UDK: 658.8:159.9]:336.71, originalan naučni članak

Relative Importance of Neuromarketing in Support of Banking Service Users

Milica Slijepčević, Nevenka Popović Šević, Ivana Radojević, Aleksandar Šević

Abstract: Neuromarketing is one of the newer tools that banks are increasingly using in their marketing in order to fight for a larger number of their clients. Responses provided by 99 entrepreneurs in the Summer of 2020 regarding the role of neuromarketing in banking are collected in the research study. In our study, the homogeneity of variances is examined, ANOVA and post hoc analyses applied to see any differences among respondents across age groups, gender, education, and firm size. However, there is no evidence that the perception significantly varies across these categories, although respondents are comparatively more positive than negative when discussing neuromarketing.

Kewords: *neuromarketing, customer behavioural intentions, retail banking services, perceived service usefulness, consumer marketing*

JEL Classification: M31

Rukopis dostavljen: 22.02.2022.
Rukopis prihvaćen za štampu: 08.08.2022.

INTRODUCTION

As an integral part of every economy, the banking sector must evolve at the pace of change and rapidly modify its marketing strategies, in order to remain relevant to twenty-first-century customers. Since digital technology has had a large impact on increasing competition and contestability of banking markets, banks have to adapt and implement a new customer-centric platform-based model (OECD, 2020), to stay competitive in the market. The proliferation of digital use and the ever-changing consumer expectations of trust, loyalty, personalization, and privacy require financial institutions to update their marketing policies and mechanisms (Streeter, 2020).

For decades, banking products and services have been mainly distributed and promoted directly through banking branches and their employees, making the marketing service traditional in nature and highly personalized. Over time, banks have begun to promote their services through partner organizations and other financial intermediaries. However, with the advent of the Internet, which is being used more and more, many banks have switched to mobile and online applications through which they are closer to their customers. Neuromarketing is also one of the newer tools that banks are increasingly using in their marketing in order to fight for a larger number of their retail and business clients. Neuromarketing is a research discipline that originated in the early 21st century when Ale Smidts first used the term „neuromarketing“ in 2002 (Smidts, 2002), while Dr. David Lewis (Veinović-Stevanović et al., 2019) is considered the father of „neuromarketing“ since he was the first author of a study dedicated to the analysis of brain neuroactivity for commercial purposes.

Neuromarketing involves various forms of studying the human (consumer) brain, which are activated as a result of certain marketing activities that subsequently cause the demand for a particular product or service. In accordance with the above, it is believed that neuromarketing

TABLE 1: Use of neuromarketing research in financial institutions

Country	Research center	Researcher	Theme of research
France	INSEAD	Hilke Plassmann	Neuroprediction
USA	Emory University	Gregory Burns	Consumer behavior
USA	Center for Neuroeconomics Studies	Vernon Smith	Experimental Economics
Israel, USA	Princeton University	Daniel Kahneman	Behavioral finance
Romania	Lucian Blaga University of Sibiu	Tichindeleau & Tichindeleau	Banking marketing communication
Russian Federation	St.Petersburg University	Molchanov & Galay	Promotion of bank's products & services

SOURCE: The authors (2022)

offers various possibilities of identifying situations in which the consumer decides to choose a company product and of influencing her selection (Eremenko & Kuzmina, 2019). Many authors treat neuromarketing as an interdisciplinary field as it combines two or more areas (Fugate, 2007, 2008; Lee et al., 2007; Babiloni, 2012; Ohme & Matukin, 2012; Fortunato, et al., 2014).

The word neuromarketing is made up of the combination of two particular components - marketing and neuroscience (Slijepčević et al, 2020; Morin, 2011) and encompasses a new field of marketing research, which use neural and physiological responses and behaviors to understand consumer subconscious reactions (Senior et al., 2007). In the end, it identifies the customer's selection purchase decision (Tichindelean et al., 2018). Several instruments and techniques are available for conducting neuromarketing research for studying either the neural activity of the brain, the electrical activity of the brain, or without looking directly at the brain of the consumer, studying the reactions of the body and mind to certain stimuli. The commercial effects of neuromarketing research are also very visible, which includes psychological and economic research (Lee et al., 2007). The following instruments are most frequently used: Functional Magnetic Resonance Imaging (fMRI); Eye Tracking; Magnetoencephalogram (MEG); Electroencephalogram (EEG); Galvanometer; Facial Coding;Implicit Response Test (Slijepčević et al., 2017; Susanta et al., 2019, Tichindeleau & Tichindeleau, 2019).

Daugherty and Hoffman (2017) claim that neuromarketing uses concepts and approaches from several different disciplines, so in addition to anthropology, etymology, neuroscience, biology and arithmetic, finance is also mentioned. In the era of digital technology, neuromarketing has become a perfect blend of neurotechnology and artificial intelligence (Karpova & Rozhkov, 2019). The results obtained by neuromarketing, in addition to fundamental research, promote company products and services, but also provide a better understanding of the same.

Through neuromarketing, all the necessary marketing elements are created in order to provoke specific neurological reactions that trigger certain emotions or responses of potential consumers that lead to the buying process (Gotter, 2019). What makes neuromarketing significantly different from other traditional testing methods is that consumers have no contact with prejudices, any values, or attitudes, because their brains are monitored, which cannot deceive researchers (Tomkova & Ondrijova, 2018). Harrell (2019) starts from the fact that neuromarketing measures psychological and neural signals in respondents' brains - potential buyers. The focus is on examining consumer motivations, preferences, and decisions that give significant feedback to marketing teams.

Finance and money are sensitive subjects for everybody. According to the research conducted by Seymour (Wellcome Trust, 2007), losing money activates the same part of the brain that is activated by physical pain. Having this in mind, it can be seen that financial decisions are not entirely rational, but, according to neuromarketing researches, people are quite emotional about their money (Wellcome Trust, 2007). The following table gives a brief historical overview of the implementation of neuromarketing in financial institutions.

