GRANT journal
ISSN 1805-062X, 1805-0638 (online), ETTN 072-11-00002-09-4 Vol. 10, issue 01
EUROPEAN GRANT PROJECTS | RESULTS | RESEARCH & DEVELOPMENT | SCIENCE

Design of corporate logo from the perspective of eye tracking method

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Grant: 7429/2020/05
Název grantu: Research project IGA VŠFS Prague
Oborové zaměření: AN - Psychology

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Abstract This paper deals with the effects and effectiveness of graphic design of company logo. The aim was to find out, using the eye-tracking method, which graphic elements have a positive or negative effect on the design of the company logo. Four corporate logos of an imaginary company worked as the basis of the investigation, whereas the logos were created on the basis of certain graphic assumptions. The results show that in order to attract the attention of the eyes, it is appropriate to include a suitable graphic element representing the production of the brand. At the same time, the appropriate choice of colours and their mutual harmonization is key for the image and positive evaluation of the brand.

Keywords design, logo, eye-tracking, graphics

1. INTRODUCTION

The paper focuses on the field of neuromarketing research, especially on the application of the research method Eye Tracking. It is very important for companies to be able to engage customers with their product and better understand their customers' needs in today's highly competitive marketing environment. Neuromarketing is a field of marketing that studies the sensorimotor, cognitive and emotional reactions of consumers to marketing stimuli. (Roebuck, 2011) 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 potential impact of a given marketing tool on consumers can be identified.

The aim of the paper is to find out which graphic elements have a positive or negative effect on the design of the company logo. 4 company imaginary logos are created for the survey, based on certain graphic assumptions. To attract the attention of the eyes, it is appropriate to include a suitable graphic element representing the production of the brand. At the same time, the right choice of colours and their mutual harmonization is key.

2. METHODS

With regard to the set goal, 4 graphic variants of company logos were created first within the framework of our own neuromarketing survey, which were subsequently submitted to the respondents. Data collection was performed using the eye tracking method, which was supplemented by a short evaluation questionnaire. The eye tracking method is a "useful procedure for the analysis of behaviour and cognition". (Zurawicki, 2011, p. 51) The logos that were the basis for data collection were created according to various graphical approaches, the process of their creation, an explanation of the colour design of the font used and the use of other elements will be described further in the text. The aim was to find out which graphic elements have a positive or negative effect on the design of the company logo using the eye-tracking method.

2.1 Creating log visuals for your own research

The first step in the methodology used was to create its own design of company logos, and it was a matter of creating a logo for imaginary companies, so that the image of the existing company was not reflected in the evaluation of the graphic design of the logo. The graphic program Adobe Illustrator was used to create the logos, which enables high quality work with drawing and flexible work with text and image. The logos were created in the form of vector graphics, which "consist of clean, flowing lines that retain their sharpness when resized. It is suitable for illustrations, text and graphics where different resizing, such as logos". (Adobe Creative Team, 2013)

A total of 4 company logo designs were processed, each with a different graphic design in order to verify different graphic theses and approaches to the design of the company logo. The proposed logos were individually related to various product categories, specifically the category of organic food production, jewellery, underwear and the creation of graphics. For individual logos, the suitability of its individual elements was verified, according to colours and individually tuned shades, symbols and other elements. Below, the individual logos are briefly characterized.

The first logo (Logo No. 1) was designed for natural organic products, and therefore was tuned to natural colours, which should evoke this fact at first glance. The dominant colour was light green, which is the colour of nature, naturalness and harmony, it is the colour of plants and ecology. (Jesenský, 2018) This basic colour of the logo was supplemented by white text, which ensures good legibility on a green background, and the meaning of white represents purity. (Shiffman and Kanuk, 2004) A handwritten font was chosen for the text, thus as natural as possible, not machine text.

The additional text of the logo is made in brown, for better clarity and also because the brown colour is natural for nature, forest and tradition. (Jesenský, 2018) The overall shape of the logo as such is in the form of a green apple, which should complement the meaning of the logo – the organic production.

