



## **HOW MUCH IS A CHARACTER WORTH IN A STORYTELLING NARRATIVE? STORYTELLING AS A FACTOR REDUCING SALES TRANSACTION COSTS**

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### **Abstract:**

Although neuromarketing research has been gaining popularity in recent years, the protagonist remains undervalued in storytelling narratives. Of the neuromarketing articles found on Google Scholar and published in the last two decades, less than 7% were devoted to storytelling.

With the development of neuroscience, commercial companies are increasingly turning to neuroimaging methods to find out the answer to the question of how to influence the buyer so as to minimise costs and maximise profits. Thus, it is not important to obtain information about what the buyer needs or is looking for, but only how to focus the buyer's attention on the product. The results of neuromarketing research indicate that by means of a properly composed communication, the creators of the message are able to efficiently and effectively reach the potential customer, thus reducing the costs associated with the sale. The EEG study described in the article shows the differences in the obtained results depending on the construction of the presented communication.

**Keywords:** transaction costs, neuromarketing, processing, storytelling

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## **Introduction**

John Sweller (1988) developed the cognitive load theory in the late 1980s. Applying the principles of this theory allows information content to be created according to natural cognitive processes. It describes how information is processed in the brain. Uri Hasson in 2012 published research that clearly shows that the brains of the person telling a good story and the listeners synchronise. It is as if the listener's brain is replaying with detail (including sensory detail) the entire story. Over 2,300 years ago, Aristotle laid the foundations for modern communication, and his structures are still used today by entrepreneurs presenting their ideas and advertisers talking about products and services. Aristotle did not have an fMRI (magnetic resonance imaging) machine. He did not know, like Sweller, that human brains only store three to four items in short-term memory. He created a model that can still be used today. Specifically, by remixing these three theories together and adding the knowledge of cognitive psychology, it is possible to work in the field of integrated storytelling. To tell stories with words and images. To simply communicate better. Integrated storytelling is a verbal message reinforced with an image (animation, video, animated gif, photo, drawing or infographics). It does not mean duplicating content. The image is included in the story in order to use the so-called image superiority effect where words are worth strengthening. Words and images are tools. Integrating images with words in an advertisement or presentation is not meant to serve cognitive overload. It is not about using all means simultaneously, duplicating visually what is being said. It is not about tautology at its worst. And it's not about overload. The human brain can take in a certain number of stimuli at the right time.

The phenomenon, which in psychology is called brain-to-brain coupling, has been studied by Professor Uri Hasson of Princeton. It turns out that with good narratives, which are vivid and comprehensible enough not to lose the thread and emotionally engaging enough to focus attention, the brains show identical activity. Someone talks about skiing,

someone recreates the skiing in their head. Provided that the brain knows how to ski. The key to this phenomenon is the commonality of experience. This makes it even more challenging to build narratives because the person has to know which worlds are close to the audience so that the brains can not only understand but also experience the story with all their neurons.

The power of storytelling can be directly drawn from brain mapping. Many experts believe that the architecture of the brain works this way, that one experiences his or her lives through the medium of storytelling and subconsciously he or she views their lives this way and experiences it as a great story. Good stories have the advantage that people connect with them, they look for the common parts. This makes them remember them longer, and they have a greater impact on them because of it. That is what drives human brains and makes it switch off its defence mechanisms. Thanks to the latest achievements of neurosciences, more is known about the techniques of creating a marketing message, which gravitates the purchaser toward making a positive purchase decision quickly and effectively. In this context a question arises whether further development of neuroimaging techniques will contribute to the reduction of transaction costs as regards the seller. This article constitutes an attempt to answer the aforementioned question. In its first part, the authors present the issue of transaction costs. In the next part, the phenomenon of neuromarketing is described with particular attention drawn to a message and the depth of processing. Thereafter, the authors focus on their own research presenting the results of neuromarketing research conducted with the use of EEG. The main objective of the research was to assess how the properly formulated advertising message affects the sphere of unconscious decisions made under the influence of an impulse and the sphere of decisions subjected to deep analysis. The hypothesis was verified: the properly formulated advertising message influences the process of unconscious choice in the same way as the process of conscious choice.

