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The Color Red Enhances Men's and Women's Attraction to the Opposite Sex

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Based on previous research, the color red has been shown to enhance one's attraction to the opposite sex. We hypothesized that if a photo of the opposite sex was framed in red, then people would rate it as more attractive than if the same photo were framed in white. Furthermore, all things being equal, men would prefer the photo framed in the darker shade whereas women would prefer the photo framed in a lighter shade of red. A total of 38 participants were shown five photos and selected the photo they found most attractive. The results revealed partial support for our hypotheses.

When conducting our study on the color red, we specifically examined the relationship between the color red and behavior. Our study had several purposes. Our first purpose was to try and establish whether or not the color red affected an individual's attraction to the opposite sex and if so, to what extent? Furthermore, we were curious to know if there was a biological connection, social connection, or a combination of both to the color red. For our second purpose, we further studied the relationship between the color red and behavior. We wondered if a particular shade of red made a difference in whether or not attraction was increased. In addition, we wondered if the preferred shade of red varied between genders.

Elliot and Niesta (2008) were interested in the connection between color and behavior. Specifically, they wanted to know if the color red would increase men's attraction to women. Through the use of psychological experiments Elliot and Niesta found that red did enhance men's attraction to women in the context of relationships and that men were unaware of the color's influence. During their study, Elliot and Niesta further examined the biological and

social link to the color red. In terms of social links, for example, there was a distinct connection between the color red and hearts on Valentine's Day. In terms of biological links, for example, women naturally become flushed when sexually aroused which sends a sexual signal to men.

To quantify the effects of red, Elliot and Niesta (2008) exposed men to photographs of women under a number of different conditions. Each individual condition used identical photos of a woman. For example, an identical photograph of a woman was placed in a red frame and a white frame side by side and the subject was asked, "How pretty do you think this person is?" In another condition, the woman's shirt in the photograph was altered to be red in one photo and blue in the other. Both photos were identical aside from shirt color. In this condition the participants were asked about their attraction to the woman and their intentions regarding dating her. The participants were asked, "Imagine that you are going on a date with this person and have $100 in your wallet. How much money would you be willing to spend on your date?" The studies concluded that participants preferred the photos that contained red over any other color. Participants rated the photos containing red as more attractive. Participants were also more willing to date and spend more money on the photos of women who were wearing red. Elliot and Niesta further believe that their findings will be useful in the dating, fashion design, and product marketing industries.

Kaya and Epps (2004) examined the relationship between color and emotion. Ninety-eight college students were asked to rate their emotional response to five principle hues. Specifically, they were to rate the positive and negative emotions they felt while observing the color. The five colors examined by the participants were red, yellow, green, blue, and purple. The participants also examined different color combinations. The color combinations were

yellow/red, green/yellow, blue/green, purple/blue, and red/purple. The results pertaining specifically to the color red were that the color red was most often associated with excitement and considered stimulating. The color red had both positive and negative impressions such as, "active, strong, passionate, warm...and aggressive, bloody, raging, and intense" (p.396).

Kaya and Epps (2004) noted that color and emotions are related to color preference. Color preference pertains to the type of emotions experienced when viewing the color. According to Kaya and Epps, brighter colors are preferred and bring about feelings of happiness and darker colors are less preferred and bring about negative feelings such as sadness. In the study, the color red evoked both positive and negative reactions. The color red is considered positive because it is associated with love and romance while it is negatively associated with fighting, blood, Satan, and evil. Red often reminds people of Valentine's Day and the shape of hearts (Kaya & Epps).

Whitfield and Wiltshire (1990) performed a critical review of Color Psychology. Color Psychology examines color preference and the different effects it has on individuals and groups as a whole (Whitfield & Wiltshire). Most of the studies they reviewed were flawed and needed corrections in the area of methodology. For example, the stimulus used was not always exactly the same for each participant when it was intended to be. Another example was that participants were not always given the same instructions; therefore they carried out different tasks for the same condition. However, even though these studies were flawed, they still contained useful information. The studies reviewed examined what exactly color preference was and more importantly what factors influenced an individual's color preference. The review found that differences in color preference depended on age. Ranging from young children up to adults, they

all preferred different colors. Women also seemed to differ from men in their color preference. In terms of gender, women rated warmer colors more pleasant while men rated cooler colors more pleasant. In addition, researchers found that differences existed among groups of people as a whole and between those individuals within that same group (Whitfield & Wiltshire).

