

NEUROMARKETING AND CUSTOMERS' FREE WILL

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ABSTRACT

In this paper the possibility of applying neuroscience to marketing and branding is researched and the limit of knowing the human brain in marketing researches is questioned. Furthermore, this paper deals with the influence of sensory elements: colour, design, and also music, scent and taste on customer's perception and on his conscious or sub-conscious purchase decision. It also explores the influence of marketing instruments on the emotions of customers.

Keywords: Neuromarketing, neuroscience, consumer perception, ethics and marketing

INTRODUCTION

This paper discusses a relatively new and insufficiently explored marketing branch - neuromarketing. The goal of this paper's research is to focus on this relatively new branch of marketing and to indicate the direction the marketing is heading. The paper points out the relevance of internal factors and customers' emotions which have been largely neglected in the previous stages of marketing research; it has now become obvious that these factors will become a "key to success" of the marketing in future.

The paper specifically focuses on the customer's perception and emphasises the importance of internal, psychological factors affecting every person and their decisions in almost all real-life situations. The perception and psychological factors represent the core interest of marketing experts, given the fact that making decisions on buying products is one of the most common aspects of decision-making.

The central topic of the paper is neuromarketing, i.e. its nature and most commonly used techniques and methods. Of particular interest are the neurodesign and neurobranding which focus on emotions, that is to say, which aim to "provoke" the desired emotions in customers by using various marketing tools such as colour, scent, design, music, and the like. In addition, the paper explores the ethical aspect, i.e. ethical limits of the influence of the marketing techniques, strategies and tools on the customer, and presents an overview of the most common ethical problems and issues related to the use of neuromarketing.

This paper's research is based on the use of the existing sources and the previously conducted analyses of a number of cases in marketing practice. The objective is to draw the attention of scientists and practitioners to the necessity of further study of the sensitive matter of neuromarketing and its two aspects: on the one hand, neuromarketing will ensure a better and more efficient marketing management, resulting in increasing purchase of desired products/services and better business outcomes; while on the other, this is clearly a very sensitive area involving ethical issues with regard to using marketing techniques and tools, so that one may rightfully ask: How much customers' free will is still left? Scientists and practitioners should be able to find out how to enhance the techniques and tools used by modern marketing and brand management, while, at the same time, respecting the ethics and customer's free will. Therefore, the paper sets forth the essential research issue: Is it possible to meet both requirements? Or, in other words: does the goal of achieving successful business performance overcome the need for respecting the free will of customers? This paper surely can not provide a definite answer as these issues are, no doubt, very sensitive because they go beyond the scope of economy and management and enter the area of philosophy and ethics

and, besides, the question arises as to how to define the limits of ethical behaviour in marketing accurately.

MARKETING AND SOCIAL CHANGES

Dibb et al. (1995) affirm that "if you ask a number of people what marketing is, they will answer the question in various ways". Marketing involves more activities than most people might imagine. Although a single definition of marketing does not exist, there are a few definitions that have been widely approved. The American Marketing Association (AMA) defines marketing as "a process for creating, communicating, delivering, and exchanging ideas, goods and services, establishing their prices, promotion and distribution, in order to satisfy the goals of customers, clients, partners, and society at large". This definition emphasises the marketing focus on planning and performing marketing activities in order to satisfy the requirements of customers.

Kotler et al. (2006) point out that, today, marketing must not be interpreted by referring to its old nature of "talking and selling" but, instead, by referring to its new meaning which includes the satisfaction of customers' needs. Sale can not be performed before creating a product. On the contrary, marketing starts long before a product is created by a company. Marketing encompasses activities carried out by managers in order to assess the needs, define their scope and identity, and find out whether a profit is possible. Marketing activities continue over the entire lifetime of a product, trying to attract new clients and keep the existing ones by improving the product's quality and appeal, using the insights into sales results and the management of repeated orders.

Sheth et al. (1995) state that marketing as a discipline has initially stemmed from economy, due to economists who lacked interest in exploring the market behaviour, in particular with regard to the function of intermediary persons.

All the "stages" of social development have strongly affected marketing, marketing activities, strategies and techniques. In certain periods of history, marketing was used to improve the "looks" of a product/service intended for sale/delivery – marketing materials were designed to look appealing, news was "constructed" to sound clever and TV channels had a large number of trusting viewers. It was the time when marketing achieved up to 70% of viewership by a single TV commercial. However, times have changed and today's marketing experts have more possibilities at hand than ever to reach the "audiences" through cable television, internet, mobile gadgets... It is not surprising that the number of commercials viewed by an average American has increased from 500 per day (in 1970) to almost 5000 per day (in 2010).

