



Healthy but good: Using eye tracking technology in context of marketing to measure the impact of the description of a healthy product on its acceptance and desirability

Saudável, mas bom: Utilizando a tecnologia de eyetracking, no contexto de marketing, para medir o impacto da descrição de um produto saudável sobre a sua aceitação e desejabilidade

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ABSTRACT:

The aim of this study is to demonstrate how the descriptive of a vegetarian food can influence its acceptance. We designed an experiment, using Eye Tracking technology, in which we used the new vegetarian McDonald's' McVeggie hamburger as a stimulus. This approach draws attention to the importance of the description to an alternative food product, since the way it is communicated can have an impact in consumer behaviour.

Keywords Eyetracking; Healthy Food; Consumer Behaviour.

RESUMO:

O objetivo deste estudo foi de demonstrar como o descritivo de um produto vegetariano pode influenciar a sua aceitação. Construiu-se uma experiência, recorrendo ao uso da tecnologia de Eyetracking, em que foi usado o novo McVeggie da Mcdonalds como estímulo. Esta abordagem alerta para a importância do descritivo de um produto alimentar alternativo, uma vez que a forma como este é comunicado pode ter impacto no comportamento de consumo.

Palavras-Chave Eyetracking; Comida Saudável; Comportamento do Consumidor.

1. Introdução

Eating behaviours established during childhood are reflected during adulthood and have a long-term health impact as well as an increased risk of developing chronic and/or cardiovascular diseases (Daniels, Pratt, & Hayman, 2011; Shrestha & Copenhaver, 2015; Story & French, 2004). One of the chronic diseases that has an impact on other pathologies is obesity - one public health problem which reached epidemic levels in developed countries (Carvalho, do Carmo, Breda, & Rito, 2011). Establishing healthy eating habits during childhood and adolescence is, therefore, crucial in the primary prevention of a range of behavioural risk factors associated with cardiovascular disease in adulthood (Daniels et al., 2011), as children/adolescents are more vulnerable to the negative effects of addictive substances than adults (Brown, Tapert, Granholm, & Delis, 2000). Poor feeding habits appear to persist throughout life and feeding styles adopted as a child are confirmed in adulthood, leading to problems in physical performance, more specifically in the adult's workability (Kaleta, Makowiec-Dąbrowska, & Jegier, 2006). Considering the relationship between workability and job satisfaction (de Almeida et al., 2016) that influences the psychological state of the individual, healthy eating as a child is crucial. Food advertising was considered by Who (2003), one of the factors responsible for weight gain and development of childhood obesity (Rodrigues, do Carmo, Breda, & Rito, 2011; Who, 2003). It is important to have a dialogue between parents and children about marketing, to reduce the tendency of the latter to request products advertised to parents (Buijzen & Valkenburg, 2005). According to Ward, Wackman, & Wartella (1977), children begin to show early recognition traits of advertiser profit motives around the age of eight. Oates, Blades, & Gunter (2002) add that this understanding of the persuasive nature of advertising campaigns is not yet evident at 10 years, despite constant exposure to day-to-day marketing communications. Rodrigues et al. (2011) also add that exposure to food marketing can influence children's eating behaviour in a variety of ways. Based on a study by Robinson, Borzekowski, Matheson, & Kraemer (2007), it was found that the notoriety of a brand can influence the taste perceptions of foods in children between the ages of 3 and 5 years. That is why, in recent years, the food industry has seen children and adolescents as one of the main forces of the market and has therefore focused on a communication aimed at children / adolescent. The main objective is to influence brand recognition, brand preference, brand loyalty and food shopping among young people so that they continue to do so as adults (Story & French, 2004).

Most consumers claim to be motivated, at least in part, by health considerations in making food choices (Glanz, Basil, Maibach, Goldberg, & Snyder, 1998). Unfortunately these same consumers are unable to accurately assess purchased foods, frequently stumbling upon barriers to the comprehension of nutritional information (Grunert, Wills, & Fernández-Celemín, 2010). The concern with food marketing, as a key factor in the re-education of the young and not only, is thus fundamental, since personal preferences for food are a highly malleable factor. The food industry often shapes the personal definition of what is acceptable and desirable to ingest and the role it plays in a rapidly evolving food environment (Harris, Pomeranz, Lobstein, & Brownell, 2009). However, this is not a stimulating proposal for the food industry, presenting significant barriers to social, legal, financial and public perception (Harris et al., 2009). Adding to this argument is the fact that children have a strong purchase power, since they can influence the consumption habits of the other elements of the family, because they are highly vulnerable (Buckingham, 2013; Rodrigues et al., 2011). As the period from adolescence to early adulthood is associated with major changes in people's lifestyles, it is important to create food marketing strategies that promote healthier, nutritional-based eating behaviours (Venn et al., 2007). Marketers and advertisers thus have a double responsibility in this new world of child / adolescent marketing: doing well by doing good (Kurnit, 2005).

