Romantic Red

Do red products enhance the attractiveness of the consumer?

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Abstract

Previous research has demonstrated that the color red can have a positive effect on perceived attractiveness of men rating women. The so called 'red effect'. Experiment 1 is a replication of the first experiment conducted by Lin (2014) in which male participants rate a photo of a woman with a red, black, blue or silver laptop. A second experiment is conducted to test this effect for women rating a man with a red, black, green or blue watch. In this second experiment an additional construct is tested; perceived status. Contrary to our predictions, the experiments fail to produce evidence that supports the red effect. We did, however, find that in experiment 2, the male model was perceived to have a higher sex appeal with a green watch, opposed to a black or blue watch.

Introduction

"The lady in red is dancing with me, cheek to cheek. (…)But I hardly know this beauty by my side. I'll never forget the way you look tonight" (de Burgh, 1986, track 4). The song, written by Chris De Burgh, is a beautiful representation of the effect colors may have on people's perceptions. In recent years, researchers picked up on the idea that color cues may affect humans in their perceptions about the opposite sex (Andrew J Elliot & Niesta, 2008; Guéguen & Jacob, 2012; Guéguen & Jacob, 2013; Lin, 2014; Meier, D'Agostino, Elliot, Maier, & Wilkowski, 2012; Roberts, Owen, & Havlicek, 2010). In these studies, among others, the color red often seems to be the color researchers focus on (Genschow, Reutner, & Wänke, 2012; Pravossoudovitch, Cury, Young, & Elliot, 2014; Reutner, Genschow, & Wänke, 2015; Tanaka & Tokuno, 2011). It is the possible effect

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that red has on opposite sexes evaluating each other on attractiveness and status, that forms the focus of this study.

Color in Context

Colors are found to have several different effects on peoples' perceptions and choices (e.g., Elliot & Niesta, 2008; Roberts, Owen, & Havlicek, 2010; Tanaka & Tokuno, 2011). For example, colors can be associated with specific emotions; gray is known to be associated with sadness and boredom (Hemphill, 1996), the color red is often associated with anger and danger (Pravossoudovitch et al., 2014) and can elicit avoidance motivation (Tanaka & Tokuno, 2011).

Social psychologists Meier, D'Agostino, Elliot, Maier and Wilkowski, (2012) were the first to formulate a theoretical framework aimed at understanding color in combination with psychological functioning. This Color-in-context Theory consists of 6 premises; first, color is argued to carry meaning; humans may associate colors with a more symbolic value rather than only an aesthetic value. Second, viewing color influences psychological functioning. The effect that a color may have on a person is in line with the value this color has. When someone has a positive association with yellow, viewing yellow will evoke positive effects. Third, these possible psychological effects due to color are automatic and unconscious. Fourth, color meanings and associated responses have two sources; learning (culture) and biology. These two processes are not seen as mutually exclusive. Color meanings formed through learning and culture build on the color meanings that are biologically programmed in our system. An example of this idea is that in nature (biology), red can be associated with danger (Setchell, Wickings, & Knapp, 2006; Waitt, Gerald, & Little, 2006) whereas in humans this avoidance-effect can

still be found in modern contexts (Genschow et al., 2012; Meier et al., 2012). Fifth, color does not only have an effect on affect (emotions), cognitions (thoughts) and behavior (e.g. attraction vs. avoidance) but these relations are reciprocal; it also works in the opposite direction. Color perception is influenced by emotions, thoughts and behavior. Lastly, all these color meanings and possible effects are influenced by context. Depending on the context in which a color is presented in, the effect this color has on a person differs (Meier et al., 2012).

Red in Different Domains

Several studies focused on the effect that the color red can have on humans. In line with the Color-in-Context Theory (Meier et al., 2012), many of these results showed that the effect depends on the context in which the color is presented. One of these studies focused on two contexts. Participants were randomly assigned to a dating interview condition (romance-context) or an intelligence interview condition (achievement-context). Then they showed the participants a picture of the person who would interview them. This person was either wearing a red or a blue shirt. The walking speed of the participants towards 'the end of the hallway', where the interview would take place, was measured. No main effect of color was found in this study. However, when context (romance versus achievement) was taken into account, a color by context interaction was found. The walking speed of participants towards a person wearing a red shirt increased in the romance-related context but decreased in the achievement-related context (Meier et al., 2012). In a consumer-related context, the color red was found to reduce snack food and soft drink intake. Participants consumed less from a red cup or plate than when these had a different color (Genschow et al., 2012). This effect was

stronger with unhealthy food options than with healthy ones, demonstrating that the impact of red on (consumer) behavior is adaptive and decreases gradually as food options become healthier (Reutner et al., 2015).

