

UDC 339.38

DOI: <https://doi.org/10.32782/2520-2200/2021-5-11>**Petropavlovskaya Svitlana**

Ph.D., Associate Professor

National Aviation University

Sydorov Andrii

Student

National Aviation University

ETHICS AND NEUROMARKETING

ЕТИКА ТА НЕЙРОМАРКЕТИНГ

Latest development of neuroscience and neurobiology is opening the opportunities for the companies and scientist to better understand the future customer. This work shows the analysis results of international approach to ethics issues in neuromarketing. This article is based on the expert works of European and American pioneers in combination of marketing and neuroscience. Neuromarketing is a new concept for understanding the customer behavior and decisions, mostly which are dictated by the subconscious. First, from an ethical point of view, it is necessary to ensure that neuromarketing does not harm or exploit anyone.. Anyone who has ever taken part in a clinical trial or baseline experiment knows how many documents are going well before the start of the study – all in the interests of safe participation in the study. The main uncertainty is that customer couldn't really determine which information he or she shares during the research, due to lack of knowledge.

Key words: neuromarketing, neuroscience, technology, innovations, customer behavior, ethical issues, cognitive interest.

Останні розробки в галузі нейронауки та нейробіології відкривають можливості для компаній та вчених краще зрозуміти майбутнього клієнта. У цій роботі представлені результати аналізу міжнародного підходу до питань етики у нейромаркетингу. Ця стаття заснована на експертних роботах європейських та американських першовідкривачів у галузі комбінування маркетингу та нейробіології. Ключовою ідеєю було визначити, які найбільші етичні питання пов'язані з цією технологією. Нейромаркетинг - це нова концепція для розуміння поведінки та рішень майбутніх клієнтів, які здебільшого продиктовані підсвідомістю. Дослідники нейромаркетингу використовують різноманітні методи, як непрямі, так і прямі, для оцінки неврологічних факторів, які корелюють увагу та збудження. На поведінку клієнта під час купівлі товарів та послуг можуть впливати багато факторів, включаючи рекламу, що містить логічно переконливу інформацію, або рекламу, в якій використовуються зображення та текст, які можуть змінити поведінку на підсвідомому рівні. По-перше, з етичної точки зору необхідно переконатися, що нейромаркетинг нікому не завдає шкоди та не експлуатує нікого. Звичайно дослідження впливає на споживачів і суб'єктів, які є частиною нейромаркетингових експериментів, але не обов'язково що цей вплив є негативний. Кожен, хто коли-небудь брав участь у клінічному випробуванні або базовому експерименті, знає, скільки документів треба опрацювати задовго до початку дослідження – все в інтересах безпечної участі в дослідженні. При використанні нейробіологічних методів і отримання інформації безпосередньо з мозку потенційних споживачів з метою оптимізації маркетингової діяльності важливо дотримуватися певних етичних принципів. Через брак знань у всіх учасників досліджень основна невизначеність полягає в тому, що клієнт не може точно зрозуміти, якою інформацією він або вона ділиться під час дослідження. Більше того, суб'єкт дослідження міг підсвідомо надати факт, який він або вона воліли б приховати. Саме останній фактор і викликає дискусії серед експертів, науковців та правозахисників.

Ключові слова: нейромаркетинг, нейробіологія, технології, інновації, поведінка клієнтів, етичні питання, когнітивний інтерес.

Последние разработки в области нейронауки и нейробиологии открывают возможности для компаний и ученых лучше понять будущего клиента. В данной работе представлены результаты анализа международного подхода к вопросам этики в нейромаркетинге. Эта статья основана на экспертных работах европейских и американских первооткрывателей в области маркетинга и нейробиологии. Нейромаркетинг — это новая концепция для понимания поведения и решений клиентов, которые по большей части продиктованы подсознанием. На преимущества покупки товаров и услуг могут влиять многие факторы, включая рекламу, содержащую логически убедительную информацию, или рекламу, в которой используются изображения или текст, кото-

рые могут изменить поведение на подсознательном уровне. Во-первых, с этической точки зрения необходимо убедиться, что нейромаркетинг никому не причиняет вреда и не эксплуатирует. Основная встревоженность заключается в том, что покупатель не может действительно определить, какой информацией он или она делятся во время исследования.

