FOOD STYLING FROM THE PERSPECTIVE OF NEUROMARKETING

Jaromír Tichý, Pavel Rosenlacher a Kristýna Šteffelová

Department of Economics and Management, Department of Marketing communication,
Faculty of Economic Studies, University of Finance and Administration
jaromir.tichy@vsfs.cz, pavel.rosenlacher@vsfs.cz, 37243@mail.vsfs.cz

Abstract:

Food styling is a relatively modern tool which is used to arrange meals. It can be used not only for the meals preparation in restaurant facilities, but also for marketing purposes of restaurants, such as the promotion of their meals. In this area, new scientific disciplines are emerging, such as neurogastronomy and gastrophysics, which reveal what and why consumers consume and recall the importance of food styling and the visual aspects of food. This study focuses on the effectiveness of the food styling tool from the perspective of neuromarketing. The content of this study is to determine the extent to which food styling affects respondents in the selection and evaluation of food. The aim of the paper is to find out the most effective composition by comparing the created photographs of the food in several different modifications. For this purpose, the eye tracking method was used, supplemented by a short evaluation questionnaire, whereby three pairs of dishes were evaluated, of which three dishes were prepared according to the principles of food styling. The results show that the dishes prepared according to the principles of food styling were evaluated more positively by the respondents and are able to attract the attention of the respondents in comparison with the dishes without arrangements. Other studies also mention the positive effect of food styling on food selection.

1 Introduction

Neuromarketing is a field of marketing that studies sensorimotor, cognitive and emotional reactions of consumers to marketing stimuli (Roebuck, 2011). Neuromarketing is a multidisciplinary field of the application and connection of neuropsychology, cognitive psychology and neuroscience into the environment of marketing decision-making (Vysekalová, 2014). In general, neuromarketing can be understood as a connection between the application of biomedical technology and marketing research (Rosenlacher, 2013). Thanks to this connection, the impact of a given marketing tool on consumers can be determined. As a result, there is a growing interest in combining cognitive neuroscience methods and consumer behaviour research (Goto et al, 2019). Neuromarketing uses brain research and clinical psychology to reveal what people think and feel when they look at print, are exposed to news from various brands, watch television, shop and browse the Internet, play video games or are trained in various activities (Gurgu, 2020). Firms and marketers thus obtain much more objective data compared to classical marketing research on consumer psychological reactions (Ford, 2019).

Heart Rate (HR), electroencephalography (EEG), galvanic skin response (GSR) or Eye Tracking (Nilashi, 2020) are used as research methods in neuromarketing. Thanks to these methods, neuromarketing research can be used to monitor brain activity in situations such as the purchasing decision-making process, the evaluation of variants or the selection of variants (Christiansen, 2016).

Ekonomika Economics
Management Management
Inovace Innovation

EMI, Vol. 14, Issue 2, 2022
ISSN: 1804-1299 (Print), 1805-353X (Online)
www.emijournal.cz

Using the Electroencephalography (EEG) method, it is possible to monitor the level of attention and the level of emotional reactions of the human brain to the stimuli with which the person is surrounded, including marketing communication tools. Thus, the EEG helps to identify and predict the emotional and attentional potential of a given communication tool.

The essence of the Eye-tracking method, which is used in this research, is the tracking of the eye trajectory, thanks to which it is possible to mark the places in the television advertisement that the respondent watched the most. This method helps to evaluate the impact of the advertising product, its emotional effect. The purpose of using this technique is to adapt the marketing product to the needs and wishes of the target group of clients, including optimizing the placement of the logo and brand in the most monitored places in advertising. The graphic output are so-called heat maps (maps), from which you can trace the places that the person looked at the longest. (Popelka, 2012) Heat maps show where the respondent looked the most, with more watched parts of the ad marked with shades of red and, conversely, less watched areas marked with blue. (Hai-Jew, 2015)

The aim of the paper is to find the most effective composition by comparing the created photographs in several different modifications. The photographs were subsequently tested using the Eye Tracking method and further verbally evaluated using a questionnaire survey of respondents.

