



A NEUROMARKETING STUDY ON MONGOLIAN CONSUMERS' BUYING DECISION PROCESS

Boldbaatar G.

*Business School of the University of Humanities, Mongolia
corresponding author: e-mail: ezo_boldbaatar@yahoo.com*

ARTICLE INFO: Received: 12 Sep, 2017; Revised: 22 Dec, 2017; Accepted: 25 Dec, 2017

Abstract: *There has been almost 20 years since science of marketing has developed in Mongolia and there has been significant progress in acquiring and using it. Business companies' leadership have become aware of the importance of this science and see marketing as business philosophy and understand that analyzing the market, business environment and conditions by consumers is the key to success.*

Today's society demands from marketing professionals' delicacy and taking into account consumers' needs and creating new needs and new means of consumption. Main purpose of business entities is to be aware of consumer needs, to establish its position on the market and to be successful. In order to provide consumers with the best products and keep them at the center of their attention it is important to establish optimal ratio of marketing factors that would most efficiently influence consumers with different behaviors.

Keywords: *Neuromarketing, consumers, business companies, market, consumer needs, products, buying decision, neuroscience;*

INTRODUCTION

In recent years new research tendencies have emerged that reveal the ways psychological factors such as emotions, imagination, feeling influence decision making of consumers in the process of buying goods. One of the fields of the research is neuromarketing.

Objectives of the study

- To investigate different theories about

neuromarketing and their scientific contributions made in the recent years.

- To evaluate through some neuromarketing research the process of Mongolian consumers' buying decision
- To evaluate the benefits and the ways of using neuromarketing application techniques in marketing in Mongolia

MATERIAL AND METHODS

Literature review: marketing books, research papers from journals with referee, journal articles, academic papers, and materials available in the internet.

Theoretical background: academic papers

and articles on human physiology, biology and neuromarketing written by foreign researchers

Interviews: surveys on over 250 people, based on the observation of buyology and field trips involving over 1500 people.

Collaboration with specialists, experts and professionals in neuroscience. Along with a business standpoint. The organizations involved:

- The “Chuluunaa” neuroclinic.
 - Mongolian marketing research institute
- Validation of the effectiveness and efficiency of neuromarketing.
- Personal interviews (papers)
 - Interviews through the internet

The structure of the study:

Part 1. Background of the neuromarketing concept

Part 2. Introduction to the neuroscience

Part 3. Techniques used to attract consumers and stimulate them through marketing and advertising

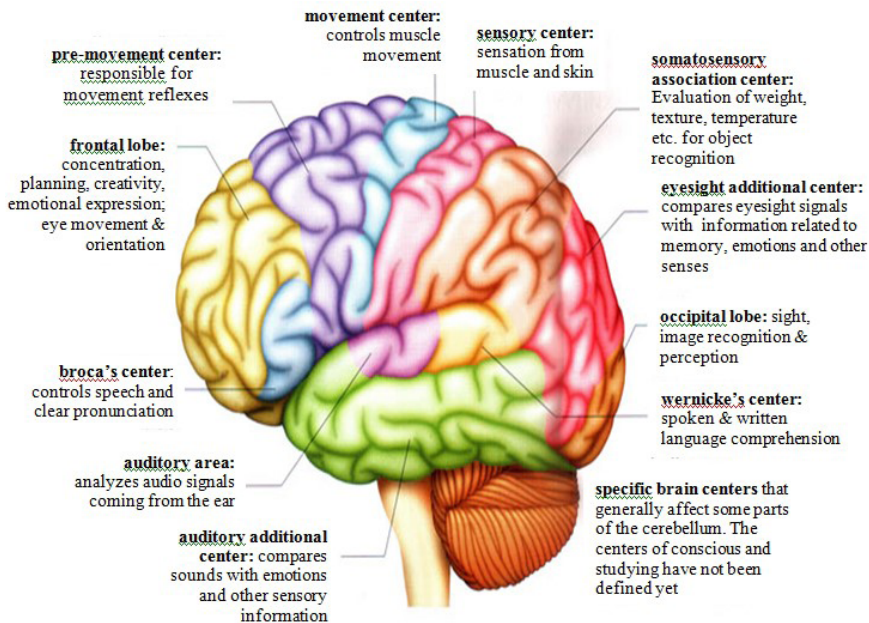
Part 4. Consumer behavior and their attitude reactions

Neuromarketing concept

Where is the limit when decoding the most attractive color, packaging, jingle or shape for the consumers? Are they able to know how and what consumers think when they buy their products? Is it possible to “read” the mind of the consumer, know their motivations, their desires and their purchase decisions? Neuromarketing aims to reveal the answer to all these questions.