LITERATURE REVIEW AND HYPOTHESES

Through a detailed analysis of consumer behavior (combined knowledge of neuroeconomics, finance, psychology, and sociology), banks can more easily see the dynamics of consumer needs and identify the best opportunities for marketing their products and ser-

vices to end-users (Dedu & Nitescu, 2014). Relational marketing via neuromarketing can create the necessary connections between the segments of banking clients according to pre-determined demographics and their preferences.

In this sense, Behavioural Economics is extremely helpful for banks to detect differences in the behavior of their clients. Using knowledge of behavioral economics, banking institutions can more easily reposition their products and services but also manage their pricing policies more efficiently (Knoll & Harmston, 2014). Today, it is more than necessary for users of banking services to be educated in the field of knowledge of banking services. On the other hand, many neuroscientists, neuroeconomists, and bankers also focus on the electrochemistry of the brains of users of banking services in order to interpret the numerous psychological processes due to which these same users decide on certain financial steps.

Due to the development of new technologies, software, and applications, users of banking services can use banking services not only directly by visiting the bank branch, but also through various devices such as tablets, laptops, mobile phones, personal computers, and ATMs. As competition in the banking services market intensifies, banks face the challenge of attracting as many customers as possible in the most subtle ways, using the achievements and results of neuromarketing research. Among other things, they use different designs and other characteristics of the site, both hedonistic and utilitarian (Korzeb & Niedziołka, 2020), to maximize service users' satisfaction. The most commonly used promotional activities are directed from the seller to the buyer in order to influence the buyer's decision to buy (Gronroos, 1990). The way the seller communicates and the messages she sends to the buyer in order to influence the purchase decision are most often the subject of neuromarketing research (Rawnaque et al., 2020).

Based on the benefits received, and implications on their attitudes and behaviors, customers analyze, and ultimately choose the bank and banking services they will use. Some researches suggested that customer satisfaction plays an important role as an intermediary in the long-term relationship between banks and customers (Ladeira et al., 2016). It can be said that the best and most accurate way to discover the main causes of customer satisfaction are neuromarketing research and the application of neuromarketing techniques. Many neuromarketing experts want to optimize the design and presentation of their products to be as compatible as possible with consumer preferences (Khushaba et al., 2013).

In the past, interpreting the findings of marketing studies that used traditional techniques might have led to misleading guidelines. As a modern and innovative research method, neuromarketing creates, together with conventional research methods, a synergy in increasing the quality of communication strategies in banking (Å¢ichindelean & Å¢ichindelean, 2019). For example, using the eye tracker, researchers can gain qualitative information, which can be used to improve the design of marketing stimuli by identifying and explaining usability issues. Besides, it can measure the quantitative desirability and performance of specific elements. In combination with the eye-tracking method, the results could be more precisely interpreted, and the whole story could be more clearly understood (Schiess, et al., 2003). Using neuromarketing, banks can gain insights into users' choice behavior in the virtual environment (Šola et al., 2021). With knowledge of what users were looking at when their emotions reached a highest point and memory formation took place, banks could act upon it.

Autor Al-Kwifi (2016) suggests the importance of using neuromarketing in order to evaluate brain activations during the decision-making process when a consumer is selecting a brand. The results of neuromarketing brand research can make better marketing and advertising strategies that enhance consumers' perception of brands and positive emotional experience. In the end, it makes it easier for customers to choose the brand. This can also be applied to banks.

A recent study in the Russian Federation on the use of neuromarketing tools in the banking sector addressed the prior knowledge and awareness of the use of neuromarketing tools for commercial purposes by users of banking services (Molchanov & Galay, 2019). The selection of the bank was the primary hypothesis, but the factors of innovation of banking technologies and infrastructure were also considered, as well as the evaluation of satisfaction with the banking service in general. The conclusion is that for the selection of a bank, corporate communication and the image of the bank are of primary importance in relation to the products and services that the bank offers, i.e. that priority should be given to media promotion of the bank's name when it comes to its selection. More precisely, the use of neuromarketing tools is one of the possible ways to examine the behavior of users of banking services, which could convey the right message in terms of banking image to its direct users. By collecting big data on service users with the

help of neuromarketing, an unprecedented opportunity is formed for marketing messages to be personalized and forwarded to the bank‘s clients.

One study showed the importance of mental activation and possible selection of a bank through attention to Targo Bank‘s advertisement. Experiments conducted using a combination of Neurocode-Tracking have shown success in researching the effects of bank advertising, which provide reliable information on both individual and cognitive emotional responses (Dimpfel, 2015).

H1: Through neuromarketing, potential users of banking products/services can select banks more easily

Numerous authors have identified the importance of the consumer experience in the context of studying services (McColl-Kennedy, 2015). Having in mind the dynamics of relations with the user of services, including banking ones, the bank›s relations with its customers are based on the following premises: 1) increased customer engagement in terms of monitoring the experiences of communication with the bank; 2) direct access to the user experience and 3) recognizing the holistic nature of the user experience during each contact with the bank clerk (regardless of whether it was achieved in the traditional or online way).

The difference between service users‘ attitudes and their behavior is the space in which neuromarketing research can provide answers (Agarwal & Dutta 2015), and thus find solutions to reduce the mismatch between attitudes and consumer behavior. Asymmetry of information (Janković, 2009) is one of the key causes of loss of trust of banking service users because the information provided by the bank in the contract is not equally clear to the service user. This is often not the malicious intention of the bank, but insufficient knowledge of the needs, attitudes, desires, and expectations of the users of banking services. In this segment, neuromarketing research can help significantly.

Neuromarketing research proves that there are significant differences in evaluating purchasing behavior between men and women (Štefko et al., 2020). Namely, it was found that men are far more sensitive to odors, music in the room, lighting, hygiene, and in general to the interior of the consumer facility. In addition, they care much more about the brand of a certain company, but they are also more price sensitive. On the other hand, from a neuromarketing point of view, women pay more attention to colors and are more influenced by online marketing (social networks) when deciding on a potential purchase. The conclusion is that women are far more diligent in using neuromarketing when shopping in terms of a better understanding of a given product/service. Furthermore, they believe much more than men that they can be educated with neuromarketing that assists when buying a certain product/service. Finally, they even advocate the use of neuromarketing in educating customers, which can significantly raise the threshold of knowledge about upcoming purchases.

