

Eye Tracking In Evaluating The Effectiveness Of Ads

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ABSTRACT

It is very important to understand the visual attention distribution when a person is shown a number of ads of the same product, with small variations. Such studies help in designing ads which convey their intent efficiently. An eye tracking study on fifteen users who are shown three categories of ladies products: mascara, makeup and lipstick, and three different ads for each category, are asked to perform two kinds of tasks of *identifying the intent* and *grading the ads*. From this data, we can successfully observe which variation of the same product is more efficient in conveying its essence. At the end of the study, based on the data gathered from the eye tracker and also the questionnaire, we have concluded that the ads with single person are ideal, though this may tend to change for larger number of subjects.

Author Keywords

Eye tracking, Crux of ads.

ACM Classification Keywords

H5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous.

INTRODUCTION

For small businesses to global organizations, ads are the elementary means to increase their business. Consumers are exposed to hundreds of ads everyday in one form or the other, may it be short 30second commercials on televisions, hoardings along the road, newspaper clippings or side of a bus. Research shows that ‘An average American is exposed to about 3000 advertising messages a day, and globally corporations spend about \$620 billion each year to make their products seem desirable and to get us buy them’[1]. With this voluminous number of ads striking human eye every day, it is very important for an organization to devise ads which are eye catching and also whose essence is efficiently conveyed.

If one knew where the consumers would be looking in an ad, that is, if he/she is looking at the portions of the ad

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which the advertiser wants them to look at, it would be easy to design ads. Eye tracking does this work. Before the ads are released into the market, certain eye tracking studies



Figure 1: Gaze map visualization of a participant during a grading task.

conducted on them, can suggest their impact on the consumers.

As a basic example of our study, we consider an ad of a lipstick, which intends to promulgate their new deal. In the figure 1, we can see the gaze map of a participant. The advertiser wants the consumer to look at the product and understand specialty of the product which is its “long lasting nature”. From the gaze map it is evident that the participant’s gaze shifts from the person, to the intent and the product. Though the gaze plot is not dense on the product, the intent is conveyed, hence this particular ad meets the advertiser’s requirement efficiently.

BACKGROUND

1) Behavior of viewing images:

The viewing behavior of arbitrary images depends on various factors like the task at hand, characteristics of the image or a person’s expectations about where to find information. *Fixations* (eye steadily gazes at one point for at least 80-100ms) and *saccades* (rapid, ballistic eye movements) constitute the eye movements generally. A

substantial amount of data which is gathered, is from the fixations [2,3].

There are three main factors that influence the placement of fixations: 1) salience of areas in the image; 2) memory and expectations about where to find the information; 3) task and information need at hand [2].

The salience of area is typically the image characteristics like color, intensity, contrast. Generally the first fixation is based on the salience of the area [4] and the following fixations would be guided by the memory and expectations about where to find the information [4,5,6].

2) Behavior of viewing ads:

[7]The history of advertisement research was divided into three basic periods by Hansen: 1. “age of recognition Vs recall debate”; 2. “the persuasion age”; 3. “age of model based research”. The “persuasion” includes preference or emotional appraisal towards the product or brand of the product where as the “model based” research was based on theoretical framework like, AIDA theory (Attention-Interest-Desire-Action). This theory suggests that a particular ad must pique the customer’s attention, maintain the interest and create the desire.

METHDOLOGY

The fundamental premise of our study is, to try and understand the advertisement viewing behavior of the consumers. So we devised an experiment to collect data from the participants who are predominantly the consumers of the products. Using this data we try to analyze: if the essence of the ad is conveyed, attitude of participant towards the brand, relative intensity of the consumer’s attention to different parts of the ad (*e.g.*: presence of people, if applicable).

Apparatus

The experiment was conducted using a DELL computer running under Windows XP. The computer is equipped with an eye tracking machine Tobii ET-17500(Tobii technology, Inc., Falls church, VA) embedded in a TFT 17” monitor with a resolution of 1280x1024. All the experiments were created and run in Tobii Studio program. The eye tracker sampled the position of users’ eyes at the rate of 50Hz and had an accuracy of 0.5°. Gaze data was logged by Tobii Studio.

Subjects

Fifteen able-bodied female volunteers were recruited for completion of this study. All the participants will be typically of the age group 19 to 30 years and with normal or correct-to-normal vision. Few of them had experience doing RTA.

Stimulus



Figure 2: Stimulus provided to the study under the category lipstick



Figure 3: Stimulus provided to the study under the category mascara

Experimental Design and Procedure

The design of this study typically facilitates us to collect gaze data from the participants. As a part of the experiment we made the participants perform tasks which are broadly classified as *Intent identification* and *grading of ads*. The basic structure of the experimental design can be seen in the fig:5.

1) Providing information to the participants

The initial step of the experiment involves giving the participants all the required information about the categories of ads and the nature of the task. That is the participants are told about the three categories: Mascara, Lipstick and Makeup; and are also asked to look for an intent in each category.