According to Whitfield and Wiltshire's (1990) review, researchers believe that color preference was based on the hue of the color, the value or brightness of the color, and the chroma or saturation of the color. Many individuals perceive color as possessing mood and emotional characteristics. Besides age and gender, color, value, and chroma of the color all influencing color preference, research suggests that other physical factors related specifically to participants also contribute to color preference. In one study, participants were asked to evaluate the colors red, blue, yellow, and green. Each had three different levels of brightness and was viewed in a room where there were three very different levels of temperature. The study concluded that the cooler shades of color were preferred in warmer conditions and the warmer shades of color were preferred in the cooler conditions. The research concluded by noting that physical conditions only influenced color preference in extreme cases (Whitfield &Wiltshire).

Meola (2005) set out to answer the question, does color influence our lives? Before answering this question, Meola examined what exactly makes up color. When we see color, we are seeing light refracted. Sir Isaac Newton discovered that the light was broken into a range of colors. These colors were red, orange, yellow, green, blue, indigo, and violet. These color waves have specific lengths and vibrations which causes them to appear the way they do. The longer end of the spectrum, at 700nm, is seen as the color red. The shorter end of the spectrum, at 400nm, is seen as violet. Due to the difference in wave lengths and vibrations, infrared, for

example, is felt as heat and waves at the violet end of the spectrum are felt as cooler. This is why we have distinguished some colors as "cool" colors and others as "warm" colors.

Meola (2005) explored all seven colors of the spectrum. When he examined the color red he had some interesting findings. When exposed to pure red light, individuals were stimulated by the light. Specifically, individuals experienced an increase in heart rate, respiration, and blood pressure. The red light had an exciting effect on their nervous system. Interestingly, Meola suggested that due to the color red's stimulating effects, red stop signs and red car tail lights could be contributing to road rage. Meola also examined the positive and negative associations and impressions Americans assign to the color red. Mental associations to the color red were hot, fire, and blood. Direct associations made were danger and Christmas. Objective impressions were passionate and exciting and subjective impressions were rage and fierceness.

Meola (2005) concluded his study by examining the relationship between color and the perceived tastes of foods and the effects of color in our surrounding environment, specifically the work place. The color red is associated with sweetness, such as watermelon, strawberries, or cherries. In a study conducted on junior high students, non-flavored gelatin was presented to the students. The gelatins were all identical except for color. The participants all perceived the red colored gelatin as sweeter tasting than, for example, the green gelatin which was perceived as less sweet. In terms of work environment, Meola found that while a red office was more stimulating and may cause feelings of anger or tension, work performance did increase.

Color allows people to identify and organize their environment. Therefore, individuals always interpret and assign different meanings to color every time they see them. People respond to color visually, intellectually, consciously, and unconsciously (Byrne, 1973).

Psychologists have found that particular colors arouse particular thoughts and emotions that can alter our behavior and/or provoke particular moods. Since the meanings we assign to color can be subjective or learned, does this suggest that colors take on different meanings in different cultures or is there a universal link to colors across cultural boundaries (Byrne)?

Byrne (1973) examined similar interpretations and meanings assigned to colors across different cultures. The color red is the dominant color in China. It is the color for good luck, happiness, and promotes a long life. The Japanese culture associates the color red with the sun which is seen as a fiery ball that gives life. In the Unites States, the Christian religion depicts Christ with red robes which symbolize the sacrifice for life, passion, and love of Jesus Christ. The color red can also be seen in the different flags around the world. Ninety-seven percent of the flags from Asia, Africa, Europe, Latin America, the Middle East, and the United States incorporated the color red. While each country may be very different from each other in terms of their culture and philosophy, there is universal acceptance of the meaning of the colors used in the flags. Other similarities pertaining to the color red were found across cultures. For example, red was considered the most exciting color in the United States and Japan. The color red was preferred by both men and women from multiple cultures and ethnicities. Coca-Cola even uses the color red to represent them all over the world because it has universal acceptance in meaning. While the meanings associated with color can vary and are subjective from individual to individual, there seems to still be a universal connection between color and the associated interpretations and meanings assigned to them across cultures.