There are still different aspects between men and women as customers in the eyes of neuromarketing science. Namely, Vecchiato et al. (2014) conducted an experiment to investigate cognitive and emotional changes in the activity of customers‘ brains while watching television commercials. They proved that it is possible to establish a difference in the way of communication according to gender. Another group of researchers determined this through aspects of visual attention that differs between men and women (Cuesta et al., 2018).

There are many instances when neuromarketing is used in the banking sector. Namely, Schiess et al. (2003) further used an eye-tracker to determine the differences between men and women when tracking a banking website. The results showed that women were more text-oriented, while men paid more attention to images, almost not reading the promotional text. Another group of researchers who used the same neuromarketing tool to study banking services from the user‘s point of view studied the layout of elements within a banking website and how different genders react to it (Yuan et al., 2014), concluding that both sides prefer simple bank‘s websites, with basic information and user-friendly.

It is a special challenge for banks to introduce new services that will significantly change the entire business system, such as e-banking. In these conditions, it is extremely important to know the wishes and expectations of clients as well. A study was conducted in India (Yadav, 2016), which showed that the perceived factors such as service utility, service quality, and perceived risk are directly related to the intention of banking users to opt for a new e-banking service. The fact is that the essential knowledge of the reaction of the human subconsciousness when encountering a novelty leads to valuable results for presenting a new way of providing services, and thus the acceptability of that way by service users.

A similar study was performed by Dimpfel and Morys (2014) in a comparative approach, seeking to determine the layout that allows for the lowest time until the subject becomes aware of the viewed content.

In this particular case, researchers have combined the eye-tracking method with electro-oculography and EEG to study how the brain works and the parameters such as level of concentration, stimulation, memory, or activation. As a final result, this pilot study consisting of the combination of Eye-Tracking and Neurocode-Tracking followed by a questionnaire has proven to provide much more information than with any of the methods used separately (Dimpfel & Morys, 2014). Some authors argue that neuromarketing research can make advertising more effective (Morin, 2011; Otamendi & Sutil Martín, 2020, Bačík 2021). It can be said that the key to understanding consumer behavior and the effectiveness of advertising lies in neuromarketing research. One neuromarketing study in the banking industry dealt with a different reaction between the sexes, when it comes to the connection between the logo and the recognizability of the banking brand, where encephalography, galvanic skin response and eye monitoring were used (D'Angelo, 2015).

As mentioned above, neuromarketing techniques answer questions that correspond to the emotions of potential consumers, different genders, while deciding on the purchase of banking products and services. The goal of these studies is to improve psychology and marketing efficiency, and as far as implementation is concerned, they are very important for improving the effects in advertising and consumer experience in all areas.

H2: Neuromarketing contributes to a better understanding of the use of a banking product/service for users of both sexes

One of the basic problems of using neuromarketing tools in monitoring banking services is extremely high costs. fMRI equipment costs more than one million dollars, and renting for research purposes alone can range up to several thousand dollars per hour of use (Felipe-Barkin, 2013). Neuromarketing research is certainly far more expensive than any form of traditional marketing research. Due to the high cost, we often have examples of unfinished neuromarketing research (Mikić, 2016). In addition to expensive equipment, what further raises costs is the lack of trained people who can work with complex neuromarketing equipment. Not only is technical knowledge crucial in terms of knowing the nature of the work of neuromarketing tools, but also a significant difficulty is the interpretation of subsequent results for commercial purposes (Chi, 2020). It is believed that neuromarketing techniques will be faster and more efficient in the future; it will also provide marketing professionals with information that will be difficult to access through traditional marketing methods (Ariely & Berns, 2010). Despite the high cost of engaging in certain research, neuromarketing supports complex industries and large institutions that represent a significant target group of users. The advantages include customer support in decision-making, interdisciplinarity, and the possibility of reaching new research results (Shigaki et al., 2017). One empirical study aimed to segment banking services clients, using their characteristics and predictive behavior. The obtained results indicated the efficiency of more homogeneous segments of banking services, which helped to adjust subsequent marketing strategies (Ben Ncir et al., 2022).

Companies with brands are fighting for customer attention more than ever. This is especially evident in the banking sector as banking services are quite similar in terms of the financial impact on service users. The difference is necessarily made by customer satisfaction, which is increasingly in the focus of researchers, since service users themselves emphasize that moment. The utilitarian aspect is taken for granted, but a step more provides a pleasurable moment. What really evokes a feeling of hedonism in users, neuromarketing can establish quite precisely (Emül & Yücel, 2021).

According to Mordor Intelligence, the value of neuromarketing in 2020 reached $ 1.158 billion, while the value of neuromarketing in 2026 is estimated at $ 1.89 billion, with the CAGR (Compound Annual Growth Rate) projected over the five-year period at 8.89 percent. It is to be expected that the banking sector, as one of the most influential, will resort to neuromarketing research that will maximize accuracy in assessing the behavior and expectations of users of banking services at all levels.

H3: Despite the high costs, it is necessary to apply neuromarketing to monitor bank services more efficiently

METHODOLOGY AND RESULTS

In order to examine attitudes towards neuromarketing in the summer of 2020 we distributed the questionnaire to potential respondents across Serbia with the kind assistance of the Woman's Entrepreneurship Group within Enterprise Europe and Chamber of Commerce and Industry of Serbia. We collected 99 valid responses, and the descriptive statistics are avail-

TABLE 2: Descriptive Statistics

Gender	Male	22	22%
	Female	77	78%
Education	Postgraduate	13	13%
	Graduate	70	71%
	High School	16	16%
Age of respondents	Male	28 - 68 years	
	Female	30 - 69 years	
Firm size	Micro	53	54%
	Small	31	31%
	Mid-size	11	11%
	Large	1	1%

able from Table 2. The sample is dominated by female respondents (78 percent), and respondents who graduated from universities or equivalents (71 percent). Most entrepreneurs in our sample are the owners of micro-sized firms (54 percent), which in Serbia includes firms not surpassing two of the following three requirements: a) ten employees, b) annual income of 700,000 euros and c) assets not surpassing 350,000 euros in value, followed by small firms (31 percent), included in the group firms with no more than 50 employees, annual income of 8 million euros and assets not exceeding 4 million euros (Accounting Law, 2019)

Respondents were asked to provide responses on a five-point Likert scale with one indicating "completely disagree" and number five "completely agree" to three neuromarketing-related questions out of 40, in total.

