



RESEARCH ARTICLE

THE EYE TRACKING AS A TOOL BRAND IN FRONT OF THE MODEL BESC (BRAND ENGAGEMENT SELF CONCEPT): COMPARATIVE ANALYSIS BETWEEN TWO COUNTRIES COLOMBIA AND EL SALVADOR

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ABSTRACT

The main objective of this research was to compare in two different countries the level of adjustment or concordance between the verbal, reasoned and elaborated answers of the participants with respect to their non-verbal, rapid and intuitive responses. To achieve the objective, the research is carried out in two phases, the first phase is to ask the participants at a level of closeness with the brands of known products, and the second phase can be requested quickly and the participant memorizes a brand of a couple of brands. Clip art in seven seconds. These two phases, verbal responses compared through the application of a survey in contrast to the responses of visual attention recorded through a tracer eye.

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INTRODUCTION

In the field of concurrent marketing is a subject of debate about the process of purchase decision of the consumer, sometimes in may be noted, rightly or wrongly, the results of studies of the consumer when these do not satisfactorily in the forecasts of those buying decisions. In this regard, the rise of new technologies of the HCI (Human Computer Interaction) that are now attainable for the marketing (16), such a mismatch or error in the results of the studies of the consumer it be minimized substantially with the implementation of these new technologies. The primary purpose of this research is to achieve a clear explanation and easy to apply the new technologies of the HCI in combination with traditional methodologies applied generally in consumer studies. For this method to achieve a better and more successful outcome in studies of the consumer. In order to achieve the objective of this study divided into two phases. The first phase applies the technique of the survey as an instrument to capture consumer data and following the proposal of (13), where is that the human being at the time of deal with cognitive processes of high load, as in our case study; fill out a survey with a few questions that activate the cognitive process called system 1. In the second phase applies the qualitative technique of the eyetracking, in which the

participant should only look at some pictures and make a quick decision (1). In this cognitive process, Kahneman called system 2. Each one of the participants will trigger the two cognitive processes, first the System 1 via the survey and second the system 2 through the observation of a few images of products.

Eye tracking

Within the great rise of new technologies, the eye tracking have been growing since the early 1980s. Various areas of study include the application of this tool from neurological research to usability inquiries or experience going through countless applications in the neuropsychology (Courtemanche, 2017; Dhar, 2010; Eckstein, Maria *et al.*, 2016; Eraslan *et al.*, 2014; Erel, 2016; Hübscher *et al.*, 2012). This research focuses exclusively on the use and relevance of the eyetracking within visual attention processes (Bisley, 2011) selective in response to some stimuli of marketing, as is the case of the exposure to brands of products known or unknown. The human eye is a large sensor detection that move at speeds almost imperceptible (Pomplun *et al.*, 1996). The field of vision is not so extensive is a relatively small field composed of a ellipse of one hundred and eighty degrees (180 horizontal), compared to 130 degrees (vertical). The accuracy of the human visual field is less than two degrees. To which it has been called the foveal area of focus and is the one that concentrates or focuses on the main visual field, followed by the ParaFoveal area that

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concentrated between two and five degrees of visual acuity, and ends with an area of more than 5 degrees which is named for the peripheral area. In this sense, it could be said that when the human being you want to view or focus accurately in the area Foveal and if you want less precision is moving into the parafoveal area and then to the peripheral area. To be able to focus our vision into something of our interest come in two types of eye move saccades and the fixations (Salvucci, 2000). The fixations are in charge of placing the retina in a stationary target for processing and the saccades is the movement whose main objective is the stabilization of the eye to focus or to "stabilize" the retina. Extremely fast move is be measured in milliseconds. Therefore, it is worth mentioning two simple things, but which are often mistaken, the eyetracking is the software that are processed the data obtained by the eyetracker that is responsible for the hardware directly record the eyes. The work of the eyetracker is to record this type of movements to the actual velocities and accelerations. It is here where relevant the use of apparatus (high-tech) eyetrackers, which actually record the movements of the eyes and not des-calibrated before the sudden movements of the head or to the artifacts such as flickering. After the eye tracker captures the data, these data was analyzed with a software program called eyetracking who, in summary, allowing at least is to group and summarize the data from the fixations, saccadic movements, the coordinates and the diameter of the pupils. Creating in the light of these data the strokes or paths followed by the Eye Gaze Maps or areas where there are fixed more vision or (Heat maps). According to (Ehlerset *al.*, 2016; de Geeet *al.*, 2014; Deltomme, 2017; Kieferet *al.*, 2016) the diameter of the pupil is an indicator of the extent of the processes of attention of the human being. In addition, there is ample literature that underpins the mountings of the gaze and the diameter of the pupil with cognitive and emotional processes (Kahneman, 1967; Kieferet *al.*, 2016), also support the increase in the diameter of the pupil in the processes of visual attention. Large dilations in the diameter of the pupil suggest positive choices in front of diameters of the pupil that suggest negative choices (de Geeet *al.*, 2014).