2 Materials and methods

The main goal of this study is to find out to what extent food styling influences respondents in the selection and evaluation of food. Eye Tracking is used as a research method, supplemented by a short evaluation questionnaire, while a total of 3 pairs of photos of meals were tested, namely 3 healthy meals prepared according to the principles of food styling and 3 ordinary meals without significant arrangement.

A Nikon D5100 camera with a 50 mm f/1.8 AF-S Nikkor G lens was used to take the photos. A tripod and remote shutter were used during shooting to eliminate unwanted shake and achieve as many professional photos as possible. The HDR method - high dynamic range - was used for photography. For the resulting photo quality, an integral part of photo creation is the post-production in the Photoshop graphics editor.

The selection of dishes for the main phase of the research was chosen on the basis of the results of a preliminary questionnaire survey made in the form of open-ended questions, which ascertained the most commonly consumed sweet, salty and healthy food in the selected target group. A total of 120 respondents from the T. G. Masaryk Grammar School in Litvínov and the Faculty of Education at Charles University took part in the pre-survey, and they were selected at random. The purpose of the preliminary research was to select for the main phase of the research such dishes that will be popular in the target group of respondents. The results of the preliminary research are summarized in Table 1, and these dishes with the most votes of the respondents were subsequently cooked, photographed and tested by eye tracking.

The prepared meals, which were selected according to the preliminary questionnaire survey, were divided into two groups – meals arranged according to the principles of food styling, and meals without significant arrangement, which were used a control group for meals with principles of food styling. Dishes that have been prepared according to the principles of food styling are summarized in Table 1, which also shows the use of the so-called rule of thirds when photographing food, which may also affect the evaluation of food photography.

Table 1: The most commonly consumed dishes

Type of dish	The name of the dish	Number of answers [%]	Food styling	Rule of thirds
Sweet	Pancakes	23 %	Yes	Yes
	Fruit dumplings	18 %	No	No
Salty	Vegetable salad	30 %	Yes	Yes
	Risotto	14 %	No	No
Healthy	Baked salmon with side dish and vegetables	24 %	No	No
	Pasta with sauce	14 %	Yes	Yes

Source: authors.

The prepared meals, which were selected according to the preliminary questionnaire survey, were divided into two groups – meals arranged according to the principles of food styling, and meals without significant arrangement, which were used a control group for meals with principles of food styling. Dishes that have been prepared according to the principles of food styling are summarized in Table 1, which also shows the use of the so-called rule of thirds when photographing food, which may also affect the evaluation of food photography.

2.1 Sample of respondents

The sample was selected by random selection. This is an improbability choice that does not use mathematical probability theory, so it cannot be inferred from the sample to the population. (Tahal et al., 2017, p. 54) Units are chosen because they are easy to access. Young university students aged 22 to 25 who volunteered to take part in the survey were used. The sample consisted of 13 respondents who were carefully acquainted with the course of the entire survey.

2.2 Data Collection

The survey was attended by the already mentioned 13 respondents, who were invited to the room gradually so as not to share information from the course of the survey and not influence each other (Rosenlacher & Tichý & Šteffelová, 2020). The windows in the room where the survey was conducted were oriented to the north so that direct sunlight did not affect the quality of lighting conditions when collecting data (Conklin, 2018). There was also a laptop in the room using Gazepoint 3.4.0. software and a monitor with a static eye camera Gazepoint GP3 Eye tracker. The 0.3MPx camera used contains a 1/3" Micron MR9V022 CMOS image sensor with a pixel size of 6 μm x 6 μm, a frame rate of 60 frames per second (fps) at a resolution of 752px x 480px (Radecky & Smutny, 2014). The eye camera was attached to the 22-inch Philips Full HD monitor, which was used to view photos of the dishes mentioned in Table 1 to respondents. The administrator sat behind the respondents, not next to them, so as not to disturb them with his work and operation of devices (Tichý & Rosenlacher & Maršálková, 2017). Before the survey, it was important not only to upload photos to the program, but also to set their length of exposure to respondents, while respondents were exposed to one of the prepared photographs for a period of 4 seconds (Tichý & Rosenlacher & Slavíková, 2018), due to the fact that more time would tempt the person to anxiously anchor and wander their eyes after the photographs to fill in the remaining time after viewing the photograph. Before the data collection began, the pupils were calibrated separately in order to be able to monitor the movement of the respondents' eyes with an eye camera.