When asked whether neuromarketing would help them to select a bank female entrepreneurs seem to be more inclined to agree with this claim as opposed to male respondents (Figure 1).

However, this claim about the difference is not supported by our ANOVA test (p-value=0.560), even though the variances are homogeneous, and suitable for further analysis. When examining this question via four age groups: less than 40 years, 41 – 50, 51 – 60 and 61 and above we face the problem of heterogenous variances and a high p-value (0.365) that fails to reject the null-hypothesis. Post Hoc Tukey HSD and Games-Howell test indicate that there is not any difference between any of the four age groups when providing answers. Interestingly, the younger respondents aged up to 50 years, are more inclined not to have any opinion vis-à-vis neuromarketing, which implies that our respondents may be inadequately informed about the neuromarketing ramifications for banking services (Figure 2).

The size of the firm (micro, small, mid-size and large) does not indicate any differences. In order to run the post hoc tests we had to exclude one observation for large firms, and Tukey HSD and Games-Howell do not imply any differences in responses among micro, small and medium-sized firm owners. The same statistically insignificant results are obtained for various educational groups (high school, graduate and postgraduate studies). We do not find any evidence that our entrepreneurs viewed neuromarketing differently with respect to age, firm size, education level and gender. However, they uniformly view neuromarketing as a more positive tool rather than a negative one, which supports H_1.

Interestingly, when asked whether neuromarketing contributes to the better understanding of the use of banking products/services none of male respondents provided a negative response, while the "no opinion" remains comparatively dominant among them, the

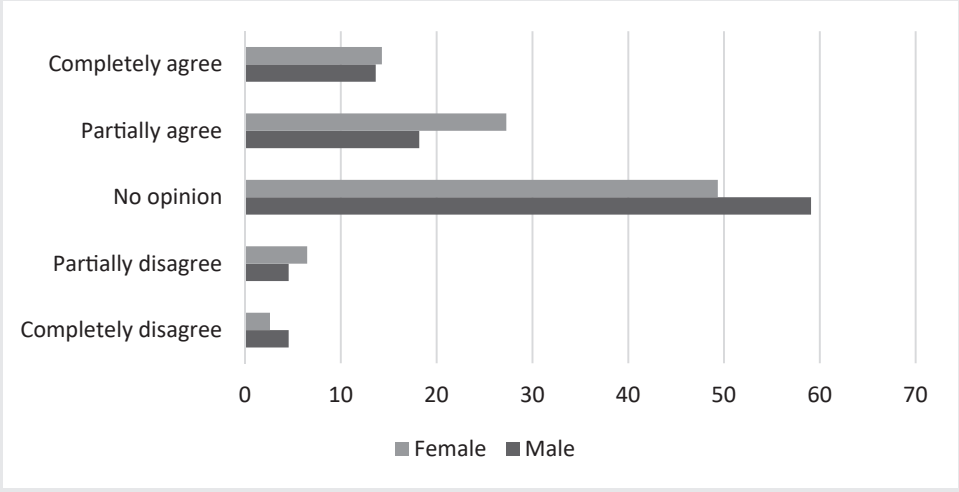
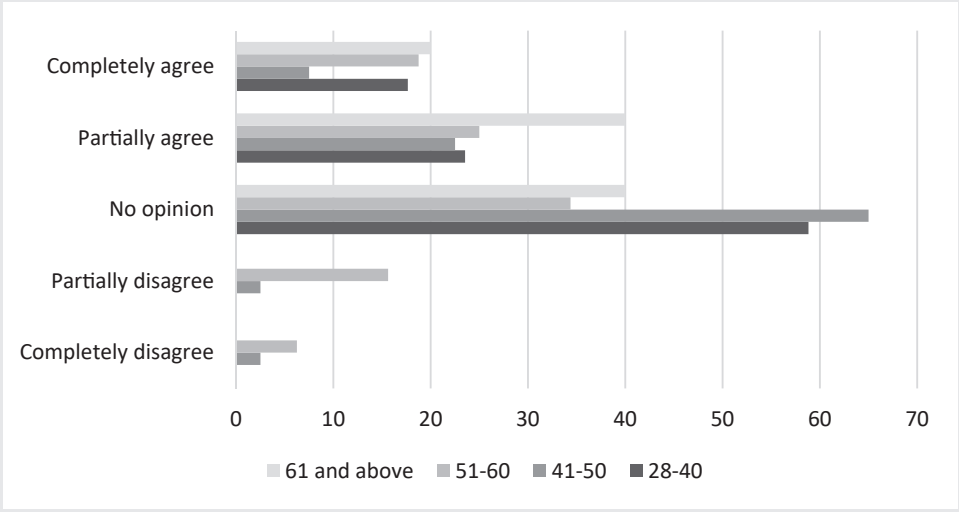


FIGURE 1: Neuromarketing helps potential users of banking products/services to select banks more easily (by gender, in percentages)