Once the participant is given necessary information about the task at hand, he/she is asked to perform the eye tracking tasks, i.e, *intent identification* and *grading tasks*. During the experimental block, the ads were presented in a fixed order.

2) Observation and Recording

Each category of ads has single intent. The crux of the mascara ads is to convey that the product has “Sculpting fibers”, that of the lipstick ads is to indicate that it is “Long lasting and finally the makeup products are “Skin matching”.

At the end of each category, a questionnaire is handed. In the questionnaire the participants are asked to identify the intent.

To elaborate more, that is, why a particular ad is liked or disliked can be known from the second part of the questionnaire. In the second part of the questionnaire the participants are asked to answer the question why they liked or disliked an ad. The characteristics that are taken into consideration to answer this are: color/presentation of the ad, stimulus of the product, brand of the product and person in the ad (if any).

After the completion of the entire task, the data from the eye tracker and the questionnaire are extracted and consolidated. The consolidated data is analyzed to observe the participant’s viewing behavior of the ads.



Figure 4: Stimulus provided to the study under the category makeup

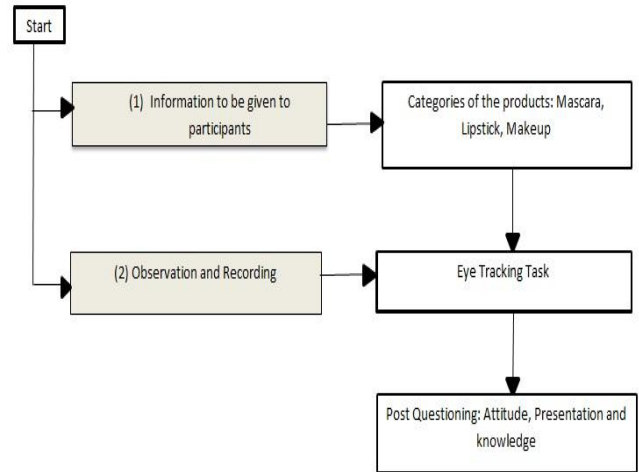


Figure 5: Procedure to be followed for collecting and analyzing data

RESULTS

In the course of study, we have presented nine different ads to fifteen participants on an average. The nine ads were categorized based on the product and also on the number of people in the ads. Typically the mascara ads were designed without the presence of person as whole, i.e, just the product; the lipstick ads had one person and the product; while the makeup ads had multiple persons in the ad.

The major goals of the analysis were to check if the crux that the advertiser is intending to convey is reaching varied customers and also to observe the participants attitude towards the presence of person in the ads. This is done by analyzing the viewing behavior of the ads.



Figure 6: Heat map distribution of all the participants on the category ‘Lipstick’



Figure 7: Heat map distribution of all the participants on the category 'Makeup'

Characteristics of viewing ads (location based)

Fundamentally each of the stimuli is divided into three regions called the AOI (Area Of Interest). The AOI's are the regions in the images which contain the substantial information and hence are looked for gathering information. In our exercise at hand, three AOIs are identified: Product, Person and the Content. The role of AOIs is crucial in fulfilling both the above mentioned goals of experiment. The *fig.6* shows the heat map distribution of all the participants in a lipstick ad, with the three AOIs identified. The *fig.7* shows the heat map distribution of all participants in makeup ad, with the all three AOIs. If we compare two figures *fig.6* and *fig. 7*, in the figure 6, most of subjects spent time fixating on the content of the ad and then person present in ad. Where in figure 7, we can say that subjects spent more time in fixating on multiple people present, rather than on content or product on ad. The heat map of third category mascara, also showed the similar fixation behavior to the lipstick ad, subjects spent more time on looking at content information in ad.

DISCUSSION

The results from the post questionnaire when analyzed, it can be seen that the image that the participant tends to like is different from the one which conveys the crux appropriately. This can be seen in *fig 7*.

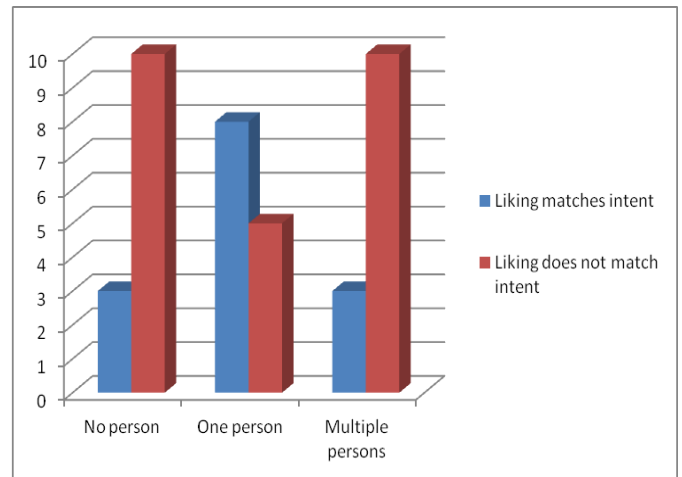


Figure 8: Comparison of the images that were liked to those which conveyed the intent. No person refers to Mascara, One person to Lipstick and Multiple persons to Makeup.

