THE EFFECT OF BRIGHT COLORS ON A FEMALE'S PERCEPTION OF MALE DESIRABILITY

by

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ABSTRACT

This study focused on the effects of color on the perceived attractiveness of humans. Specifically, I examined the influence of red and other bright colors on female ratings of male attractiveness. Based on various studies conducted on the effect of red on perceived attractiveness, I hypothesized that red will increase the attractiveness rankings. Based on observations of non-human mating procedures, I also hypothesized that other bright colors would increase the attractiveness rankings of males. Attraction was measured using an online survey of female students after they viewed pictures of men in variously colored shirts. There was a significant effect of color on attraction; however, bright colors did not affect attractiveness as predicted. Females found men in red more attractive than men in dull colored shirts, but they did not find men in bright colored shirts significantly more attractive than men in dull colors.

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INTRODUCTION TO PREVIOUS RESEARCH

Non-Human Attraction

In many non-human species, mate choice is influenced by various secondary sex characteristics. These characteristics vary from increased size and strength to dramatic ornaments such as the elaborate tail feathers of a peacock. These elaborate characteristics that have evolved seem to suggest that they are being selected for. However, many of these dramatic characteristics come with a cost. The upkeep of a healthy, bright plumage, for instance, requires access to better nutrition. The ability of these animals to survive with these elaborate characteristics leads scientists to believe that they must be linked to genes or behaviors that increase adaptability. The idea that animals with more costly secondary sex characteristics are actually those that are most fit was termed the "handicap principle" by Amotz Zahavi. Secondary sex characteristics such as brightly colored plumage or the ability to perform an intricate mating dance have evolved to signify evolutionarily beneficial characteristics such as good health or swiftness (Andersson, 1986). For example, a peacock with a large and brightly colored tail must be healthier than one without such a tail, because it has managed to procure enough nutrients and evade predators long enough to allow its plumage to grow (Zahavi, 1975).

Peacocks aren't the only type of fowl that has been known to use its plumage to indicate its desirability as a potential mate. Marelene Zuk and her colleagues found in a study conducted in 1990, that female red jungle fowl (Gallus gallus) seemed to base their choice of a mate on certain phenotypic secondary sex characteristics rather than on courting rituals (Zuk et al., 1990). They found that the amount of crowing and wing flapping (common courting behaviors) did not have a significant effect on the likelihood

of a male being chosen as a mate. However, head ornamentation, such as comb length, eye color and ornamental feathers, played a significant role in mate selection. Zuk and her colleagues theorized that the head ornaments must reflect the current health of a potential mate more accurately than feathers, and are thus used as a measure of desirability.

There is still much debate over why exactly certain phenotypic characteristics are used as an indication of desirability. However, while there are competing theories, it is generally agreed that phenotypic secondary sex characteristics do convey information about the health of a mate to their partners. In a review of the various theories about the evolution of mate choice, Hanna Kokko, Robert Brooks, Michael D. Jennions and Josephine Morley suggest that the evolutionary theories, including indirect selection, direct selection, sensory drive and sexually antagonistic coevolution, all play a part in sexual selection (Kokko et al., 2003). Kokko and her colleagues suggest that a female will mate with males who have certain phenotypic characteristics in order to increase the fitness of their offspring as well as protect themselves. They also suggest that the psychosensory system in contexts besides mating biases, as well as the evidence for sexually antagonistic genes (genes that benefit one sex but harm the other, such as hip width in humans) play a role in mating choice as well. It is the interplay of all of these different processes that accounts for the diversity of morphology that is seen in the natural world. Kokko et al. (2003) hold that "Indirect benefits arise because choosy females acquire genes for their offspring that increase net fitness through any possible mixture of increased mating success, fecundity and survival in sons and/or daughters,"

further reinforcing the belief that mate selection based on appearances is evolutionarily advantageous (p.661).

Human Attraction

Color has been seen to play a role in human attraction. There have been many studies conducted on the effect of the color red on human male mating choices. Kayser, Elliot and Feltman (2010) found that the presentation of a moderately attractive woman wearing a red shirt prompted men to select more intimate questions to ask the woman, and to sit closer to where she was expected to sit. The increased attraction behavior occurred independently of the mood of the participants, their own perceptions of their own attractiveness, and seemed to be caused by the reddish hue of the woman's shirt, instead of just the lightness or chroma (Kayser, Elliott & Feltman, 2010).