## Transaction costs

Transaction costs accompany each exchange and constitute additional burden for the parties to a transaction. Aristotle noticed their presence as early as in his *Politics*, in which he discussed the issue of speculation based on a change of prices (2003). Considerations given to the conflict of interests between merchants and buyers can also be found in Adam Smith's *An Inquiry into the Nature and Causes of the Wealth of Nations*. A seller, when establishing a price which for a buyer constitutes a cost exceeding his abilities to pay, when harvest is poor, forces more careful management of resources. Smith also underlines, when discussing the issue of an export bonus, that costs incurred by population have their consequences. They among others reduce the ability to self-finance education or reduce the number of births (Smith, 2007). Together with the discussion on costs arising from concluding transactions, in sociology by works of Herbert Spencer, the concept of an Institution appeared (Stankiewicz, 2012). Institutions constitute both legal regulations and moral habits or norms binding in a society. Their objective is among others to lower transaction costs. For instance, the Act of 30<sup>th</sup> May 2014 on Consumer Rights regulates the legal issues in connection with a consumer's rights by specifying among others the duties of an entrepreneur concluding transactions with a consumer, or specifying the rules and procedures of concluding distance contracts.

Ronald Harry Coase is considered to be the father of the theory of transaction costs (Zygan, 2014). In the article *The Nature of the Firm*, he analyses functioning of firms and the reasonableness of their existence on the market. In his considerations, he introduced the concept of costs connected with making a decision, including costs in connection with gaining information. He also highlighted the costs of negotiations characterising the moment proceeding concluding an agreement and the costs of a contract appearing at the moment of concluding an agreement and when the provisions of a contract are enforced (Coase,

1937). The term transaction costs was used in the economic literature for the first time in 1940 in the article *A Study of Interest and Capital* (Scitovsky, 1940).

The economics of transaction costs is characterised by a multidisciplinary approach to both costs and attempts to reduce them. Transaction costs are often treated as a friction phenomenon (Williamson, 1998). Friction means slowing down, and sometimes, considering high costs, preventing a transaction. Interdisciplinarity was underlined as early as by Coase, who indicated the fact that some costs were generated by external factors, that is market mechanisms, and some by internal conditioning, that is processes happening in a company (Coase, 1937). Moving away from firms, the essence of transaction costs can be examined illustrated with the example of a purchasing individual. It is impossible not to mention here limitations resulting from an individual's cognitive processes, from limited rationality and from opportunistic behaviours. The latter may be connected with using by one or both parties to a transaction deceptions, fraud ad lies (Williamson, 1998). Such types of behaviour are fostered by situations in which one of the parties has a worse access to information than the other party to a transaction (Karpacz and Podkówka-Sędek, 2014).

Information asymmetry along with moral hazard and adverse selection constitute elements of Frederic Stanley Mishkin's triad. Information asymmetry, caused by unequal access to information, manifests itself when at least one party to a transaction does not have enough information to make the right decision. Following this, one of the parties gets involved in a risky situation or on the contrary – refrains from a transaction even when it is not risky. Moreover, the lack to access to information causes moral hazard (Mishkin, 1992). The triad model, which refers to the issues of world crises, explains downturn in economic activity (Ostaszewski, 2013).

## **Neuromarketing**

Neuromarketing is a relatively new field of research that is undergoing dynamic development. It was created in response to the need to objectivise the results of research with consumers and enables a more comprehensive and insightful analysis of purchasing behaviour. It draws on the achievements of neuroscience, especially in the field of psychophysiological measurement methods such as electroencephalography, electromyography, oculography and galvanometry. These methods allow a direct measurement of how the body reacts in response to certain marketing stimuli. Emotions and the motivation to make a positive purchase decision are to a large extent the deciding factor in choosing a product. It is emotions and motivation that should be measured. Due to their partly unconscious course and the fact that they cannot be verbalised, they are not completely captured by traditional measurement methods. Hence the frequent discrepancies between declared purchase intentions and actual purchase behaviour. Despite the new possibilities offered by science, the market remains sceptical about the effectiveness of neuromarketing research. The lack of control conditions and the lack of unanimously accepted and accredited methodological guidelines, along with the high costs of conducting research and the subjective nature of research analysis, result in a lack of confidence in this tool, especially in Poland. That is why classic research methods such as questionnaire surveys or in-depth interviews still dominate the market, especially in Poland (Ohme, 2018).

One can find 16,500 articles published between 2000 and 2019 on neuromarketing in google scholar. In turn, storytelling in neuromarketing describes 1150 articles that appeared in the same time range. In the case of the protagonist in storytelling, the articles are devoted to archetypes rather than the protagonists themselves. This is a pity. Because in the context of marketing narratives researched, whose effectiveness is verified with the help of neuromarketing tools, it is worth asking the question about

the financial value of the hero used in storytelling narratives. At the valuation it would be necessary to calculate the value of the marketing campaign and the value of neuromarketing research, for example using an EEG device. The conclusion is almost automatic. It is worth introducing a tangible human hero into the narrative as a carrier of meaning and a trigger for association. This manoeuvre translates into concrete financial results.