Elliot and Maier (2007) conducted a study to create a general model of color and psychological functioning. Through their literature research they found that red is naturally

experienced as stimulating and arousing due to its longer wavelength. In their study they hypothesized that the color red stimulates reactions such as romance, sexual readiness, passion and attractiveness. They theorized that these stimuli can be biologically based on the use of red to attract future mates in nonhuman mammals.

Alliot, Moeller, Friedman, Maier, and Meinhardt (2007) believed that individuals learn to react and think a certain way when we see a color. The color red can mean a variety of different things, as well as make us feel different ways. Red can mean danger but it can also bring pleasure and sexual arousal. The color red can stir up passion, lust, or love. Red is also said to invoke action; Alliot, et al. found that a thief tends to steal more red cars than any other color car.

Before conducting our study, two hypotheses were formulated. Our first hypothesis was that if a photo of the opposite sex were framed in red, then participants would rate the individual in the photograph as more attractive than if the same photo were framed in white. Furthermore, all things being equal, our second hypothesis stated that men would prefer the photo framed in a darker shade of red whereas women would prefer the photo framed in a lighter shade of red. We clearly believe that gender will influence the preferred shade of red and that the color red will increase the participant's attraction to the opposite sex.

In order to conduct our study, participants were recruited through the Human Subject Pool at Lindenwood University. On arrival, participants were asked to fill out several forms, such an informed consent and a pre-survey, before the study began. Once the study began, participants were given one minute to view several photos. To conclude the study, participants filled out a post-survey and were provided a feedback letter.

Method

Participants

For our study we recruited students from Lindenwood University through the use of the Human Subject Pool (HSP). Seventeen men and 21 women ranging from 18-26 years of age were recruited. Students involved in the HSP are usually enrolled in entry level Psychology, Anthropology and Sociology classes. For their participation, students may receive bonus points in these classes. To ensure that students do not repeat the same experiment twice, they are only allowed to participate in an experiment once. From our data collected, we concluded that only one participant was color blind and 16 out of 38 participants wore corrective eyewear. Sixteen participants selected blue as their favorite color, eight participants selected red as their favorite color and five participants selected green as their favorite color. These were the top three favorite color selections.

At the end of our study, two participants' data had to be excluded from the final results. One participant's data was excluded because he was colorblind. The second participant's data was excluded because the participant wore corrective eyewear but was not wearing it at the time of the study. With both participants, we were concerned that they would not be able to accurately distinguish between the different shades of red and photos. We were concerned that their choice would have been influenced indirectly by their vision.

Materials

Four cardboard picture frames were used varying in shades of red (light to dark) with the fourth frame being completely white. Each frame was labeled either A, B, C, or D (see Appendices A & B). The colored frames were used to determine which shade of red

men/women would select most often. A large piece of poster board was also used to attach the four picture frames to. An additional poster board was used to conceal the photos until the participant was ready to view them. Two photos were selected to be used in this research project. The photos selected were black and white and were headshots of a random man and woman. The photos were removed from the photo frames they were purchased in. The photos were purchased from a Target shopping center. We tried to choose photos of individuals we felt were of average attraction to the majority of the population. Unfortunately, there was some subjectivity to our selections.

Other materials ranged from writing utensils, several documents (including a pre-survey [see Appendix C] and post-survey [see Appendix D], participant lists and receipts, consent forms [see Appendix E], feedback letters [see Appendix F] and a stop watch). The study took place in Young Hall, room 105, lab B on Lindenwood University's campus. The room was well lit and quiet. The room contained a long table with one chair on the left side (for participants) and two chairs on the right side (for researchers). This setup allowed for the researchers to face the participants. There was also a computer desk with a monitor and a chair.