The findings described above, predominantly implicate that red elicits avoidance motivation in achievement- and consumer-related contexts. However, in romance-related contexts red seems to have an attracting effect (Guéguen & Jacob, 2012; Guéguen & Jacob, 2013; Meier et al., 2012), e.g., the red-dress effect (Elliot & Niesta, 2008). Red can also be associated with anger. When in anger, the skin reddens due to increased facial blood flow (Drummond & Quah, 2001). Moreover, red can be associated with danger (Pravossoudovitch et al., 2014) e.g., traffic signs signaling danger are often red.

Red is known to have a variety of negative effects. In a study conducted by Maier and colleagues (2013) participants were assigned to a color condition (red versus green) and to one of the three context conditions (job application, no additional information or affiliation). No main effect was found on context nor was there an interaction effect of context by color. However, in the job application condition wearing a red shirt led to a lower perceived intelligence than when wearing a green shirt. Also, participants reviewing an applicant wearing a red tie perceived him to have less earning and leadership potential in contrast to a blue tie. Finally, applicants were perceived as being lower in ability and less likely to be hired when participants were primed with the color red (color memorability question) than when primed with green (Maier et al., 2013). A similar effect was found in a different study. When shown the color red, participants underperformed on IQ-tests compared with those who were shown different colors (Elliot, Maier, Moller, Friedman, & Meinhardt, 2007). Moreover, in a study conducted by

Zhang and Han (2014) a group of Chinese college students underperformed on an IQ-test when primed with the color red (compared with green), in line with the previous studies. However, when a similar experiment was conducted with a group of Chinese stockbrokers, they found an opposite effect. These results provide direct evidence for learned color associations; in the Chinese stock market financial gain and success is linked to the color red, whereas green is linked to financial loss and failure. This provides an explanation for the opposite effect that was found within the group of stockbrokers.

Red, Attraction & Sexuality

Not only humans seem to be influenced by colors in their surroundings. In the animal kingdom reddening of the skin is known to be associated with sexuality (attraction). Researchers found that female Mandrills had a varying red facial coloration depending on age and phase of the menstrual cycle they were in, suggesting that redness of the skin signals fertility for potential partners (Setchell et al., 2006) Male Rhesus Macaques spent a significantly longer time gazing at the behinds of female Rhesus Macaques that had turned red than at those that had not (Waitt et al., 2006). A similar effect was found within humans; raising oxygenated blood coloration (redness) in human faces increased perceived health and attractiveness ratings (Re, Whitehead, Xiao, & Perrett, 2011).

The effect that skin coloration has on humans remains speculative; two studies have examined whether redness of the skin is linked to fertility in women, measured over different phases of the ovulation cycle. One study found support for their hypotheses (Pflüger, Oberzaucher, Katina, Holzleitner, & Grammer, 2012), whereas the other did not (Samson, Fink, & Matts, 2011).

Red is often associated with sexuality and romance. For example, when giving roses to your lover, they are often red. In cities, sex trade areas are referred to as red-light districts. Also, most love-related images and products (e.g. a heart) are red. As mentioned earlier, red seems to be having an attracting effect on humans in a romance- or sexual-related context. Some researchers suggest that this preference, at least in part, is biological (Re et al., 2011; Setchell et al., 2006; Waitt et al., 2006).

