The Effect of Positive Mood Induction on Eye Fixation in a Visual Search Task

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The effects of positive mood induction on eye fixation were examined. Participants included 15 male and female Belmont University undergraduate students. The participants were primed for a positive mood by using a classical musical piece combined with a positive mood induction survey, which asked participants to rate various positive scenarios. The neutral group listened to a different piece of classical music, but were not primed with the positive mood survey. All participants completed a visual task, while their gaze was recorded by an eye tracking program. It was found that positive mood did not increase attention toward positive visual stimuli over negative visual stimuli, but further research should be done to gain more knowledge on the topic.

In *Principles of Psychology*, William James (1890) wrote, "Everyone knows what attention is. It is the taking possession by the mind in clear and vivid form, of one out of what seem several simultaneously possible objects or trains of thought...It implies withdrawal from some things in order to deal effectively with others" (p. 403-4). It is impossible for the human brain to process everything in sight. This begs the question: What determines what we attend to? Selective visual attention helps us process the world around us and determine what our brain can and cannot process. The way each individual views the world is influenced by various stimuli that will later serve as a point of recognition or a memory trigger (Valuch, 2013). To fully understand how and why individuals focus on certain objects rather than others can be a complex process.

Studies have been conducted confirming that visual attention can be easily altered or manipulated by tasks, color, and mindset. In 2013, Valuch et al. wanted to know whether a recognition task increased the number of fixations on certain details that repeat from learning to recognition. Eye fixations were measured during a memorization task and later a recognition task in order to see how participants’ selective visual attention were altered depending on how the participants were primed before each task. Participants fixated on previously seen images more often than completely new images. This confirmed Valuch’s original hypothesis that manipulating mindset can determine participants’ eye gaze while completing a memory or recognition task.

Furthering research, certain mood states can provide a bias for selective attention. In 2006, Anderson et al. suggested certain mood inductions are connected with changes in attention that affect perception and cognition. It was hypothesized that with positive mood, a change would occur in selective attention that would increase “cognitive flexibility and creative thinking” (Anderson, 2006). Participants went under positive or negative mood induction and were then asked to complete a visual search task. The participants who had the positive mood induction tended to have more holistic processing (i.e., viewing a forest over simply one tree), while the participants under negative mood induction had more focused, selective viewing patterns. This shows that positive affect may represent a shift in the way the human brain processes information.
According to Tamir and Robinson (2007), much of the research conducted on mood and selective attention has primarily focused on negative mood states and disorders, including fear, anxiety, and depression. Further research is needed for the understanding of how different moods may influence participants’ selective visual attention, specifically positive moods.

Sanchez, Vasquez, Gomez, and Joorman (2014) reported most research studies thus far have examined how participants’ attentional process may be altered by introducing positive mood induction and therefore changing their stress level. Ultimately, this led Sanchez and colleagues to research the specific relationship between attention and mood. Participants underwent positive or negative mood induction and then were asked to view a slideshow of images, each slide having one positive human face and one negative human face. It was found that positive mood induction resulted in higher attention to positive faces as compared to the baseline. The present study intends to determine how positive mood may influence participant perception. Based on previous research in the field of mood induction and attentional preferences, it was hypothesized that positive mood will increase attention toward positive visual stimuli over negative visual stimuli.

**Method**

**Participants**

Fifteen undergraduate students, 5 women and 10 men, from Belmont University introductory psychology courses voluntarily participated in the study. Participants were recruited through an online registration system and were offered course credit as compensation for their participation. Ages ranged from 18-43 years ($M=22.47$).

**Materials**

Materials included a consent form and demographics form, the Mood-Induction Procedure (MIP) (Mayer, 1995), the Eye Metrix eye tracker by Mirametrix, a 42” Samsung SmartTV monitor, an Alienware Aurora desktop computer, the International Affective Picture System (IAPS; Lang, Bradley & Cuthbert, 1995), the Mood Thermometer (Tuckman, 1988), and finally a debriefing form.

The purpose of the consent form was to inform the participants that they are voluntarily participating in a research study and that they reserve the right to withdraw from the study at any time. The demographic form was used to gather information about the participants that included: sex, age, year in school, and degree of study. The debriefing form, in addition to verbal debriefing, was used to give participants knowledge of the purpose of the study, related studies, when and where the study is going to be presented, contacts if there are any concerns or questions about the study, and to not disclose the nature of the study.