Tab. No. 1: Summary of graphic design of individual logs

	Graphic design	Colour and font	Assumptions and expectations of perception
Logo No. 1	An image of an apple together with the brand name is used for the logo. Everything is uniform in the style of a healthy lifestyle.	Green colour for harmony with nature. Text supplemented with white and brown. The font is handwritten.	An apple with leaves may be dominant, but the respondent should then register a strong brand name. Perception of sympathy with nature and ecology and thus evoke positive emotions.
Logo No. 2	The logo consists of a brand name and an icon for a diamond, i.e. jewellery.	The colour of the logo is black and complemented by gold. The font is handwritten and decorative.	The logo is intended to evoke luxury and jewellery, which respondents should perceive and arouse desire and interest. Easy to read and navigate.
Logo No. 3	The text is set in a distinctive and dark background. The logo consists only of text and background.	Black background colour and pink text. The font is soft serif and easy to read.	The impression of the logo can be damaged by a hard black background. The logo is simple, respondents register the entire logo, but in terms of perception it can leave rather negative reactions.
Logo No. 4	Square logo with colored background. Icon for abstract perception and imagination. Brand text inside a circle.	The dominant colour of the background is blue, the shade is rather dark turquoise. The main text is complemented by brown and then also white.	The blue colour creates a pleasant impression and will evoke professional quality and a higher price. The respondent should read the brown text and thus the brand name first.

Source: Own calculation.

Logo No. 2 was designed for the jewellery product category, which should give a luxurious impression It is due to the fact that part of the logo is diamond contour drawn by lines in gold colour. The combination of gold and black should give a luxurious impression. (Schiffman and Kanuk, 2004) Black is hard and can be aggressive, but it is a very popular colour in fashion and design. The combination of gold in the logo can evoke wealth and luxury. (Schiffman and Kanuk, 2004) A handwritten font was chosen, which is slightly wavy with a decorative look, but larger spaces between the letters of the brand name were chosen to maintain easy readability.

The third, penultimate logo (Logo No. 3) is the Chic Lingerie logo. It is the logo for the field of women's underwear. A colour combination of black as the background for the logo and pink font was chosen, which can accentuate the text, but the black background of the logo may be too thick. Even the dominant black colour in the logo could evoke strong and unpleasant feelings. (Samara 2016, p. 122) The pink colour was chosen because it is a logo producing women's underwear. The text and its font are in the form of a serif, simple font and are relatively thin.

The fourth and last logo (Logo No. 4) is called "JB Design" and was chosen for the category of design products and housing designs. The logo is dominated by blue in the background, and rather in a shade of dark turquoise. This colour is generally associated with feelings of trust, security and friendship. (Jesenský, 2018) Light inscriptions and a combination of blue and white were used for the inscriptions and the name of the logo, so that the overall logo looked harmonious and natural. Sans serif was chosen as the font, which should look light and clear. (Griger, 2018)

2.2 Characteristics of respondents

A total of 12 people, namely 7 men and 5 women, participated in data collection using the eye tracking method and a supplementary questionnaire survey. The eye tracking survey was conducted at the University of Finance and Administration in Most. The selection of respondents was simply random and there was the same possibility in all cases that they could take part in the survey. Randomly selected respondents were informed in advance about the date of the survey and asked in advance whether they could participate in the survey. As they were students, the respondents can be included in the younger age category, which is confirmed by the average age of the respondents of 25 years.

2.3 Data collection process

Data collection took place in Most in the University of Finance and Administration building. Data collection took place in a quiet, undisturbed room, which ensured that there was no unwanted distraction of respondents by environmental influences. The orientation of the windows in the room was to the north, which had the advantage that the room was not exposed to direct sunlight and did not affect the quality of eye tracking measurements. (Conklinová, 2018) There were also blinds on the windows, which helped to set suitable lighting conditions in the room, which were comparable for all respondents. These standardized conditions were set before the start of the survey itself and were complied with all respondents. The laptop, which was used to operate the eye tracking method, was placed behind the respondent so that the administrator did not disturb the respondent with his work and did not enter the field of vision. (Tichý, Rosenlacher and Maršálková, 2017) An external 22-inch Philips full HD monitor was connected to the administrator's laptop, on which individual logos were projected to the respondents, while a Gazepoint GP3 static eye camera using Gazepoint 3.4.0 software was attached to the monitor. The same program was used for the subsequent analysis of the results. Respondents were invited individually at a specific time to collect data, so that mutual meetings and contact, during which they could exchange impressions and experiences from the survey which could affect their reactions to the presented logos is avoided. (Rosenlacher, Tichý a Šteffelová, 2020)

The individual logos were projected one after the other to the respondents, while the display time of each logo was set to 4 seconds. This time is set because customers generally do not have time to research the message for a long time, and therefore it is necessary to convey the main idea through the message as quickly and clearly as possible. (Tichý, Rosenlacher and Slavíková, 2018) For this reason, in order to create the most realistic conditions for the respondents, it is based on 4 seconds, which is the time during which it is possible to find out what potential the logo has to attract attention.