Vodopija and Felici (2009) state that experts have calculated that an average 65-year-old American belonging to the "TV generation" has seen about two million commercials over his/her lifetime. If turned into work-days, this means that he or she "worked" six years as a commercial viewer, every day, eight hours a day.

We can say that a new marketing is "on the air" today, a marketing tending towards a complete individualisation, a marketing that does not consider people as goals but is aimed at emotions, heart and mind of an individual, thus creating an emotional link between an individual and a product/brand. It is a marketing whose objective is, as Peter Drucker says¹, to make sales superfluous. The objective is to know and understand a client so well that a product or service corresponds to the client... and sells by itself. The "new" marketing has come to understand the role of emotions and the fact that a purchase decision is not a rational act.

MARKETING AND CONSUMER PERCEPTION

McClure et al. (2004) carried out an interesting research based on the fact that the Coca-Cola and Pepsi drinks have an almost identical chemical composition. They examined the influence of perception on the preferences of consumers with regard to aforementioned products. They ran a few tests. We find two of them particularly interesting. During the first testing, the respondents drank Coca-Cola and Pepsi not knowing which beverage they drank (the so-called "blind test"), whereas on another occasion they drank from the brand-marked glasses. The researches found out that the results differed a lot. In the first test the respondents equally favoured Pepsi and Coca-Cola; however, when they knew which drink they had, the domination of Coca-Cola was significant. Furthermore, the researchers established that the brain activity was higher when drinking the "marked" Coca-Cola than when drinking "marked" Pepsi. This research, as well as many other studies, clearly showed the influence of emotions, motives, perception – in short, the inner consumers' world on their purchase decisions and opinions on the quality of a product/brand.

According to Dibb et al. (1995), the psychological factors are inherent to the inner world of a human being; therefore they determine the overall human behaviour, hence the consuming behaviour as well. One of the most important psychological factors is perception.

Kotler et al. (2005) define the perception as a process where an individual selects, organises and interprets information in order to create an intelligible image of the world. The reason for

¹ The famous teacher in business, organisation and management, often called "the father of management".

experiencing the same situation in different ways lies in the fact that each of us receives, organises and interprets information in our own way.

Foxall et al. (2007) state that the perception of goods and services partly depends on the stimuli the consumers are exposed to, and partly on the way the consumers interpret these stimuli. The latter is sometimes called "perceptual coding". Different perceptions of a product can serve as an explanation of different behaviours and views related to the product. Furthermore, Foxall et al. (2007) affirm that each consumer in our economic system is daily "bombarded" by hundreds of messages attempting to inform him/her about something, persuade, teach or change him/her in some way. It is clear that no one has enough time for evaluating each message received, or even time to pay attention to each message. Therefore customers, as Dibb et al. (1995) point out, adopt certain "inputs" while neglecting others, as they do not have capacity for a simultaneous reception of all possible "inputs". The phenomenon is called selective exposure and involves selecting the "inputs" we are exposed to in order to become aware of them. The selective nature of selection creates two situations: selective twisting and selective remembering.

Selective twisting is changing or twisting the received information. The situation occurs when a person receives the information which is not in line with his/her personal feelings or beliefs. For example, when a person watches a commercial advertising a brand that he/she does not like, he/she may twist the information in order to match his/her previous standpoints. Twisting considerably reduces the effect of marketing on an individual.

In the case of *selective remembering*, a person remembers the information inputs that support his/her personal feelings, beliefs and views, while forgetting the inputs that do not provide such a support. After a sales presentation of a brand at a shop, the customer forgets most of the presentation if it was in conflict with his/her earlier views.

Foxall et al. (2007) point out that there are many examples of manipulation of perceptive processes in marketing. Packing in aluminium foil is good not only for drawing the attention; using this material for wrapping a product also increases the value of the brand in the eyes of consumers, suggesting a prestige and high status (Higgins, 1984). A yellow nuance on the chicken skin gives the impression of health, rich taste and freshness. In order to make chicken skin yellow and distinguished on the shop shelves, hence better evaluated than the less yellow brands provided by the competition, Frank Perdue² feeds his chicken on large amounts of corn and marigold petals (Copulsky and Marton, 1977). Consumers use sensory characteristics

² The former chairman of the Perdue Farms board of executives.

such as colour, design, pattern and visual impression to find out the quality, the message and the value of a brand. The prestige, i.e. the status of a brand (outdated or modern, in or out) is often determined through its package looks and the way of selling (Moran 1980). The image that consumers have of a brand, in other words, results from their perception of the brand, which has been created on the basis of relatively few stimuli. Nevertheless, these images may form the basis for selecting a brand, faithfulness to a brand, or trying a new product.