Elliot and Niesta (2008) conducted a series of experiments whose results strongly suggest that red has a significant impact on male perception of female attractiveness and sexual desirability, but not overall likeability. In this series of experiments, Elliot and Niesta discovered strong evidence that the color red enhances attraction to women when viewed by heterosexual or bisexual men. Both men and women participants viewed a picture of a woman that was mounted on either a red or a white background. The rankings provided by the male and female participants who viewed a picture on a white background did not differ. However, there was a significant difference between male and female rankings of attractiveness for the picture mounted on the red background. The male participants found the woman in the picture to be more attractive when it was presented on a red background. These findings seem to suggest that red triggers an unconscious connection in male minds to sexual desirability (Elliott & Niesta, 2008).

Elliot and Niesta also compared the effects of the color red and the color gray on male ratings of a female's attractiveness, as well as the effect on males' judgments of sexual attraction, and their judgments of the woman's likeability. They found that, though red increases the judgment of attractiveness and their own sexual attraction, it has no effect on their perception of the woman as likeable. They discovered the same effect when they looked at red's impact on men's perception of kindness and intelligence. They did notice an increase in the predicted likelihood of men inviting a woman on a date and their willingness to spend money on the woman when she was shown wearing red as opposed to her wearing blue. Thus, only the color red had a consistent effect on attraction, sexual attraction, and attraction behaviors in male humans (Elliott & Niesta, 2008).

Through a series of experiments, Elliott et al. (2010) found that red has a similar effect on women viewing men in red as it does on men viewing a woman in red. Women ranked a man's attractiveness as higher when they saw his picture on a red background than if it was on a white one and they report more desired sexual behavior with a man in red. These results do not exist when men rate a fellow man's attractiveness, meaning that red carries a special, sexual meaning for heterosexual or bisexual women (Elliott, et al., 2010).

PURPOSE

In non-human interactions, there is no known significant difference between the effects of red and the effects of other bright colors such as yellow, green, or orange, on mating. There have been many different investigations of the effect of red on human attraction; however, there have not been many that study the effect of other bright colors.

This study seeks to further examine the effect of bright colors, other than red, on human mating choices. Specifically, I predict that I will be able to replicate the "red effect" on female ratings of male attractiveness, and that I will find a similar effect of bright colors on the perceived attractiveness of male targets.

METHOD

Participants

Seventy-two female students (M_{age} = 18.75, SD = 1.08) were recruited from Texas Christian University to participate exchange for extra credit in their psychology courses. Of the women, 83.3% were Caucasian, 6.9% identified as Black, 4.2% identified as Hispanic, 1.4% identified as Native American, 4.2% identified as Asian, and 2.8% identified as "Other."

Materials and Procedure

Participants completed an online survey (i.e., Qualtrics) for which they were instructed to view pictures of various men in order to make character assessments about them. They viewed pictures that were selected from various online sites such as American Apparel of models wearing different colored shirts, including red, white, beige, black, yellow, green and orange. Participants were randomly assigned to a set that randomized the order and the color of shirts they viewed. Each participant looked at 3 different models, each of which was wearing a different colored shirt: one red, one dull-colored shirt, and one non-red bright colored shirt. Participants never saw the same model in a different colored shirt, as models were crossed with shirt color such that a participant in Group 1 viewed Model A in a red shirt, Model B in a dull shirt, and Model C in a

bright shirt, but a participant in Group 2 saw Model A in a dull shirt, Model B in a bright shirt, and Model C in a red shirt, etc.

RESULTS AND DISCUSSION

The present study examined whether only the color red significantly increased the perceived attractiveness of a man compared to both bright and dull colors. To test this, a one-way within-subjects analysis of covariance (ANCOVA) examined the effects of shirt color (red, dull, vs. color) on targets' attractiveness ratings while controlling for the presentation order of the pictures was performed. The analysis revealed significant effect of shirt color, $F(2,140) = 10.30$, $p < .001$, $d = 0.99$. However, the effect was not what was hypothesized. Specifically, post-hoc tests using Tukey's Least Significant Difference (LSD) test showed that participants rated the men in dull shirts (significantly more attractive $M = 2.49$, $SD = 0.87$) than men in a bright shirt ($M = 2.23$, $SD = 0.98$), $p = .03$. There was no significant difference in the evaluation of men wearing a dull versus red shirt (M = 2.33, SD = .90), $p = .22$, or between the individuals wearing the red versus bright clothes, $p = .38$. These results suggest that women found the men in dull-colored shirts significantly more attractive than men in either the red or brightly colored shirts, which does not support the proposed hypothesis that red and brightly colored shirts will increase a participant's sexual attraction to a target.

