The Effect of Mood on Visual Gaze Patterns on Healthy and Unhealthy foods

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ABSTRACT

One’s mood deviates from day to day, and different stressors can cause one to have a positive or negative mood. While one’s mood can help determine various decisions in one’s life, it also can determine the foods which we are more interested in eating. Using eye-tracking techniques and methodology, we explore what type of foods people tend to fixate on and compare that to a positive or negative mood.

KEYWORDS

eye tracking, visual attention, mood, packaging, food

ACM Reference Format:

1 INTRODUCTION

When shopping for groceries, there’s always one aisle that garners the customer’s attention the most: the snack aisle. Whether one goes down that aisle and grabs a snack item can depend on a lot of different factors: budget, dieting restrictions, food allergies, doctor recommendations, and even fitness or weight loss goals of the customer. Not to mention, some snacks are healthier than others, such as fruit cups, especially compared to what is commonly referred to as “junk food” (i.e. potato chips, cookies, and candy). The questions proposed by the study are: how much does a customer’s mood affect their choice when shopping? And is there a correlation between mood and what a customer focuses their eye gaze on, especially when given the choice between healthy or unhealthy food options? The proposed hypothesis in this study is that users with lower mood levels will choose unhealthier food options, and users with higher mood levels will choose healthier food options.

2 BACKGROUND

A study conducted researching the effect of mood on participants’ food choice found that those with a lower mood tended to gravitate more towards unhealthier food options, while those correlated with a higher mood were bound to choose healthier food options Gardner et al. [2014]. Visual attention is an important area of research which Schupp et al. [2007] found that emotion was tied to visual attention. Bartkiene et al. [2019] found that during stressful periods, people tend to have unhealthier food choice habits and suggest that mood has a direct link to the choice of foods that people are inclined to eat. In order to find out if visual attention is a good enough measure for cognitive preference, Evans et al. [2011] stated that visual attention is a process which requires multiple parts of the brain for a process of selection. Other previous research also suggest that mood can elicit a response that focuses more on a rewarding stimuli Tamir and Robinson [2007].

3 EMPIRICAL VALIDATION

We conducted experiments to evaluate the effectiveness of packaging on swaying the user to choose healthy or unhealthy food options, as stated in our hypothesis.
3.1 Experimental Design
In summary, this experiment will implement a 2 x 2 within subjects design with food products that have had their logos and markings removed to reduce bias toward brand. The experimental design has been broken down into three main parts: the participants involved, the experimental procedure, and the apparatus involved in order to conduct the experiment.

3.2 Participants
The number of subjects participating in this experiment will be approximately 20-30 people, with an age range of such participants being between 18-30 years old. The participants will not receive any incentive, and their identities will remain anonymous by the researchers guiding them through the procedure steps. At the end of the experiment, a determination will be made whether or not the data collection supported the hypothesis.

3.3 Procedure
At the beginning of the experiment, the researchers will have the computer setup and ready to go. The test subject user will be instructed to complete a pre-experiment survey before beginning the experiment, containing questions about the user’s age and gender demographic, as well as questions regarding the user’s current mood, and more. The researcher will assign a participant number to the user and will keep their name anonymous.

Once the pre-experiment survey has completed, the user will be walked through the calibration steps with the Gazepoint eye-tracker’s “Gazepoint Control” software. The user will be instructed to look directly at the screen, and should be able to see their eyes show up in two separate panels, along with a gauge that moves from left to right as the user moves further or closer towards the eye-tracker. The user will need to ensure that their distance, corresponding to the moving circle on the gauge, is as close to the center as possible. This will allow an effective and appropriate distance between the user and the eye-tracker for proper experimentation setup and data collection. Note that the user should not look into the eye-tracker, but rather, directly at the computer screen.

Once Gazepoint Control is open and running, the researcher will walk the user through PsychoPy to run the overall experiment. Once the experiment is running, there will be calibration steps that the user completes in order to ensure proper eye-tracking functionality for smooth operation of the experiment. After calibration, the user will follow the on-screen instructions to begin the experiment. First, a set of three images - a healthy food option, unhealthy food option, and a random image - will all appear on the screen in a triangular arrangement. These images will have a randomized orientation for each experiment and the order of the images will also be randomized. The participant is to look at the items on the screen that are most interesting or appealing to them. There is no right or wrong image to focus one’s gaze upon. The program will randomly shift after 10 seconds to the next set of three images, and will keep running until all possibilities of image arrangements have been exhausted.

At the end, there will be text prompting the user that the experiment has ended. Once this step has been reached, the user is to complete a post-experiment survey provided by the researchers, containing questions about their mood and how this influenced their item selection. This will provide data for the researchers to use to determine whether or not the hypothesis was supported.

3.4 Apparatus
The necessary items for the experimental design include: 1. Gazepoint GP3 Eyetracker with a 60 Hz sampling rate and accuracy at 1 degree, 2. Chair for participants to sit in during the experiment, 3. Table for the computer and other hardware to rest on, 4. Printed copies of both the pre-experiment and post-experiment surveys, 5. Writing utensil for the user to complete the pre- and post-experiment surveys with, 6. Microsoft Desktop computer running Windows 10 Enterprise, with “Gazepoint Control” and “PsychoPy” installed, and 7. Dell computer monitor with a resolution of 1920 x 1080, and a diagonal monitor screen size of 60 centimeters (23.62 inches).

It is also implied that there will be a human user participating in the experiment, as well as at least one human researcher guiding the user through any steps of the experimental design.

4 DISCUSSION
Discussion

5 LIMITATIONS & FUTURE WORK
Limitations and Future Work

6 CONCLUSION
Conclusion

REFERENCES