Model BESC

The BESC (Brand Engagement Self Concept) is a vision or overview of the all brands, and how the individual be engage with your own "ego". This research support mainly on the analysis of the foundations of the BESC exposed by (20). In addition, perform a detailed analysis of the validity of the proposed scale in the BESC, and that the summary in eight variables presented in Table 1.

Table 1. Measure instrument

VARIABLES BESC
I have a special bond with the brands that I like.
I consider my favorite brands to be a part of myself.
I often feel a personal connection between my brands and me.
Part of me definedby important brands in my life.
I feel as if I have a close personal connection with the brands I most prefer.
I can identify with important brands in my life.
There are links between the brands I prefer, and how I feel with it.
My favorite brands are an important indication of who I am.

Source: Own elaboration.

Participants and devices

This research has divided in two phases: the first phase consisted in applying an instrument of eight questions contained in Table 1 and that correspond with the model

BESC. There is each participant was asked to respond to each of the questions in accordance with the seven-point scale where 1 meant strongly disagree with the claim presented and 7 meant total agreement with the claim presented. All completed questionnaires were tabulated and analyzed in the software SPSS (17.0). The participants after completed the questionnaire of eight questions of the BESC they invited to perform the test of the eyetracking. There was used the eyetracker by Eyetech. The VT3mini operated at a distance of 70 centimeters with adjustment of 0.5⁰ with speed of 60 fps. Allowing us to apply the tests with normal lighting conditions. The tests applied to 363 participants, of which 40% in the city of Bogotá (Colombia) and the 60% in San Salvador (El Salvador). The 50% men and 50% women. The gender variable by country presented a slight variation being in Bogotá (Colombia) a 54% man and 46% of women. For San Salvador 47% man and 53% women. The average age for Bogotá was of (29.4, SD 8.9), for San Salvador, the average age was (35.7 SD 7.8). Reviewing the ages by gender and code is obtained for the city of Bogotá that men with an average age of 31.9, SD 9.3) and women (26.5, SD 7.64). For the city of San Salvador men with an average age of 35.8, SD (6.8) years and women with (35.7, SD 8.8).

Stimuli and Procedure

The stimuli used in this experiment were of two kinds the first class consisted of presenting brands and which is generally used in the regular consumption by the participants. The second class was products with generic brands or not well known or used by the participants. The product pairs presented by stimulus in separate way, a product with well-known brand versus a product with a generic or little known but in the same category. The classes of products and brands that selected were in line to each of the case study countries. Some classes for Colombia and other classes for El Salvador. The classes with each one of the stimuli presented in figures 1 and 2 respectively. The methodology of presenting the stimuli for each of the countries (Colombia and El Salvador) was the same and in the same environmental lighting conditions. We used a 17" monitor and the eyetracker was 70 centimeters away from each one of the participants. The dimension of each stimulus was 621x 300 pixels and the resolution of the monitor used was 1366 x 768 pixels. The brands within the presentation of the stimuli rotated randomly so that it does not appear always in the same location on the screen. The software used for the analysis of the data obtained with the eyetracker was the Mangold Vision from Mangold International. Each one of the participants was informed before the test was and a brief explanation of the eyetracker, which is a non-invasive technology without any risk to the health of the individual. Each participant should see a series of products for couples and should choose a product per couple and memorize it without saying anything until the end of the test. At the end of the test will be presented again the stimuli to the individual and asked which had been selected from each of the couples observed and responses are recorded in a categorical variable with two possible answers "Chose brand"; "Not chosen Brand" in the software SPSS 17.0.