This was followed by the measurement itself, during which the individual photographs gradually appeared in the set time interval, which the person in question had only the task of watching. After the Eye-tracking measurement, each individual was asked to complete an evaluation questionnaire, which

Ekonomika Economics
Management Management
Inovace Innovation

EMI, Vol. 14, Issue 2, 2022
ISSN: 1804-1299 (Print), 1805-353X (Online)
www.emijournal.cz

identified specific reasons for the evaluation and selection of meals (Rosenlacher & Tichý & Šteffelová, 2020).

3 Results

The data collected using the eye-tracking method were processed using the so-called Areas of Interests (AOI), for which statistics on viewership of selected parts of the photo were calculated in the Gazepoint program for each photo of the dish. The completed questionnaires were evaluated according to the frequency of answers in MS Excel.

3.1 Evaluation of the first pair of dishes

The first pair of dishes consisted of sweet dishes, namely pancakes and sweet dumplings. The results from the eye tracking method were processed by means of heat maps and by means of AOI areas, which are shown in Table 2.

Figure 1: Heatmaps of the first pair of dishes

Source: authors.

From the heat maps of the first pair of dishes, it is evident that the respondents' eyesight was most focused on the centre of the two photographs, on which the plates with the dishes are placed. However, the pancakes show a greater focus of respondents' attention not only on the food itself, but also on the surrounding decorations, which were prepared according to the principles of food styling. More detailed information and statistics are given in Table 2.

Table 2: Areas of interest of the first pair of dishes

	Area of interest	Number of respondents	Time to 1st display in sec	Viewing length in sec (%)	Return to the area of interest
Pancakes (FS)	Pancakes	46 %	1.07	1.12 (28 %)	1.75
	Bowl with bananas in the background	38 %	1.08	1.23 (31 %)	3.33
	Banana and blueberry on pancakes	31 %	1.09	0.45 (11 %)	2.67
	Jars with blueberries	31 %	1.00	0.70 (18 %)	2.67
	Bowl with almonds on a tea towel	31 %	1.31	0.24 (6 %)	2.00
Dumplings	Whole dumpling	46 %	1.37	0.61 (15 %)	1.33
	Dumpling with apricot	31 %	1.51	0.61 (15 %)	1.50
	Sugar with curd	46 %	1.29	1.03 (26 %)	2.80
	Butter with curd on a plate	38 %	0.24	0.38 (10 %)	1.00

Source: authors.

When comparing the length of viewing of the two dishes, it is clear that pancakes prepared according to the principles of food styling were watched 28 % of available time (1.12 seconds), while fruit dumplings were watched 15 % of available time (0.61 seconds), the same is true even when watching a sliced dumpling. The results show that the dish prepared according to the principles of food styling was able to attract more attention and gradually distribute the respondents' attention to more parts of the photo, such as decorations in the form of a bowl with almonds. The average number of revisits per already observed object of the photograph is 2.48 for pancakes, while for fruit dumplings there are 1.66 returns, which indicates a lower interest of objects in the second photograph.

In the questionnaire survey, the subjective evaluation of the presented dishes was determined using the semantic differential method, using a 5-point scale, where a value of 1 meant the most positive evaluation and a value of 5 a negative evaluation.

Table 3: Descriptive statistics of the semantic differential for the first pair of dishes

|		Beautifully served	Familiar	Photogenic	Healthy	Tasty
Pancakes (FS)	Average	1.00	1.46	1.00	2.00	1.08
	Median	1.00	1.00	1.00	2.00	1.00
	Standard deviation	0.00	0.50	0.00	0.39	0.27
Fruit dumplings	Average	3.00	1.31	3.77	4.15	2.46
	Median	3.00	1.00	4.00	4.00	3.00
	Standard deviation	0.88	0.61	0.70	0.66	1.08

Source: authors.