Although the intention to advertise healthy foods is essentially linked to a change in the consumer's choice of food, articles in the area reveal that advertising only reaches the target audience for which the advertising message is directed (Bargh, 2006; Dovey, Torab, Yen,

Boyland, & Halford, 2017). However, Doolan, Breslin, Hanna, Murphy, & Gallagher (2014) and Bailey (2016) show that food presence and energy density influence motivational processing of food advertising campaigns when they are absent from the environment. In the same study, Bailey (2016) points out that the sympathetic system directs the body, most of the time, to look for denser food in energy instead of the less dense. Although apparently food with a high caloric density arouses an activation of the sympathetic nervous system, Dovey et al. (2017) state that it is possible to change the choice of food consumed in response to healthy advertisements. However, the authors also show that advertising for healthy foods has a limited impact on the choice of food when applied to the general population.

The importance of technologies such as eyetracking in scientific research is notorious for providing a direct measure of visual attention allocation, since eye movements are the most sensitive measure to capture the visual biases of attention (Field, Munafò, & Franken, 2009; Werthmann et al., 2015). Most eyetrackers (Eyetracking systems) produce signals that represent the orientation of the eye within the position of the reference point, on a screen, at a specified distance. The ocular tracking system typically provides a horizontal and vertical coordinate for each sample. Based on sample rate and session duration, this can ensure a high number of data (Lund, 2016). By providing a more detailed and accurate description of the processing of visual information, eyetracking thus overcomes the disadvantage of Indirect Attention Indexes, which reflect only an instantaneous view of attention allocation (based on the duration of the stimulus) (Mogg, Bradley, Field, & De Houwer, 2003). The tool uses infrared light to detect the observer's pupils, and, consequently, detect the fixation points and measure eye movements (essentially voluntary movements) between these fixations. These movements are an interesting object of study because they reflect human cognitive behaviours, since the changes in attention (cognition) made by the observer are generally reflected in the fixations that the observer makes (Findlay & Gilchrist, 2003; Hayhoe & Ballard, 2005). In general, eyetracking allows to collect a large number of metrics (Jacob & Karn, 2003), however the most frequently used ones are: a) Fixations and gaze points - a fixation is a series of points of observation (gaze points) Very close in time and space, showing a period of focus of the eyes on a certain object; B) Heat Maps - views showing the general distribution of fixings and points of observation (attention indicators); C) Regions of Interest (ROI) - tool to select subregions of the displayed stimuli and extract metrics specifically for those regions. Using a tool that measures attention involvement, such as the eyetracker, when exposed to a given advertisement, allows us to perceive visual elements that have a greater impact on the consumer, through fixed points, sequences traversed and / or visual routines (Hayhoe & Ballard, 2005).

Several studies have focused on the relationship between food marketing, associated with high-calorie food products, and the prevalence of chronic foodborne diseases. However, the study of advertising of healthy food products and its consequent relation with attention to nutritional and descriptive information, as is the case of the present study, is still scarce.

Werthmann et al. (2015) showed that all children, regardless of their weight, tended to be oriented towards high calorie food choices (bias of the initial orientation of the gaze), initially maintaining the first fixation in the alimentary suggestions and not in the surrounding information (bias of the initial fixation), which also shows that foods are highly salient stimuli for children, regardless of the surrounding environment. These authors also add that the selection of stimuli can also affect the attention process of exposed individuals, showing that even in contrast to other attractive elements, food products can attract early attention more easily. In response to this type of question, Graham, Orquin, & Visschers (2012) further add that there are undoubtedly additional characteristics to nutritional labels and food packaging, which have an influence on consumer attention to nutritional information. The authors show that the location, order of nutrients and label size may affect the visibility of total nutritional information. These conclusions are also supported by the work of Liversedge & Findlay (2000) when studying the relation between eye movement and fixation points in relation to textual