Having all the aforementioned in mind, it is understandable that the marketing experts have been focusing on "deeper" and better familiarisation with the consumers, their emotions, desires and needs – in short, focusing on discovering their inner world. In an attempt to get the consumers "know" better, marketing experts have started using new methods, tools and scientific disciplines. It can be openly said that they have shifted the area of operation from "visible to invisible". Instead of traditional research of all conscious, rational and explicable elements involved in the purchase process, they have turned to exploring unconscious, irrational, inexplicable and emotional elements. In order to make the research successful, they have had to include a number of scientific disciplines ranging from sociology to psychology and medicine. As a result, a new branch of marketing has been created – "neuromarketing".

THE CONCEPT AND EMERGENCE OF NEUROMARKETING

The word "neuromarketing" might sound rather strange. As Sar (2009) explains, the word is fairly new as it was used for the first time by German professor Ale Smidts (Erasmus University) in 2002. However, it is considered that the real founder of neuromarketing is Gerry Zaltman (Harvard University) who first used fMRI³ as a marketing tool, way back in 1999.

Lee et al. (2007) assert that, in the past few years, there has been a real explosion of abilities of neuroscientists to directly study brain activities related to frequency, time and the space where these activities take place. Psychologists and psychiatrists were quick to apply the new technology in order to better understand human brain, emotions and insights of individuals. Soon the marketing experts realised the potential of such technologies and, associated with neuroscientists, created "neuromarketing". Neuromarketing can be defined as a marketing branch using neuroscientific methods and techniques for analysing and understanding human behaviour with regard to market and important marketing issues.

³ Functional magnetic resonance imaging

Sar (2009) states that, given the fact that the marketing balances between the products/services the marketing experts want to sell and the consumers' desires and needs, it is of paramount importance for marketing experts to know and understand consumers. In the "traditional" marketing these attempts would use the form of interviews, focus groups, research, observations... Even though these methods are very useful and usable, they have a pronounced shortcoming: they are not enough precise and accurate. The most frequent reason for their insufficient accuracy lies in respondents and their inaccurate/untrue responses. The reason of their insufficient accuracy was discovered by neuroscientists who found out that "what people say is often contradictory to the activities of the human brain". To put it more straightforwardly, what we say and what our brain says are two different things.

Ariely and Berns (2010) assume that the brain scanning techniques can provide indications regarding the basic preferences of an individual, which are more accurate than the data gathered by standard market research as these data are subject to prejudice due to a subjective approach to values. If this is true, the concepts and prototypes of the products could be quickly tested and the products which are not "promising" could be eliminated. This would result in a more efficient allocation of resources that could be used only for "promising" products.

A sudden expansion of neuromarketing and the interest of scientists are exactly due to this potential of detecting "hidden" information. As a proof, Wilson et al. (2008) affirm that there are more than 90 private neuromarketing agencies in the USA alone⁴.

Advantages and disadvantages of neuromarketing methods

As it has been already stated, neuromarketing and its methods have made a great "fuss" in public and media, as well as among marketing experts and researchers. In both groups there are critics and advocates of this branch and its methods.

Schull (2008) states that there are numerous scientists who disagree with the whole concept of neuromarketing. Actually, they oppose the increasing efficiency of marketing campaigns on these grounds. They believe that the factors not directly affecting the quality of a product must not influence a potential buyer in any way. They insist that the consumers should be encouraged to buy a product exclusively by emphasising its quality.

Touhami et al. (2011) point out that the number of respondents in neuromarketing is still low. This is perhaps owing to certain techniques that are used in neuromarketing (e.g. fMRI),

⁴ This information refers to 2008.

which are rather noisy and claustrophobic. They also set forth the information that the testing process is long due to numerous procedures to be carried out prior to testing itself (from signing the consent to the doctor's approval).

Moreover, Ariely and Berns (2010) question the essential advantage of neuromarketing – detecting hidden information. Namely, they claim that very little is known about the connections between the brain's activity and the expressed preference. Likewise, they wonder whether a neuronal signal that is measured during or just before the decision is made can be a good indicator of satisfaction or reward in the time of spending. Furthermore, they question the return on investment of these researches compared to "classical" methods. An average cost of scanning is about 500 dollars per hour. However, the real scanning costs are much lower as 75% of the total costs refer to personnel and overheads.

Wilson et al. (2008) state that today's MRI⁵ machines are large, noisy and expensive, but they also say that our computers were the same forty years ago. They claim that these machines will likely continue to develop and eventually become small and portable (just like today's computers).