Procedure

For our research project participants were recruited through the HSP at Lindenwood University. Before conducting the study, participants were given two copies of the informed consent form to read and sign. Participants were allowed to retain one copy for themselves and one copy was kept by the researchers to be filed (see Appendix E). Participants were then given an anonymous pre-survey questioning them about their gender, age, if they were color blind or

wore corrective eyewear, and what their favorite color was. Once the pre-survey was completed it was collected and retained by researchers.

Next, participants were informed that the study would begin and that they would have one minute to observe the photos. Participants were asked, "Which man/woman do you find more attractive?" The participants were then shown four identical framed photos of a man/woman (depending on participant's gender). Three of the picture frames were different shades of red, a light red, a medium red, and a dark red. The fourth picture frame was white. All of the picture frames were equal in brightness and saturation level. Participants were given exactly one minute from the time the photos were shown to the participants, until the one minute was up at which point the photos were covered back up and removed. A stop watch was used to keep track of time.

The participant was then given a post-survey that asked, "Which man/woman do you find more attractive?" Each frame was labeled A, B, C, or D. The participant then circled the letter that corresponded to the picture of their choice on the post-survey. The post-survey asked, "How attractive do you think this person is?" The participant then circled a number ranging from 1 being not at all to 5 being extremely attractive. The final question on the post-survey asked, "Which of the following factors influenced your choice the most?" The factors were as follows: the man's/woman's facial expression, the way the man/woman was dressed, or the color in which the photo was placed (see Appendix D). The post-survey also remained anonymous. To conclude the study, participants were given a feedback letter explaining the purpose of the experiment and contained contact information if they had any further questions (see Appendix F).

Results

For our first hypothesis, we performed a related sample t-test. Our first hypothesis stated if a photo of the opposite sex were framed in red, then people would rate it as more attractive than if the same photo were framed in white. The results from our statistical analysis yielded statistical significance, $t\ (37) = -5.559$, $p<.001$.

For our second hypothesis, we performed a *Chi-Square* analysis (2[sex] x 4[shade]). Our second hypothesis stated all things being equal, men would prefer the photo framed in the darker shade of red whereas women would prefer the photo framed in a lighter shade of red. The results from our statistical analysis yielded no statistical significance, $\chi^2_{(3)} = 6.442$, p=.093.

Discussion

For our first hypothesis, which stated if a photo of the opposite sex were framed in red then people would rate it as more attractive than if the same photo were framed in white, resulted in statistical significance. It turns out that the results from our first hypothesis supported similar findings from other studies. Based on our significance, the color red did increase attraction of the opposite sex. The three photos framed in red were selected as more attractive than the photo framed in the white frame. Other researchers, such as Elliot and Niesta (2008), had similar results when they compared the color red to other colors such as blue or green.

While our second hypothesis yielded no statistical significance, there were however, other interesting findings worth mentioning. Our second hypothesis stated all things being equal; men would prefer the photo framed in the darker shade of red whereas women would prefer the photo framed in a lighter shade of red. Majority of both men and women selected photo "A" as

most attractive. Photo "A" was framed in the darkest shade of red. Specifically, six men and ten women selected photo "A". Photo "D", which was framed in white, was the least selected photo.

Current research today has been geared more towards men and the color red and not women and the color red. While we did not find a gender difference in our second hypothesis, we believe that further research is still warranted. For example, there may be gender differences between the preference of pastel colors and non pastel colors.

As researchers, it is important to examine your results and what may have influenced a study's outcome. A concern of ours pertaining to our study was the layout of the photos. The darkest shade of red frame always appeared to the far left and was always labeled "A". Seeing as how individuals read left to right, was the darkest shade of red selected most often because of its color or was it because it was first in the sequence and was labeled "A"? In the future, the arrangement of the colors needs to be mixed up and additional colors, such a blue or green, should be added.