Several studies elaborated on the possible link between red and (sexual) attraction (e.g., Elliot & Niesta, 2008; Guéguen & Jacob, 2012; Guéguen & Jacob, 2013; Lin, 2014). An experiment carried out in a restaurant showed that waitresses wearing lipstick, opposed to waitresses wearing no lipstick, were associated with greater tipping behavior of male guests. No such effect was found with female guests. Specifically, this effect was found only when wearing red lipstick (Guéguen & Jacob, 2012). This 'red-effect' was also found in online dating. Women wearing red in their profile picture received significantly more male contacts than women wearing a different color. In the same study, women presented in a picture with a red background received greater sexual attractiveness scores when men rated them, this effect was not found when women rated these pictures (Guéguen & Jacob, 2013). In a different study, conducted by Roberts and colleagues (2010), it was found that color of clothing can have an effect on both the wearer of the clothing and on the person who was asked to rate the person wearing a specific color. Male targets wearing red or black were rated as more attractive by either sex compared to the same targets wearing other colors. Female targets wearing red or black were only rated as more attractive by males. Females rating females showed no effect. Moreover, targets who were initially photographed wearing red but later digitally

altered to, for instance, a white shirt, were still perceived as more attractive than targets who wore white on the original photo. This finding demonstrated how the color of a shirt also can have an effect on how the wearer presents him- or herself.

Buechner, Maier, Lichtenfeld and Elliot (2015) linked color (red vs. blue) to emotion expression (pride vs. shame) and measured the influence on perceived attractiveness and social position. They found an emotion expression by color interaction when women rated men displaying pride and shame. In the pride condition, the color red increased their perceptions of the men's attractiveness. However, in the shame condition red tended to decrease the perceptions of attractiveness. This, once again, is in line with the Color-in-Context theory (Meier et al., 2012).

Research Overview

In a study conducted by Lin (2014) the effect of carrying a red laptop (in contrast to black, silver, and blue) on perceived female attractiveness was investigated. In the first experiment, Lin recruited 80 male participants. These participants were randomly divided into four groups, each consisting of 20 participants. A picture of a woman carrying either a red, blue, silver of black laptop was shown to each group. After looking at the image, all participants were asked to fill out a questionnaire with the following questions: (1) How much does the woman in the photo attract you? (2) How strong is her sex appeal? (3) How strong is your desire to engage in sexual activity with her? (4) How assertive do you find her? (5) How healthy do you think she is?

Using one-way ANOVA's, Lin determined whether the perceptions of the male participants about the woman were influenced by the color of the laptop. The results showed that when the woman was carrying a red laptop, she was perceived to possess a

significantly higher level of attractiveness and sex appeal according to male participants. Regarding desire to engage in sexual activity and assertiveness no significant differences were found. Concerning the woman's perceived level of health, no effect was found when the woman was carrying the red laptop. When the woman was holding the silver laptop, in contrast to the blue one, she was perceived as being significantly healthier by the male participants. No possible explanations for this effect were discussed in the paper.

To investigate whether the earlier found effects is a general phenomenon or a gender-related phenomenon, a second experiment was designed. A total of 80 female participants were recruited to rate the same image, on the same topics as in experiment one. Only the third question regarding the desire to engage in sexual activity with the woman was omitted for this experiment. As hypothesized; no effect was found when the same experiment was conducted with females rating a female. Possibly, because (heterosexual) females are less likely to rate a female as sexual attractive.

In the current study, the first experiment of the Lin study was replicated; a woman wearing a laptop was rated by male participants. An added value of replicating this experiment was to get more insight in the actual strength of the found effect. Chances are that in a replication, the findings are not similar to the ones of the initial study. This could imply that an effect may have been a false positive (Type I Error) (Field, 2013), suggesting that the new finding is less robust than when first introduced. Nevertheless, when replication studies are successful, they can provide us much greater confidence about an effect (Brandt et al., 2014).

In this study a second experiment has been conducted that is related to both experiments of Lin's study. However, this experiment will not be a replication of an earlier study; female participants will rate male models with different colored watches. With this experiment, the possible limitation found in Lin's study (2014) of females rating females was hoped to be prevented.

Experiment 1

The first experiment is a replication of the first experiment of Lin's study (2014). The findings of this experiment leads us to the following hypotheses:

1. A woman carrying a red laptop is perceived as more attractive than a woman carrying a black, blue or silver laptop.
2. A woman carrying a red laptop is perceived as more sexually appealing than a woman carrying a black, blue or silver laptop.