RESULTS

The results for the BESC

The variables applied to the participants in the instrument and that can be seen in Table 1 were measured on a scale of 1 to 7 where 1 was "strongly disagree" and 7 "full agreement".

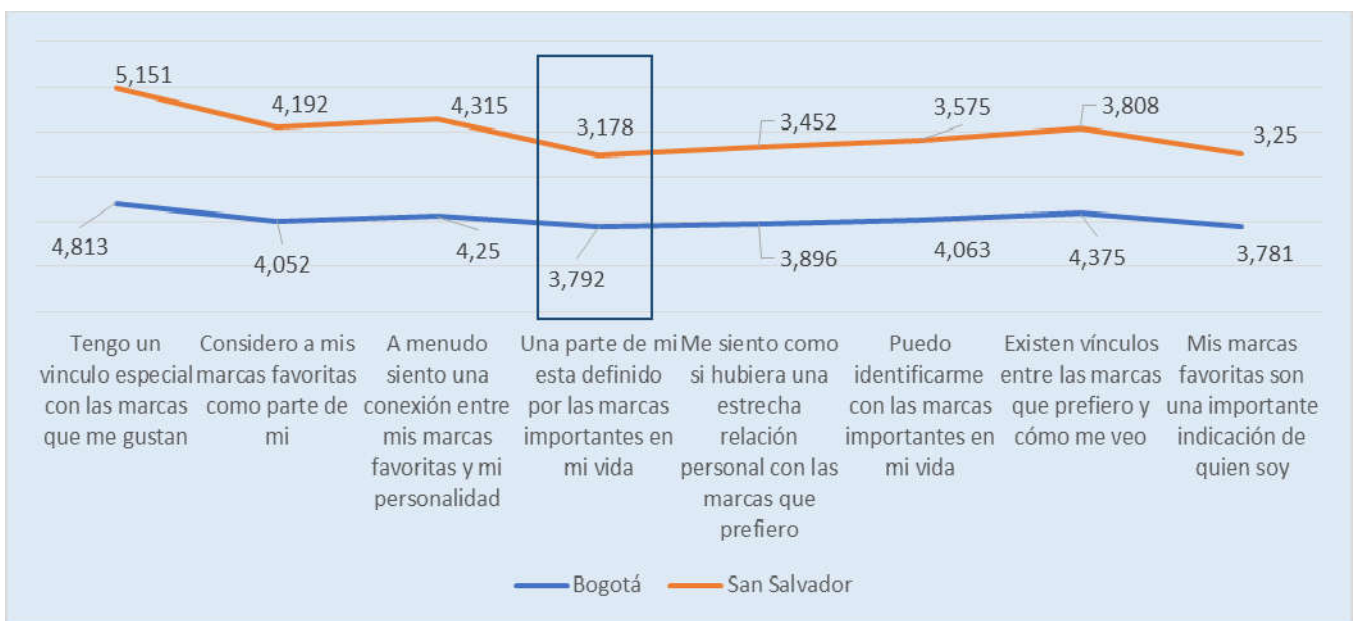


Source: Own elaboration.

Figure 1. Seven stimuli presented for El Salvador



Figure 2. Seven stimuli presented for Colombia



Source: Own elaboration.

Figure 3. Variance Analysis

Collected scores to each of the 363 participants (218 in El Salvador and 145 in Colombia). In the analysis of variance the independent variable was the country and the dependent variables or to explain, the eight variables of the model BESC. In Figure 3 shows the summary of the averages of the scores of the participants by country. You can highlight two relevant facts, the first is that seven of the eight variables are averages around a rating of four points on seven, and can be interpreted that there would be a general agreement in the two countries in that the brands on the products are not involved within the personal image of the individual “ego”. This would be his conscious declaration to fill out each of the sentences proposed in the instrument of measurement (Kahneman, 2003). On the other hand, run the ANOVA there are no statistically significant differences in seven of the eight variables studied, only there is a significant difference in 0,039 in the variable: <<a part of me is defined by the major brands in my life>>, a F of 5.019 and the Wilks' Lambda of 0.959. But the average for this variable are 3.178 and 3.792 for Colombia for El Salvador, reinforcing what has been stated in previous lines that an overall score of the BESC close to the four points would indicate that the population under study the marks do not reflect the individual and are not involved as part of the “ego”. Even more interesting, those two different countries within the same region are of the same opinion around the BESC.