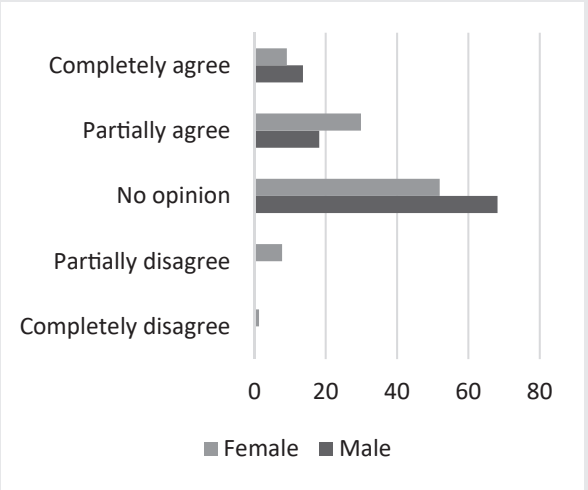
Figure 2. Neuromarketing helps potential users of banking products/ services to select banks more easily (by age groups, in percentages)



same as in the previous case (Figure 3). When viewing responses across various age groups, those in the 51-60 year cohort seems to be the most positive about this neuromarketing claims. Unsurprisingly, the youngest cohort of entrepreneurs confirms to be the least suspicious regarding the role of neuromarketing, with no negative answers (Figure 4). However, even though variances are homogeneous, we do not find statistically significant ANOVA results and our post hoc analysis indicates that we do not see differences among various gender and age groups. When examining respondents across educational levels the most sceptical group seems to have postgraduate degrees, but we fail to find statistically significant support for this claim, i.e. Tukey HSD and Games-Howell fail to find any differences between the three educational cohorts. In general, we find some limited support for H_2.

When asked whether *in spite of high costs*, it is still necessary to apply neuromarketing as a follow-up of services offered by banks, female respondent were, as before, more receptive for this idea (Figure 5). When examining attitudes towards this notion among various educational groups, respondents with MSc and higher degrees were comparatively more suspicious (Figure 6). However, the ANOVA and post hoc analyses do not find support for differences among these gender and age categories. What remains is the larger support rather than disagreement across all examined

Figures 3. and 4: Neuromarketing contributes to the better understanding of using banking products/ services for all users (by gender, in percentages and by age group, in percentages, respectively)



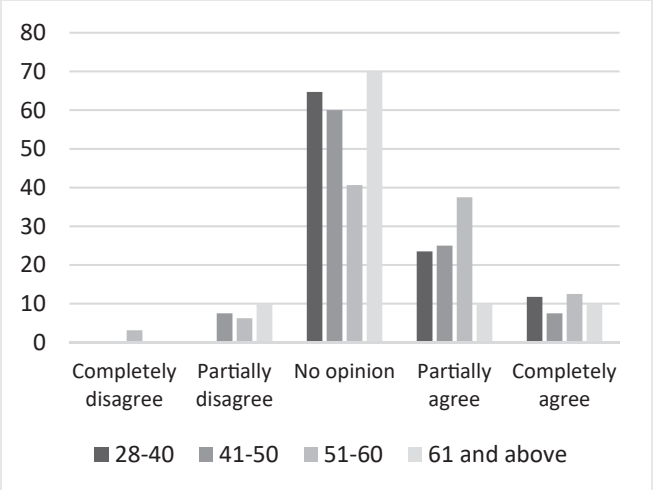
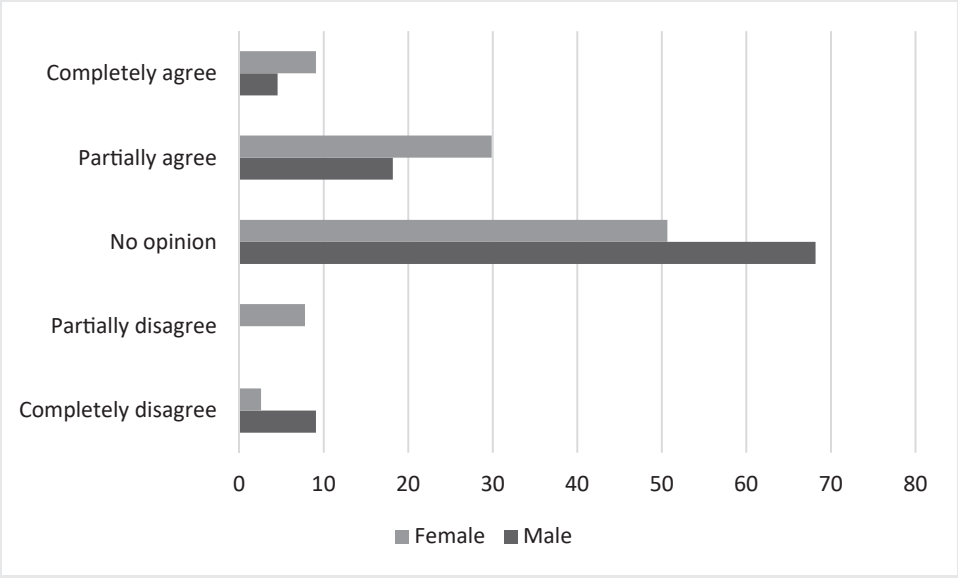


FIGURE 5: Despite high costs, it is necessary to apply neuromarketing as an efficient follow-up of banking services (by gender, in percentages)



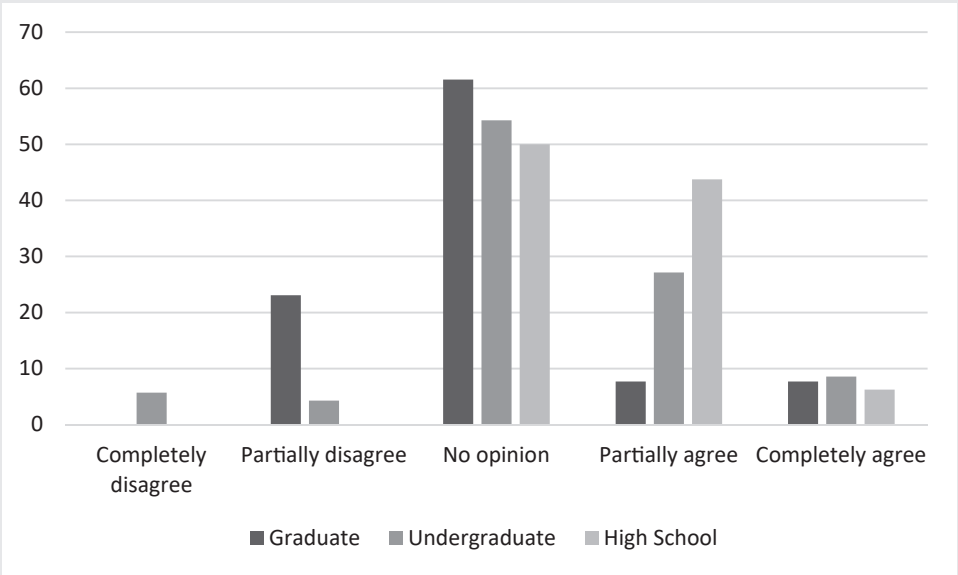
categories, i.e. gender, age, education and firm size, which supports H_3.