The Institute of Media Monitoring has analysed advertising expenditure for 2018. According to the data obtained, the pharmaceutical industry allocated 4 billion 215 million. The data collected by IMM is presented in table 1.

Table 1. Advertising expenditure in selected industries for 2018

Industry	Net expenditure
Pharmaceuticals	4,2 billion
Retail	4.2 billion
Finance	1,2 billion
Automotive	1,2 billion
Communication	1,1 billion

Source: [www.im.com.pl](http://www.im.com.pl)

The process of making purchase decisions is contingent on numerous factors. Ontogenetic conditionings, next to economic factors, play an essential role among them. Also emotions as an important element influence consumers' decisions. In the economic theory, for a long time, consumers were thought to make rational decisions. Moreover, it was believed that consumers tried to be objective when forecasting the future. In making investment decisions, the theory of rationality based on a formalised analysis and unchanging market laws, which assumed rationality of buyers' conduct, was the most useful.

According to this theory, a rational consumer interprets information from the environment correctly and on its basis estimates the probability of future events. The financial theory says that a rational customer follows two principles. He is willing to take a risk, if additional benefits can be obtained thanks to it, and takes choices in order to maximise expected usefulness. It was not until a behavioural element with systems, the first one (emotional one) and the second one (rational one), was introduced that interest in the psychological aspects of making purchase decisions aroused showing one-sidedness characterised by a strictly economic approach to the issue of making purchase decisions by consumers. Recently, primarily due to the development of neurosciences together with the methods of neuroimaging of processes taking place in the brain, the certainty regarding an irrational way of making decisions by customers has been maintained and deepened (Kahneman, 2011).

The irrationality of making decisions by a consumer results primarily from marketing communication, which, through implementing the discoveries made by neurosciences in the field of marketing, manipulates purchase decisions of a customer more precisely. Looking from the angle of specialised form of reaching a customer, it must be underlined that a customer's finances are not safe because a consumer, when making the decision to spend a specific amount of money, does not act autonomously. Therefore, what is the science which benefits from the achievements of marketing and the latest discoveries of neurosciences at the same time?

Neuromarketing constitutes a multidisciplinary approach to neurophysiological attitudes of consumers and the impact of marketing tools on behaviours and decisions of entities (Dooley, 2015). Only by using methods of brain imaging was it possible to redefine the traditional tools used in marketing, which allowed their more effective use. The idea to use the knowledge of the way a human being thinks in marketing is nothing new. The concepts like the psychology of advertising or the psychology of selling have grown in



significance in the last years. Moreover, the development of contemporary neurology has significantly influenced the appearance of neurosciences, from which marketing or economics have started to take handfuls of benefits. The traditional psychology treated the brain like any other organ. More complex models of thought processes based on observations, experiments and deduction. The willingness to understand neurological processes was ignored completely. Contemporary neurology has come up with tools thanks to which it is able to have an insight into the mind. A functional nuclear magnetic resonance has enabled observing the reaction of the brain to an exorbitant price, and an electroencephalograph may be used for optimisation of advertisements and products.

Thanks to direct observations of the electrical activity of the brain (EEG), more specific information can be obtained. During an examination with the use of electrodes, the electric potentials of the brain are measured. One of the methods of using EEG is the analysis of reaction to demonstrated stimuli called an analysis of evoked potentials appearing in a split second after a stimulus is showed. In comparison with the neuroimaging techniques, it is cheap and easy to use (Lindstrom, 2009).

It is difficult to define clearly the phenomenon of neuromarketing. Some researchers use this term only with regard to the marketing analysis of magnetic resonance of the brain. Others view this concept in the wider framework, they also accept the use of biometrics (breath and pulse measurements) or following eye movements. Neuromarketing research aims at answering the question what the brain does with information about a brand, how a human really reacts to a stimulus at a level deeper than a conscious reflection, how subconsciousness can influence behaviour of a consumer, who usually behaves conversely to his declarations (Pradeep, 2011). The importance of neuromarketing is growing, because the traditional methods of marketing research are slowly becoming obsolete. Market research or focus groups say little about what consumers

really think. Unreasonable human minds depend on structuring them cultural stereotypes. They are formed by tradition, the way of upbringing and by other factors. That is the reason why the results of marketing research, quantitative ones consisting in conducting surveys concerning for example a product concept or packaging, and qualitative ones – basing on focus groups, often bear no relation to real reactions of consumers to a product. Focus groups and surveys are nowhere near as good as the facts neuroimaging helps to discover.