The Mood Thermometer (Tuckman, 1988) was used to measure the mood of the participant after the visual search task was completed, it served as a way to determine if the participant was primed to the condition to which they were assigned.
The Mood-Induction Procedure (MIP) was from a study conducted by Mayer et. al (1995). The MIP consisted of 8 likert type items that instructed participants to rate how happy a certain scenario would make them feel from 1 (not happy at all)-5 (extremely happy). An example item of the MIP stated, “You just won the lottery for $100,000 how happy does that make you feel?” The MIP yields an overall score of 40, a higher score indicates a higher positive mood. Participants assigned to the experimental condition listened to *Flute Concerto No. 2 in D major* while filling out the MIP. For those in the neutral condition, participants were not administered the MIP and were only instructed to listen to *Coppelia Mazurka* for one minute, which acted as a neutral primer.

The pictures selected for the visual search task were carefully chosen from the International Affective Picture System (IAPS) developed by Lang, Bradley and Cuthbert in 1995. The slide show consisted of 12 slides, with two images per slide, one positive and one negative. Each images selected had been previously validated and assigned a number between 1 and 5, indicating its positive or negative rating (1- very negative, 5- very positive). The mean for the 12 positive images selected was 3.16 and the mean of the 12 negative images was 1.77. All participants were shown the slide show; however, those in the experimental condition continued to listen to *Flute Concerto in D Major* and those in the neutral condition listened to *Coppelia Mazurka*. Both songs have been successfully implemented in previous studies and shown to be successful (i.e. Martin & Metha, 1997; Mayer et al., 1995; Siemer, 2005).

**Procedure**

All participants were randomly assigned to either the neutral or positive condition, prior to the beginning of each session. Upon arrival, participants read and signed the consent form, followed by the demographics form. Then, depending on the condition, participants were asked to fill out the MIP while listening to the *Flute Concerto in D Major* (Positive) or simply listen to *Coppelia Mazurka* for one minute (Neutral). Then all participants were calibrated to the Mirametrix Eye Tracker and presented with the visual search task slideshow that included the IAPS positive and negative images. The Eye Tracker was used to record the information about their eye gaze and their preference of either the positive or negative images from the slideshow. After the slideshow, participants filled out the Mood Thermometer to measure whether their mood had been altered according to their assigned condition. Once participants had completed the given tasks and had been debriefed on the purposes of the research, they were thanked for their time and given class credit. Each session lasted approximately 30 minutes with one to two participants per session.

**Results**

A 2-sample t-test was conducted to compare the mean difference between positive and neutral mood induction groups. There were a total number of 72 trials within each mood induction group (see Table 1). These 72 trials consisted of 6 participants that viewed 12 slides each; 3 participants had to be removed due to eye tracker malfunctions. The data was analyzed by measuring the total percentage of time that the participants fixated on the positive stimuli during each slide’s ten-second duration. The percentage of time each participant fixated on the negative
stimuli could also have been found by taking the number for the positive fixation and subtracting from zero, but it was not necessary for the scope of our study. Though the neutral induction group ($M=38.70$, $SD=21.15$) focused slightly more on the positive images than the positive induction group ($M=35.28$, $SD=9.82$), there was not a significant difference in the mean percentage of time, $t(141)=-1$, $p > .05$.

**Discussion**

The results suggest that positive mood does not increase attention toward positive visual stimuli over negative visual stimuli. This is unusual, as previous research has been shown where the positive mood would have produced a favoring to the positive visual stimuli, but instead, no such favoring was found, and it was observed that the positive and neutral conditions were actually extremely similar in our findings (Sanchez, Vasquez, Gomez, & Joorman 2014). This shows that the hypothesis of positive mood induction resulting in longer eye fixation on positive stimuli was not supported within the scope of the current study.

As with previous studies, this one contained its fair share of limitations. One of these would be that the small sample size of 15 participants, of whom only 12 had analyzable data. With a larger sample size, the statistical power would increase. Therefore, further research should be conducted with a larger sample size. Other major limitations were the various technical malfunctions with the eye tracker. These malfunctions were one of the key factors not all 15 of the participants could be analyzed in the study. Many of these malfunctions were likely due to the participants’ corrective eye wear, such as glasses or contact lenses. The mood induction technique may also have been another limitation. Despite best efforts to induce the participants with certain moods, the data did not show a significant difference in the two inductions, and almost shows a trend toward the neutral induction group behaving how the positive group was expected to perform. Future studies should explore the use of techniques that keeps the induction for longer periods of time, and should explore mood induction techniques that may exhibit greater mood responses.

Though previous research had shown that participants who had positive mood induction had greater attention to positive facial stimuli, this study did not show similar results of positive mood and attention in regard to general positive stimuli. After this study, the hypothesis that positive mood will increase attention toward positive visual stimuli over negative visual stimuli was not supported. This indicates that further research is needed in determining how eye fixation is dependent on mood.

**References**