Neuromarketing is an integration of marketing and neuroscience which studies the use of neuroscience and its findings in marketing science, including the psychological process of buying, the factors that affect the process and decision making process. Consumer’s buying decision is related to the brain activity; therefore, the businesses should study neuromarketing in order to make consumers buy more.

How does our brain work?



Graph 1. In the graph below there are shown the main brain areas in which the stimuli are originated, and also how the nervous system process is developed

Source: Kim Min Ju (2008) “Neuromarketing”

Left hemisphere functions**Abstract thinking**

Oriented to details
sees things in parts
analysis
smart
mathematical thinking
based on the consequences
real desire
realizing things
be close to reality
knowledge & five senses
past and present
words & speech
cognition, proof

**Right hemisphere functions****Creative thinking**

oriented to general things
sees things as a whole
prediction
intuition
philosophical thinking
summarising
subjectivity
using one's feeling
imagining
expression, signs
present and future
hope and hypothesis
factual evaluation

Figure 1. The brain is divided into the two equal parts.

Source: Graf, P. (2002): *Lifespan Development of Human Memory*. Cambridge: MIT Press

The left brain is associated with *logical thinking* and it is responsible for speaking, numbers, sequence and analysis. The right brain is associated with creative thinking and it is responsible for space, colors, music

rhythm, imagination and description. Also this part is called 'scientific'. However, in most human brain processes related to conscious and thinking both parts of brain are involved.

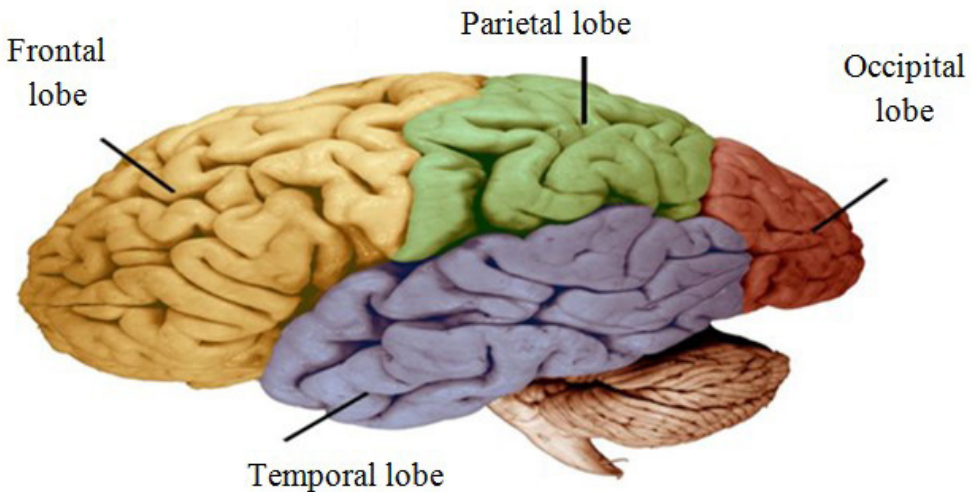


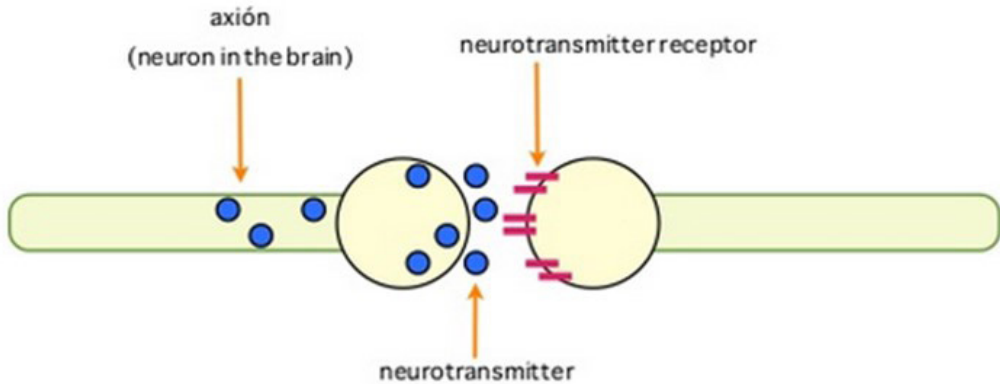
Figure 2. Brain formed by four main lobes (Frontal lobe, Parietal lobe, Occipital lobe, Temporal lobe).

