Can eye trackers and EEG be used by small-medium marketing and advertising agencies? A qualitative study.

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Abstract. The objective of this article is to evaluate whether neuromarketing tools, like eye trackers and electroegephalography (EEG), in the form of an integrated software system (NeuroMkt) can be used by small-medium marketing agencies to evaluate their clients' marketing material. Results that are based on physiological responses are more valid compared to results that are based on customers' self-reported data. However, with the specialized knowledge that is required to use neuromarketing tools, it is uncertain whether marketers can embrace this change in the marketing field. The findings of this study provide evidence that small-medium marketing agencies are really interested in gaining information about eye trackers and EEG and if the cost is permittable they are willing to use them in the near future. However, a crucial factor for using such tools is whether their clients openness towards the use of such methods in their campaigns. Small-medium marketing admit that lack of appropriate knowledge to clearly understand results and outputs of eye tracking and EEG is a caveat for using such methods. Therefore, they require simple and easy to understand information from future neuromarketing software. This study is part of a research project around the evaluation of a neuromarketing system to improve the promotion of groceries.

Keywords. Eye tracking, neuromarketing, advertising, qualitative research

1 Introduction

As marketing researchers gradually admit the shortcomings of self-reported data obtained from surveys and qualitative methods, consumer behaviour researchers are searching for different approaches to overcome the biases that come along with self-reports. Neuroscience methods offer alternative tools, as well as a way to unearth the cognitive processes and inherent mechanisms that help describe consumer actions. Kenning and Plassmann (2008, p. 532) say that the goal of consumer neuroscience "is to use insights and methods from neuroscience to enhance the understanding of consumer behavior".

Brain activity can provide marketers with information not accessible via traditional marketing research methods (e.g., observations, interviews, surveys, focus groups) (Ariely and Berns, 2010). This is largely led by the fact that people cannot (or do not want to) fully describe their preferences when openly questioned; as human behaviour is driven by processes operating below the level of conscious awareness (Calvert and Brammer, 2012).

Neuromarketing methods have increasingly been used by business practitioners, especially consumer brand managers. For example, Coca-Cola has been using neuroscience methods, including functional magnetic resonance imaging (fMRI), eye tracking, electroencephalogram (EEG), magnetoencephalography (MEG) and other biometrics (i.e. physiological measures used to characterize human behaviour) to better evaluate consumer responses to their ads (Looney, 2016). Procter & Gamble (P&G) has launched research centers where researchers use eye trackers to study consumer behaviour in a supermarket environment. General Electric (GE) also launched the GE BBQ research center, to examine consumer responses to food and taste, to improve their BBQ recipe (Garun, 2015).

Recently, Plassmann et al. (2015) recommended five ways neuroscience can be employed to enhance academic and practitioner knowledge of consumer behaviour:

1. identifying mechanisms;
2. measuring implicit processes;
3. dissociating between psychological processes;
4. understanding individual differences; and
5. improving predictions of behaviors.

2 Eye tracking

Eye tracking is a human-computer interaction mechanism to analyze subjects' eye movement when looking at an advertisement (Duchowski, 2007). Although this method is widely used in research laboratories, some universities also employ it to analyse human visual and attention processes regarding texts, images and general content (i.e. online games) (Duchowski, 2007). A study by Horsley et al. (2014) agitates the basis of eye tracking research and research methodologies becoming progressively more widespread in many disciplines. The authors argue that eye tracking research recommends innovative ways of collecting data, structure research questions, and anticipate about how we view and understand the world. Eye tracking methodologies are favored in cross-disciplinary and multi-disciplinary studies because they assemble exceptionally detailed results (Wade and Tatler, 2011).

Scientists generate new conclusions about the way the visual system collaborates with attention, cognition, and behaviour (Horsley et al., 2014). More and more eye tracking studies are persistently being circulated and new inventive ideas are shared among researchers (Horsley et al., 2014). Eye tracking helps advertisers and marketers understand the consumers' internal processes and then tailor the information to change some aspects of the advertisement in order to be effective (Duchowski, 2007).

Eye tracking outputs consist of gaze plots, heat maps and fixation analyses. The latter enables scientists to examine the framework of attention and distraction in various visual examples (Horsley et al., 2014). On the other hand, gaze investigation serves as a new approach to understand eye movements. Although eye movement is both fast and dubious, eye tracker is able to generate reliable data through algorithms and significance analysis (Wade and Tatler, 2011). It is believed that heat maps and gaze plots are very important not only because they illustrate what areas of an advert people are looking at, but, more importantly, they provide data for what areas people are bypassing, thus helping advertisers to improve the aforementioned areas to catch peoples' attention.
In real life, eye trackers have been used widely by big brands in the last years to evaluate the packaging of their products (i.e. Procter & Gamble), the customer experience in their shops and showrooms (i.e. Toyota), the design of their websites (i.e. BMW) and many more. It is unknown whether those brands are managing the eye tracking experiments internally with specialized personnel, or whether they outsource the job to marketing agencies.