Ethics is certainly one of the most common concerns related to neuromarketing and its techniques and methods. Lee et al. (2007) assert that there is concern about finding the information which could be used for creating such marketing campaigns that would be impossible to ignore and refuse. Besides, there is concern that marketing will use the brain scanning techniques in a way that privacy will be invaded to an extent which is completely unacceptable.

Apart from these negative connotations related to neuromarketing and its methods and techniques, there are a number of authors who claim that a comprehensive approach such as neuromarketing can only create better connections and understanding between supply and demand. The first and the basic advantage emphasised by many authors is exactly the possibility of detecting hidden information. Wilson et al. (2008) state that the use of neuromarketing could help buyers and marketing experts to understand each other better, but also to understand better the products they want, which leads to a win/win⁶ situation for both sides. Lee et al. (2007) point out that the applications of these techniques have been focused only on brands and customer behaviour so far. Schull (2008) writes about an interesting research that Martin Lindstrom⁷ carried out using the neuromarketing methods and

⁵ Magnetic Resonance Imaging.

⁶ The term is often used in negotiations to describe a situation which is beneficial to both sides.

⁷ One of the best known marketing experts lately.

techniques. The research proved that warnings on cigarette packets such as "smoking kills" or "smoking can cause a slow and painful death", at a sub-conscious level, trigger activities in the brain area that are "in charge of" desire and addiction, in such a way that these activities overcome the activities and the influence of the conscious and rational thinking that smoking is bad for health.

With regard to this research Sam Lindstorm (2008) says: *"The warnings and images on cigarette boxes have absolutely no effect on smokers and smoking reduction. This means that billions of dollars invested by 123 states in this campaign have gone with the wind. And this is not the strangest part. According to the results produced by the research, all these warnings and images on cigarette packs stimulate the part of the brain known as the "point of desire". This brain region consists of a chain of specialised neurons that "switch on" when the body wants something – whether it is drugs, sex, cigarettes or gambling. This implies that the warnings do not have any effect on smoking reduction, they actually stimulate smoking."*

Finally, it can be asserted that, regardless of advocates and opponents of neuromarketing, everyone agrees that neuromarketing has introduced great changes into the perception of the marketing and has changed the attitude towards the consumers. However, it should be noted that, no matter how big is the step that neuromarketing has made, there is still plenty of room left for progress, primarily in connecting the consumers' activities with their thoughts, emotions and brain activities. The new technologies will certainly help neuroscientists and marketing experts to better understand the role of emotions in decision-making, to develop more efficient methods of stimulating these emotions, to reinforce trust and loyalty to a brand and, generally, to be more persuasive in marketing. But where are the ethical limits in this process?

Techniques and methods in neuromarketing

There are a number of techniques and methods that neuromarketing uses for detecting hidden information. Lewis (2004) affirms two most important techniques of analysing human brain activities that are used in neuromarketing - fMRI and EEG:

fMRI - Functional magnetic resonance imaging is the most frequent technique of scanning human brain in neuromarketing. The functional magnetic resonance is a technique using powerful magnetic and radio waves to create high-quality brain images.

Ariely and Berns (2010) state that this technique uses MRI scanner to measure the level of oxygen in blood in certain brain areas. Changes in the oxygen level correlate with brain activity. The more active is a brain area, the more oxygen it requires, and this is recorded in

minute detail by the scanner. The result is most frequently a fragmented brain area shown in colours. But Lewis (2004) says that, regardless the undoubtedly "seducing" colourful brain images produced by the scanner and displayed in high resolution by the computer, we must not be tempted to interpret them without thorough understanding of the analytic methods through which these images are generated.

According to Ariely and Berns (2010), the second most frequently used method is EEG - electroencephalography. The method uses electrodes placed on the skull to assess the electrical activity of the neurons. Owing to a very high temporal resolution (millisecond), EEG can detect a very short neuronal "spike". As Lewis (2004) points out, EEG technique is the most practical among the currently developed method of brain scanning; it is the most cost-effective and the most suitable, due to the simplicity of use and compactness of the apparatus which is able to make a quantitative assessment of brain activities through the high level of sensitivity and temporal resolution.

When observing brain activities with the aid of fMRI and EEG techniques, researches actually detect the brain areas which "switch on" with regard to certain sounds, scents, images and messages. The gathered information is then combined with traditional questionnaires and is further analysed and placed into the correlation and context of consumer behaviour.