After the end of data collection using the eye tracking method, a short evaluation questionnaire was completed, which used the semantic differential method to evaluate the presented logs (Rosenlacher, Tichý and Šteffelová, 2020), using a 7-point scale. Furthermore, the respondents were asked to communicate which logo is evaluated the most positively and the most negatively.

3. RESULTS OF THE INVESTIGATION

In this part of the paper, the identified outputs from data collection using the eye tracking method and concurrently from the evaluation questionnaire will be presented. The results will be presented

individually according to the tested logos, and the data will be aggregated for all 12 respondents.

Based on eye tracking data, the evaluation of the graphic effect of the logo will be performed using the so-called AOI areas (Areas of Interest) for each of the photographs, i.e. areas of the stimulus that the researcher is interested in by gathering data about participants eye movements like time viewed of the areas, returns etc. (Holmqvist, 2017) For these AOIs, detailed statistics on viewership of selected parts of the photograph were calculated for each photograph. Data obtained using the eye tracking method will be presented within individual pairs of photographs. Based on the data obtained using the eye tracking method, the effectiveness of the design was evaluated using heat maps. "Heat maps are commonly used to show the relative attention paid to different areas of the display." (Conklinová, 2018, p. 195)

3.1 Evaluation of the effect of logo No. 1

In the case of the first logo, the respondents' eyes focused mostly on the upper part of the logo, especially on the text 100 % and on the apple leaves. Partly the eyesight of the respondents also focuses on the text "Bi jóó". It is clear from the heat map that the respondents registered their marketing-relevant information, which is the brand text.

Fig. No. 1: Heat map of logo No. 1

Source: authors.

In addition to heat maps, eye tracking data were also evaluated using the so-called AOI (areas of interest), the statistics of which are shown in Table 2 below.

Tab. No. 2: AOI statistics of logo No. 1

	Viewed by number of respondents	Viewing order	Average tracking time (s)	Average tracking time (%)	Revisits
AOI 1 - apple leaves	8/12	4	0.64	15.90	5/12
AOI 2 - apple	12/12	1	2.29	57.13	9/12
AOI 3 - 100 %	10/12	3	0.73	18.16	8/12
AOI 4 - Bi-jóó	10/12	2	1.04	25.92	9/12

Source: authors.

The Logo as a whole, which is marked in the table as the area AOI 2, was viewed by 100 % of respondents, which indicates the visual attractiveness of the logo. The average tracking time for this area was 2.29 seconds, which is 57 % of the total time. Furthermore, the respondents focused their eyes on the apple leaves, which were viewed by a total of 67 % of respondents. The text was read by 100 % of respondents and a total of 10 respondents viewed Bi jóó, i.e. 83 % of respondents, which is a very important aspect from a marketing point of view. The second highest time spent was in the area of AOI 4, i.e. the text of the brand, and it was almost 26 % of the total screening time. The results show that the respondents looked at the main elements of the logo, including the name, additional text, which were significant elements in terms of visual attractiveness of the logo, because most respondents looked at this area of the logo several times (this indicates the column "revisits" in the table showing number of respondents who returned to the given area of the logo with their eyes).

In the questionnaire survey, 33 % of respondents stated that this is the most interesting of all the presented logos. They cited graphic design and good memorability as the reasons for this positive evaluation and they also liked the pun with pronunciation in the name of the word Bi-jóó.

Further and more accurate information about the perception of the logo by respondents is summarized by the question on the principle of semantic differential in the following table number 2. The evaluation of logo intelligibility is interesting, where the average value is 2 rather understandable, but the median value is 1. The standard deviation is relatively low and the logo can be considered really understandable and clear. The combination of the words healthy - unhealthy has the same result, when again the median value is 1, but the average value is 2. It can therefore again be considered that the respondents perceive it as 100 % healthy. The logo therefore evokes the image of the production, which is suitable for the given design.