Every participant answered five questions in order to assess their sexual attraction to the targets, including: how attractive is this person, would you want to date this person, would you want to kiss this person, would you want to make out with this person and would you want to have sexual intercourse with this person? Each question provided a scale for the participants to use while answering. The first question about the

attractiveness of the person had a scale of 7, where 1= extremely unattractive, 4=neither attractive nor unattractive and 7= extremely attractive. The questions that asked the participants to record their possible desires regarding the target used a five option scale, where 1= No, definitely not, 3= Maybe and 5=Yes, definitely. The questions evaluating the participants' sexual attraction to the target were based off of Greitmeyer's five step assessment of sexual interest that was used in his 2005 study. The participants were able to view the pictures of the targets for the entire time they were answering questions about him. The participants' impressions of the targets' sexual attractiveness were calculated by finding the mean score of all of the responses for each color group, regardless of set. The scale reliabilities for the grouped questions were calculated using the Cronbach alphas, which were as follows: red $\alpha = 0.91$, dull (meaning white, beige or black) $\alpha = 0.91$ and bright (meaning orange, green and yellow) $\alpha = 0.92$.

CONCLUSIONS AND FUTURE STUDY

The present study examined whether only the color red significantly increased the perceived attractiveness of a man compared to both bright and dull colors. To test this, a one-way within-subjects analysis of covariance (ANCOVA) examined the effects of shirt color (red, dull, vs. color) on targets' attractiveness ratings while controlling for the presentation order of the pictures was performed. As predicted, the analysis revealed significant effect of shirt color on ratings of target desirability, $F(2,140) = 10.30$, $p < .001$, $d = 0.99$. However, the effect was not exactly what was hypothesized. While the study found that color affected attractiveness, bright colors other than red did not increase attractiveness the same way red did. Specifically, post-hoc tests using Tukey's Least Significant Difference (LSD) test showed that participants rated the men in

dull shirts significantly more attractive (M = 2.49, SD = 0.87) than men in a bright shirt (M = 2.23, SD = 0.98), p = .03. There was no significant difference in the evaluation of men wearing a dull versus red shirt (M = 2.33, SD = .90), p = .22, or between the individuals wearing the red versus bright clothes, p = .38. These results suggest that women found the men in dull-colored shirts significantly more attractive than men in brightly colored shirts, which does not support the proposed hypothesis that both red and brightly colored shirts will increase a participant's sexual attraction to a target.

This experiment failed to replicate the "red effect" that was found for female participants in past studies. This experiment suggests that women prefer males in dull colored or neutral clothing compared to those sporting bright or red shirts. There were some possible confounding variables, however. On TCU campus there is a general association of brightly colored shirts and Greek life, which could have influenced the participants' perception of attractiveness. Also, the models were not ranked for attractiveness before they were presented for the study. Individual preference might have influenced the attraction results, despite my attempts to choose average-looking males. Finally, with humans, interaction between skin tone and color can heavily influence the perceived attractiveness of a person. Though this was controlled for by selecting professional models that were specifically chosen to model certain colors, personal preference could have played a role in the ranking of sexual attraction as well. The allotted viewing time for participants might have also affected their rankings. The participants were allowed to look at the picture of the target for as long as they wished, thus allowing time to look closely at the target and memorize any potential flaws in their physique. Perhaps limiting the amount of time would have allowed the effect of color to have a stronger effect.

Despite these possible interferences, the results of this study seem to suggest that the "red effect," if it does exist, is not as strong as other experiments have found. It also suggests that bright colors are not an attractant for human females. There are many possible explanations for these results. Since human beings control when they want to procreate and do not have a set mating season, humans have learned to consider multiple different factors when deciding on the sexual desirability of a potential mate, especially when they are considering the possibility of pursuing a long-term sexual relationship. Since previous studies have found that when men flaunt flashy status signals they are exhibiting a desire for a short-term relationship which is subconsciously perceptible to women (Sundie et al., 2011), it is not unlikely that flaunting bright or obvious color choices could be sending the signal that these men weren't interested in investing in a romantic relationship, which might have deterred the participants. There are definite risks associated with mating for females, so they would be less likely to desire to act upon sexual attraction without a firm belief that their investment of time and resources will be well spent. When this hesitancy is considered along with the lack of information that was provided to the participants about the targets' lifestyles, success, wealth, health, and personality, their lower rankings of sexual attraction would seem more logical.

Future Research

There is still plenty to research in regards to the effects of color on attraction and mating choice in humans. Future studies may wish to look at the effect of specific colors on a female's perception of a male's attractiveness. They may also like to look at how a positive description of a mate (such as a good personality, a steady job, and good health) coupled to a picture of a male in a certain color might affect attraction ratings and mating

potential. Also, future studies may want to look at the effect of viewing time on attraction ratings, in order to study if color has an influence on snap judgments of attraction and mating potential. Another interesting study would be to look at how wearing red or other bright colors might make a potential mate more noticeable. While, for humans, bright colors and red might not increase attractiveness, they might increase the likelihood of being noticed by a potential mate, which would in turn increase the chances of finding a potential mate. Because of this effect, humans might find it advantageous to wear red or brightly colored clothing.

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