Although these methods and techniques look like science fiction, they are part of the marketing's present (and future). Due to this futuristic appearance connotation, these methods have made quite a "fuss" in public and among scientists. The media started to treat the subject in a tendentious and sensationalist way, reporting about the alliance of neuroscientists and marketing experts in pursuing the "Holy Grail of marketing" – "purchase keys" in the consumer's brain.

However, Ariely and Berns (2010) point out that present proofs indicate that the cognitive process associated with the purchase decision is far more complex and involving too many factors to be "reduced" to a brain activity area. Nevertheless it is possible to ascertain that some brain areas are actually more engaged than others in the process of making decisions and selecting a particular brand/product.

Perspectives of neuromarketing

As it was stated above, the greatest advantage of neuromarketing is precisely the ability to detect hidden information in the consumer's mind. The aforementioned Lindstorm's example clearly shows how much resources and how many human lives could have been saved if

neuromarketing techniques and methods had been used when launching the anti-smoking campaign.

Ariely and Berns (2010) indicate a few other areas where neuromarketing could have a considerable role, particularly in the stage of designing a product/service:

Food – A high potential of neuromarketing lies in designing food and juices which could be created in line with the taste and desire of consumers. As the perception of a product is achieved under the influence of a set of factors such as taste, scent, texture, appearance, even sound, which are so complex that even the respondents themselves would not be able to explain, the brain scanning technology could be of great help. Of course, to make the idea work, we should identify the product dimension (taste, scent, texture) we want to analyse, prior to the attempt of maximising the brain response to different variations and dimensions. Such methods could be used in food production in order to make food more appealing (for example, healthy food or food for children). However, some researchers point out a disadvantage of this approach – and this is a potential possibility of creating "super food" – so tasty that almost no one could resist it. This is likely to result in obesity, health issues, and threatened free will of consumers.

Entertainment – This is an area where neuromarketing has not been enough active yet. The area surely has a large potential. If we know that making an average high-budget Hollywood movie costs approximately 100 million dollars, plus additional 100 million dollars needed for marketing, the potential value of neuromarketing in the film industry is obvious. One of the mitigating circumstances is the fact that, apart from a still image, a movie is the easiest "product" to be presented and examined by fMRI scanners. Neuromarketing research can be designed in such a way that the respondents are given an opportunity to watch two versions of a movie. After comparing the brain images, the version which stimulated more activity in the desired brain areas can be released into movie theatres.

Architecture – This is certainly an interesting and atypical area for using neuromarketing. Some studies using human brain scanning during driving or orientation within buildings have already been conducted in order to produce information on how to design buildings (for accommodation or public use) which would be easier for their users to find their way around. This idea has a great potential and is very useful from the social point of view, especially if we apply it to designing and building facilities such as, for example, old people's homes in order to compensate for the loss of memory experienced by their users, due to their age or the Alzheimer's disease.

Politics – It seems that politics is omnipresent, including the neuromarketing. This is another interesting area requiring huge funds, which could benefit from the introduction of neuromarketing techniques and methods. According to the data provided by Federal Election Commission⁸, the cost of the US presidential campaign amounted to 1.6 billion dollars in 2008. If we observe political candidates in the context of marketing, they are "goods" that should be "sold" to voters. Candidates and their campaigns operate in two stages – before and after the "image designing". Neuromarketing could be used before "designing" when these candidates, their messages and the nature of campaign could be better designed owing to previous neuromarketing research. A neuromarketing research performed by The New York Times showed in what way the different brain areas respond to various people and policies. This, however, raises the issue of manipulating people in the political marketing, but if neuromarketing is used for promoting the messages of the general public interest (e.g. in anti-drug and anti-alcohol campaigns aimed at young populations) or for promoting humanitarian campaigns, its benefits to general public are unquestionable.

These and similar areas of possible neuromarketing application indicate that neuromarketing and neuromarketing research do not necessarily have to be focused only on commercial activities, but can serve well for the benefit of a wider community. These studies may indicate the right course the neuromarketing should take in the future. These ways of using neuromarketing could reduce negative connotations that are frequently undeservingly associated with neuromarketing.

NEURODESIGN AND NEUROBRANDING

Lindstrom (2008) states that in 2005 corporations spent over 7.3 billion dollars on marketing research in the USA alone. In 2007, this figure amounted to 12 billion dollars, not including the funds that were spent for the marketing of the product, such as packing, TV commercials, billboards..., which amount to a total of about 117 billion dollars per year – in the USA alone. If this machinery "works" and makes sense, why are 8 out of 10 new products in the USA unsuccessful?

It is obvious that marketing experts have forgotten to pay attention to one aspect: the synergy of all senses. To date, marketing experts have focused only on one, maybe two senses (in most cases, the eyesight).

