consumers.

The respondents are equally distributed in the 3 age categories, while the number of females exceeding the number of males with only 16 percentages. The balance is maintained also between the number of respondent married and unmarried (41%, and 52%; the percentage of divorced or widowers can be ignored in this analyze), the number of respondents with children (58% don't have children, while the other half has one or 2 children) and the average monthly income (a small difference exists between the boundaries; 30% of respondents have an income lower than 1.500 RON, while only 15% have an income higher than 5.000 RON). A high percentage of respondents have higher education studies (only 26% have only high school studies) and a working schedule of 8 hours a day (only 33 respondents are not employed, most aged between 15 and 25 year and most of them students).

All these aspects are important in creating the complete picture of consumer behavior, which is changing over time even for the same person, as more and more factors occur. For example, the consumer behavior of a 21-year-old female student is difficult to predict, her shopping cart containing products among which it is hard to find a link, while a 35 years old woman, married and mother of 2 children, will study the offers during the shopping, her consumer behavior being more constant over time.

Regarding the shopping frequency, for most of the respondents going to supermarket have become a weekly necessity and a supermarket is chosen according to the products

it has and the location of the store. Over 50% of the respondents go to a specific supermarket to buy products that are on sale (15% go even for one product, while 37% go for at least 2-3 products), while the rest of them go to a specific supermarket because of the products that they can find there, and not because they are driven by offers (although, once they are in a store, half of them choose products that are on sale, so offers have a strong impact during the shopping activity, when the consumer is focusing on the buying decision process).

The percentages change if the offer is personalized: the respondents that are not interested in offers maintain the same attitude also for personalized offers, but the other respondents (57%) would change even the supermarket to benefit for personalized offer (72% would change the supermarket because the offered is personalized, while the rest are in general attracted by offers). In conclusion, personalized offers could increase the sales in supermarkets as the consumer may change its behavior because of them. Although, the offer must be justified in order to be chosen by the consumer, only 75% from the respondents that said they buy according to offers have bought in 2015 a product on Black Friday.

Due to the amount of data (188 observations for 21 characteristics, in total 3.948 data) and overlap of information the following statements were written in R for Principal Component Analysis (figures 4 and 5):

```
fit <- princomp(mydata,cor=TRUE)
summary(fit)
```

```
Importance of components:
                          Comp.1    Comp.2    Comp.3    Comp.4    Comp.5    Comp.6    Comp.7    Comp.8
Standard deviation     1.7864951 1.6532030 1.44884248 1.24362031 1.16354100 1.07677219 1.02771822 0.93217507
Proportion of Variance 0.1519793 0.1301467 0.09995926 0.07364721 0.06446798 0.05521135 0.05029546 0.04137859
Cumulative Proportion  0.1519793 0.2821259 0.38208520 0.45573241 0.52020039 0.57541174 0.62570721 0.66708580
                           Comp.9    Comp.10    Comp.11    Comp.12    Comp.13    Comp.14    Comp.15    Comp.16
Standard deviation     0.92379801 0.89774008 0.87260694 0.84311750 0.80474833 0.76353800 0.73311311 0.68875951
Proportion of Variance 0.04063823 0.03837796 0.03625918 0.03384986 0.03083904 0.02776144 0.02559309 0.02258998
Cumulative Proportion  0.70772402 0.74610199 0.78236117 0.81621104 0.84705008 0.87481152 0.90040461 0.92299459
                          Comp.17    Comp.18    Comp.19    Comp.20     Comp.21
Standard deviation     0.67944380 0.65465504 0.54684479 0.48648115 0.437256666
Proportion of Variance 0.02198304 0.02040825 0.01423996 0.01126971 0.009104447
Cumulative Proportion  0.94497763 0.96538588 0.97962584 0.99089555 1.000000000
```

Figure 3. Principal Component analysis results
Source: author's creation

According to the acceptance percentage criterion, I consider that a percentage of 70,77% is enough to express the amount of information present in the original data, so I will chose the first 9 principal components to express the entire initial space. According to Kaiser principle I will select the first 7 principal components (only these components have a variance bigger than 1). In order to decide the final number of principal components I also used the level slope curvature (figure 5), according to which 7 principal components are enough to explain the original information from the data. The code written in R program for this last method of selecting the optimal number of principal components is the following (first statement creates the graphic, while the second one draws a red line through the 7th component):

```
plot(fit,type="lines")
abline(v=7,col="red")
```