Method

Participants. Two-hundred and seventy-three male participants participated in this experiment. Their mean age was 22.26 years ($SD = 4.32$ years; range = 16-47 years) and 94.4% of participants indicated their sexual orientation is hetero- or bisexual (other include homosexual and 'prefer not say'). 93.4% of all participants were student at the time of the data collection.

As a compensation for their participation, participants could get included in a raffle. In this raffle 10 cinema tickets (€15,- each) were divided between the winners. This experiment was approved by the psychology ethics committee of the university where it was conducted.

Design, Procedure, and Materials. Participants were randomly assigned to one of four between-subjects conditions; red laptop (N = 69), blue laptop (N = 68), silver laptop (N = 68) or black laptop (N = 68). After providing informed consent (Appendix 1 & 3), the participants were given an envelope containing the survey with the photo of the woman (Appendix 2 & 4). On the first page of this survey the participants were instructed to provide their demographic information: Age, Gender ('male', 'female' or 'other'), Ethnicity ('Dutch' or 'other'), if they were currently a student ('student' or 'non-student') and Sexual Orientation ('heterosexual', 'homosexual', 'bisexual', 'prefer not say' or 'other'). After this, the participants rated one of the four photos (see Figure 1), placed centrally at the top of the page, on perceived sexual attractiveness, assertiveness and health by answering the corresponding questions.

Figure 1: Original photos Lin study (2014)
Top left; black condition, top right; blue condition, bottom left; silver condition, bottom right; red condition.

The procedure was slightly different from the Lin study (2014). Instead of letting participants fill out the questionnaires in small groups, in this experiment the questionnaires will be filled out individually and anonymously. Participants were recruited at various buildings of Universities in Leiden, Netherlands (Universiteit Leiden and Hogeschool Leiden). The data collection was done by two experimenters: Jo (1) and, Lotte (2). The data were collected on week days in February and March 2017, between 11am and 5pm. Each filled out questionnaire was marked by the experimenter with their corresponding number (1 or, 2). Participants were asked to individually fill out the questionnaire, without any consultation of others. In order to ensure this, the participants sitting close together were asked to go and sit further apart if possible. If not, they were asked to use the envelope we provided to shield their questionnaire when filling it out.

The questionnaires were developed with Microsoft Word, written in Calibri font, size 14. The picture had a 11.11cm width and a 9.53cm height. To prevent possible biases due to differences in color displays on varying digital screens, the questionnaire could only be filled out on paper. Moreover, all questionnaires were printed in color from the same printer.

Measures. After looking at the photo, participants were asked to rate the woman on five different items:

1. How much does the woman in the photo attract you?
2. How strong is her sex appeal?
3. How strong is your desire to engage in sexual activity with her?
4. How assertive do you find her?
5. How healthy do you think she is?

For every question, the participants can answer with a Likert-scale ranging from 1 (not at all) to 5 (very much). This scale was selected to replicate the findings of the original experiment in which a 5-point scale was used as well (Lin, 2014). After answering these questions the participants were asked one last question; 'What color laptop did you see?'. This question was asked to check for colorblindness and to what extent they paid attention to the experiment.

Statistical Analyses. One-way ANOVA's were performed with color condition (color of the laptop) as independent variable and perceived attractiveness, sex appeal, assertiveness and level of health as dependent variables. For these ANOVA's various subgroups were selected based on the demographic information to check if any of these factors were of influence. All analyses were conducted using IBM SPSS Statistics 23 and JASP 8.0.1.1.

First, the complete dataset, without any filters was used for analysis. In addition, a set of ANOVA's was performed that only included the sexual orientations that incorporate sexual attraction to females; heterosexual and bisexual (Black N = 64, Blue N = 64, Red N = 65, Silver N= 64). Homosexuality can be defined as the romantic and sexual attraction between two individuals of the same sex (Mucherah, Owino, & McCoy, 2016). Being homosexual could, by this definition, influence the results since these men are not attracted to women. Another set of ANOVA's was performed, only including the participants who got the color check question correct, controlling for possible colorblindness or lack of attention (Black N = 50, Blue N = 24, Red N = 67, Silver N= 37). Finally, these two filters were combined; only including hetero- and bisexual participants who got the color check question (almost) correct (Black N = 48, Blue N =

22, Red N = 63, Silver N= 36). In these results these filtered samples will respectively be referred to as complete sample, sexual orientation sample, color check sample and combined filter sample.