⁸ An independent auditor.

As asserted by Vodopija and Felici (2009), the synergy of senses, a unique experience in which all senses take part, is very powerful and strongly affects the decisions of each individual. The goal of the "new" marketing is to achieve that synergy in branding by using all available information produced by neuromarketing research. For once the associations are triggered by good branding, this is followed a psychological chain reaction. In that case it is enough to stimulate one of the senses to launch an unstoppable association sequence – one sense awakes another until all awoken senses generate an effect which literally launches us into a certain emotional state/mood.

"Emotions" – this is the new marketing "weapon" of the 21st century. Owing to neuromarketing methods and technologies, it is now clear that emotions are very important when selecting a product/brand.

Norman (2004) states the example of neuroscientist Antonio Damasio⁹ who studied the behaviour of people who were perfectly "normal" in all aspects, except that they had a brain damage which reduced the functionality of their emotional system. Regardless of "normal" appearance, they were incapable of making decisions and normal functioning in the world. Although they were able to explain how exactly they should function, they could not realise where they lived, what they ate or what products to buy and use. These findings contradicted common beliefs that decision-making is a result of rational, logical thoughts.

Beauty IS important

In order to "provoke" reactions and feelings, marketing experts have gathered an entire "arsenal" of weapons used to "shoot the heart" of the consumer. The most common "emotion triggers" include package, design, colours, even scents and music. Aesthetics, i.e. aesthetic experience of the consumer plays an important role here, hence certain questions are of particular importance in neuromarketing and neurobranding: What do consumers consider beautiful? Do all consumers experience aesthetics in the same way? How does the concept of beauty change through space and time? And finally: How can marketing become more efficient in creating/designing the products/services matching the taste of consumers, taking into consideration the insights into the consumers' experience of the beautiful?

In this sense, it seems that the applied (neuro)marketing provides positive effects by producing beauty and thus taking the marketing closer to, and sometimes across, the limits of art, i.e. pop-art. In 1962, Andy Warhol, one of the pioneers of the "popular art" discovered the

⁹ Internationally recognised researcher in several areas of neurology and neuroscience.

amazing simplicity of the Campbell's tomato soup can – the can that now has become legendary. He drew and painted it over and over again, then produced a large number of its silk screens. He became famous worldwide due to these images. The famous Warhol's illustration of Campbell's soup can (Figure 1) was sold for incredible nine million dollars – a real proof of the popularity of his art.



Figure 1: Campbell's soup can – silk screen illustration by Andy Warhol

Source: http://www.christies.com/lotfinderimages/D53716/andy_warhol_campbells_soup_can_d5371697h.jpg.

Lindstrom (2009) writes that in 1915 a designer at Root Glass Company from the city of Terre Haute in Indiana was commissioned to design a glass bottle. The task was specific: the bottle had to be so characteristic and original that, in case it was broken, its pieces would remain recognisable. Never in his wildest dreams could he imagine such a success. It was the classic Coca-Cola bottle, one of the best known symbols created in glass ever. It has been used for over 80 years now, and the generations of consumers recognise it even if it is shattered into pieces.

Reimann et al. (2010) point out that the design and aesthetic quality of the product are increasingly important on the market where many of the basic customers' needs have already been satisfied. As the essential (core) product's attributes, such as quality and functionality, have become increasingly homogeneous, the companies turn to less tangible features of their products in order to make them recognisable. Such characteristics include the design and

esthetical aspects. The trend to differentiate a product with the aid of design and aesthetic quality may be based on the fact that, regardless of a product's consumption, these qualities stimulate positive responses and emotions, as well as a direct desire to own such a product, readiness to pay a higher price, and an increased inclination for showing concern about the product. More importantly, a product bought exclusively because of its functionality may cease to be appealing when it becomes technically outdated, whereas a product featuring aesthetic values, beauty and quality may remain "valuable" long after it loses its technical value.

The statements of Reimann et al. have been confirmed by a number of studies; here are some of them.

Reimann et al. (2010) and Nadal et al. (2008) conducted a research which showed that the products considered as beautiful were associated with a higher "reward value" in the eyes of the respondents, unlike the products which were considered as ugly.

Becker (2009) states that various shapes of products affect customer's opinion. Rounded or angular shapes may associate with various levels of domination. Thus, for example, angular (square) shapes are associated with a higher degree of aggressiveness compared to rounded shapes. This stimulus can be described by various and sometimes contrastive emotional and associative responses evoked by various shapes. Referring to Berlyne (1976), Becker (2009) showed that angular shapes are often associated with energy, toughness, strength, whereas rounded shapes are associated with friendship, harmony...