Source: Miller, B.I. et al. (1999): *The Human Frontal lobes*. New York: guilford Publications

These lobes are responsible for processing different stimuli and thought.

Synapses: specialized intercellular junction between neurons. It carries out the transmission

of nerve impulses and download chemical that causes an electric current transmitted along the axon by transmitters, to other neurons, thus triggering a reaction to a stimulus.



Graph 2. specialized intercellular junction between neurons

Source: Hausel, H.G. (2002/2003): *Think Limbic!* Planegg: Haufe Verlag

Study intended to understand consumer behavior

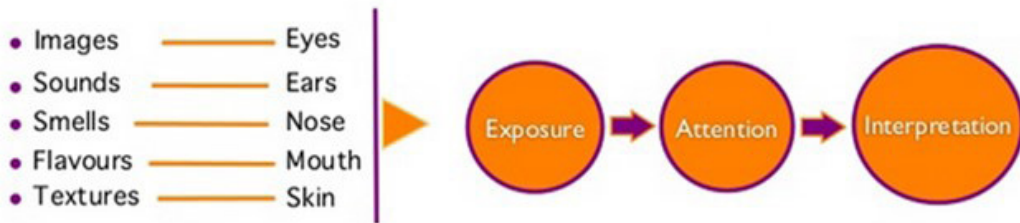
“Marketing and surrounding environment affect consumer mind whereas psychological process is interrelated to certain characteristics resulted in buying decision and decision making. The purpose of marketing is to understand what happens in the consumer

mind between the final buying decision and the stimuli of buying”.

Below we can see the changes happening in consumer’s mind during this process.

Sensory system:

- Exposure
- Attention
- Interpretation



Graph 3. Sensory system

Source: Hausel, H.G. (2002/2003): *Think Limbic!* Planegg: Haufe Verlag

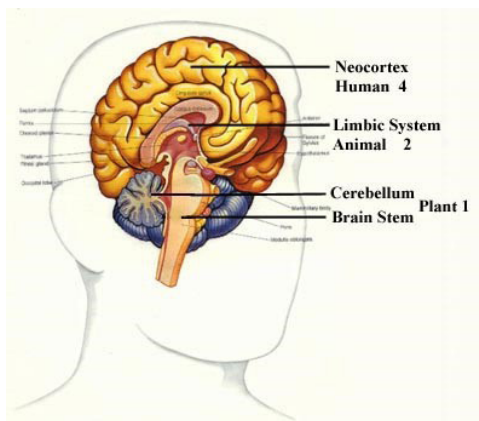


Figure 3. General structure of brain

Source: Kim Min Ju (2008) “Neuromarketing”

Consumer goods have their value when they activate the feelings and reasoning in consumer's brain. The more this system is intervened, the more value the goods have.

In order to understand the buying decision process let us see a detailed brain picture.

Brain generally is divided into the three parts. The lowest part is called brain stem which is the oldest one in origin. Above it there are other parts: cerebellum, diencephalons and cerebrum. Neocortex is the most important

component of the cerebrum which originated last and is the biggest in size.

Feelings or emotions are in charge of decision making because the human brain is ruled by one's emotions.

The reasoning and emotional system is located between the brain stem and diencephalons. The latest researches have proved that the cerebrum is a limbic system which works in accordance with reasoning rules. [12]