It also reflects the good consistency and validity of the BESC proposed by (Sprottet *et al.*, 2009) and applied in this research.

Restulados Eye tracking

Addressing the results of the tests of the eyetracking notes that the 74% of the total 363 participants <<Chose>> compared to 26% that <<Not Chose>>. These same results by country behave in a similar way to Colombia (75.25) and for El Salvador (74.26). In Figure 4 we present the results summarized in the heat maps for the participants of Colombia. As seen in the boxes of each of the pairs of stimuli summarized in colors ranging from violet to red color, the stroke of the averages of the fixations of all individuals for each of the stimuli.

These boxes generally known with the name of areas of interest (Mercer *et al.*, 2012). It highlights the fact that the most relevant areas of interest were concentrated in the well-known brand products and not in the generic brand products or distributor. For the specific case of Colombia, an example of the power of the brand and its cultural roots could be reflected in the stimulus number six, where it see the Colombian burger restaurant <<El Corral>> in front of the brand internationally recognized <<McDonald's>>. There is a preference toward the <<El Corral>>vs<<McDonalds>>. In the figure 5 similar to the Colombian answers, the seven pairs of stimuli also include products with well-known brands with respect to a little-known branded products or distributor. In the boxes summarizes the areas of interest where more fixations on average obtained from participants in the study. In the stimuli two, six and seven, with respect to cultural roots of the brands



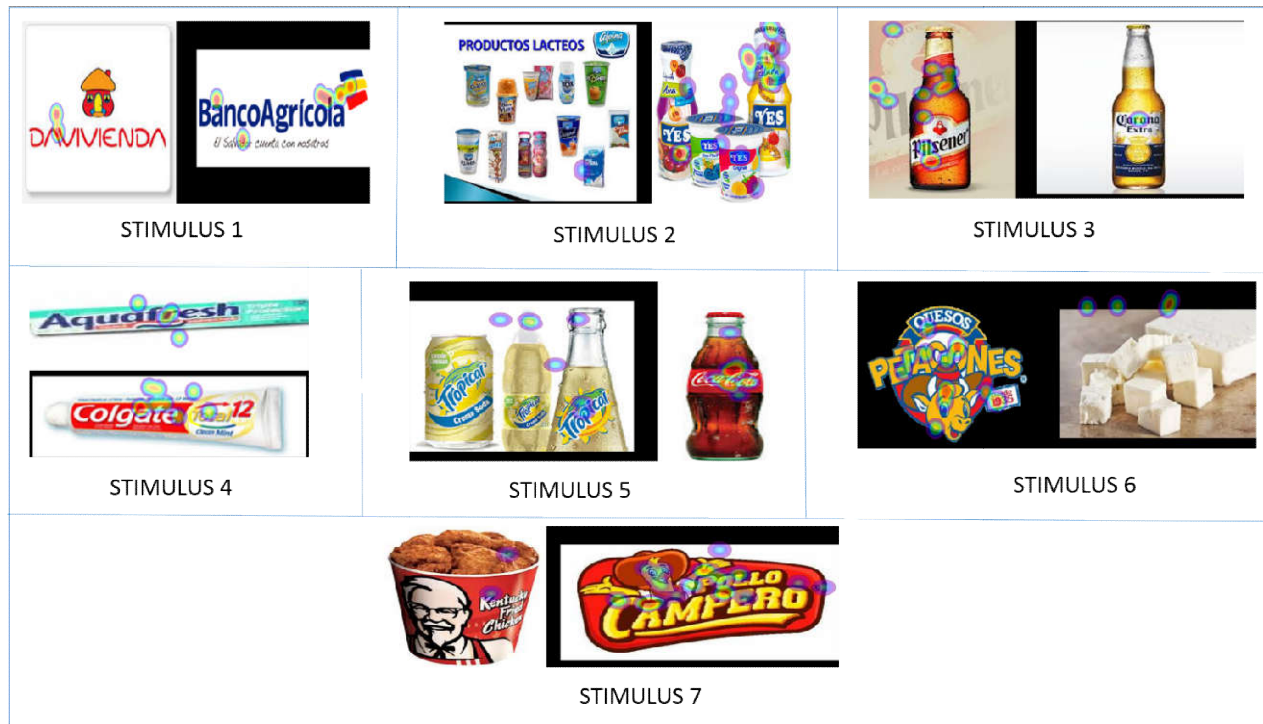
Source: Own elaboration.