Finally, we have decided to exclude "no opinion" categories and re-run test on the remaining sample that has been halved in size. When examining hypothesis No. 1 we find weak support at 10% that there is a difference between 28-40 year and 51 – 60 year groups, which partially supports out claims in Figure 2.

CONCLUSION

We have examined the role of neuromarketing in banking by having asked entrepreneurs to respond on the five-point Likert scale to three questions. Our first hypothesis questioned the ability of potential users of banking services/products to select banks more easily, followed by a claim that neuromarketing contributes to the better understanding of using banking products/services for all users and, finally, in spite of high costs, whether it is necessary to apply neuromarketing as an efficient follow-up of banking services. We examine homogeneity of variances, apply ANOVA and post hoc analyses to see if there are any difference among our respondents across age groups, gender, education, and firm size. However, we do not find any evidence that the perception varies across these cate-

FIGURE 6: Despite high costs, it is necessary to apply neuromarketing as an efficient follow-up of banking services (by education, in percentages)



gories, but it is apparent that respondents are comparatively more positive rather than negative when discussing neuromarketing, which supports our claims in hypotheses.

Our study is limited by the number of respondents and the fact that entrepreneurs provided a disproportionately large number of "no opinion" responses, which indicates that they may not be acquainted with the neuromarketing concepts. Future research could include the two groups of respondents, whereby one of them would be briefly informed about the meaning of neuromarketing, while the remainder would be asked to respond to questions without any a priori input.

References

1. Å¢ichindelean, M., and Å¢ichindelean, M., (2019). «A Study Of Banking Marketers› Perception Regarding The Use Of Neuromarketing Techniques In Banking Services,» Annales Universitatis Apulensis Series Oeconomica, Faculty of Sciences, «1 Decembrie 1918» University, Alba Iulia, vol. 2(21), pages 1-8.
2. Agarwal, S., Dutta, T., (2015). Neuromarketing and consumer neuroscience: current understanding and the way forward. Decision, 42(4), 457-462. DOI: 10.1007/s40622-015-0113-1
3. Al-Kwifi, S.O. (2016). The role of fMRI in detecting attitude toward brand switching: an exploratory study using high technology products. Journal of Product & Brand Management, 25(2), 208-218. https://doi.org/10.1108/JPBM-12-2014-0774
4. Ariely D., & Berns, G.S. (2010). *Neuromarketing: The Hope and Hype of Neuroimaging in Business*, Macmillian Publishers Limited, Vol. 16, 283-292.
5. Babiloni, F. (2012). Consumer Neuroscience. IEEE Pulse. 3 (3), 21-23. doi: 10.1109/MPUL.2012.2189166.
6. Bačík, R., Gavurova, B., Fedorko, I., & Fedorko, R. (2021). Website quality factor as a multidimensional construct and its impact on the use of e-banking. *Journal of Entrepreneurship and Sustainability Issues,* 9 (1), 519-528. https://doi.org/10.9770/jesi.2021.9.1(34)
7. Ben Ncir, C.E., Ben Mzoughia, M., Qaffas, A., & Bouaguel, W. (2022). Evolutionary multi-objective customer segmentation approach based on descriptive and predictive behaviour of customers: application to the banking sector, *Journal of Experimental & Theoretical Artificial Intelligence*, DOI: 10.1080/0952813X.2022.2078886
8. Chi, A. (2020). The limitations and challenges of neuromarketing. Retrieved from https://www.boonmind.com/limitations-and-challenges-of-neuromarketing/
9. Cuesta, U., Nino, J. I., & Martinez-Martinez, L. (2018). Neuromarketing: Analysis of Packaging Using Gsr, Eye-Tracking and Facial Expression, *Papper presented at The European Conference on Media, Communication & Film*.
10. D'Angelo, C.J. (2015). *Logos: evocative or just decorative? A neuromarketing study of the theory of perception in the Maltese banking industry*, dissertation facEMAMar, https://www.um.edu.mt/library/oar/handle/123456789/5149
11. Daugherty, T. & Hoffman, E. (2017). *Neuromarketing: understanding the application of neuroscientific methods within marketing research*, Springer International Publishing.
12. Dedu, V., & Nitescu, D.C. (2014). Banking relationship management – A new paradigm?, *Theoretical and Applied Economics, Asociatia Generala a Economistilor din Romania - AGER*, vol. 0(4(593)), 7-22.
13. Dimpfel, W., & Morys, A., (2014). Quantitative Objective Assessment of Websites by Neuro- code-Tracking in Combination with Eye-Tracking. Journal of Behavioral and Brain Science, 4, 384-395. http://dx.doi.org/10.4236/jbbs.2014.48037
14. Dimpfel, W. (2015) Neuromarketing: Neurocode-Tracking in Combination with Eye-Tracking for Quantitative Objective Assessment of TV Commercials. *Journal of Behavioral and Brain Science*, **5**, 137-147. doi: 10.4236/jbbs.2015.54014.
15. Emül, S., & Yücel, A. (2021). Hedonik Tüketim Temali Reklam Görsellerinin Eye-Tracking İle İncelenmesi; *Romaya Journal*, 1(1),1-30.
16. Eremenko, D.S., & Kuzmina, E.V. (2019). Neuromarketing Of Financial Reporting: Russian View Of Methodology For Improving Reporting. DIEM, 4 (1), 75-81. Retrieved from https://hrcak.srce.hr/228684
17. Felipe-Barkin, E. (2013). The prospects and limitations of neuromarketing. *Destination Customer Relationship Management.*[online] Retrieved from https://www.destinationcrm.com/Articles/ReadArticle.aspx?ArticleID=90150.
18. Fortunato, V., Giraldi, J.M.E. & Oliveira, J.H.C. (2014). A review of studies on Neuromarketing: practical results, techniques, contribution and limitations. Journal of Managemente Researsh. 6 (2), 201-220. https://doi.org/10.5296/jmr.v6i2.5446