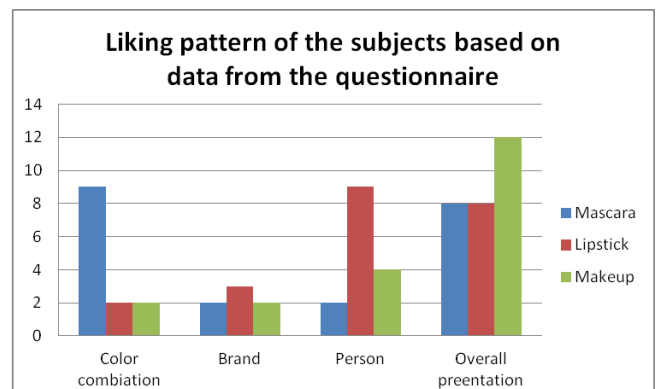
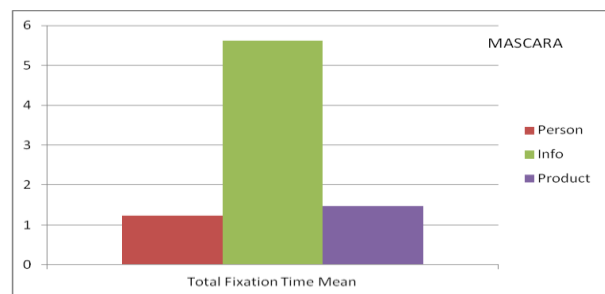


Figure 9: Liking pattern of the participants based on the variables- color combination, brand of the product, person, overall presentation.



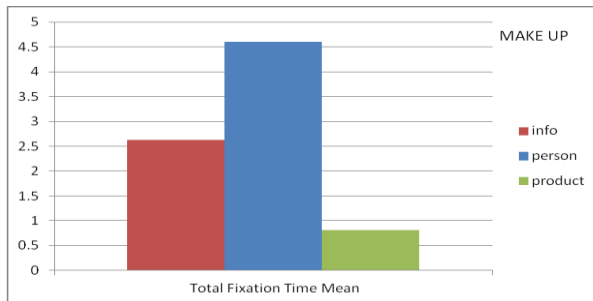
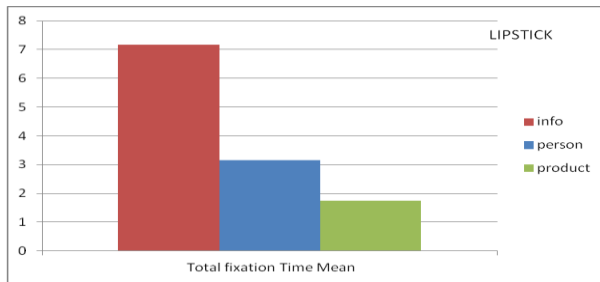


Figure 10: Gaze data of the ads from the eye tracker based on different AOIs

Apart from the data collected from the questionnaire, the data from the eye tracker indicates the total mean fixation times of all the categories with regard to the AOIs. It is observed that participants looked into the “information” area of the ads when there were no persons and one person (mascara and lipstick respectively), whereas for the ads with multiple persons (makeup), the mean fixation time was significantly high at the “persons”.

CONCLUSION:

We have presented the methods for understanding the consumer’s viewing behavior in order to design ads more efficiently in organization’s point of view. Based on the results of heat map and graphs of Total fixation time mean, of the subjects’ viewing pattern, we observed that the presence or absence of a single person does not affect the information viewing attitude of the participant, that is, in both the cases most of the subjects tend to read the information present on the ad. And the category in which there is more than one person present showed a significant fixation time on the person’s faces rather than other AOIs, that is, presence of multiple persons did affect the information viewing attitude of the subject.

The analysis done on the answers of questionnaire, shows that there is difference in, the ads liked by the subjects and the ads which they thought conveyed the intent more precisely. So in order to satisfy advertiser’s goal, that the consumer should like the ad and at the same time it should convey the crux, based on consolidated result from eye

tracker and the questionnaire, we can say that with one person will be a close choice.

The experiment was conducted with the help of a small number of subjects, there is every possibility that the conclusion tends to change on a broader perspective, as the latitude towards the ads tends to change from place to place and person to person.

ACKNOWLEDGEMENT

We would like to thank Dr. Andrew T. Duchowski, Dr. Patricia Knowles, Dr. John Leininger for their valuable inputs, guidance, comments and support all through the project.

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