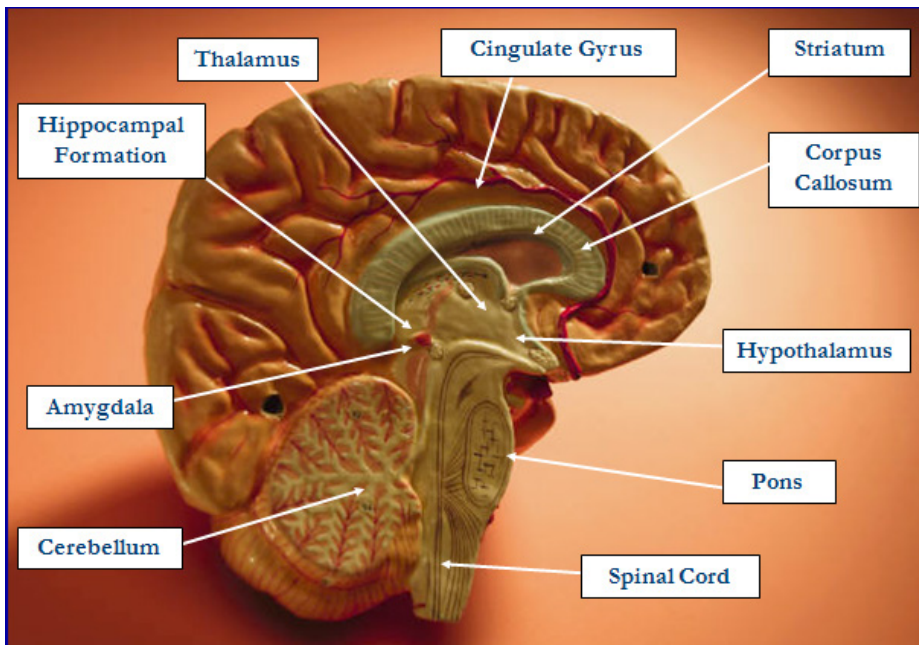


Figure 4. The limbic system is responsible for our feelings, emotions and desires.

Source: Hans-Georg Hausel "Brain View", 2008

Neuromarketing studies was first done by the Harvard university professor Herry Zaltman in the XIX century whereas German neuropsychologist Hans-Georg has developed the "Limbic Map" which has become the means of increasing sales of business companies and individuals and rational strategic planning.

There are three different reasoning and feeling systems in human brain that totally manage one's life. They are called 'great threes' and they are as follows:

- triggering system
- managing system and
- balancing system

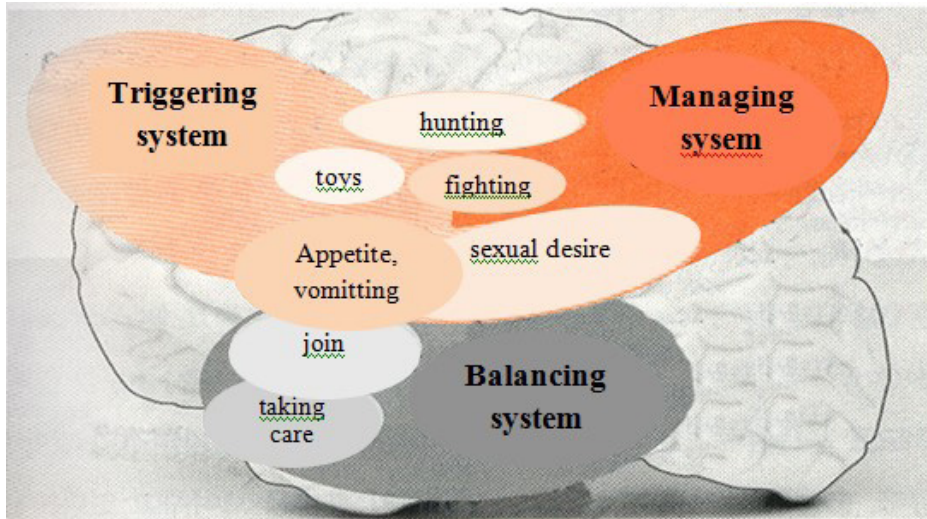


Figure 5. "great threes"

Source: Kim Min Ju (2008) "Neuromarketing"

In the human evolution process except of these three more different modules have developed. These modules exist within or between the abovementioned three systems. The modules are responsible for better adapting people to their environment. They are as follows:

- reconciliation module
- module of taking care

- toys & play module
- hunting module
- fighting module
- appetite/vomiting module
- sexual desire module

Behind the each module in 'three great' there are hidden high level orderly processes which involve all the brain parts and a lot of neurons.[18]

RESULTS

Findings of our study: Recent researches in this field show that percentage of emotions and feeling that affect buying decision is 70-80%, that is done unconsciously. Conscious evaluation exists, though. It is represented by 20-30% but it cannot be as free as we imagine.

In accordance with 'Limbic map' we can classify consumers into 7 types based on the consumer's extent of feeling. Classification of Mongolian consumers according to this map showed the following:

Relation of Children and Temper

Child(ren) can affect their parents' moods or temper. Often their enthusiasm for success and risk can decrease and caring module can have a big influence on their brain activity.