Ключевые слова: нейромаркетинг, нейробиология, технологии, инновации, поведение клиентов, этические вопросы, когнитивный интерес.

The **main problem** is the lack of understanding by all parties, which are involved in neuromarketing research. Moreover, as neuromarketing is a new science it also has no clear regulations from both ethical and legal perspective, which is a big raising concern for a society as a whole.

Literature review. Neuromarketing is a subsection of neuroeconomics. It also describes a very young, interdisciplinary research direction which, based on an inductive approach, integrates and links findings and processes from neurosciences, cognitive science, and market research in the context of marketing-relevant topics [2].

As the result neuromarketing opens a possibility for companies and researchers to use all spectrum of human perception. The first opportunity to use neuroscience is for understanding the personal traits and implications for consumer behavior.

Ienca and Andorno [7] analyze the effectiveness of the use of neurotechnology in the advertising industry:

- determining the intentions of consumers when ordering goods and services on the Internet by decoding information about the brain activity of consumers [5];
- determining the information received by consumers by scanning the brain when re-viewing the information [18];
- identification of political views when analyzing the differences in brain activity of various supporters of political forces using fMRI scanning [17];
- identification of differences in consumer behavior of men and women using the analysis of brain activity and functional differences in the brains of men and women [1].

One of the neuromarketing implication is the measurement of brain activity. The particular advantage of analyzing of electrical brain activity is that potential customer couldn't control the results of test or fake them. The reason why many of marketing research fails is moral prejudice which leads to misunderstanding of conductor and researcher. Neuromarketing is relatively new field of science that is why standards for them are not clear. Cook and colleagues used EEG in order to prove that source localization can be useful in marketing field. They showed advertisements which were scanned from their original print

format and shown during the experiment. With the help of EEG technology, they were able to surface electrical activity across all brain regions and determine which of them are more effected. Using source-localized EEG technology, Cook and colleagues showed that logically compelling advertisements elicit consistently higher activity specific to the orbitofrontal, anterior cingulate gyrus, amygdala, and hippocampus, compared to messages that don't need conscious distinction. In fact, it means that data proves the differences in regional brain processing of real-world advertising images, depending on whether the images appeal to rational, logical functions or to nonrational, emotionally valanced functions [3]. EEG is totally safe for people, so the biggest ethical concern is usage this technology as an idea.

Second category based on the scanning of metabolic processes induced by changes in neural activity [14]. The two techniques receiving the most attention are positron emission tomography (PET) and functional magnetic resonance imaging (fMRI) which measure several of these physiological functions, including changes in metabolism and metabolic by products, blood flow, blood volume and blood oxygenation [9]. In fact, with the help of the screening the activity and energy consumptions in different parts and local expansion of blood vessels and, consequently, a change in regional cerebral blood flow.

Neuromarketing researchers have used a variety of methods, both indirect and direct, to assess neurological correlates of attention and arousal. Although slightly different, attention and excitement have a similar appeal to marketers, who primarily seek to inform consumers about the existence of a particular product or brand. Research in this area can be useful in studying contextual variables that either contribute to or impede attention / impairment. For example, different ways of presenting in the media (eg, print, radio, television, Internet) may be based on different combinations of neurological processes (eg, affective, cognitive) to increase or decrease arousal / awareness. Comparing and contrasting neural responses (eg, brainwave activity, brain functionality) to different types of media can also provide a huge understanding to advertisers seeking to determine whether to list ads for one type of media for use with another

type. Finally, cross-cultural comparisons are also needed to better understand how attention and arousal differ as a result of environmental influences [20].

Neuromarketing as a science is criticized by human rights activists. The main criticism focuses on unethical research methods, unethical forecasting of consumer choices, unethical use of technology and manipulation of consumers. However, in recent years the number of studies in the field of neurobiology is growing. However, neuromarketing is most often associated with ethical hazards that are unrealistic [19]. On the other hand, neurology can violate clients' personal boundaries and affect their subconscious. Therefore, many experts insist on the division of ethics of neurobiology into ethics of science (consumer neurobiology) and ethics of practice (neuromarketing) [3]. Buying becomes unfair in the eyes of some experts. A study by Sacred Heart University found that the use of neuromarketing by commercial organizations was considered unethical, while the rejection of neuromarketing was considered an ethical art [8].