Stoll et al (2008) produced the results of the research performed by Erk et al. (2002), proving that the brain activity, in the area in charge of the reward process, rapidly increases when the respondents assess an object of "desire" (e.g. sports car), unlike the activity when assessing an "undesirable" object (e.g. a small cars). A similar research was carried out by Aharon et al. (2001) when they showed pretty male and female faces to respondents. The produced results also confirmed that the brain area in charge of the reward process is much more active when looking at, or being looked by, a pretty (attractive) face than when looking at (or being looked by) an ugly (unattractive) face.

Considering all that has been set forth about the design so far, it is clear that the design (along with packing) has a "power" to stimulate either positive or negative emotions, and to sell a product even at a higher price. However, can a product function better due to an aesthetically attractive design? Although it appears impossible and inexplicable, this was exactly the case with ATM cash machines.

Norman (2004) gives the example of ATM cash machines which functioned better precisely due to their design! In the early 1990s, Japanese scientists Masaaki Kurosu and Kaori Kashimura claimed that they proved that more attractive products functioned better. The two scientists studied ATM cash machines which had different appearance and design of control panels. The panels of all cash machines were the same regarding their functions, number of keys and ways of operation, but some of them had more attractive keyboard and screen design than others. The result was quite a surprise. It turned out that more attractive machines were more "efficient", as they were considered more user-friendly (despite the fact, we repeat, that the keys, functions, and way of operation were identical).

Noam Tractinsky, an Israeli scientist, was rather puzzled. Attractive products should be more appealing than the "ugly" ones, but why should they function better? Tractinsky was suspicious. He thought that his Japanese colleagues' research may have had flaws or, if not, the results may have referred only to the Japanese who belong to a specific culture that highly appreciates and recognises a beautiful and appealing design. In his view, such a research could not produce similar results in Israel – in a different country and entirely different culture. He decided to repeat the research using identical parameters. Surprisingly, the research not only produced the same results – the findings were even more convincing than in Japan.

The researchers have explained the obtained results with the aid of emotions. The emotions, as we know now, change the way the human brain solves problems – the emotional system changes the way our cognitive system works. Attractive items make people happier and make people feel better and, consequently, make them much more creative. How does this fact makes the attractive things function better? Quite simply – due to creativity and positive emotions when dealing with attractive products, it is easier for people to find various solutions, alternatives and answers to problems they encounter at work, i.e. when engaged in activities associated with such products. This makes their work (and the product itself) more efficient.

ETHICAL LIMITS IN NEUROMARKETING

There are a relatively small number of issues in marketing which are more controversial than ethics. Most of marketing decisions can be estimated as right or wrong, ethical or non-ethical. Yet the problem with ethics is that it is connected with an individual and therefore differs from one person to another.

Dibb et al (1995) state that ethics is a moral assessment of certain decisions or actions as acceptable or unacceptable from the standpoint of generally approved principles of behaviour. It can be concluded that ethics in management is formed by all moral principles which determine good or bad behaviour in marketing. It should be also pointed out that most of fundamental ethical issues have been formalised in laws and behavioural codes by which someone's behaviour conforms to the standards of society.

In the past few years the issue of ethics has become particularly topical by introducing neuromarketing and neuromarketing methods in the almost every-day practice of market research. With regard to neuromarketing and its methods, the first and foremost issue that the public is concerned with is certainly the possibility of creating such products and marketing campaigns that would be "impossible to resist". The general public is concerned about finding a "purchase key", i.e. a brain area which is in charge of purchase.

Murphy et al. (2008) affirm that precisely the issue of consumer's "autonomy" is paramount. They also claim, as most of other authors do, that the present-day technologies do not provide the possibility of "access" to the human brain with the purpose of manipulation, in the way that the manipulation results in an exactly desired behaviour.

Other authors also believe that the purchase process is very complex and involves too many factors to consider that only one brain region is in charge of it.

In addition to the widespread issue related to the "purchase key", some authors question other more or less realistic aspects of the neuromarketing ethics.

Ariely and Berns (2010) raise the question of privacy of information on consumer preferences. Namely, we are witnessing the selling of information about our preferences and activities to companies. It is particularly emphasised in the "internet marketing" where a number of more or less private information (such as e-mail address, history of purchase, search history) is shared/sold among companies. Another issue refers to handling of the images obtained by brain scanning. Many questions require to be answered: who owns these images, who has right to access them... Theoretically, it may occur that, during a neuromarketing survey, the fMRI scanner detects a disease in a respondent's brain. The information could be forwarded to the employer who could then lay off the employee.

