Effect of colors on the brain and on emotions

Life, Emotions

Introduction Colors are an intimate facet of our everyday lives and exist in everything that we see. Colors and emotions have a strong relationship between them. It is widely recognized that colors have also a strong impact on our emotions and feelings (Hemphill, 1996; Lang, 1993; Mahnke, 1996). The color red has been associated with excitement, strength, sex, passion, speed, and danger. White has been associated with pure, virginal, clean, youthful, and mild. Blue that is most popular color has been associated with trust, reliability, belonging, and coolness. Black is allied with sophistication, elegant, seductive, mystery, and sexual. And Pink is allied with soft, sweet, nurture, and security. Colors are linked with many different emotions. All colors have positive and negative impression connected with it. It has been tested and proven that colors have different alpha rate associated with it. The purpose of the study was to see if the brain responses differently while looking at different colors and to see if there were any connections between color and emotions. Methods Participants The data for this study was gathered by a total of 11 participants from Cognitive Neuroscience Lab class (4 male and 7 female) at the University Center, Lake County Campus. Among those participants included one professor and the other ten consisted of undergraduate students from psychology department at Northeastern Illinois University. All the participants tested had no sort of color deficiency. Stimuli Series of six questions were prepared for the experiment consisting of two parts: the first part included power-point with the five different colors playing each for 20 seconds followed by the questionnaire. The series of questions asked the participants about their emotional stage while looking at the colors. Five random colors were chosen based on cultural reference for

America. The colors consisted of red, white, blue, black and pink. The color samples were prepared using Microsoft PowerPoint 2010 software. Procedure For this study, participants were tested individually in a classroom designed as a computer lab. Each participant was seated front of a desktop computer. The monitor displayed each color illustration full screened one at a time which lasted 20 seconds each. Participants were told to look for a smiley face while looking at colors to keep them focused on the screen. Each participant was observed under the NeuroSky Mindset EEG while viewing the colors to record their brain activity. The order of color illustration was same for all the participants. After each participant was done looking at the colors; they were asked a series of questions related to emotions. Participants were asked, “ What emotional response do you associate with (name of color)? and What color attracted you more? " These questions were modified from Boyatizis and Varghese (1994) and Hemphill (1996). Only one response was permitted for each question. The answers were recorded on an observation sheet. Each observation lasted about 5 minutes each. Results Data for this study was analyzed using Microsoft Excel. The median and mean was conducted to get the different alpha amplitude. There were a total of seven different responses for answers to choose from for the emotion section of the questionnaire and five different colors to choose from for the response to what color attracted the participant more. Some of the questions had the same meaning (e. g., calm, angry) and some had different meaning such as (honest, stable). Based on the results; red had the highest amplitude which means that participants were calm while watching the color red. Pink had the lowest amplitude which means that participants were excited or stressed

while watching the color pink. The average mean ranged from 29. 3 - 11. 6. Even though red is considered an excited color; the EEG showed that participants were more calm or relaxed while observing red. Pink is considered a soft and sweet color but the EEG showed that participants were stressed and excited while observing pink. One-tailed t-test was used to analyze the data for significance. There was significance between all colors except when we compared red vs. white and white vs. black. The p-value for red and white was 0. 1, for white and blue p-value was 0. 02, between blue and black p-value was . 14, and p-value between black and pink was 0. 03. These results show that there was significance difference in alpha. The different amplitude showed the different alpha rate. Nine out of eleven participants chose pink as most excited color and six out of eleven chose pink as their favorite color. This shows a correlation between brain activity and emotions. The EEG showed pink as the most stressed or excited color and the participants chose pink as more excited as the answer to one of the question for experiment. Discussion The main aim for this study was to examine color-brain activity allied with emotions among random sample from undergraduate students and professor. The present study consisted of five different colors including red, white, blue, black and pink. A headset from NeuroSky Mindset, desktop computer and a questionnaire. Overall, 54. 4% participants said that pink was their favorite color and 81. 8% of participants said that they felt excited when they say the color pink. 18% of participants said they were attracted to the color red and the rest of 27% was distributed equally among the color white, blue and black. The results concluded that there was a significant different among all the colors except

for red vs. white and black vs. white. A total of six participants said that they felt danger when they saw red but the EEG results showed the opposite concluding that they were more relaxed. A total of six participants said they felt calm while looking at white and seven said they were calm while looking at blue color. Almost all for except one said they felt serious while seeing the color black. For future studies, I would have the participants write their emotional response right after they see the color and have them decide what response they feel instead of having them to choose one of the answers given. References Boyatzis, C. J., & Varghese, R. (1994). Children's emotional associations with colors. Journal of Genetic Psychology, 155, 77-85. Hemphill, M. (1996). A note on adults' color-emotion associations. Journal of Genetic Psychology, 157, 275-281. Lang, J. (1993). Creating architectural theory: The role of the behavioral sciences in environmental design. New York: Van Nostrand Reinhold. Mahnke F. (1996). Color, environment, human response. New York: Van Nostrand Reinhold.