Christian Ducu determined that one of the main questions to take into account is neuromarketing in a totally new, broader field, or just a different perspective for the same, and therefore only a marketing unit or another discipline. There are authors who view neuromarketing as a kind of new interdisciplinary, but, nevertheless, independent sphere, since with help of neuroscience it is connected not with the economic behavior of a person as such, but about the internal mechanism that determines economic behavior. By examining brain activity, a neuropathologist is trying to explain why customer prefer one over the other in front of a store shelf, for example. The declaration uses information obtained using neuroimaging techniques and/or biometric measurements, that is, without mediation, and it differs from classical marketing research, in which the investigation included either direct contact with the research object or observation of behavior [20].

For Pop et al. neuromarketing emerged from neuroeconomics and gained momentum until it became an independent science. This statute should not only provide an autonomy concerning its subject and tools, but also come with some specific ethical issues [15].

As the result of ongoing concern with neuroscience implementation in marketing NMSBA code was presented. The core principles of code are:

- Neuromarketing researchers shall comply with the highest research standards enforced in their respective countries and use accepted scientific principles.

- Neuromarketing Researchers shall not act in any way that could negatively impact the reputation and the integrity of the Neuromarketing research profession.

- Neuromarketing findings shall be delivered to clients without exaggerating or misrepresenting the neuromarketing insights beyond what is scientifically accepted [12].

Nevertheless, many experts are highlighting the positive aspects of neuromarketing application. Ducu offers an example of research of medical association that finds a connection in the alcohol abuse in South Dakota with the increased quantity of car accidents. Experts rise the question whether it would be unethical to start an advertising campaign that will be based on neuromarketing insights and the main goal of it will be reduction the level of alcohol consumption. The controversial part here is that the goal of the advertising campaign is sure enough a good one, but does it really fits in a moral evaluation. It is not hidden fact that in this situation you could apply phrase "the end justifies the means". Yet this doesn't pass the ethical test because the campaign itself would involve pervasive techniques that eliminate any level of consumer autonomy. It would be interpreted by some as a paternalistic method of dealing with a social problem by addressing individual behaviour [20].

Hensel and colleagues pointed out the ethical problems due to the non-separability of academic consumer neuroscience and applied neuromarketing. They determined that academics and industry cooperation is crucial, because it opens the possibility to learn from both sides in order to share the knowledge, especially in ethical questions [6]. One comprehensive code of ethics must cover both worlds. Implementing a guideline to the standards of scientists and the specific characteristics of different tools will avoid ethical problems in the future. This will reduce the likelihood of ethically incorrect research and increase confidence in the field of neuromarketing. The merger of the two areas will increase public confidence in neuromarketing tools and research [22]. Harvard Professor Karmakar, exhort companies to look for employees, who have adequate and skeptical respect for neuroscience. Moreover, to start the project with scientists or with the respective advisory board, which gives an opportunity to maintain arising concerns. Karmakar clarified that neuroscience is not determining the direction of company development but could help to understand it [11].

According to Nansi Lungu, the situation when the power of prediction will hinder with the preservation of our private data and worth must be radically avoided. It means that this is not a

decision that could be made in advance, but only later with taking into account the experience. At this stage, we need to know how strong our predictions are, and then understand the practical mechanisms for confirming our evolution. If person understand how far we can predict, then you could also assume how practical verification mechanisms manifest themselves in how predictions are made [10].

Study of Pop and colleagues showed that all three stakeholder categories of neuromarketing research (companies which offers the research, companies which could potentially benefit from them and advertisement companies) have lack of knowledge of ethical education, which proved the concept that unitary code of ethics for all neuromarketing studies is essential for all the stakeholders involved in a business relationship [15].

The research objective is to determine the main ethical concerns which relate to neuromarketing and how they are regulated in the world based on literature overview of European and American experts in this area.

Research and discussion. Neurotechnology regulation for advertising industry in Ukraine is missed. In fact, it means that neuromarketing is not permitted but on the same time is still prohibited [13]. Controversial sights on new technology in different countries and by different experts determines that this sphere couldn't exist without check and balances policies. It is assumed that neuromarketing increases efficiency of in ads, promotions or in merchandising. Moreover, such technologies are widely used by alcohol, tobacco, casinos, and political advertising companies, which in reality could be dangerous for society as a whole. Neuromarketing could be easily implemented in both offline and online businesses.