In Martin Lindstrom's (2009) opinion, finance and economic research cannot go any further. Researchers should look inside the brain to find out why consumers make the decisions they make. Market research and economic models base on the assumption that purchasers behave in a rational, therefore predictable way. They could not be more mistaken. The discoveries of neurosciences make it possible to see what a significant influence emotions exert on a purchase decision. Thanks to neuroimaging tools, researchers have gained an insight into how emotions impact economic decisions. Martin Lindstrom (2009) concluded it accurately claiming that the brain is dominated by automatic processes and not by target thinking. Therefore, most of the processes taking place in the brain are emotional and not cognitive.

Gerald Zaltman (2008) proves that 95% of thoughts, emotions and learning processes take place outside human consciousness. Neurologists unanimously agree that the majority of thought processes occur under the surface of human consciousness (in subconsciousness, unconsciousness or in preconscious). The whole discipline of neuromarketing bases on the assumption that subconsciousness determines a significant part of consumers' behaviours. A conscious and rational cognitive process has a slight impact on purchasers' decisions. Customers' emotions and subconscious needs constitute the main area of the interest of neuromarketing. Through the study of neuromarketing indicators, neuromarketers are

able to determine precisely whether a given product or advertisement attracts recipients' attention. Moreover, researchers can specify whether a given product stirs consumers' emotions and generates memories. Further study referring to indicators of derivatives can show whether a given product is effective, that is whether it generates willingness to buy, whether it is seen as original and whether a product along with surrounding marketing strategy are perceived by a consumer's brain as clear and understandable, thus effective. Attention constitutes one of the basic forms of brain functioning and it manifest itself in the form of characteristic brainwave structures (Zurawicki, 2010). Only by using a gauge basing on brain activity is it possible to indicate the element of a message that drew a consumer's attention. Emotional involvement in turn is nothing else but the tendency of the brain and the nervous system to a stronger or weaker reaction to stimuli. It is emotions of that kind that become a motivator of consumers' intentions, decisions and actions. Apart from attention and emotions, being retained in memory constitutes one of the most crucial factors leading to a positive purchase decision. If something cannot be remembered, it will have no impact whatsoever on making the decision to buy something. Similarly to the case of attention or emotions, the processes of retaining memories generate constant and measurable brainwave structures. An emotionally involved brain will preserve memories connected with a given product under the influence of a marketing message. Originality is another indicator of derivatives. The brain prefers novelties, therefore it values originality, which is a value intensifying interest, surprise and fascination. Another indicator answers the question whether the recipients of a marketing message interpret the content of a message correctly, whether a message is clear and precise.

### **A message and processing**

During the conducted research, the participants were showed two videos concerning marketing showing

characteristic places of two cities, Boston and Bydgoszcz. The used videos differed significantly. The narration describing Bydgoszcz was characterised by a coherent structure with a clear beginning, development and ending. The protagonist is introduced at the very beginning. He also appeared on numerous occasions when the plot continued. However, his presence was the most visible at the beginning and at the end of the video. The narration presenting Bydgoszcz was characterised an unusual dynamics of the image and of subsequent plots. The vivid and dynamic action was intensified by a dynamic way of operating a camera as well as varied perspectives, sometimes with close-up shots, sometimes from the air. In the visual aspect, the frames offered warm colours harmonising with the dynamic image sequence showing the attractions of the city. Through introducing characters and involving them in individual frames in life situations requiring a reaction, the effect of stirring the message recipient's emotions was achieved. The message is addressed to a wide spectrum of recipients, to families with children, young people, students and mature people and business people visiting Bydgoszcz for occupational purposes.

The narration describing Boston constitutes a total contrast to the video about Bydgoszcz. The film is characterised by a lack of the leading character or supporting characters, which significantly diminished the effectiveness of the information processing. No dynamics or colours seen in the message about Bydgoszcz can be seen here. The film about Boston creates the impression of being cold and distanced. The impression is additionally underlined by the monumentality of the buildings and anonymity of the presented objects and places. The message recipient is a person strongly motivated to gain information about the centre of Boston.