When a child is born there are changes in his/her father's hormone system. The volume of testosterone decreases and the caring module hormone called 'prolactin' increases every time the father has a contact with his child.

Men and women's brain

The brain researchers have found a lot of differences in men and women's brains.

The part of the brain that connects right and left hemispheres is thicker in women than in men.

The size of the control/nerve center in the hypothalamus in men are twice bigger than in women's brain.

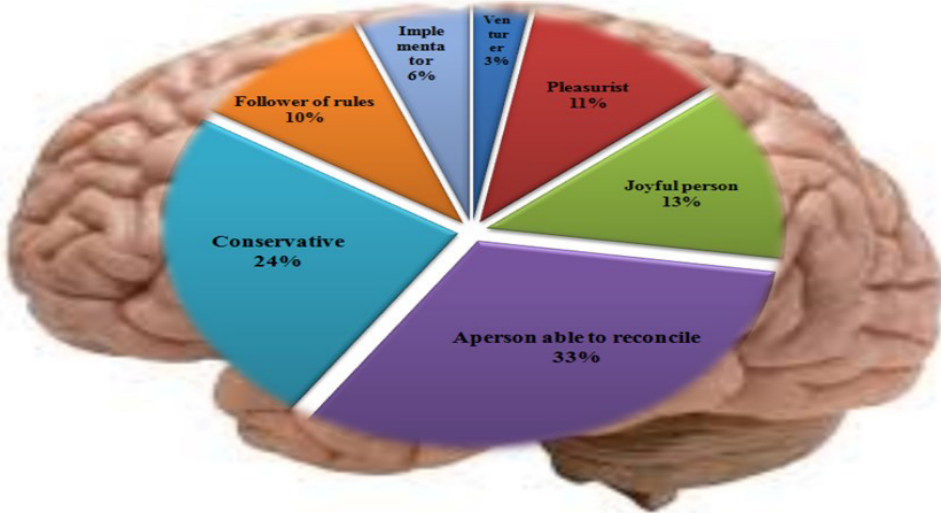


Figure 6. Limbic map' classification of Mongolian consumers

Source: results of research

The part of the brain in Limbic system that controls caring and socializing functions are twice bigger in women than in men.

Men's brain functions are more

differentiated than those of women.

Brain structure is different, too. Women's brain has more brown cells/tissues while men's one has more white cells/tissues.

Table 1. Level of interest towards goods/products by men and women

Products /goods of interest	males	females
Sport products	160	90
HiFi stereo instruments	170	80
Vehicles	185	65
Home appliances and interior design products	60	190
Foods	75	175
Cleaning products & cosmetics	67	183

Consumers spend a lot of money when they buy products that trigger their emotions.

Table 2. Clothes and age

Fashion style /age	14-29	30-44	45-59	Above 60
Old-fashioned clothes	24%	41%	50%	60%
Clothes comfortable for exercising	57%	54%	45%	25%
Clothes of latest trend	53%	41%	33%	16%
Plain clothes	13%	24%	30%	45%
Elegant colorful clothes	25%	19%	17%	12%

Style of clothes is usually regulated by control and triggering system of the brain.

Influence of music on buying

We have studied the way different music affects consumer's buying decision by observing them on CCTV in wholesale trade center. The results were as follows:



<i>Regression Statistics</i>	
Multiple R	0.049495607
R Square	0.002449815
Adjusted R Square	-0.05296964
Standard Error	0.05873715
Observations	20

ANOVA

	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	1	14259946.47	14259946.47	0.044204967	0.835834327
Residual	18	5806565534	322586974.1		
Total	19	5820825480			

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>
Intercept	14806.42105	8343.313092	1.774645262	0.092870596	2722.229283	32335.07139
X Variable 1	146.4360902	696.4863201	0.210249772	0.835834327	1316.827368	1609.699549

	<i>Lower 95.0%</i>	<i>Upper 95.0%</i>
	-	-
	2722.229283	32335.07139
	-	-
	1316.827368	1609.699549

F-Test Two-Sample for Variances

	<i>Variable 1</i>	<i>Variable 2</i>
Mean	48846.5	65190.5
Variance	951621318.7	1224349437
Observations	20	20
df	19	19
F	0.777246504	
P(F<=f) one-tail	0.294138184	
F Critical one-tail	0.461201089	