3 Electroencephalography (EEG)

The Neuromarketing Science and Business Association (NMSBA) in USA describes EEG as one of the most widely used methodologies employed by neuromarketers today. EEG measures brain activity by detecting and amplifying faint electrical signals, that are emitted continuously by the brain. These signals, or brainwaves, are the means by which human brain communicates activity across different anatomical regions. When researchers discover differences in brainwave activity, they spot changes in human cognitive processing.
As a direct measure of brain-related activity, EEG can thus be used to understand how brain cells (neurons) communicate with each other. EEG is thus distinct from fMRI, which is a measure of changes in blood flow to a brain region reflecting neural operations within that area. The use of EEG methods, which is almost real-time data, can assist researchers in discerning cause and effect relationships between the marketing stimuli and their associated cognitive response (Lin et al., 2018).
Compared to other methods, EEG is a relatively less invasive and less expensive method of measuring brain waves on the surface of the scalp, which is increasingly gaining attention in the field of marketing research (Lin et al., 2018). EEG is especially useful for capturing direct and objective data to further assist researchers in understanding the cognitive and emotional processes involved in information processing and decision-making (Lin et al., 2018).

4 Methodology

This study is part of a large research project that started in July 2021 and focused on the evaluation of supermarket marketing material with the use of an integrated system named "NeuroMkt" that includes eye tracking and EEG. "NeuroMkt" is a Multimodal Brain-Computer Interface that provides information about consumer response in various advertising stimuli that are presented on a computer screen. In fact, this study is the Work Package 1 (WP1) of the research project where the researchers investigate the possibility of commercialising "NeuroMkt" as it is assumed that small-medium marketing and advertising agencies' services will gain added value if they incorporate such tools in their portfolio when suggesting solutions to their clients.

Qualitative methodology is employed, in the form of focus groups, and seven representatives from small-medium advertising agencies in Greece were invited in a Zoom meeting. The use of Zoom was necessary due to the restrictions imposed by the Covid-19 pandemic. The focus group took place in November 9th 2020. Participants were selected voluntarily. Especially, we sent emails to the 15 largest advertising agencies in Greece, where we call them to participate in this focus group. In this email we informed them about the scope of the study and other important information about how the focus group will take place. Seven out of the 15 agencies, replied that are willing to participate in the study. After that, we asked them to provide just one employee from each agency, and preferably the one that has the highest level of experience in the advertising sector, based on years. They all agreed and as a result the Director from each agency participated in the study. Four of them were male and three were female. Their age was 45 years old and above. We informed them that the Zoom call will be recorded for the research needs only, while information provided by them will be strictly confidential. Before we started the focus group a form of ethics and a form of participation was signed by them. Participants had the opportunity to leave the focus group any time they decided to. The team had prepared a set of six open ended questions that would be the main guide for the progress of the focus group. The goal was to derive information about six main sections that are described in detail in our Findings. The focus group lasted approximately ninety minutes and participants were encouraged to voice their views on the topic. Two academic researchers were present to facilitate the focus group and provide guidance throughout the study. The respondents were introduced to the capabilities of the integrated "NeuroMkt" system as well as distinct eye tracking and EEG techniques and various real-life examples were presented to better illustrate the importance of neuromarketing tools in Greece and abroad.

5 Findings

The focus group meeting started with a presentation of the "NeuroMkt" system as well as the two separate tools: eye tracking and EEG. Then, the participants were asked whether they are using/have ever used both or any of the two methods. They all replied negatively. However, all of them mentioned that they had heard about the use of eye tracking and EEG in marketing. Moreover, they were impressed by the idea of the "NeuroMkt" system that combines the use of eye tracking and EEG with a user-friendly interface software. All participants strongly supported that "NeuroMkt" can be considered as a future tool for small-medium marketing and advertising agencies.

During the prosecution of the focus group, six major questions/sections were set under investigation considering the use and applicability of "NeuroMkt". The first one was about the appropriate information that "NeuroMkt" should provide to advertisers. Participants were informed that "NeuroMkt" can provide information about 1) consumer attention to the advertising stimuli, 2) consumer emotional response to the stimuli, 3) consumer cognition to the stimuli. Participants declare that important information like consumer reaction to certain words, images or other stimuli and the capability of the software to easily prioritize the provided information should be included. Moreover, all agreed that "The more information provided, the better"; however, this information needs to be significant and easily understandable. For instance, participants highlighted that it is very important for them to have clear information about the benefits and values perceived by the consumer for the product or the advertised message. Their main concerns were whether "NeuroMkt" is able to provide detailed information that leads to credible results coming from a highly efficient tool.

The second question was "how the additional information provided by "NeuroMkt" system could be used by them to improve their services". The most frequent answer was that they are interested to use all the above information to determine the levels of consumer loyalty

to certain products and their intention to buy the product. Moreover, a participant stated that it is very important to him to understand whether consumers perceive the ad message as a credible one. In general, they are interested to use the "NeuroMkt" system to predict consumer behavior and perception. Finally, one participant declared that she would use this neuromarketing tool in combination with questionnaires to corroborate consumers answers with two different approaches.