Monitored with EEG stimulation or settling down of brainwaves emerging from processing the frames of the films showed that the respondents initially interested in Boston changed their minds choosing Bydgoszcz. It is highly

possible that it happened in view of the construction of the two showed marketing messages, of which one met the requirements of neurosciences in terms of the effectiveness of message processing. Taking the requirements of neurosciences regarding message construction and current knowledge of the depth of processing into consideration, the fact concerning the communication of human beings should be emphasised. It is no coincidence that people use messages with a characteristic and repetitive construction. The method of constructing stories, the emotional and practical dimensions of a narration contribute to increasing recipient's efficiency of absorbing information provided in a story. Through stories and using appropriate constructions and making use of images, unambiguously decodable in their semantic structure, it is possible to guarantee an effective exchange of information, which happens basically unnoticeably, allowing interlocutors to gain new and permanent knowledge subconsciously and discreetly. Apart from a characteristic construction of communication, it is emotions evoked by narrations in a group of recipients that have an energizing influence on relevant areas in the brain responsible for processing information. A well-constructed message is retained in memory, it activates not only peripheral consciousness, but also intellectual perception, which is emphasised by dynamically developing neurosciences, which underline the importance of narration in an effectively programmed message. Only narrations possess the power to activate mirror neurons, which are responsible for among others deep processing of a message and the process of mentalization. The marketing message concerning Bydgoszcz, in addition to taking account of the key requirements of neurosciences (the protagonist on his way to reach a goal), also introduces emotional elements such as a joke, joy of fulfilment and of people-to-people relations, satisfaction, or relax. Thus depicted emotions activate mirror neurons of the recipient of the message evoking emotional states identical with those of the protagonists. Therefore, narrations have the power of involving recipients enabling them during receiving a story

to engage the areas of the brain that are responsible for instance for movement. Studies show that while absorbing information which is not included into a narrative structure, only two areas of the brain, that is Broca's area and Wernicke's area, are active (Vetulani, 2014). Exactly those areas are responsible for processing language. This fact is of utmost importance for the depth of information processing. While cold facts are processed, the human brain is engaged in order to sort out the meaning of words from their collection. The situation is different in the case of processing a narration. During communicating by means of a story, the brain areas that are active are the same ones that would be active if communicating people realistically experienced the events presented in a story. All this is possible thanks to the presence of mirror neurons in the brain (Vetulani, 2014), which create a particular arrangement of neurons. This arrangement implements a motor program, which encodes observed activities slightly stimulating relevant neurons. However, it does not cause any real movement of an observer.

Emotional engagement and a coherent form of narration introducing the protagonist guarantee transmitting information to deeper levels of message processing, thus leaving a memory trace in a recipient's brain. A memory trace is a side effect of a stimulus analysis, and its durability depends on the type and depth of processing (Nęcka, Orzechowski i Szymura, 2006). If it is to be transported to a client's memory and consciousness, a message he receives needs to include information which will find its way to the deep levels of processing. The levels of processing theory, unlike the block approach to memory models, views memory as a uniform system. Craik and Lockhart in their theory divide the levels of processing into shallow processing, which is connected with an analysis of physical qualities. The other levels are called deep processing involving a more meaningful analysis, which is characterised by bigger complexity. It should be emphasised that in each of the abovementioned levels, an unspecified number of sub-levels can be found. A message is retained in a recipient's memory

only when it reaches deeper levels of processing, where processing itself means searching for and assigning meanings. The deeper the level of processing of given information, the more efficient its absorption by the brain. The increase in the complexity of operations of processing information reaching the system results in the increase in the intensity of processing a message by the brain (Sikorski, 2015). From the point of view of neurosciences, the levels of information processing are consistent with the levels determined by Craik and Lockhart. The first level is the most shallow one, at which a sensory analysis of data is conducted. The results of information processing at this level are short-lasting and susceptible to disruptions. At the next level a semantic interpretation of a received signal occurs. It is through processing information at this level that the meaning of words and sentences is recognised. At the third level of information processing, an activation of previous knowledge takes place. The brain uses various kinds of associations, also at this stage knowledge is reorganised. New information can complete what was already known. Previous information can help to understand new information. It can also be transformed into new structures joining older and new information. Information processing at the deeper levels influences remembering of information. The way Bydgoszcz was presented resembles a story. The main character arrives in Bydgoszcz on business. On his way to his destination, he stops at places important for the story, which are also the attractions of Bydgoszcz. After sorting out his business, the hero leaves the city. The circle closes and the information the marketing message provides is processed at the deep levels and is retained in memory because attention was drawn to it effectively.

### **Our own research**

The research was conducted from March 2017 to March 2018.