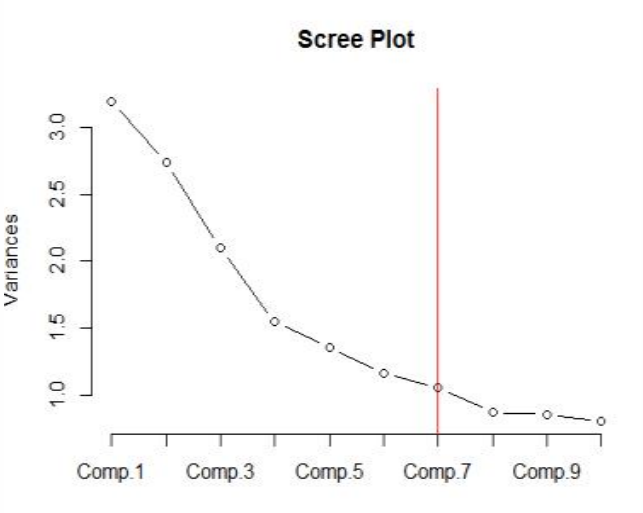

Figure 4. Level slope curvature
Source: author's creation

According to all 3 criterions used in order to reduce the quantity of information, the first 7 principal components can resume the initial data sample and they can be renamed in the following way: PC1 (offers), PC2 (general consumer data), PC3 (work), PC4 (diversity of shopping cart), PC5 (shopping frequency), PC6 (particularities of buying behavior) and PC7 (sex).

In order to make the customer segmentation, a Cluster Analysis was developed using the following code in R program (first 3 statements created the dendrogram, while the last 2 statements group the observations into 4 clusters; for the Ward method the squared Euclidian distance was used; the cut was made where the distance aggregation is the largest, dividing the sample into 4 clusters):

```
d <- dist(mydata, method = "euclidean")
fit <- hclust(d, method="ward")
plot(fit)
groups <- cutree(fit, k=4)
rect.hclust(fit, k=4, border="red")
```

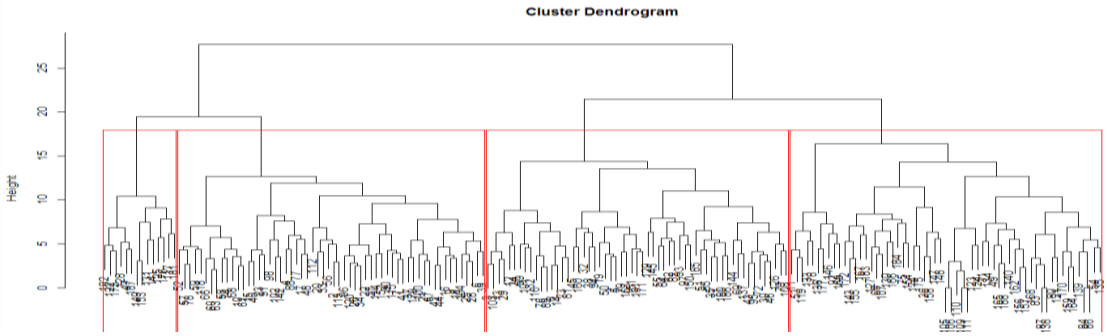

Figure 5. Cluster dendrogram
Source: author's creation

The cut was made where the distance aggregation is the largest, dividing the sample into 4 clusters. The main characteristics of the clusters are synthesized in the following table.

Table 1. Customer segmentation according to Cluster Analysis

	Offers followers	**Product followers**
Old (over 40 year)	**Cluster 1 contains 14 observations** • most of the respondents are married women with at least one child; they are all employees with a lower income (less than 3.000 RON) • they go regularly to supermarket, choosing it according to the offers (they may go to a supermarket even for 1 product on sale) • they are attracted by the idea of a personalized offer	**Cluster 4 contains 59 observations** • respondents are married men and women, with at least one children, most of them employees with varied income • they go frequently to supermarkets because of the products they can find there • they may chose a product on sale when they see it, but they are not attracted by the idea of a personalized offer
Young(less than 26 years)	**Cluster 2 contains 58 observations** • most of the respondents are unmarried women, with no child, employees with a varied income or students with low income • they go frequently to supermarkets, but they also make online shopping (they are attracted by "real deals") • they are attracted by the idea of a personalized offer	**Cluster 3 contains 57 observations** • respondents are unmarried men and women, with no child, most on them employees with high income (over 3.000 RON) • they go to supermarkets only because they need to make the weekly supply, according to the products they can find in the store • they are not attracted neither by general offers, nor by personalized ones

Source: author's creation

5. Conclusions

Consumer behavior became in the last decade one of the main concerns of every company. In order to improve the customer experience companies began to use complex market research techniques and aggressive advertising which encouraged consumption and ultimately increased their sales. In order to identify if the consumers buy what they need or their behavior is influenced by the different techniques of companies (particularly offers) a survey was made.