Until recently, researchers had to rely only on what buyers themselves would tell them about a particular marketing message (through questionnaires, polls, focus groups, interviews, etc.). It was believed that humans were able to describe and predict their own cognitive processes. Analyzing brain responses provides a more objective insight into consumer behavior. Research data can help reduce risks when launching new products or implementing major changes that can affect the perception of the entire brand. At a tactical level, companies can improve their audience segmentation and personalize their marketing and sales experience. The ethical problem is complex, considering not only the confidentiality of personal information, but also the mentality, national and religious characteristics of the respondents participating in

the neurotechnological research. It is not hidden fact that, the respondents participating in such studies agree to use the information obtained during the experiment, on the other hand, advertising and marketing companies can use the obtained data for their own purposes. Therefore, in this regard, restrictions may be imposed on the use of the information received. To ensure that respondents' confidential data is treated ethically, it is possible to establish legal liability for marketing companies and their employees who use the data for their own purposes.

Neuromarketing, as other parts of neuromarketing, is paying more attention to understand the willingness to pay of the customer. In order to do reach this goal neuromarketing analyze with help of neuroscience:

- attention;
- emotions;
- cognitive interest;
- memory;
- motivation.

If some technology opens the borders to customer behavior it is logical that human rights activists rise up such questions:

- How manipulative is neuromarketing?
- How far can subconscious marketing go?
- Who is responsible for the exchange and use of the received data?
- Where is the line between which data can be used and which cannot?
- How date could be kept confidential if the customer doesn't control it?

As an example, neuroscience opens an opportunity for companies to observe attention of the customer. It is important to understand what your consumer sees and what stays in focus. That is, you can actually see your product or service through the eyes of a potential consumer. With Eye-Tracking technology, you can see what the customer is really focusing on. During this experiment, the device analyzes the movement of the eyes. The practical application of this method opens up new opportunities to see what the consumer is concentrating on in the store, during advertising, how he reacts, what he sees and whether it is possible to see anything on the external sign. In fact, the new technology opens the key to understanding what exactly the customer ignores and what is most important to him. In other words, the visual attention of man is deciphered. Eye-tracking is extremely useful for companies, on the contrary, subject of research not fully control the movement of eyes. Here the first main consideration arises. Your privacy is in danger, because potential customer shares the information, which is produced unintentionally, hence, in the eyes of many experts, usage of it unethical.

It is true that the NMBSA Code, though called "The Code of Ethics for the *Application of Neuroscience in Business*", does not regulate these two major issues: the autonomy of the consumer and the fair competition. In reality the main focus is not on the applications of business, but on the methods of the neuromarketing research. Nevertheless, with the help of NMBSA Code now integrity, transparency, privacy, participant rights and publication of neuromarketing research are clarified. Therefore, all participants of the research have possibility to withdraw from research at any period of time. Furthermore, new regulations offer the subject of neuromarketing research a security of nonbeing harmed or stressed as the result of their participations in research with help of neuroscience technology. The potential of neuromarketing can only be realized if confidence in the industry grows, and this strongly correlates with ethically correct behavior when using neuromarketing tools. Moreover, the ethical problems should be solved not only from global perspective, but also to the properties of different specific tools [21].

The other point, which is constantly discussed in the world community is the usage of neuromarketing for non-profit organizations. It is important to mention, because neuroscience technology could be possibly used in a fight against issues like increasing smoking, drug or alcohol addiction. Will we take into consideration ethical issues of research, knowing that it reduces the level of AIDS/HIV? As the result Jason Flores with colleagues separated NPOs in their study from For-profit and not clarified neuromarketing applying for them as unethical [8]. Many people believed that from an ethical standpoint the antitobacco warnings is a life saver and if there is at least one opportunity that can be done to support this initiative it should be done. Furthermore, neuromarketing applications giving us access to understand the smokers reactions and how they are connected to real-world approach is curious from science perspective, but also opens a new opportunity to take a look on current knowledge and thus, through this noble cause, support more reliable and meaningful data [20]. There is, of course, no denying the fact that allowing neuroscience technologies only for nonprofit organizations would leads to raising concern and inequality within the industry.

Quite recently, considerable attention has been paid to determination whether neuromarketing is just a new approach of marketing or a separate area which requires much stricter control. In reality, overpowering of neuroscience in marketing is overestimated and criticized mostly due to

pushing customer for purchase or to change the customer behavior.