elements. These authors realized that the behaviour of eye movements is affected not only by the characteristics of the words being fixed but also by the fixed word and the text that precedes it. In addition to the correlates of oculometry, behavioural outcomes are important because they allow us to be closer to the phenomenology of behaviour (Almeida et al., 2017). The purpose of the present study was to understand how the description and slogan of a healthy product, in this case McDonald's McVeggie, has an impact and can influence its acceptance and consumption among the population. The present study contributes to the literature in the areas of Food Marketing, Healthy Eating and Consumer Behaviour, investigating the relationship between attention to brand, nutritional information and selected product.

2. Methodology

2.1 Participants

The sample was composed of 32 participants (14 women) with ages ranging from 18 to 24 years, being the average 20.6 (SD=1.5). recruited from the University of Aveiro.

2.2 Eyetracking

To record eye movements we used the EyeTribe tracker (more information in <https://theeyetribe.com/>) connected with the OGAMA software (Voßkühler, Nordmeier, Kuchinke, & Jacobs, 2008), where the experiment was set. The sampling frequency was set up to 60Hz and a 16-point calibration was used.

2.3. Stimuli and Experiment

The experiment consisted of three exactly alike images of the McVeggie hamburger, preceded by a fixation cross (500 ms), where we manipulated the description of the hamburgers. One of the images showed "Juicy Taste", another "Quality of Life" and the latter "Healthy Longevity". Each image was displayed for 15 seconds, followed by a question about how attractive the subject considered the burger, in a 1-7 Likert scale. The order of the images was counterbalanced. While they were performing the task, eye movements were recorded with an Eyetracking device. The Regions of Interest used in the present study are shown in figure 1.



Figure 1: Region of Interests (ROI's)

2.4 Procedure

After completing the informed consent, the participants performed the experimental task.

3. Results and data analyses

3.1 Behavioural Results

One repeated measures ANOVA was produced to verify differences in attractiveness between the images. The results show an effect of logotype $F=8194, p<.001, \eta^2p=.204$. Pairwise comparisons showed that the description "Juicy Taste" led participants to consider the hamburgers more attractive than others ($p's<.01$).

3.2 Gaze tracking Results

The gaze pattern in each logotype is represented in figure 2, using Heatmaps, Spotlights, and Dimensional Circles.