When reviewing possible limitations of our study, it was apparent that a few did exist. For example, one limitation in our study was that we were limited on subjects so our sample data was small. Although 56 available openings were offered, only 38 participants actually attended the study. Had we had more time to conduct our study, we believe we would have been able to recruit more participants. Another limitation to our study was that the majority of our participants were women. This had a direct effect on our results based on gender differences, making our sample biased. We could possibly avoid this limitation in the future by recruiting participants through other avenues. This would be especially important for future research in the

area of color and gender differences. We would want to have an equal amount of men and women when comparing the two.

In addition to gearing future research towards gender differences, one may want to examine color preference and personality types. The future research could examine common personality types and favorite color combinations. Maybe outgoing women prefer the color red and wear it often. So, is it the color red that men are attracted to or is it that the woman is more outgoing and more available to men? Either way, there is much more to learn about the relationship between color and behavior.

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Author Note

Heather Franklin, Lindenwood University Undergraduate Psychology Student; Jessica Forbes, Lindenwood University Undergraduate Psychology Student.

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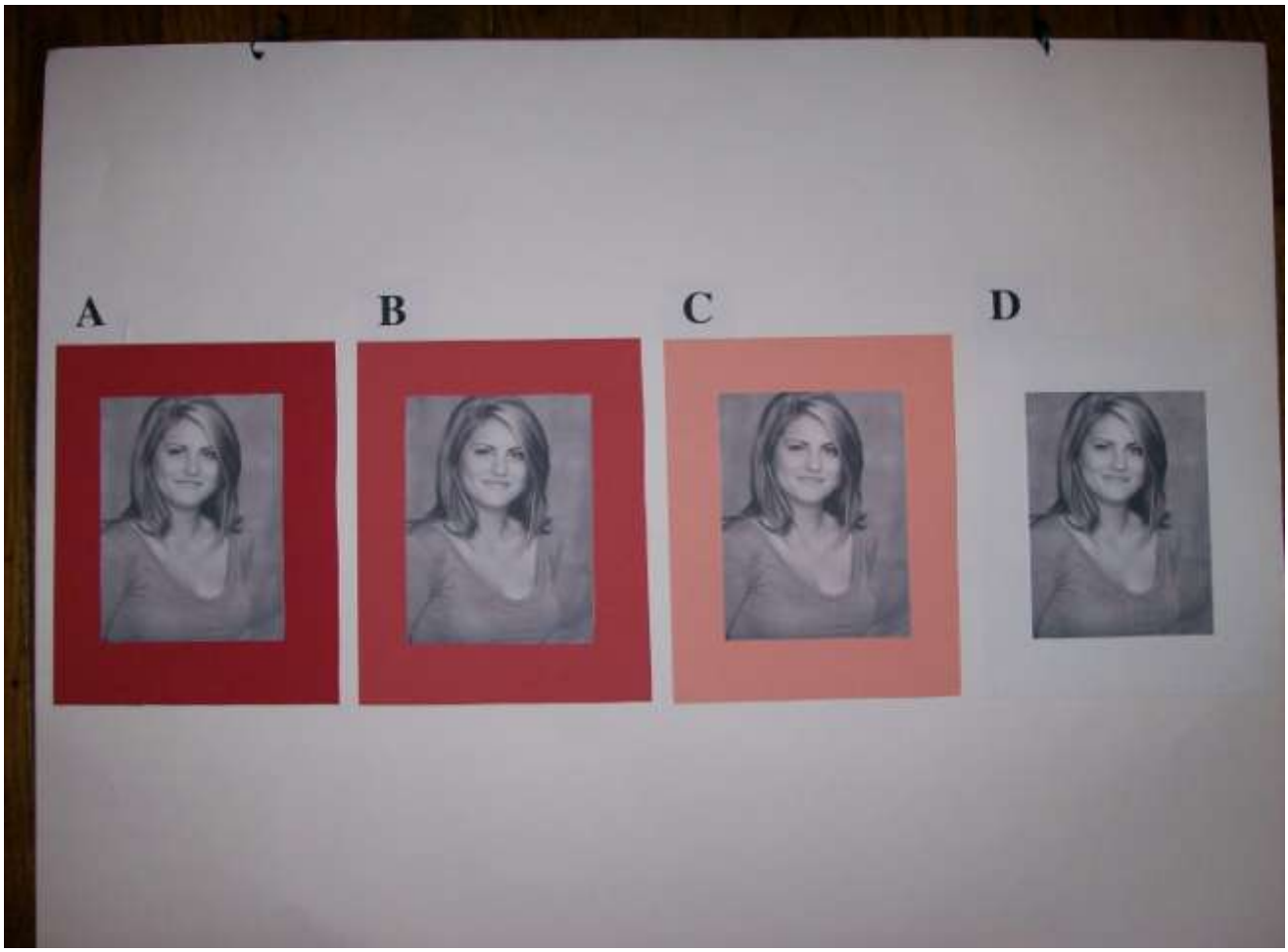
Correspondence concerning this article should be addressed to Heather Franklin, E-mail: lilrosebud111@aol.com

