Human Computer Interactions within SONA psychological experiments

Preshtibye Raggoo

College of Engineering & Computer Science

The Australian National University

u7522927@anu.edu.au

Abstract

This report discusses two experiences set up by SONA, in an attempt to establish a relationship between human-computer interaction and web design. The two experiments that will be thoroughly analyzed in the following sections both relate to cognitive performance of the human brain in response to stimuli, that being content displayed on the screen. The latter allows us to establish a relationship between human computer interaction and web design as studying people's response to stimuli in the form of texts and images is a convenient way to depict what is most suitable for website users when designing the latters.

Introduction

The first experiment that will be detailed below is the 'Everyday Cognitive Failures' study. It involves elements of Human Computer Interaction that will be further elaborated on in the following section. Its general methodology involves making participants respond to stimuli on the screen as well as evaluating their capacity to retain information and also tests the attention span of the participants. The second experiment that will be studied also encompasses similar elements, with the addition of more graphic images to which participants are exposed to, collecting data on both the user's attention span as well as emotional response to those stimuli.

Everyday Cognitive Failures Study

This experiment aims at examining the cognitive behavior of the human mind in response to stimuli and how it varies with factors like repetitiveness, frequency and variation of visuals. It also takes into account the mental state of the participant. Statistics about the latter are collected in the form of questions about social habits, emotional state and current situation. For example, the study included a series of questions about the participant's anxiety, stress and depression levels in the past week in order to find a correlation between the participant's responses to the questions and stimuli presented to them by the study and their mental state. The study also tests the reflexes of the participant by varying their stimuli at an increasing speed throughout the experiment. For example at one point, the participant is asked to make the choice between two options, by selecting which one conforms to the prompt given. An example of that is I was asked to select which of the two graphics contained the letter T, and this question was repeated multiple times but in various mediums, like the letter H filled with the letter T to test the alertness of the participant, and at varying speed.

As a participant, my affirmation is that the experiment was well presented, with various scenarios and set at an adequate pace. While this experiment might have proved to be boring if stretched longer, the study was set in such a way that the duration was well thought of such that cognitive behavior is not affected by other factors like loss of interest in the study by the participant. In addition, while the questions asked in the brief survey about the 'mental health' of the participant, the questions were not invasive and conform to the guidelines of a successful and concise study.

Attention and Emotion Study

The second study I partook in was also conducted online, making it convenient and available to a larger pool of participants. This study does come with a warning, making participants aware that it does include some graphic images that may be

triggering to some people. I think that this is one of the best aspects of the study as it ensures that its participants are well aware of the contents of the latter prior to starting the experiment. The experiment consists of exposing the participants to some intense images of various intensity levels to test how the attention span varies after exposure to such visuals. It covers the spectrum of both images reinforcing positive vibes as well as images that may dig up negative emotions on the viewers' side. The viewer is exposed to some mundane images like flowers as well as images of erotic nature like nude bodies or pornographic images to see how their attention wavers according to the nature of those images. The viewer is also exposed to some distressing images like mutilated bodies or bodily fluids. Following the viewing of each series of images, the participant is prompted with some simple questions like in the first experiment so that data can be collected as to what images cause the attention of participants to waver.

The downside of this study would be its length. I feel like the study was way longer than it needed to be as by the end of the experiment, rather than just the nature of the images affecting my responses, it was more the need to finish the experiment as soon as possible.

Comparison of the two experiments

Both experiments contain graphic elements with the aim of testing the reaction of tha participant towards them. While the first experiment focuses more on the attention span and cognitive alertness of the participant, the second experiment is more focused in its focal point, in that it is more precise in what it exposes the user to.

Overall, both experiments were well constructed and structured. They were both quite concise in their questions and the aim of both experiments were explicit. The websites designed for conducting those experiments were also well structured to focus on the task at hand and were straight-forward to use.

The only downside that I spotted as a participant is the lack of a feedback survey. A feedback survey with questions specifically designated to the participant to share how their experience with the participation of those experiments was would have been helpful for any future experiments that the researchers might conduct and allow for a margin of improvement in any future development of HCI environment for such online studies.

Relevance of user-participation experiments to web design and development

The statistics collected by those responsible in the first study could be used to develop more captivating websites as the HCI elements in this study directly correlate as to what content web developers should be focusing more to reach their target audience. For example, the study also asks the participant to input an estimate of their screen exposure time as well as the time spent on video games. This information could help web designers of websites targeted towards gamers to have a better understanding of what kind of visual and textual content retains the attention of the viewers of such websites.

The second experiment also includes several HCI elements. This experiment involves several HCI elements, which may allow web designers to determine what type of graphics are to be avoided in the creation of websites. I think that data collected in this study may also allow website developers to deem what kinds of ads are appropriate and will draw a greater audience.

Conclusion

Both experiments focus on the participant's perception of content on the screen, bridging the gap between the collection of data via those studies and human computer interaction.

While those experiments' data could be used for a plethora of studies, they can greatly contribute to keeping web designers up to date to the content that is most likely to attract a greater number of users to their websites.