It consisted of two stages:

- I. Examination with the use of electroencephalography (EEG)
  - √ Similar conditions were provided for all respondents (the time of the day, the distance from a monitor, the seat position, the light).
  - √ A basic examination lasting about 20 minutes
  - √ An examination with the use of a presentation
  - √ An exclusion of disturbing variables
- II. Surveys

The characteristics of the group in terms of socio-demographic features is presented in table 2.

Table 2. Characteristics of the examined group – socio-demographic features.

variable	specification	number	%
sex	woman	10	50
	man	10	50
age group	30 – 35	7	35
	36 – 40	13	65
education	secondary or vocational education	8	40
	higher	12	60
residence	village or town of up to 20,000	3	15
	town of 20,000 – 100,000	1	5
	town of over 100,000	16	80
marital status	single	7	35
	married	8	40
	divorced	3	15
	in an informal relationship	2	10

Source: own study based on the conducted surveys



Women accounted for half of the group, men accounted for the other half. The age of the respondents due to the specificity of the research (the changes in the brain occurring throughout life) was narrowed so that all the respondents were between 30 and 40 (the age span was 10 years).

Table 3 presents average amplitudes of  $\beta$  waves in the frontal lobe observed while the respondents were watching the film about Bydgoszcz, and table 4 while they were watching the film about Boston.

Table 3. Average results of amplitude of waves ( $\beta$ ) in the frontal lobe (Bydgoszcz).

side	waves	N	Average	SD	Trust (-) 95.0 %	Trust (+) 95.0 %	min	max.	Q2 5	median	Q7 5
right (R)	B1	20	19.9	5.089	17.5	22.2	11.0	30.0	16.8	19.3	23.8
	B2	19	21.2	6.336	18.1	24.2	10.0	30.0	15.5	21.0	27.0
left (L)	B1	20	21.3	4.447	19.2	23.4	14.5	29.0	18.8	20.0	25.5
	B2	19	20.0	4.947	17.6	22.4	11.0	29.0	16.0	20.0	24.0

Source: own study based on the conducted research

A higher average amplitude of  $\beta_2$  waves was noted on the right side – 21.2 Uv.  $\beta_1$  waves on the right side were noted in the cases of all the respondents. A higher amplitude of  $\beta_1$  waves was noted on the left side – 21.3 Uv.  $\beta_1$  waves on the left side were also noted in the cases of all the respondents.

Table 4. Average results of amplitude of waves ( $\beta$ ) in the frontal lobe (Boston).

side	waves	N	Average	SD	Trust (-) 95,0 %	Trust (+) 95,0 %	min	max.	Q2 5	median	Q7 5
right (R)	B1	20	19.5	3.642	17.7	21.2	14.0	26.0	17.0	19.3	22.0
	B2	20	19.3	5.777	16.6	22.0	10.5	35.0	14.5	18.3	23.0
left (L)	B1	20	19.1	3.895	17.3	20.9	13.0	28.0	15.3	20.8	21.5
	B2	18	20.4	4.949	17.9	22.8	13.5	30.5	17.0	20.0	22.0

Source: own study based on the conducted research

A higher average amplitude of  $\beta_1$  waves was noted on the right side – 19.5 Uv.  $\beta_1$  waves and  $\beta_2$  waves on the right side were noted in the cases of all the respondents. A higher amplitude of  $\beta_2$  waves was noted on the left side – 20.4 Uv.  $\beta_1$  waves on the left side were also noted in the cases of all the respondents.

The second part of the survey was a survey in which the respondents were to indicate the elements remembered from the viewed materials promoting the cities of Bydgoszcz and Boston and to justify their choice of the place they would like to visit. Table 5 presents the results obtained.

Table 5. The most frequently indicated terms of Bydgoszcz and Boston.

Specification	The terms most frequently indicated by the respondents	
	Bydgoszcz	Boston

The respondents who showed a desire to visit Boston	airport, river, music, sports, university, canoeing, trams, bridge, opera	greenery, order, modernity, city I do not know, interesting city, space, university, beach, ships, Harvard, architecture
The respondents who showed a desire to visit Bydgoszcz	people (young people) and places, mill island, opera, Bydgoszcz-canal, PESA, interesting city, many attractions, Flood-fountain, library, sun, emotions, greenery	boring city, just buildings, pitch

Source: own study based on the conducted surveys

The qualitative analysis of the answers provided indicates that the respondents who decided to visit the city of Bydgoszcz used more terms in comparison to those who decided to visit Boston. Moreover, these terms were characterized by a positive emotional colouring. From the observations made while completing the questionnaires, it can be concluded that the material about Bydgoszcz aroused positive emotions in the respondents. The narration used in the description of the city of Bydgoszcz was saturated with dynamism, a changing perspective. It preserved the consistency of the story told, it had an engaging effect on the recipient of the message because it presented people as the heroes of the narrative.