Figure 4. Eyetracking Heat maps of Colombia

Table 2. ANOVA Eyetracking

		Mean	Deviation	Error T	Minim	Maxim	F	Sig
PupilLeft	Selected Brand	4,1537	0,207	0,0217	3,8	4,68	554,142 C	0,00
	No Selected Brand	3,2687	0,046	0,0083	3,19	3,37		
PupilRight	Selected Brand	4,1933	0,152	0,0159	3,75	4,59	1029,111 C	0,00
	No Selected Brand	3,2981	0,049	0,0089	3,19	3,45		
Fixations	Selected Brand	270	83,56	8,76	79	416	201,612 C	0,00
	No Selected Brand	53	23,18	4,165	15	96		

Source: Own elaboration.



Source: Own elaboration.

Figure 5. Eyetracking heat maps of El Salvador

in el Salvador, as dairy company <<Yes>>, <<Petacona>> and the chain of restaurants <<Pollo Campero>>. These last three brands concentrated the attention of the participants with respect to international brands of greatest strength as <<KFC >> and <<ALPINA>>.

The analysis of the results of the eyetracking beyond fixations could be summed up in areas of interest. we proceeded to perform the analysis of pupil diameter (Bayat *et al.*, 2016; Strauch *et al.*, 2018; Yuan *et al.*, 2007), as a measure of the level of visual attention generated by the stimulus presented and that could complement and validate with measures of brain asymmetry (Davidson, 1988). There is a large literature that supports the proposal that the greater the dilatation of the pupil diameter is greater attention to the emotional stimulus accompanied by valence. In Table 2 presents the analysis of variance (ANOVA) that the hypothesis of equality of means in the diameters of the pupils and in the number of fixations or areas of interest. Given the behavior in connection with the election of the brands between the two countries was very similar around the 75% of choice of brands. The variable defined to contrast in the ANOVA model to the choice of brand: <<Chose>><<Not Chose>>. Independent and the diameter of the pupils and the number of fixations or areas of interest. It can check by the levels $p < 0.05$, that the average diameters of the pupils, when individuals observed the brands and chose the brands were significantly greater than the diameter of the pupils with respect to not chose brand. In addition, it is the difference in the averages of the fixations or areas of interest, when the participant chose that when not chosen.

Conclusion

It was very interesting to find in this research that the behavior of two distant countries in Latin America in 1952 kilometers is very similar in relation to their behavior in front of the decision to choose brands. Both groups of participants of the test

expressed verbally through the execution of a survey that do not involve the marks on his "ego" as an individual. To ask participants to fill out the questionnaire was leading to activate a high-level cognitive load, which in general terms we know them as an activation of your conscious or rational system. When we take the individual to select his conscious and we answer a few questions, your brain will activate all their baggage <<rational>> to answer. Already in the second phase of the investigation when the Eyetracker, did not question or request of the participant to the brain will activate a high cognitive load. Only the participant should observe in silence the screen in which the stimuli and choose mentally a brand by stimulus. It is there where there are elections of the brands and the results are nearly identical in both countries. The visual attention summarized in the areas of interest, and the dilatation in the diameter of the pupils showed different results to the results verbal, chose brand names. The conclusion is that the brand of the products is very important for the election of the product but does this mean that consumers involved major brands that consume as part of its "ego" Inside, there must be other reasons that are beyond the scope of this investigation. On the other hand, a source of error in the research of consumers could be the implementation of the technical survey or by any technique that enable their rational processes activate and surely these responses will differ if you apply the new techniques of neuroscience applied to consumer research or new technologies HIC. In this sense, make advisable to combine all the available techniques in order to minimize the error in the findings and conclusions in the studies of the consumer.

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