The results of the semantic differential of the first pair show that the pancakes, which were prepared according to the principles of food styling, were evaluated more positively, which is evident mainly from the first and third criteria (beautifully served and photogenicity of the dish). This was followed by a questionnaire survey, which of the dishes the respondents would choose in the restaurant, and 69 % of the respondents chose pancakes, which were supported by food styling during preparation.

3.2 Evaluation of the second pair of dishes

The second pair of dishes consisted of savoury dishes, namely vegetable salad and risotto. The results obtained using the eye tracking method are summarized in Figure 2 showing the heat map.

Figure 2. Heatmaps of the second pair of dishes
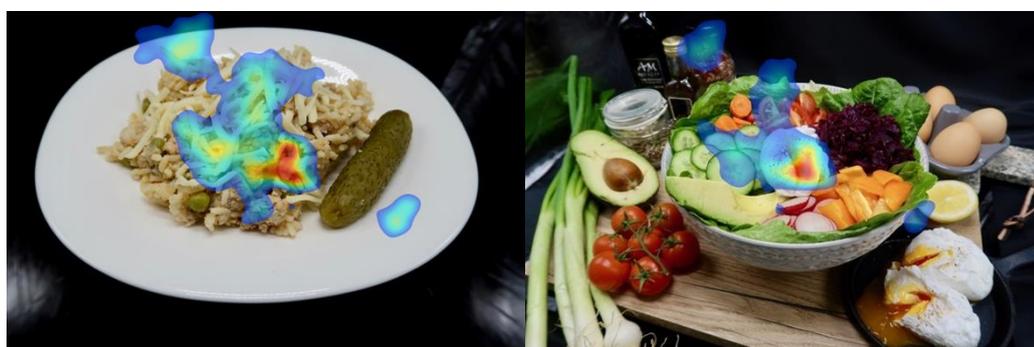
Source: authors.

A comparison of the two heat maps shows that most attention was focused on the centre of the dishes and their main ingredients. The decorations or edges of the plate were monitored less or not at all.

Table 4: Areas of interest of the second pair of dishes

	Area of interest	Number of respondents	Time to first display in sec	Viewing length in sec (%)	Return to the area of interest
Risotto	Peas and meat	100 %	0.50	1.00 (35 %)	1.75
	Risotto	54 %	0.30	2.03 (51 %)	2.33
	Cheese	38 %	0.90	0.39 (10 %)	4.00
	Cucumber	31 %	2.12	0.62 (15 %)	1.33
Salad (FS)	Eggs	38 %	0.54	0.94 (23 %)	1.67
	Cabbage	38 %	1.05	0.13 (3 %)	0.00
	Cucumbers	31 %	0.68	0.23 (6 %)	1.00
	Spring onion	31 %	1.63	0.48 (12 %)	1.00
	Spices in a bottle	31 %	2.19	0.53 (13 %)	2.50
	Tomatoes	23 %	1.47	0.14 (4 %)	1.00

Source: authors.

From the AOI results, it can be stated that by the vegetable salad prepared according to the principles of food styling there was evenly distributed respondents' visual attention throughout the photo. To some extent, this could be due to the relatively varied composition of the dish, which consisted of several vegetables and decorations, which provided plenty of objects for eye-catching. In the case of risotto, the individual objects were observed for a longer period of time in comparison with the individual parts of the vegetable salad, but in the case of the vegetable salad, the attention of the eyes was gradually distributed.

Table 5: Descriptive statistics of the semantic differential for the second pair of dishes

		Beautifully served	Familiar	Photogenic	Healthy	Tasty
Risotto	Average	4.08	2.00	4.46	3.69	4.15
	Median	4.00	2.00	5.00	4.00	4.00
	Standard deviation	0.73	1.11	0.63	0.91	0.77
Salad (FS)	Average	1.00	1.38	1.00	1.00	1.15
	Median	1.00	1.00	1.00	1.00	1.00
	Standard deviation	0.00	0.49	0.00	0.00	0.36

Source: authors.