The presented advertising spots, showing in all their complexity the qualities of Bydgoszcz and Boston, differ in the manner of conducting the narrative. The first of them, a spot characterizing Boston, is saturated with images of streets, buildings, shows the geography of the city in the smallest detail. The second one is filled with photos

depicting the corners of the city shown from a bird's eye view, on a high level of generality and anonymity of the place. The anonymity was achieved by getting rid of the inhabitants. The streets are empty, there are no people following the streets. There are no identification media for the recipient of the message. In turn, the advertising spot about Bydgoszcz is built from the beginning on the story of people visiting the city. The viewer gets to know Bydgoszcz through the journey of the characters who take on the role of guides through the city, experiencing successive points on the narrative path. The image is dominated by a close perspective that follows the protagonists. The viewer identifies with them, curious about what will happen to the heroes of the advertising spot. The spot about Bydgoszcz is constructed in a way that is friendly to processing by neuronal structures, which get familiar with information in the deep structures of the brain and fix the memory trace, building strong associations with the place through the characters presented in the spot. The message is an emotional one.

The respondents who decided to visit the city of Boston used words emphasizing unknown space with interesting architecture. The message describing the city did not engage the viewer enough to arouse intense interest despite the attractiveness of the city itself. This fact should be explained by the structure of the narrative about Boston. The description of the city was factual and economical in form. It showed the city from a distance. It was focused on buildings and streets. There were no references to people in the narrative. The narrative did not have a protagonist who would show the audience the streets of Boston showing the most attractive corners of the city.

## **Conclusions**

As can be seen from the data in table 3 and table 4, for the city of Bydgoszcz an average amplitude of  $\beta_2$  wave noted on the right side of the frontal lobe and the average amplitude

of  $\beta_1$  wave noted on the level side of the frontal lobe were higher than for the city of Boston. The left hemisphere is responsible for logical thinking and verbal processes, the right one for holistic thinking and intuitive thinking.  $\beta_1$  wave characterises concentration and attention directed outside,  $\beta_2$  wave is characteristic for emotional agitation (Markiewicz, 2017). Although an in-depth analysis due to the statistical significance ( $p > 0.05$ ) indicated a lack of statistically important differences between the examined groups in terms of the results of the amplitude of  $\beta$  waves, the obtained results can indicate a bigger interest, both volitional and emotional, evoked by the presented promotional material for the city of Bydgoszcz. Additional confirmation of the obtained results and preliminary conclusions are the data obtained in the process of analysis of the respondents' statements. Both the form and the selection of words used in the descriptions by the respondents indicate the emotional reception of the city of Bydgoszcz and the lack of interest in Boston in 75% of the respondents. As a result, it could cause in unconscious choice (EEG results) and conscious choice (questionnaire) choosing Bydgoszcz as the city the respondents wanted to see. Out of 20 respondents, 15 of them chose Bydgoszcz after seeing the material, 5 people decided to visit the city of Boston.

## **Discussion**

On the one hand, the cost of the neuromarketing research for one respondent is considerable higher than the cost of conducting a survey, on the other hand, the required number of the people examined with the use of specialised equipment is significantly smaller than in the case of the questionnaires. Moreover, the results obtained in examination with the use of an electroencephalograph or a functional nuclear magnetic resonance come from data uncontrolled by a respondent, but in the case of questionnaires intentional or unintentional data distortion can be expected. Consequently, the transaction cost

incurred by an entrepreneur can be lowered. Also, assuming that as a result of neuromarketing research an entrepreneur (e.g. a trading enterprise) will gain information about the most effective stimuli bringing an expected result, that is a decision to buy, higher revenue from sale should also be expected.

The research discussed proves that an advertising message constructed in accordance with the guidelines of neuroscience is processed more efficiently reaching deeper levels of attention and memory, which has a direct impact on the intensity of the potential customer's interest in purchasing a given consumer good, and this significantly shortens the path from noticing the good to making a decision to buy it. What is more, the decision-maker makes a conscious decision based on the available but unconsciously obtained information. Hence, choices based on analysis often coincide with choices made emotionally. Undoubtedly, this fact has an impact on lowering transaction costs on the seller's side.