19. Fugate, D.L. (2007). Neuromarketing: a layman's look at neuroscience and its potential application to marketing practice. Journal of Consumer Marketing. 24 (7), 385-394. https://doi.org/10.1108/07363760710834807
20. Fugate, D.L. (2008). Marketing services more effectively with Neuromarketing research: a look in the future. Journal of Services Marketing. 22 (2), 170-173. https://doi.org/10.1108/08876040810862903
21. Gotter, A. (2019). *Neuromarketing 101: How Neuroscience Affects Customers' Buying Behaviors,*' [Online]. Retrieved from https://www.singlegrain.com/digitalmarketing/neuromarketing-101-howneuroscience-affects-customers-buyingbehaviors/
22. Gronroos, C. (1990). Service Management: A Management Focus for Service Competition, International Journal of Service Industry Management, 1(1), 6-14. https://doi.org/10.1108/09564239010139125
23. Harrell, E. (2019). *Neuromarketing: What You Need to Know*,' [Online], Retrieved from https://hbr.org/2019/01/neuromarketing-what-you-need-to-know
24. Janković, B.B., (2009). Bank marketing in times of the global economic crisis – risc and/or chance?, *Bankarstvo, 9-10,* 53-69. UBS; Beograd
25. Karpova, S.V., & Rozhkov, I. (2019). Research on the Application of Neuromarketing Technologies on Financial Markets, Conference: *International Conference Technology & Entrepreneurship in Digital Society*, 126-129. DOI: 10.17747/TEDS-2018-126-129
26. Khushaba R. M., Wise C., Kodagoda S., Louviere J., Kahn B. E. & Townsend C. (2013). Consumer neuroscience: Assessing the brain response to marketing stimuli using electroencephalogram (EEG) and eye tracking, *Experts systems with applications*, 3803-3812
27. Knoll, D., & Harmston P. (2014). Perspectives – Behavioral economics helps customers change the channel. Retrieved from www.kpmg.com/global/en/issuesandinsights/articlespublications/perspectives/pages/behavioral-economics.aspx
28. Korzeb, Z., & Niedziółka, P. (2020). Resistance of commercial banks to the crisis caused by the COVID-19 pandemic: the case of Poland. Equilibrium. Quarterly Journal of Economics and Economic Policy, 15(2), 205–234. https://doi.org/10.24136/eq.2020.010
29. Ladeira, W.J., Santini, F.D.O., Sampaio, C.H., Perin, M.G. & Araújo, C.F. (2016). A meta-analysis of satisfaction in the banking sector. International Journal of Bank Marketing, 34 (6), 798-820. https://doi.org/10.1108/IJBM-10-2015-0166
30. Lee, N., Broderick, A.J. & Chamberlain, L. (2007). What is 'Neuromarketing'? A discussion and agenda for future research. International Journal of Psychophysiology. 63 (2), 199-204. https://doi.org/10.1016/j.ijpsycho.2006.03.007
31. McColl-Kennedy, J.R., Gustafsson, A., Jaakkola, E., Klaus, P., Radnor, Z., Perks, H. & Friman, M. (2015). Fresh perspectives on customer experience, *Journal of Services Marketing*, 29 (6/7), 430-435. https://doi.org/10.1108/JSM-01-2015-0054
32. Mikić, A. (2016). Neuromarketing as a New Paradigm for Understanding Consumer Behavior.In: *Proceedings of ICSD 2016, Innovation, Competitiveness and Sustainable Development.*Belgrade, 25 May 2016. Belgrade: Metropolitan University.
33. Molchanov N. N., & Galay N. I. (2019). Examining Consumer Reaction to the Use of Neuromarketing Tools in the Selection of Banking Products. *Ekonomika i Upravleniye*, 1(159), 87–100.
34. Morin, C. (2011). Neuromarketing: the new science of consumer behavior. Society, 48(2), 131-135. https://doi.org/10.1007/s12115-010-9408-1
35. OECD (2020), Digital Disruption in Banking and its Impact on Competition. Retrieved from http://www.oecd.org/daf/competition/digital-disruption-in-financial-markets.htm
36. Ohme, R., & Matukin, M. (2012). A small frog that makes a big difference: Brain wave testing of TV advertisements. IEEE Pulse, 3(3), 28-33. DOI: 10.1109/MPUL.2012.2189169
37. Otamendi, F., J. & Sutil Martín, D., L. (2020). The Emotional Effectiveness of Advertisement. *Frontiers in Psychology*, 11, 2088. doi: 10.3389/fpsyg.2020.02088
38. Rawnaque, F.S., Rahman, K.M., Anwar, S.F., Vaidyanathan, R., Chau, T., Sarker. F., & Al Mamun. K. A., (2020). Technological advancements and opportunities in Neuromarketing: a systematic review. Brain Inf. 7, 10 (2020). https://doi.org/10.1186/s40708-020-00109-x
39. Shigaki, H. B., Gonçalves, C. A., & Santos, C. P. V. D. (2017). Neurociência do Consumidor e Neuromarketing: Potencial de Adoção Teórica com a Aplicação dos Métodos e Técnicas em Neurociência. Revista Brasileira de Marketing, 16(4), 439-453. DOI:10.5585/remark.v16i4.3427
40. Schiess, M., Duda, S., Thölke, A., & Fischer, R., (2003). Eye Tracking and Its Application in Usability and Media Research. „Sonderheft: Blickbewegung" in MMI-interaktiv Journal, 6.
41. Senior, C., Smyth, H., Cooke, R., Shaw, R.L. & Peel, E. (2007). Mapping the Mind for the Modern Market Researcher. Qualitative Market Research: An International Journal, 10 (2), 153-167. doi: 10.1108/1352275071074082.
42. Slijepčević, M., Popović Šević, N., & Radojević, I. (2017). Neuromarketing research – a new mirror on consumer behavior. In: Proceedings of ICSD 2017, Innovation, Competitiveness and Sustainable Development. Belgrade, Metropolitan University.