Tab. No. 3: Evaluation of logo No. 1 using a semantic differential

bipolar word combination	median	average rating	standard deviation
happy - sad	2	2	0.829
intelligible - unintelligible	1	2	0.759
imaginative - no idea	2	2	0.898
professional - non-professional	3	3	0.640
liberating - binding	3	3	0.898
healthy - unhealthy	1	2	0.759
cheap - expensive	4	4	0.898
exceptional - simple	4	4	1.225

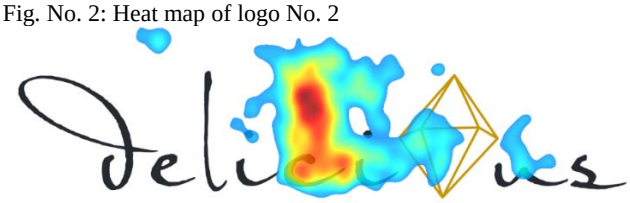
Source: authors.

Based on the data obtained, the logo number 1 can be considered positively evaluated and the assumptions used in its creation can be considered functional. The logo is understandable to the respondents, the text of the logo is able to attract attention and the logo evokes associations associated with health, a healthy diet, which is desirable.

3.2 Evaluation of the effect of logo No. 2

The logo with the brand name Delicious to represent a luxury brand of jewellery, which should be supported by the contour of the diamond, which is part of the logo. The heat map shows that the respondents viewed the logo across its parts, with the centre of the logo containing the contour of the diamond being dominant.

Fig. No. 2: Heat map of logo No. 2



Source: authors.

Dominant for the respondents' eyesight was not only the text itself, but also the drawing of the diamond in gold. This may be one of the factors that attracted the eyes of respondents to the middle parts of the logo. However, for reading the logo, it is debatable whether this is the ideal state. It is debatable whether it would not be appropriate to place the contour of the diamond, for example, on the left edge of the logo, from which the logo begins to be read.

Tab. No. 4: AOI statistics of logo No. 2

	Viewed by number of respondents	Viewing order	Average tracking time (s)	Average tracking time (%)	Revisits
AOI 1 – overall logo	12/12	2	2.52	62.90	7/12
AOI 2 – diamond	11/12	1	0.49	12.25	8/12

Source: authors.

Table 4 above shows the two AOI areas that have been identified for the logo to evaluate its effectiveness. The full number of respondents viewed the logo as a whole and the average viewing time of the entire logo is almost 63 %. The second AOI area was marked only by the diamond icon, which was viewed by 11 respondents out of 12 and the average viewing time is 0.49 seconds, which corresponds to 12 % of the total 4 seconds available to respondents.

It is clear from the results of the values in Table 4 that the diamond drawing functioned in the logo as a relatively important point of reference for the respondents' eyesight, because after displaying the logo to the respondents it was observed first and only subsequently did the respondents start reading the text of the logo. The significance of this graphic element is also confirmed by the number of so-called revisits, when 8 out of 12 respondents returned to watching the diamond with their eyesight. The location of this drawing thus fulfilled its purpose or attracted attention.

In the subsequent evaluation questionnaire, 25 % of respondents stated that they rated this logo as the logo that most interested them, while positively evaluating the simplicity of the logo, its luxurious impression and the font used.

Tab. No. 5: Evaluation of logo No. 2 using a semantic differential

bipolar word combination	median	average rating	standard deviation
happy - sad	4	4	1.323
intelligible - unintelligible	3	3	1.037
imaginative - no idea	2	2	0.799
professional - non-professional	2	2	0.954
liberating - binding	3	3	0.954
healthy - unhealthy	4	4	0.624
cheap - expensive	6	6	1.115
exceptional - simple	3	3	1.382

Source: authors.

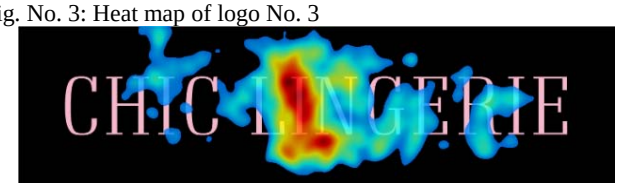
The data from the semantic differential (see table no. 5) show that the brand is perceived as luxurious on the basis of the given logo (average value 6 on a 7-point scale), which confirms the basic assumption of its creation. At the same time, the logo was perceived as professional, imaginative and understandable, which can be given by the inclusion of the contour of the diamond, which can evoke these associations, including the colours used.