The results of the semantic differential in Table 5 show, as in the case of the first pair of dishes, a relatively clear difference in the evaluation of a food prepared according to the principles of food styling and a meal without these principles. This then affects the willingness or desire of respondents to taste or buy such food, which is evident from the values of the criterion "Tasty", where food prepared according to the principles of food styling attracts far more respondents. This is also confirmed by the answers of the respondents to the question of which of these two dishes they would buy - all 13 respondents stated that they would choose a vegetable salad.

3.3 Evaluation of the third pair of dishes

The third pair of dishes intentionally uses food styling for a less healthy, caloric dish, such as spaghetti bolognese, and vice versa, for a healthier dish – baked salmon, food styling is not used. This to some extent verifies the assumption that food styling can support the selection of unhealthy, caloric food.

Figure 3. Heatmaps of the third pair of dishes

Source: authors.

The heat maps show that the red focus with the highest concentration of sight (attention) is more extensive with spaghetti bolognese. In general, heatmaps with a more intense concentration of vision in spaghetti are larger and cover a larger part of the photograph than salmon. By salmon, it is clear that the focus is mainly on salmon, not the side dish, which can be given by the use of the central composition when photographing the dish.

Table 6: Area of interest of the third pair of dishes

	Area of interest	Number of respondents	Time to first display in sec	Viewing length in sec (%)	Return to the area of interest
Salmon	Salmon	46 %	0.23	1.63 (41 %)	3.00
	Lemon	38 %	1.52	0.53 (13 %)	2.67
	Beans	23 %	2.11	1.18 (29 %)	4.00
	Potatoes	15 %	3.06	0.28 (7 %)	3.00
Spaghetti (FS)	Spaghetti bolognese	54 %	1.07	1.31 (33 %)	3.33
	Basil	46 %	0.94	0.76 (19 %)	2.00
	Tea towel with ladle	31 %	1.23	0.57 (14 %)	1.00
	Plate	31 %	0.89	0.85 (21 %)	3.00
	Bowl with cheese	15 %	1.50	0.33 (8 %)	1.00
	Garlic and tomatoes	15 %	0.60	0.16 (4 %)	1.00

Source: authors.

Although the data in Table 6 show that healthy non-aesthetically served salmon had a higher revision in all areas of interest, which could be influenced by the smaller number of objects on which respondents could focus their eyesight. In addition, respondents observed small details in the attached photographs. On the contrary, more respondents watched food styling spaghetti, but for a shorter time, because the respondents also focused their attention on other components of photography. In addition, individuals "scanned" all components with less return than salmon.

Table 7: Descriptive statistics of the semantic differential for the third pair of dishes

		Beautifully served	Familiar	Photogenic	Healthy	Tasty
Salmon	Average	2.15	1.38	2.69	1.38	1.92
	Median	2.00	1.00	3.00	1.00	2.00
	Standard deviation	0.66	0.62	0.99	0.49	1.07
Spaghetti (FS)	Average	1.31	1.00	1.38	2.85	1.46
	Median	1.00	1.00	1.00	3.00	1.00
	Standard deviation	0.46	0.00	0.62	0.77	0.84

Source: authors.

Ekonomika Economics
Management Management
Inovace Innovation

EMI, Vol. 14, Issue 2, 2022
ISSN: 1804-1299 (Print), 1805-353X (Online)
www.emijournal.cz

The results of the semantic differential show that spaghetti prepared according to the principles of food styling has a slightly more positive evaluation than salmon, but the difference is not as significant as in the previous pair. Furthermore, the data show that the respondents perceived the evaluation that spaghetti is a less healthy dish than salmon, however, when evaluating the "Tasty" criterion, spaghetti has a slightly more positive evaluation. Nevertheless, 54 % of respondents (7 people) would rather choose salmon than spaghetti, which 46 % of respondents (6 people) would choose. In the end, the choice of a dish that is not prepared according to the principles of food styling prevails, but there is a very small difference in the answers (a difference of 1 person). At the same time, the final selection of dishes does not to some extent reflect the more positive evaluation of spaghetti in Table 6.