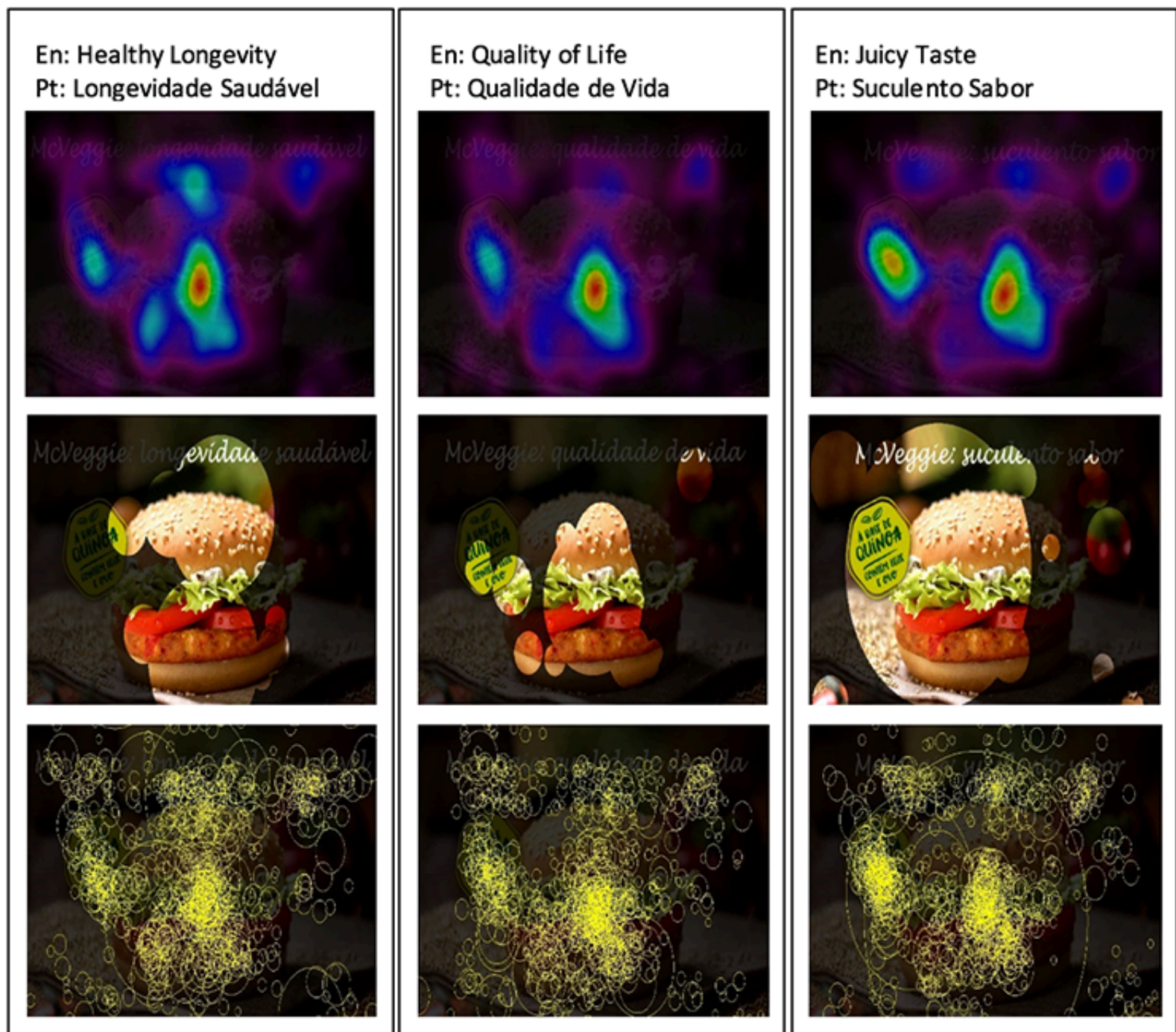


Figure 2: Heatmaps, Spotlights, and Circles in each study logotype.

Relatively to the parameter "number of fixations", differences in logotypes were observed only in the ROI "Ingredients" $F=6913, p<.001, \eta^2p=.178$. Indeed, the pairwise comparisons showed that the number of fixations in the ROI ("Ingredients") was higher for the image with the description "Juicy Taste" relatively to Healthy Longevity ($t(31) = -2.834, p<.001, 95\% \text{ CI}$

[-3.438, -.5624], $d = -.493$, CI Effect size = .31, and to Quality of Life ($t(31) = -3.679$, $p < .001$, 95% CI [-3.107, -.893], $d = -.640$, CI Effect size = .69.

Importantly, when the participants looked at the picture containing "Juicy taste" description, they also looked more to the hamburger and for the McVeggie brand.

An example of the gaze path in "juicy taste" logotype is displayed in figure 3.