We observed that sales in the center has increased by 16344 Mongolian tugruks or 33% and we concluded that 4% of sales increase is due to music played at the trade center and

other indexes are the result of other factors. The music increases the sale on average for 146 tugruks which is F=0.77

Table 3. Influence of some factors on make buying decision

ANOVA^b

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	19.451	7	2.779	1.775	.103 ^a
	Residual	128.337	82	1.565		
	Total	147.789	89			

a. Predictors: (Constant), Buy based on brand name, buy taking into account the necessary to satisfy the consumption, Fashion, design, exotic kheentsert to buy based on the emotional, appearance and beautiful drawn into in buy, Regard product casting and technology used in the production of goods to buy, Buy based on the quality

b. Dependent Variable: make buying decision

Table 4. Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.389	1.906		.204	.003
	Fashion, design, exotic kheentsert to buy based on the emotional appearance and beautiful drawn into in buy	-.101	.282	-.039	-.359	.721
	Buy taking into account the necessary to satisfy the consumption	.089	.359	.027	.249	.804
	Buy based on the quality	.013	.298	.005	.042	.966
	Regard product casting and technology used in the production of goods to buy	.632	.291	.238	2.171	.033
	Buy based on brand name	.983	.522	.205	1.882	.063
		-.142	.134	-.116	-1.065	.290

a. Dependent Variable: make buying decision

The strongest factor affecting to customers buying decisions is the Regard product casting and technology used in the production of goods to buy (0.98), and Buy based on the quality (0.63).

In studying consumers' brain activity we focus on combination of the latest techniques of psychology and neuroscience research with neuromarketing in analysis of consumers' responses to products, brands and commercial ads. The results show that marketers need to differentiate unusual waves in consumers' brain while using brain science technology and methods.

Systems and techniques to measure the brain activity

- fMRI – functional magnetic resonance imaging
- QEEG – electroencephalography
- Eye tracking

Essential methods of nueromarketing are

presented below:

fMRI – functional magnetic resonance imaging. The method has developed since the beginning of the 1990s. The equipment allows to see the detailed observation of activated zones in the brain in defining psychological responses to trigger. 3D encoding: activated zones are multicolored. The method initially has been used to reveal headaches, paralysis and convulsions.

QEEG – electroencephalography. Issues defining cognitive messages and psychological responses [on the subconscious level] give opportunities to make valuable, deep and accurate analysis about consumers' internal decision making process“.

Eye tracking. Application of these methods are only in the beginning stage in Mongolia. In other words, the level of applying these methods show the following result: fMRI is only 1%, QEEG- 3% and Eye Tracking -0.3%.

Furthermore, fMRI and QEEG are used in cooperation with clinic and medical specialists in only academic research whereas Eye

Tracking has been used by MCCG marketing Research Company in Mongolia since 2015. As we can see in Tab. 3

CONCLUSION

Combining neuromarketing science and marketing

fMRI, QEEG methods can reveal performance failure in the cerebrum which is responsible for buying decision making.

Sudden decision of buying (regulated by Limbic system) is based on buyer's mood

whereas balanced buying decision is processed in the brain cortex in front lobe of the brain. Inappropriate purchase or sale is connected with nervous system currents.

Potential influence of neuromarketing promotion campaign

Poster/notice board:

- Location
- Period of time

Web advertising:

- Period of time
- Content

Sponsorship:

- Holidays
- Event

Potential influence of neuromarketing advertising model

Poster/notice board:

- Size
- Slogan/message
- Colour harmony
- Sportsman

TV advertising

- Balance of information/entertainment
- Length
- Main product
- Colour harmony
- Image
- Music

Potential influence of neuromarketing of product development

- Taste
- Smell
- Color
- Health/fasion tendency
- Defining a new target group

Potential influence of neuromarketing – product packaging/model

- Logo
- Packaging material
- Colour
- Prepagkage size

TV/radio:

- Channel/station
- Broadcasting time

Free of charge/additional bonus

- Location
- Choice of the product

Promotion through radio:

- Balance of information/entertainment
- Length
- Voice
- Music

- | | |
|--|----------------------|
| - Limited printing | - Smell |
| <i>Potential influence of neuromarketing in distribution</i> | |
| - Goods' counter/sand | - Product groups |
| - Special offer | - Smell |
| - Music | - General atmosphere |
| - Sufficiency | |

Neuromarketing between the reality and promotion

Technological limitations:

- People involved in neuromarketing experiments express resentment about participating in brain tests.
- Some participants feel cautious and anticipated due to noises and closeness of experimenting equipment.
- The results of the experiments are not always accurate due to worry and uncomfortable feeling of the participants.
- Big and inflexible equipment (artificial environment)
- Lack of medical observation during the experiments
- Time and money constraints do not allow to conduct extensive observation and study

General limitations:

- Accurate measurement of brain activity is limited
- Some emotions and feelings cannot be clearly distinguished
- Analysis of obtained data is not clear, somewhat puzzling
- Neuromarketing do not express future.
 1. Consumer behavior cannot be constituted in laboratory conditions
 2. Experiment time and expenses prevent participants from taking part in many tests
 3. The brain activity cannot be measured.

“Marketing leaders point out the significance of the neuroscience in developing best practices and models of product realization. [...] Marketing consulting companies use smartly fMRI in creating ads aimed at finding a buying button in man’s brain”.

This gives significant additional opportunity for marketers to understand today’s consumer behavior, and the neuroscience methods of

studying consumers lead to changing the basics of today’s marketing principles.

It will introduce the perspective of potential subconscious to update and extend the quantitative research. This study might be the first method that used the opportunity to include habitat in quantitative research. We do not dismiss possibility of the errors in the experiment feedback.

REFERENCES

1. *Becker, J.B. et al Behavioral Endocrinology. Oxford: MIT Press, 2002:*
2. *Boldbaatar, G. Neuromarketing. Ulaanbaatar: University of the Humanities Press, 2014.*
3. *Boldbaatar, G. Marketing research. Ulaanbaatar: University of the Humanities Press, 2015*
4. *Boldbaatar, G. Consumer behavior. Ulaanbaatar: University of the Humanities Press, 2004*
5. *Canli, T. (Ed.) Biology of Personality and Individual differences. New York: Guilford, 2006*
6. *Dabbs, J.M. Testosterone and Behavior. Columbus: McGraw Hill, 2000*
7. *Forgas, J.P. Feeling and Thinking. Cambridge: Cambridge University Press, 2000*
8. *Goldberg, E. The Executive Brain. Oxford: Oxford University Press, 2001*
9. *Graf, P. Lifespan Development of Human Memory. Cambridge: MIT Press, 2002*
10. *Grigsby, J. et al. Neurodynamics of Personality. Greensboro: Guilford, 2000*
11. *Haan, M. et al. Cognitive Neuroscience of Development. New York: Psychology Press, 2003*
12. *Hans- Georg Hausel "Brain View", 2008*
13. *Hausel, H.G. Think Limbic! Planegg: Haufe Verlag, 2002*
14. *Hausel, H.G. Limbic Success! Planegg: Haufe Verlag, 2003*
15. *Hellige, J.B. Hemispheric Asymmetry. Harvard: Harvard University Press, 2001*
16. *Hof, P. et al. Functional Neurobiology of Aging. London: Academic Press, 2001*
17. *Kahneman, D. et al. Choices, Values and Frames. Cambridge: Cambridge University Press, 2000*
18. *Kim Min Ju "Neuromarketing", 2008*
19. *Leon-Carrion, J. Behavioral Neurology in the Elderly. London: CRC- Press, 2001*
20. *Miller, B.I. et al. The Human Frontal lobes. New York: Guilford Publications, 1999*
21. *Parker, A. et al. The Cognitive neuroscience of Memory. New York: Psychology press, 2002*
22. *Powell, D. H. Profiles in Cognitive Aging. Harvard: Harvard University press, 1994*
23. *Raichle, M. E. et al Practice related changes in human brain functional anatomy during nonmotor-learning. p4, 8-26, In: Cerebral Cortex, 1994*
24. *Roberts, A.C. et al. The Prefrontal Cortex. Oxford: Oxford University Press, 1998*
25. *Rolls, E.T. The Brain and Emotion. Oxford: Oxford University Press, 1999*
26. *Whalley, L The Aging Brain. Portland: Weidenfeld&Nicolson, 2001*
27. *Zaidel, E. The Parallel Brain. Cambridge: MIT Press, 2003*
28. *Available from: <http://en.wikipedia.org/wiki/Neuromarketing>*
29. *Available from: <http://neuromarketing.blogs.com/>*
30. *Available from: <http://www.neurosciencemarketing.com>*
31. *Available from: <http://www.kyobobook.co.kr>*