Based on the data collected, it can be stated that the created logo represents a given product category and induces the desired associations. At the same time, the drawing of a diamond seems to be a very suitable graphic element, which attracted the attention of the respondents first and the text only subsequently.

3.3 Evaluation of the effect of logo No. 3

The penultimate logo was conceived very simply, only from the text of the brand and a black background in the form of a rectangle. The simplicity of the logo without a significant graphic element is also evident from the result of the heat map, where it is clear that the respondents' eyesight is spread more or less over most of the logo.

Fig. No. 3: Heat map of logo No. 3



Source: authors.

The heat map shows that due to the absence of a more pronounced graphic element (such as a diamond in the previous logo), there was a more significant distribution of respondents' eyesight across the entire logo. To some extent, however, it may be less advantageous in terms of the intuitiveness of the logo and its easy recognition at first glance. Area AOI 1 was viewed from 92 %, when of this number another 83 % of viewers returned their eyesight back to this area, see Table No. 6.

Tab. No. 6: AOI statistics of logo No. 3

	Viewed by number of respondents	Viewing order	Average tracking time (s)	Average tracking time (%)	Revisits
AOI 1 - chic	11/12	1	0.74	18.47	10/12
AOI 2 - lingerie	12/12	2	1.40	34.97	12/12

Source: authors.

The AOI areas were set to individual parts of the text - the word "chic" and the word "lingerie". In the case of this logo, the respondents focused on the word "chic" after displaying the logo first, and they proceed in the same way as when reading ordinary text. The second AOI area was viewed by all respondents. It is also necessary to point out the relatively high values of "revisits", which does not necessarily mean a high interest of respondents in a given part of the logo, but it may be affected by the absence of other graphic elements in the logo and its excessive brevity (respondents had nowhere to anchor their eyesight). The longer tracking time for the word "lingerie" may be due to the number of characters in that word compared to the initial, shorter word.

Based on the data of the questionnaire survey, it follows that 25 % of respondents were least interested in this logo and the reasons for this evaluation were too simple and inappropriately chosen font.

Tab. No. 7: Evaluation of logo No. 3 using a semantic differential

bipolar word combination	median	average rating	standard deviation
happy - sad	4	4	1.362
intelligible - unintelligible	2	3	1.323
imaginative - no idea	5	4	1.700
professional - non-professional	4	4	2.000
liberating - binding	4	4	1.552
healthy - unhealthy	4	4	1.588
cheap - expensive	4	5	1.848
exceptional - simple	6	5	1.908

Source: authors.

The detected negative results are supplemented and confirmed by data from Table no. 7 where again a relatively more negative evaluation in comparison with the previous logos is evident. The logo is clearly not perceived as happy, but rather neutral to sad, which is influenced by the excessive dominance of black in the logo. Furthermore, the logo is perceived as rather "without an idea", which may be due to the excessive austerity of the logo and the lack of a graphic element.

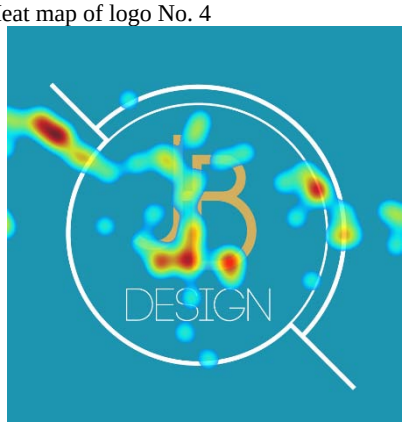
Within the overall evaluation of the effect of this logo, it is necessary to mention the fact, that the black colour was too dominant and had a rather negative, sad impression. At the same time, it is clear from the data that the logo lacks a graphic element that would attract and, above all, keep the attention of the respondents' eyesight. The graphic austerity of the logo then led to a

rather negative evaluation, especially as a less imaginative logo. In general, the logo is evaluated the least positively of all 4 tested logos.