Some experts consider the way to make the process more transparent and to increase responsibility of companies, which are conducting neuromarketing research or use their results. There is not enough public attention on this question. Therefore, the perception correctness of using such technologies is often wrong. In order to achieve this goal companies which provides such type of service should state publicly which tools, approaches, neurosciences methods and technologies they are applying. The best solution is providing not only promotions, but also the scientific based clarification on approaches, their consequences, and ethical concerns. Moreover, such information should be based on appropriate literature which is available and proved by reliable experts. It is true that many neuromarketing companies sell their service as a trade secret, which is poorly clarified to industry and based on successful implementation in other cases. Thus, it is impossible to determine the quality and validity of any particular proposed approach from the words of those who propose. Trettel and colleagues clarified the consequence of such approach as "the claims of the neuromarketing companies cannot be checked seriously from a third party, since the science behind such approach is not revealed overtly" [21]. Neuromarketing is seemed to be untransparent for most of the service recipients, as the result it leads to misunderstanding, which in the end of the day leads to raising ethical concerns.

Conclusion. Neuromarketing as all other research science should have clear and realistic regulation which will take into account all stakeholder of the research. The situation in the world at this point is still changing, customers are not really understanding what does it mean and which information they are sharing during the study. Simultaneously, neuromarketing companies is trying to sell their service as a secret, but incredibly efficient, while companies as always trying to find the best way to predict customer behavior. Ethical issues which were discussed in this paper are applicable to a classical marketing itself also. The point which still unclear and needs the discussion on international level is the idea of determination of the neuromarketing as a separate science or as a subgroup of other. Literature research showed that scientists are hesitate over this issue. Nevertheless, plenty of countries and organizations started an implementation of research standards in order to solve problem of data privacy, misinformation of customers, legal consequences of using forbidden data and the human rights violation during neuromarketing research.

I am considering that point of view, that implementing neuroscience in marketing research has much more positive consequences. As it was discussed in the paper with the help of neuromarketing, non-profit organizations and governments could implement more efficient social programs, which at the end of the day leads to saving millions of lives. It is true that political companies could use technology in order to influence the potential voters decision. Therefore, in my opinion, using of tools analyzing electrical activity in human mind should be regulated much stricter than eye-tracking for example. Literature review showed that lack of experience and information are the reasons for rising uncertainty in using of neuromarketing. Nevertheless, with

the research subject possibility to withdraw at any time of the research or opportunity to prohibit sharing the results of study the significant ethical issue of sharing unwanted information is solved.

To sum up, I would say that neuromarketing is the new era in our lives, which as all other technologies has its own pros and cons. Undoubtedly, it will help to understand customer behavior better and improves the system of selling goods and services. Nevertheless, with the appropriate legislative framework the situation of data leakages and overpowering the companies would be avoided. Human rights activists, scientists and marketers should gather in order to clarify all uncertainties, which gives an opportunity to fair use an outstanding technology.

References:

1. Baron-Cohen, S. (2004) Essential difference: Male and female brains and the truth about autism. *New York: Basic Books*.
2. Briesemeister B. (2013) Was ist das eigentlich: neuromarketing? Available at: <http://discover-neuro.de/neuromarketing-was-ist-das-eigentlich/> (accessed 20 October 2021).
3. Cook, I. A., Warren, C., Pajot, S. K., Schairer, D., & Leuchter, A. F. (2011) Regional brain activation with advertising images. *Journal of Neuroscience, Psychology, and Economics*. 4(3), 147–160. DOI: <https://doi.org/10.1037/a0024809> (accessed 20 October 2021).
4. Daugherty Terry and Ernest Hoffman Neuromarketing: Understanding the Application of Neuroscientific Methods Within Marketing Research. 2017. DOI: 10.1007/978-3-319-45609-6_2. Available at: https://www.researchgate.net/publication/309307381_Neuromarketing_Understanding_the_Application_of_Neuroscientific_Methods_Within_Marketing_Research (accessed 20 October 2021).
5. Haynes, J-D, Sakai, K, Rees, G, Gilbert, S, & Frith, C. (2007) Pass-ingham RE. Reading hidden intentions in the human brain. *Current Biology*. 17(4), 323–328.
6. Hensel D., Wolter LC., Znanewitz J. (2017) Erratum to: A Guideline for Ethical Aspects in Conducting Neuromarketing Studies. Springer. Cham. DOI: https://doi.org/10.1007/978-3-319-45609-6_13 (accessed 10 October 2021).
7. Ienca, M. & Andorno, R. (2017) Towards new human rights in the age of neuroscience and neuro-technology. *Life Sciences, Society and Policy*. 13, 5. Available at: <https://lssjournal.biomedcentral.com/articles/10.1186/s40504-017-0050-1> (accessed 22 October 2021).
8. Jason Flore. Is Neuromarketing Ethical? Consumers Say Yes. Consumers Say No. 2014. Available at: https://digitalcommons.sacredheart.edu/cgi/viewcontent.cgi?referer=https://www.google.com/&httpsredir=1&article=1390&context=wcob_fac (accessed 10 October 2021).
9. Kenning P., Plassmann H., Ahlert D. (2007) Applications of functional magnetic resonance imaging for market research. *Qual Mark Res Int J*. 10(2):135–152
10. Lungu Nansi (2017) The Limits and the Ethics of Consumer Profiling. Springer. Available at: <https://www.springerprofessional.de/en/the-limits-and-the-ethics-of-consumer-profiling/10908180>. (accessed 10 October 2021).
11. NMSBA. Code of ethics. <https://www.nmsba.com/> (accessed 23 October 2021).
12. Nobel C. (2012) What neuroscience tells us about consumer desire. Interview with Urma R. Karmakar. Available at: <http://hbswk.hbs.edu/item/what-neuroscience-tells-us-about-consumer-desire> (accessed 18 October 2021).
13. Oleksii M. Skriabin, Dmytro B. Sanakoiev, Natalia D. Sanakoieva, Vita V. (2021) Berezenko and Yuliia V. Liubchenko. Neurotechnologies in the advertising industry: Legal and ethical aspects. *Innovative Marketing*. 17(2), 189- 201. doi: 10.21511/im.17(2).2021.17 (accessed 18 October 2021).
14. Plassmann H., Ambler T., Braeutigam S., Kenning P. (2007) What can advertisers learn from neuroscience? *Int J Advert*. 26(2):151–175.
15. Pop A., Dabija D.C., Iorga A. (2014) Ethical responsibility of neuromarketing companies in harnessing the market research – a global exploratory research. *Amfiteatru Econ*. 16(35):26–40.
16. Raab, Gerhard/Gernsheimer, Oliver/Schindler, Maik. Neuromarketing: Grundlagen – Erkenntnisse – Anwendungen (2, überarbeitete Auflage.). Wiesbaden: Gabler Verlag / Springer Fachmedien Wiesbaden GmbH, Wiesbaden. 2009. Available at: <https://permalink.obvsg.at/wuw/AC07998596> (accessed 18 October 2021).

17. Schreiber, D., Fonzo, G., Simmons, A. N., Dawes, Ch. T., Flagan, T., Fowler, J. H., & Paulus, M. P. (2013) Red brain, blue brain: Evaluative processes differ in Democrats and Republicans. *PLoS One*. 8(2).
18. Smith, K. (2013) Reading minds. *Nature*. 502, 428–430.
19. Steven J. (2017) Stanton Walter Sinnott Armstrong Scott A. Huettel. "Neuromarketing: Ethical Implications of its Use and Potential Misuse". *Springer*. Available at: <https://link.springer.com/article/10.1007/s10551-016-3059-0> (accessed 16 October 2021).
20. Thomas Andrew R., Nicolae Alexandru Pop Ana Marialorga and Ducu Cristian (2017). Ethics and Neuromarketing Implications for Market Research and Business Practice. *Springer International Publishing*. Ch. 1–10.
21. Trettel Arianna, Cherubino Patrizia, Cartocci Giulia, Rossi Dario (2017). Transparency and Reliability in Neuromarketing Research. *Springer International Publishing*. Available at: https://link.springer.com/chapter/10.1007/978-3-319-45609-6_6 (accessed 18 October 2021).
22. Wolter, Lisa-Charlotte & Hensel, David & Hattke, Judith (2017). A Guideline for Ethical Aspects in *Conducting Neuromarketing Studies*. DOI: 10.1007/978-3-319-45609-6_4.