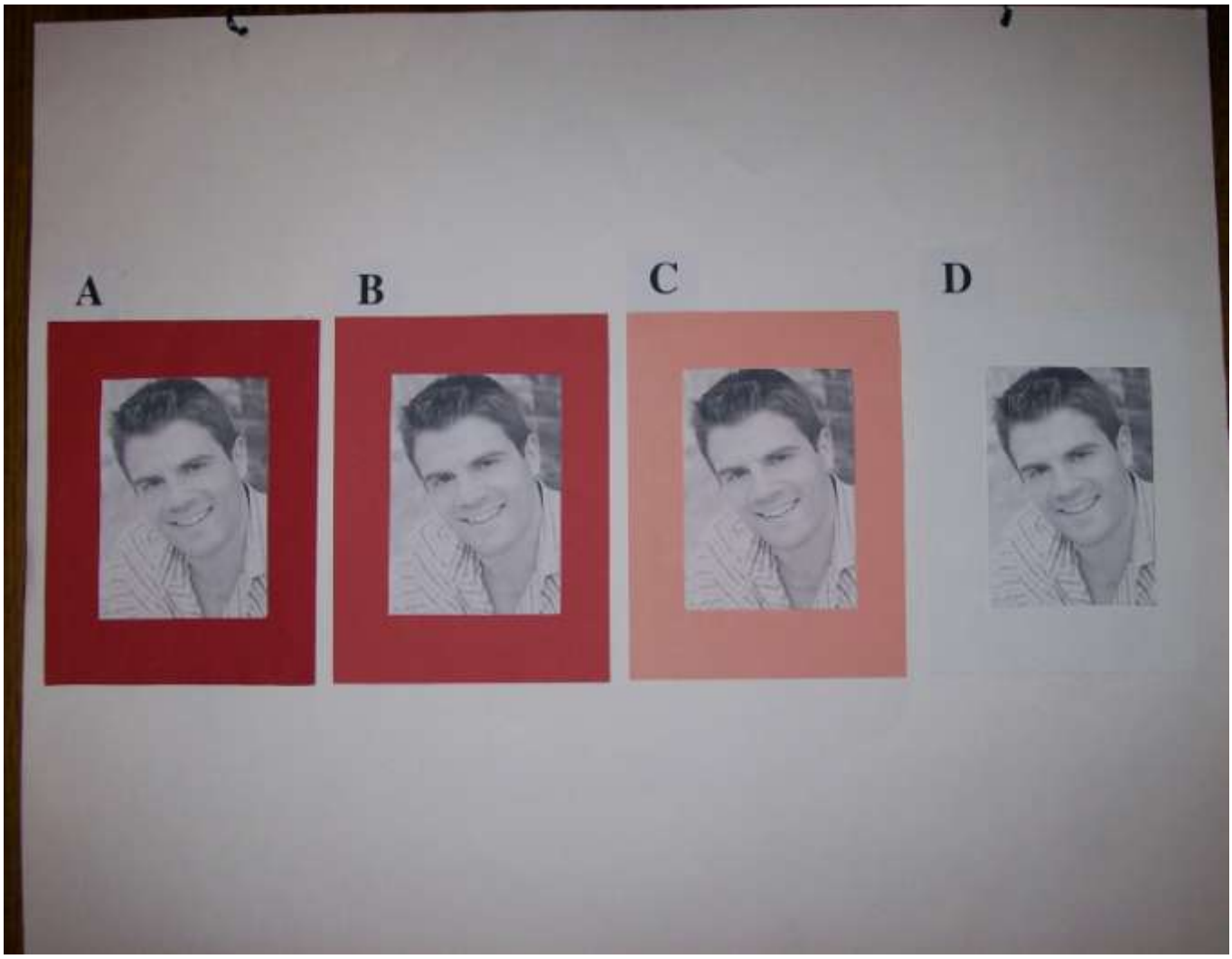
Appendix A

Stimuli shown to men



Appendix B

Stimuli shown to women



Appendix C

Pre-Survey

SUBJECT ID NUMBER: _____ (Assigned by Researcher)

***IMPORTANT: As a participant you are not required to answer any of the following questions. However, if you choose to answer any of the following questions then your information will remain anonymous. Your information will not be shared with anyone outside of this research project nor will it be identifiable.**

1) Are you **MALE** **FEMALE**?
2) Are you color blind? **YES** **NO**
3) Do you wear any form of corrective eyewear (ex: contacts or eyeglasses)?

   YES **NO**

4) What is your age?
5) What is your favorite color (please 1 choose from the list below)?

   RED GREEN BLUE YELLOW PURPLE ORANGE WHITE

Appendix D

Post-Survey

SUBJECT ID NUMBER: _____ (Assigned by Researcher)

***<u>IMPORTANT</u>: As a participant you are not required to answer any of the following questions. However, if you choose to answer any of the following questions then your information will remain anonymous. Your information will not be shared with anyone outside of this research project nor will it be identifiable.**

1) Which photo do you find most attractive?

A B C D

2) How attractive do you think this person is?

1 2 3 4
Not attractive at all Neither attractive nor unattractive Somewhat attractive Very attractive

3) Which of the following factors influenced your choice the most?

A) Individual's facial expression

B) The way the individual was dressed

C) Color in which the photo was placed on.

Appendix E

Informed Consent Form

I, _____ (print name), understand that I will be taking part in a research project that requires me to complete a short pre-survey asking me about my gender, age, whether I am color blind, whether I wear corrective eyewear of any kind, and what my favorite color is,. I will also be asked to complete a post-survey asking me questions about the photos I previously observed. I understand that I should be able to complete this project within 10 minutes. I am aware that my participation in this study is strictly voluntary and that I may choose to withdraw from the study at any time without any penalty or prejudice. I am also aware that as a