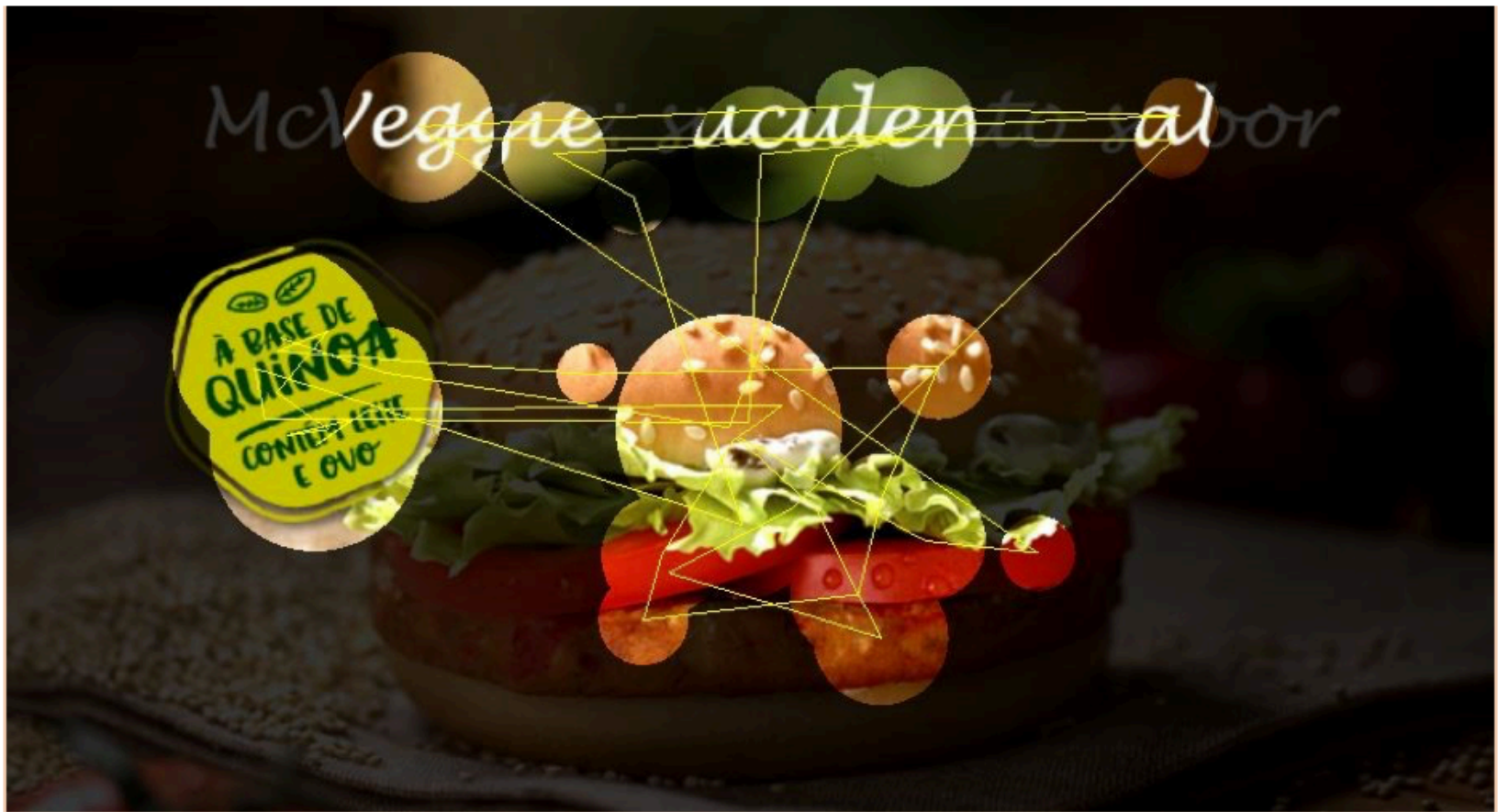


Figure 3: Gaze path example in "Juicy taste" logotype.

4. Conclusions

Eating behaviours established during childhood are reflected during adulthood and have a long-term health impact as well as an increased risk of developing chronic and/or cardiovascular diseases (Daniels et al., 2011; Shrestha & Copenhaver, 2015; Story & French, 2004). Food advertising was considered by Who (2003) one of the factors responsible for weight gain and development of childhood obesity (Rodrigues et al., 2011; Who, 2003). Most consumers claim to be motivated, at least in part by health considerations in making food choices (Glanz et al., 1998). Although the intention to advertise healthy foods is essentially linked to a change in the consumer's choice of food, articles in the area reveal that advertising only reaches the target audience for which the advertising message is directed (Bargh, 2006; Dovey et al., 2017). However, Dovey et al. (2017) have shown that health food advertising has a limited impact on food choice when applied to the general population. The aim of the present work was to understand how the description and slogan of a healthy product, in this case, McDonald's McVeggie, has an impact and can influence its acceptance and consumption among the population. Results showed that the number of fixations in the region of interest ("Ingredients") was higher for the image with the description "Juicy Taste" relatively to Healthy Longevity and "Quality of Life" descriptions. When the participants looked at the picture containing "Juicy taste" description, they also looked more to the hamburger and for the McVeggie brand. Thus, despite looking more at some of the indicators that point to a healthy product, the preference was the hamburger in the picture with the description "Juicy Taste"

This study draws attention to the importance of the description to an alternative food product.

4.1. Limitations

We consider the small age span, a short number of participants and the fact that we only showed each picture once as limitations.

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