4   Discussion

This study deals with the preparation and comparison of photographs with dishes, the effectiveness of which is verified by the Eye-tracking method as in Rosenlacher & Tichý & Šteffelová (2020), Tichý & Rosenlacher & Maršálková (2017) and Danner et al. (2016). In the case of this study, three categories were prepared, each containing two different dishes – one prepared according to the principles of food styling and the other without aesthetic interventions, which is the same in the Rosenlacher & Tichý & Šteffelová survey (2020). Tichý & Rosenlacher & Maršálková (2017) prepared the same dish in the first category, which was once subject and the second time not subject to the principles of arrangement. The same followed in the second category, and conversely, in the last category, they chose a drink, not a dish, to verify. Danner et al. (2016) did not focus on food styling, but prepared eight categories, which in one photo depicted four food products of everyday life, which were familiar to the participants and had a slight visual complexity. Danner et al. (2016) as well as Rosenlacher & Tichý & Šteffelová (2020) based their photos on a preliminary survey that included 31 to 40 respondents, which is slightly different from the preliminary survey conducted for this survey, which numbered 106 respondents. The main survey involved 13 respondents, mostly female, which is similar to Rosenlacher & Tichý & Šteffelová (2020) with 14 respondents, with the difference that the majority were male, which could be crucial in determining the effectiveness of food styling. A similar number of respondents (10) was surveyed by Tichý & Rosenlacher & Maršálková (2017). In contrast, the research of Danner et al. (2016) was attended by 59 respondents, in the same age range as in this survey. All of the above surveys have benefited from Gazepoint except Danner et al. (2016), who used Tobii 3.0.5 software. The measured findings may have differed due to the time for which respondents were able to view photos on monitors. The time of 4 seconds was used in this study and also appeared in the survey by Tichý & Rosenlacher & Slavíková (2018), but on the contrary Tichý & Rosenlacher & Maršálková (2017) had the respondents scan the provided materials for 5 seconds and Danner et al. (2016) left the follow-up period only on the respondents. This could be the reason why Eye-tracking measurements show a longer fixation time and a higher return on vision of previously monitored objects in surveys that do not have a specified monitoring time or have a period of more than 4 seconds. The reason could also be the richness of the photo, i.e. the fewer components in the photo, the more time to monitor the individual raw materials. Subsequent verification of the reasons for choosing the dish took place through a supplementary questionnaire, which is identical to the survey of Tichý & Rosenlacher & Maršálková (2017) and Rosenlacher & Tichý & Šteffelová (2020). The study by Danner et al. (2016) differs mainly in that they did not use the post-test, but the respondents recorded their choice directly when measuring with an eye camera by clicking on the food they selected. Respondents in this survey mainly chose dishes that were food-styled, and these also received a more positive evaluation in the semantic differential, which is confirmed by studies by Tichý & Rosenlacher & Maršálková (2017). On the contrary, the Rosenlacher & Tichý & Šteffelová (2020) surveys did not confirm these findings in all the prepared categories, but only in one, which is probably caused by the examined sample consisting mainly of men.

5 Conclusions

The main aim of this study was to find out to what extent food styling influences respondents in the selection and evaluation of food. For these purposes, the eye tracking method was used, supplemented by a short evaluation questionnaire, and the subject of the evaluation was 3 pairs of dishes. The results of the research show that dishes prepared according to the principles of food styling were evaluated more positively using a semantic differential than dishes without a significant arrangement. Furthermore, these food styling-supported dishes were more often chosen by respondents when asked which of the dishes they would choose. These results are also confirmed by eye tracking data, which show that dishes prepared according to the principles of food styling can attract the attention of respondents and at the same time the respondents' eyesight spreads more to other objects and food decoration than just the main part. It would be appropriate to build on these findings through more extensive research to identify ways to promote a healthy diet through food styling.

6 Bibliography

Conklin, K., Pellicer-Sánchez, A., Carrol, G. (2019). *Eye-Tracking*. Cambridge, United Kingdom. Cambridge University Press. 248 p. ISBN 978-1-108-40120-3.

Danner, L., De Antoni, N., Gere, A., Sipos, L., Kovács, S., Dürrschmid, K. (2016). Make a Choice: Visual Attention and Choice Behaviour in Multialternative Food Choice Situations. In: *Acta Alimentaria* [online]. 2016, 45(4), 515-524 [cit. 2021-03-20]. DOI:10.1556/066.2016.1111.