Subsequently, participants were asked to provide information as to how they would communicate and recommend the use of the tool to their customers. Five out of seven participants stated that the first thing they would take into is price. If the price of such a tool is too high, they seem to be unwilling to invest in such a system, because they feel that their customers will opt out from using such an expensive tool. They highlighted the fact that small businesses may not be able to pay a high amount of money in marketing campaigns. However, medium sized businesses may be keener on using it. Moreover, four out of seven participants put focused on the importance of explaining the benefits and added value of using the tools to their customers. For instance, someone declared "this tool could optimize their products and advertising messages". Finally, all participants mentioned that "NeuroMkt" matches better for FMCG and in general consumer products and they would not recommend it to customers related to B2B marketing or political marketing. The participants felt that there is lack of evidence as to whether the tool provides valuable information for B2B or political marketing campaigns.

Considering the way "NeuroMkt" can be developed in the future, all participants clearly stated that a future edition has to be compatible with smart phones. In fact, from their point of view, in the future, an effective system like "NeuroMkt" should be able to run on devices other than PCs and laptops. The use of a smart phone camera in combination with a simple EEG hat is more practical for the advertisers as they stated that smartphones are the future for neuromarketing.

The fifth section was about the fact that the presence of a researcher trained in neuroscience, statistics and marketing is necessary. In some cases, external partners might be needed to consult them with major issues arising from the use of the system. So, they were asked whether they are willing to allocate a part of their budget to employ a trained researcher or collaborate with an external partner. Surprisingly, six out of seven participants said that they prefer to train themselves in using such a tool compared to hiring someone else for the job. Only one participant stated that he is willing to open such a job position, if a system like this could offer added value to her company.

In the final section participants were asked to suggest what would be the best way to get the results out of the proposed system for their immediate use. Two of them answered that 'all information is useful and crucial, as long as it is easily understandable. So, the output must make use of infographics and simple forms of numbers. In most cases, statistical analysis and numbers make our job more difficult". All participants mentioned that an explanation of each graph or number is necessary, while a small description of each metric should be included in the "NeuroMkt" system. Finally, five out of seven participants agreed that it could be very useful if "NeuroMkt" can provide a customized and dynamic dashboard based on the agency's particular needs each time.

6 Conclusions

This preliminary qualitative study provided some interesting information about the contingency use of eye tracking and EEG by small-medium marketing and advertising agencies. Even though no participant has ever used such tools in their working environment, all of them are interested in gaining information about them and, if the cost is permittable, they

are willing to use them in the near future. However, a crucial factor for using such tools is their client's openness to using neuromarketing methods in their campaigns. Even though a system like "NeuroMkt" can provide detailed information about emotions, cognitive load, consumer attention and other concepts that are widely used in the marketing literature and research, advertising agencies are interested in gaining information about the levels of loyalty and intention to purchase a product. This result highlights that there is a crucial gap between small-medium marketing agencies and marketing researchers. While researchers can gain detailed information about consumer behavior, intention, emotions and other well studied constructs, practitioners are interested in more practical issues and particularly in metrics that can boost sales and loyalty. Yet, small-medium marketing and advertising agencies are willing to learn more about neuromarketing and understand that the use of neuro-tools is the future of marketing. Therefore, advertisers are willing to invest in such technologies. Within the contemporary digital environment in which consumers are bombarded by marketing messages, small-medium marketing and advertising agencies understand that every and each detailed information about consumers is crucial for them, to be able to apply effective marketing campaigns that grab consumer attention and preference. However, they comprehend that using eye tracking and EEG in the current form is complicated, as they do not have the appropriate knowledge to clearly understand results and outputs coming from the software. Hence, advertisers need neuromarketing systems that provide infographics, simple forms of numbers, explanation graphs, description of metrics and customized and dynamic dashboards that present detailed information based on the agency's particular needs each time.

7 Limitations and future research

This study is subject to certain limitations. Firstly, the qualitative nature of the study does not permit for the generalization of the results. Moreover, the sample of the present study is another limitation since representatives from small-medium marketing and advertising agencies from Greece were only invited in the focus group. As a result, in other countries where the commercial use of neuromarketing tools might be a common practice, advertising agencies might respond differently to the queries. In this vein, larger marketing and advertising agencies might have different attitude towards the neuromarketing tools as they handle a bigger budget for their marketing campaigns. As a result, future qualitative studies in different countries and with larger marketing and advertising agencies is a direction for future research. Another limitation of the study is that the "NeuroMkt" system is a neuromarketing tool that is under development. As a result, participants were presented with a beta-version of the present system. However, in the contemporary marketing industry there are neuromarketing software that are in their final form and are sold to interested parties like researchers and practitioners. Nevertheless, this software is expensive, hence probably not affordable to small-medium marketing and advertising agencies. Probably, larger, and multinational agencies that make use of the existing neuromarketing software have slightly different opinion about the discussed topics.

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