According to the answers of the respondents offers do not influence their decision to go to a specific supermarket (the location of the store and the products that can be found there are more important factors in this decision), but once they are in the store half of them would decide to buy a different product, or even a product that was not on their initial shopping list, because it is on sale. The cause is that consumers tend to compare things with one another due to the fact that everything is relative to something. Dan Ariely, professor of Psychology and Behavioral Economics, states: "We like to make decision based on comparison" [17].

In conclusion, although at the decision moment consumers think they choose the product that will bring them the highest utility, they later realize that they actually didn't buy what they want or need. So, another questions is raised: the main objective of companies is to improve the consumer experience or are they really following only their interest? In my opinion, both companies and consumers have the same goal: less effort for more effect. Companies use offers in order to increase their sales and by doing this increase their profit, while consumers choose the offers in order to pay less for a product that will satisfy the same need. The reason why the consumer sometimes act like this is explained by Maslow's pyramid. Today social needs, like having the last technology on daily devices or wearing the most fashionable clothes, are more important than physiological needs, like eating or sleeping.

Because of that, consumers sometimes give up to products that satisfy their physiological need (like cheaper food) in order to buy products that will satisfy their social needs (the last version of a phone).

References

1 Open Sap course, **Creating business value with user experience,** http://open.sap.com/courses, 2015.

2 Nielsen, **More than half of global consumers are willing to buy groceries online,** http://www.prnewswire.com/news-releases/more-than-half-of-global-consumers-are-willing- to-buy-groceries-online-300074168.html, 2015.

3 Ecommerce News, **Online supermarket eMAG launched in Romania,** http://ecommercenews.eu/online-supermarket-emag-launched-in-romania/, 2014.

4 Gamble, P.R., Tapp, A., Marsella, A. and Stone, M. **Marketing Revolution,** Ed. Kogan Page Limited, 2008.

5 Miller, G. **Spent: Sex, Evolution and Consumer Behavior,** Viking Adult, New York, 2009.

6 Brosekhan, A.A., Velayutham, M. and Phil, M. **Consumer Buying Behavior – A Literature Review,** Journal of Business and Management, Vol. 1, No. 1, 2003, pp. 8-16.

7 Kahneman, D. and Thaler, R.H. **Utility Maximization and Experienced Utility,** Journal of Economic Perspectives, Vol. 20, No. 1, 2006, pp. 221-234.

8 Kahneman, D. and Tversky, A. **Prospect Theory: an Analysis of Decision Under Risk,** Econometrica, Vol. 47, No. 2, 1997, pp. 263-290.

9 Taylor, J. **How to start and succeed in a business of your own,** Reston Publishing Company, 1978.

10 Bohler, S., **150 de experimente pentru a intelege manipularea mediatica. Psihologia consumatorului de mass-media,** Ed. Polirom, Iasi, 2009.

11 Rifkin, J. **La fin du travail,** la Découverte/Boréal, 1996.

12 Marinescu, C. and Marinescu, A. **Supermarketul, locul preferat de cumparaturi pentru peste 83% dintre romani; 66% prefera produsele elimentare romanesti (studiu)**, AGERPRES, http://www.agerpres.ro/economie/2015/10/07/supermarketul-locul-preferat-de-cumparaturi-pentru-peste-83-dintre-romani-66-prefera-produsele-alimentare-romanesti-studiu--13-59-16, 2015

13 Rosca, C. **Romanii au ajuns campionii Europei la cumparaturile din hypermarket,** Ziarul Financiar, http://www.zf.ro/companii/romanii-au-ajuns-campionii-europei-la-cumparaturile-in-hipermarket-14622786/, 2015

14 Burke, R. and Leykin, A. **Identifying the Drivers of Shopper Attention, Engagement, and Purchase,** Review of Marketing Research: Shopper Marketing and the Role of In-store Marketing, Vol. 11, 2014, pp. 147-187.

15 Ruxanda, G. **Analiza datelor,** Ed. ASE, Bucharest, 2009.

16 Ihaka, R. and Gentleman, R. **R: a language for data analysis and graphics,** Journal of Computational and Graphical Statistics, Vol. 5, 1996, pp. 299-314.

17 Ariely, D. **Predictably irrational. The hidden forces that shape our decision,** Harper Collins Publishers, New York, 2008.