Ford, B. John. (2019). What Do We Know About Neuromarketing? *Journal of Advertising Research*. Vol. 59 no. 3 257-258. ISSN 0021-8499. DOI: 10.2501/JAR-2019-031. Published 1 September 2019.

Goto, N., LIM, X.L., Shee, D., Hatano, A., Khong, K.W., Buratto, L.G., Watabe, M., and Schaefer, A. (2019). Can Brain Waves Really Tell If a Product Will Be Purchased? Inferring Consumer Preferences From Single-Item Brain Potentials. *Front. Integr. Neurosci*. 2019 Jun 28. DOI: 10.3389/fnint.2019.00019.

Gurgu, Elena, Ioana-Andreea Gurgu, Rocsana B. Manea Tonis. (2020). Neuromarketing for a better understanding of consumer needs and emotions. *Independent Journal of Management & Production*; Sao Paulo Sv. 11, Čís. 1, (Jan/Feb 2020): 208-235. ISSN: 2236-269X. DOI: 10.14807/ijmp.v11i1.993.

Hai-Jew, S. (2015). *Enhancing qualitative and mixed methods research with technology*. Hershey, PA: Business Science Reference, an imprint of IGI Global. p. 351. DOI: 10.4018/978-1-4666-6493-7.

Christiansen, Bryan. (2016). *Neuroeconomics and the Decision-Making Process*. Hershey, Pennsylvania: IGI Global. ISBN 14-666-9990-6.

Nilashi, M.; Yadegaridehkordi, E.; Samad, S.; Mardani, A.; Ahani, A.; Aljojo, N.; Razali, N.S.; Tajuddin, T, 2020. *Decision to Adopt Neuromarketing Techniques for Sustainable Product Marketing: A Fuzzy Decision-Making Approach*. 12, 305. February 2020. DOI: 10.3390/sym12020305.

Popelka, S., Brychtová, A., Voženílek, V. (2012). *Eye-tracking a jeho využití při hodnocení map*. Geografický časopis / Geographical journal, no. 64, p. 78.

Radecky, M., P. Smutny. (2014). *Evaluating user reaction to user interface element using eye-tracking technology*. In 15th International Carpathian Control Conference (ICCC), pp. 475-480, 28-30 May 2014, ISBN: 978-1-4799-3527-7.

Roebuck, K. (2011). *Brain-computer interface*. Milton Keynes UK: Lightning Source. ISBN 1743042639.

Rosenlacher, P. (2013). Využití zdravotnické techniky v neuromarketingu. *In: Ekonomika a management ve zdravotnictví*. 3. vyd. Praha: ČVUT, FBMI. pp. 82 – 86.

Rosenlacher, P., Tichý, J., Šteffelová, K. (2020). Food styling and neuromarketing research. In. *CER Comparative European Research, 14th International Scientific Conference for PhD students of EU countries*. Published in October, 2020 by Sciemcee Publishing, London, Volume 7. Issue 1. pp. 161-165. 209 p. ISBN 978-1-9993071-6-5.

Tahal, R. (2017). *Marketingový výzkum: postupy, metody, trendy.* Praha: Grada Publishing. Expert (Grada). ISBN 978-80-271-0206-8.

Tichý, J., Rosenlacher, P., Slavíková, B. (2018). Creating of effective product photography from perspective of neuromarketing. In. *Economics Management Innovation*, Olomouc: Moravská vysoká škola Olomouc, roč. 10, 2/2018, pp. 16-26. ISSN 1804-1299.

Tichý, J., Rosenlacher, P., Maršálková, L. (2017). Neuromarketing Approach to Efficient Food Styling. In. *AD ALTA: Journal of Interdisciplinary Research*, Hradec Králové: Magnanimitas, roč. 7, č. 1, s. 180-183. ISSN 1804-7890.

Vysekalová, J. (2014). *Emoce v marketingu: jak oslovit srdce zákazníka*. 1. vyd. Praha: Grada. 289 s. Expert (Grada). p. 140.