3.4 Evaluation of the effect of logo No. 4

The fourth and the last logo consist mainly of turquoise, which should evoke a pleasant impression and perception of the entire logo. The main text of the logo, the letters JB, were chosen large and distinctive with a brown colour so that it immediately catches the eyesight of the respondent and he starts reading the logo right here. From the heat map in Figure 4, it is clear that the respondents watched the logo relatively globally, looking at most of its parts and elements, but the central composition of the logo can better direct the respondents' eyesight than logo No. 3.

Fig. No. 4: Heat map of logo No. 4



Source: authors.

Due to the design of the logo, only two AOI areas were identified, namely the area of the text "JB" and the area of the supplementary text "design".

Tab. No. 8: AOI statistics of logo No. 4

	Viewed by number of respondents	Viewing order	Average tracking time (s)	Average tracking time (%)	Revisits
AOI 1 - JB	12/12	1	1.47	36.70	12/12
AOI 2 - Design	12/12	2	0.67	16.23	10/12

Source: authors.

The text of the logo (both "JB" and the word "design") was viewed by all respondents and the data show that it is the dominant part of the logo. 100 % of respondents also returned the eyesight to the dominant text of JB. 83 % of respondents returned their eyesight on the supplementary text "design" and it took almost 37 % of all projection time to watch this part (i.e. 37 % of the total 4 seconds of projection). If the viewing time of both texts is added, it can be stated that the respondents devoted more than half of their time to the texts in the logo, which worked as the main point of eye-catching and to some extent can be perceived as graphically dominant due to the composition of the logo. This result is positive from a marketing point of view, because the text with the brand name was crucial and important in the logo. It was managed to appropriately select and harmonize the colour resolution of texts and other elements.

In the questionnaire survey, 17 % of respondents mentioned this logo as the logo that most interested them, and the reasons for this positive evaluation are the graphic design and good memorability. However, another 17 % of respondents mentioned this logo as the least interesting, and the reasons for the negative evaluation were that the logo is not concise and is too simple.

Tab. No. 9: Evaluation of logo No. 4 using a semantic differential

bipolar word combination	median	average rating	standard deviation
happy - sad	3	3	1.312
intelligible - unintelligible	2	2	0.954
imaginative - no idea	4	3	1.639
professional - non-professional	2	3	1.605
liberating - binding	4	4	0.759
healthy - unhealthy	4	4	0.759
cheap - expensive	5	5	0.862
exceptional - simple	3	3	1.599

Source: authors.

From the values of the semantic differential in Table 9, it is clear that the logo looks rather cheerful to the respondents and is very understandable, when the value of intelligibility was evaluated on average with a mark of 2. This can be influenced by the central composition of the logo, where the text is the dominant part of the logo and is located in the middle of the field of view. It is also worth mentioning the professionalism that the brand evokes, which is one of the important marketing attributes. This is also confirmed by the fact that the brand is perceived more as more expensive (on average, the logo was evaluated with a cheap-expensive criterion of 5).

Within the overall effect of the logo 4, it is therefore possible to state that the logo is evaluated rather positively by the respondents and there is a connection with the established research assumptions and expectations. The fact that the respondents' eyesight was spread throughout the logo is also positive, which was evident from the heat map in Figure 4. It is also perceived relatively positively, which is the main difference compared to logo No. 3.

4. CONCLUSION

Based on the neuromarketing survey performed, it was possible to evaluate the graphic effect of individual company logos and their attributes, such as the text and colour processing of the logo. In comparison of all created logos, it is possible to evaluate that the most successful are the logo 1 - Bijóó and the logo 2 - Delicious. It was possible to create logos from the general characteristics and validity that met the set requirements and were evaluated positively by respondents. At the same time, the two logos suitably evoke the product category they should represent, which is also suitable from a marketing point of view. This was achieved mainly by a suitable shape of the logo - an apple for organic production and a diamond for a logo representing jewellery. On the contrary, the logo 3 - Chic lingerie can be included among the worst rated logos, the evaluation of which was clearly influenced by the black colour and relatively simple to austere design, which lacked a suitable logo shape, such as a diamond in the logo 2. The results show that the key to the positive perception of the logo by respondents is a well-chosen combination of colours and intuitive shapes, which should represent the product category.

These last two arguments are semantically almost identical with debate in the year 2018. (Tichý, Rosenlacher a Slavíková, 2018)

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