As reported by Wirtualne Media, according to a report by Starcom, 2018 saw the advertising market grow by 7.8% compared to 2017. Taking into account the results of the own research, which clearly showed the importance of the hero in the story about the product, it can be concluded that a skilfully led hero in storytelling allows to reduce costs on the part of the seller.

These studies have been piloted. The aim was to verify the correctness of the test method used, including the possibility of using the EEG and the usefulness of the information obtained in the test. Due to the small size of the sample and the lack of representativeness of the results obtained, it is not possible to generalize the sample to the whole population. However, they are a valuable study for analysis and a determinant of relevant studies. With the development of neurosciences and measuring instruments, the areas accessible so far only on the way of questionnaires and introspective research gain a new quality. However, errors can be found in the process. It should be emphasised that

the authors are planning further in-depth research concerning making purchase decisions through appropriately composed messages, and the above research is treated as an introduction to detailed research aiming at providing understanding how the brain buys and what has the greatest impact on it.

### **Bibliography**

- Arystoteles. (2003). *Polityka*. W Arystoteles, *Dzieła wszystkie* (L. Piotrowicz, Tłum., Tom I). Warszawa. [Online], [Retrieved January 2, 2020], <http://libertarianin.org/Ebooks/Arystoteles%20-%20Polityka.pdf>
- Coase, R. H. (1937). The Nature of the Firm. *Economica*, 4(16), 386–405. doi:10.1111/j.1468-0335.1937.tb00002.x
- Dooley, R. (2015). *Neuromarketing. 100 szybkich, łatwych i tanich sposobów na przekonanie klienta*. Warszawa: Wydawnictwo Naukowe PWN.
- Kahneman, D. (2011). *Pułapki myślenia. O myśleniu szybkim i wolnym*.
- Karpacz, J. i Podkówka-Sędek, J. (2014). Pasywny i aktywny oportunizm w relacjach międzyorganizacyjnych. *Prace Naukowe WWSZiP. Zarządzanie Strategiczne. Rozwój koncepcji i metod.*, 27(2), 279-290.
- Lindstrom, M. (2009). *Zakupologia*. Kraków: Wydawnictwo Znak.
- Markiewicz, R. (2017). Zastosowanie EEG Biofeedback/Neurofeedback w rehabilitacji psychiatrycznej. *Psychiatria Polska*, 1095–1106. doi:10.12740/PP/68919
- Mishkin, F. S. (1992). Anatomy of a financial crisis. *Journal of Evolutionary Economics.*, 2(2), 115–130.
- Nęcka, E., Orzechowski, J. i Szymura, B. (2006). *Psychologia poznawcza*. Warszawa: Wydawnictwo Naukowe PWN.
- Ohme, R. (2018). *Biometryczny przełom w marketingu, Harvard*

*Business Review Polska.*

Ostaszewski, J. (Red.). (2013). *Finanse*. Warszawa: Difin.

Pradeep, A. K. (2011). *Mózg na zakupach. Neuromarketing w sprzedaży*. Gliwice: Wydawnictwo Helion.

Scitovsky, T. (1940). A Study of Interest and Capital. *Economica*, 7(27), 293-317. doi:10.2307/2549745

Sikorski, W. (2015). *Neuroedukacja. Jak wykorzystać potencjał mózgu w procesie uczenia się*. Słupsk: Dobra Literatura.

Smith, A. (2007). *Badania nad naturą i przyczynami bogactwa narodów* (Tom II). (A. Prejbisz i B. Jasińska, Tłumacze) Warszawa: Wydawnictwo Naukowe PWN.

Stankiewicz, W. (2012). *Ekonomika instytucjonalna. Zarys wykładu*. (wyd. III uzupełnione). Warszawa: Wydawnictwo Prywatnej Wyższej Szkoły Businessu i Administracji.

Sweller, J. (2003). *Cognitive Load Theory*. Berlin: Springer-Verlag.

Vetulani, J. (2014). *Mózg: fascynacje, problemy, tajemnice*. Kraków: Homini.

Williamson, O. E. (1998). *Ekonomiczne instytucje kapitalizmu. Firmy, rynki, relacje kontraktowe*. Warszawa: Wydawnictwo Naukowe PWN.

Zaltman, G. (2008). *Jak myślą klienci. Podróż w głąb umysłu rynku*. Poznań: Rebis.

Zurawicki, L. (2010). *Neuromarketing. Exploring the Brain of the Consumer*. Berlin: Springer-Verlag Berlin Heidelberg.

Zygan, M. (2014). Zaufanie a koszty transakcyjne. *Kwartalnik Nauk o Przedsiębiorstwie*(1), 49-55.

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