43. Slijepčević, M., Popović Šević, N., Radojević, I., & Asanin Gole, P. (2020). Ethical aspects in neuromarketing research. Research in theory and practice in contem. porary business issues. Monograph of the DOBA Business School 2020, pp. 95-111. doi: 10.32015/DOBA.MON.2020
44. Smidts, A. (2002). Wat onhoudt een consument van een tv-commercial? Een kijkje in het brein met neuro-imaging technieken. Ontwikkelingen in het marktonderzoek : jaarboek .. / MarktOnderzoekAssociatie, 145–155. Retrieved from http://hdl.handle.net/1765/20516
45. Streeter, B. (2020). COVID Forcing Major Changes to Bank Marketing in 2021 (and Beyond). The Financial Brand. Retrieved from https://thefinancialbrand.com/102640/covid-pandemic-bank-marketing-innovation-digital-channels/
46. Susanta, S., Widjanarko, H., Utomo, H., S., & Suratna, S. (2019). The Role of Satisfaction as Mediation Influence Relational Benefits against Bank Customer Commitment: Survey on Institutional Customers. Proceedings of the 1st Aceh Global Conference (AGC 2018). https://doi.org/10.2991/agc-18.2019.71
47. Šola, M., H., Steidl, P., Mikac, M., Qureshi, F., H. & Khawaja, S. (2021). How Neuroscience-Based Research Methodologies Can Deliver New Insights To Marketers. International Journal of Social Science and Humanity. 4(10), 2963-2972. DOI:10.47191/ijsshr/v4-i10-41
48. Štefko, R., Tomkova, A., Kovalova, J., & Ondrijova, I. (2020). Consumer Purchasing Behaviour and Neuromarketing in the Context of Gender Differences, 36th IBIMA Conference: 4-5 November 2020, Granada, Spain.
49. Tichindelean, M., Cetina, I., & Tichindelean, M. (2018). Neuromarketing services: an analysis of international specialists' experience. Proceedings of the 12th International management conference „Management Perspectives in the Digital Era", Bucharest, Romania. http://conferinta.management.ase.ro/archives/2018/pdf/5_3.pdf
50. Tichindelean, M., & Tichindelean, M. (2019). A study of banking marketers' perception regarding the use of neuromarketing techniques in banking services, *Annales Universitatis Apulensis Series Oeconomica,* 21(2), 73-82.
51. Tomkova, A. & Ondrijova, I. (2018). Podstata a prinosy neuroekonomie, *Journal of global science*, 3 (2).
52. Vecchiato, G. et al. (2014). Neurophysiological Tools to Investigate Consumer's Gender Differences during the Observation of TV Commercials, *Computational and Mathematical Methods in Medicine*, 1–12. https://doi.org/10.1155/2014/912981
53. Veinović-Stevanović, J., Jovanović, J., & Štavljanin, V. (2019). Upotreba alata neuronauke prilikom istraživanja ponašanja potrošača i predviđanja uspeha na društvenim mrežama, Proceedings of the *Izazovi savremenog marketinga,* SeMa. http://www.sema.rs/repository/download/izazovi-savremenog-marketinga-2019-zbornik-radova.pdf
54. Wellcome Trust. (2007). Why Losing Money May Be More Painful Than You Think. ScienceDaily. Retrieved from www.sciencedaily.com/releases/2007/05/070502072658.htm
55. Yadav, P. (2016). Active drivers of adoption of internet banking. *Independent Journal of Management & Production,* 7(2), 445–464. https://doi.org/10.14807/IJMP.V7I2.403
56. Yuan, X., Guo, M., Ren, F., & Peng, F., (2014). Usability Analysis of Online Bank Login Interface Based on Eye Tracking Experiment, *Sensors & Transducers*, 165(2), 203-212
57. Zakon o računovodstvu, Službeni glasnik Republike Srbije 73/2019 (Accounting Law, Official Gazette of the Republic of Serbia 73/2019).

Apstrakt

Relativni značaj neuromarketinga u podršci korisnicima bankarskih usluga

Milica Slijepčević, Nevenka Popović Šević,
Ivana Radojević, Aleksandar Šević

Neuromarketing predstavlja jedan od novijih alata koji banke sve češće koriste u svom marketingu kako bi se izborile za što veći broj klijenata. U okviru sprovedenog istraživanja, o ulozi neuromarketinga u bankarstvu, prikupljeni su odgovori 99 preduzetnika tokom leta 2020. U istraživanju je ispitana homogenost varijansi, primenjene su ANOVA i post hoc analize kako bi se videle bilo kakve razlike među ispitanicima po starosnim grupama, polu, obrazovanju i veličini preduzeća. Međutim, nema dokaza da se percepcija značajno razlikuje u ovim kategorijama, iako su odgovori ispitanika relativno više pozitivni nego negativni kada razgovaraju o neuromarketingu.

Ključne reči: *neuromarketing, bihejvioralne namere potrošača, usluge maloprodajnog bankarstva, percipirana korisnost usluga, potrošački marketing*

Kontakt:

Milica Slijepčević, milica.slijepcevic@metropolitan.ac.rs
Univerzitet Metropolitan u Beogradu, Fakultet za menadžment

Nevenka Popović Šević, nevenka.popovic.sevic@fsu.edu.rs
Univerzitet Privredna Akademija u Novom Sadu, Fakultet Savremenih Umetnosti, Beograd

Ivana Radojević, gujanicaivana@yahoo.com
Univerzitet Metropolitan u Beogradu, Fakultet za menadžment

Aleksandar Šević, a.sevic@tcd.ie
Trinity College Dublin, University of Dublin