Due to this and many other issues, Murphy et al. (2008) suggest the creation of a code of ethics which would be adopted by neuromarketing industry. The overall objective of the code of ethics would be to encourage research and development, entrepreneurship and company profitability by applying neuromarketing technologies in a beneficial and harmless manner in all stages of development, implementation and dissemination. The code should, inter alia,

address the issues related to respondents' safety (their health, scanning effects, handling of images), as well as protection of "niches" that are threatened by marketing exploitation.

Finally, it should be noted that some authors approached the ethical issues in a different way. Instead of raising questions about ethical problems in neuromarketing, they point towards benefits the ethics may have from neuromarketing.

Lee et al. (2007) state several areas where the application of neuromarketing could reform the "ethical image" of the marketing in general. The first and the fundamental area is the study of efficiency of marketing campaigns. The public and the scientists often reproach the marketing industry for its excessive spending, which is a form of social irresponsibility. Here we can again mention the Lindstorm's example of a futile anti-smoking campaign which could have been avoided if a neuromarketing research had been undertaken. Lee and the co-authors affirm that the information on views, awareness, behaviour and product assessment obtained by neuromarketing could help marketing experts to give up relying on unethical sales instruments and strategies.

CONCLUSION

Marketing has changed in recent years. It can be said that it has become more focused on individuals and their needs. The change has been encouraged by the emergence of a new branch of marketing called the neuromarketing. The latter has appeared as a product of introducing neuroscientific methods into the marketing system. This application has enabled "insights into human brain" and finding previously unknown facts and data. Owing to this kind of "revolution" the marketing experts have started a "deeper" exploration of connections and relationships between particular marketing elements and customers' behaviour. All these insights have been implemented in practice to create a product/brand which will "provoke" consumer's emotions and which will not make him/her indifferent.

In short, it could be asserted that neuromarketing relies on the fact that many decisions, about 70% of them, are made at a sub-conscious level and that many people can not explain the reasons for making their decisions in a logical way. Neuromarketing provides a possibility of detecting the data about purchase decision-making and buyers' preferences that have not been known until now. In order to turn the data into information, neuromarketing will have to "learn" how to connect the gathered data with customers' preferences, selection and behaviour, in order to achieve the set goals, which certainly represents one of the future research areas of neuromarketing. Therefore it is expected that the future research in this area will focus precisely on understanding the cause-effect relations between the activities of

a particular brain area and the customer's actions. It should be pointed out that the connections between these instruments and customers' behaviour have not been fully explained and ascertained, nor it can be done at this stage of technology development and understanding of human brain. However, it is assumed that this will be feasible in the future.

From the practical point of view, i.e. regarding the aspect of possible application of neuromarketing tools and techniques, it should be said that neuromarketing has a great potential, both commercial and social, although today's fMRI scanners used for performing neuromarketing researches are huge, expensive, slow and noisy.

This paper's authors also discuss the concepts of neurodesign and neurobranding, summarising them as the concepts of "applied neuromarketing" which uses a number of more or less common "marketing weapons" such as colour, packing, scent, design, music... The purpose and the goal of all these "weapons" is but one: "provoke" emotions in (potential) customers. It is emotions that modern marketing wants to produce.

On the basis of previous analyses of the available literature on the concept and application of the neuromarketing, the authors believe that there is not enough scientific evidence that can confirm the uniformity of its application; for example, it can not be assumed that, say, the red packing help sell a product, whereas the blue one does not.

In this paper the authors have approached the neuromarketing from an objective, scientific standpoint, without any intention to glorify particular neuromarketing results or neuromarketing in general, or to approach neuromarketing with negative connotations in mind. This is an area where ethical issues, with regard to the boundaries and the scope of neuromarketing application, are very accentuated and inevitable. Therefore, further research, using a multi-disciplinary and interdisciplinary approach including economy, psychology, ethics, medicine and other fields of science, should provide answers to these questions.

Namely, it seems that the answer – To what extent does the use of neuromarketing tools and techniques impinge on the free will of the consumers? – is not remotely answered.

The authors believe that further research should be done aimed at providing an answer to this question, which is not just a marketing issue, in particular given the fact that there has not been enough detailed research into the matter. Most of the existing studies only indirectly touch this area, perhaps simply because of the fact that neuromarketing is a relatively new discipline.

Unfortunately, in their "race for profit" the marketing experts occasionally use unethical instruments and methods. In its further stages of development, marketing should by all means resist the temptation to use such instruments for achieving profits.

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