participant of this study I am not required to answer any questions I am not comfortable answering and that I should not incur any penalty or prejudice because I cannot complete the study. I understand that the information obtained from my responses will be analyzed only as part of aggregate data and that all identifying information will be absent from the data in order to ensure anonymity. I am also aware that my responses will be kept confidential between myself and the researchers, Heather Franklin and Jessica Forbes. In addition I understand that data obtained from this study will only be available for research and educational purposes. I understand that any questions I may have regarding this study shall be answered by the researcher(s) involved to my satisfaction. Finally, I verify that I am at least 18 years of age and am legally able to give consent.

_____ Date: _____
(Signature of participant)

_____ Date: _____
(Signature of researcher obtaining consent)

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Appendix F

Feedback Letter

Thank you for participating in our study. The purpose of our study was to examine the relationship between color and behavior. Specifically, we hypothesize that men would find the photo of the woman in the dark red frame most attractive and that women would find the photo of the man in the lightest red frame most attractive. Furthermore, we believe that this attraction takes place on a biological level and neither men nor women are aware of it.

Please note that we are not interested in your individual results; rather, we are only interested in the results of a large group of participants, of which you are now a part of. No identifying information about you will be associated with any of the findings.

If you have any questions or concerns regarding any portion of this study, please do not hesitate to bring them up now or in the future. Our contact information is found at the bottom of this letter. If you are interested in obtaining a summary of the findings of this study at a later date, please contact us and we will make it available to you at the completion of this project.

Thank you again for your valuable contribution to this study.

Sincerely,
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