Preliminary Screening. Before conducting the analysis, we checked the assumptions listed for ANOVA's. Boxplots showed some outliers (Figure 2, 3 & 4). However, Cook's Distance, standardized residuals and Leverage showed that none of these outliers were influential. No outliers were deleted from the dataset. To check if all categories of the independent variable were normally distributed Kolmogorov-Smirnov tests were performed. These results showed that the assumption for normality was violated in all conditions and variables, $p < .05$, as displayed in the boxplots (Figure 2, 3 & 4). However, evidence has been found that the empirical type I error and the empirical type II error remain constant under violation of the normality assumption (Schmider, Ziegler, Danay, Beyer, & Bühner, 2010). In this experiment, the sample size was large. Consequently, the test-statistic will be fairly robust against non-normality, given the central limit theorem.
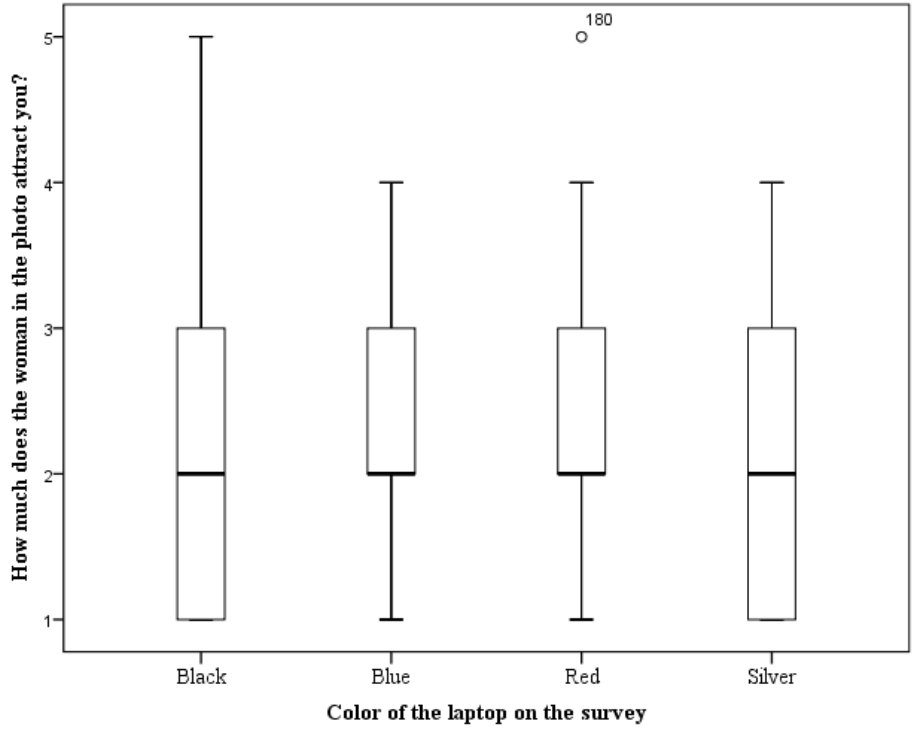
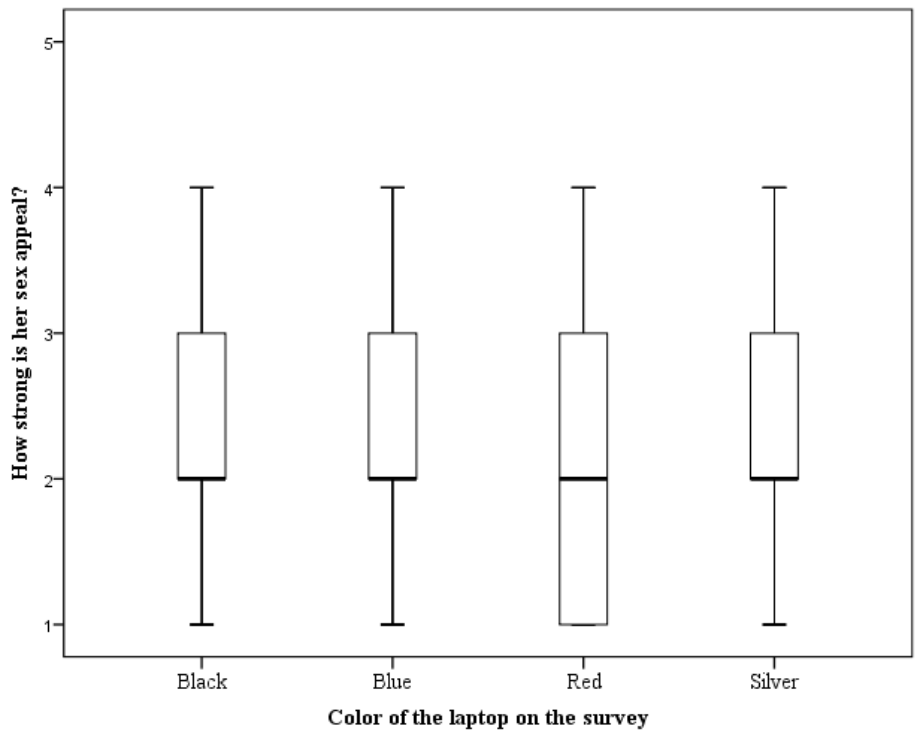Figure 2: Boxplots of perceived attractiveness on every color.
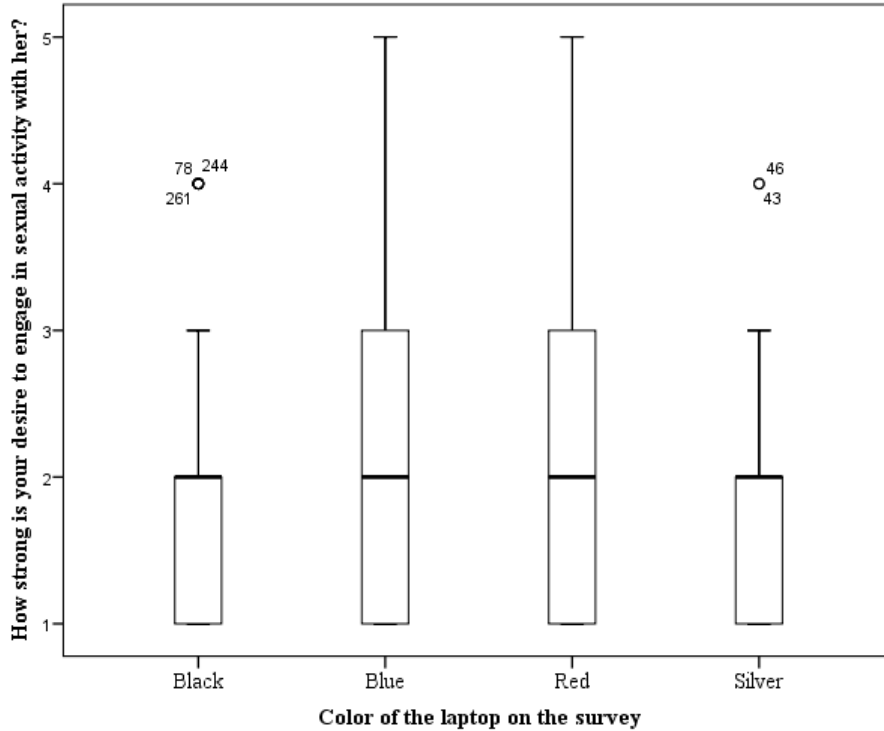

Figure 3: Boxplots of sex appeal on every color.

Figure 4: Boxplots of sexual activity on every color.

The homogeneity of variances assumption was checked by calculating a Levene's test for every variable. For the variables where Levene's test was significant ($p < .05$) and so the assumption was violated, a non-parametric test was performed.

The 'color check' question was compared to the actual color of the laptop. The answers to this question give an indication of how the participants perceived the color of the laptop. Answers that were close to the actual color of the laptop, however not exactly expressed in the wordings used in this experiment, were nevertheless labeled as 'correct'. The specific answers were determined for all four conditions. For black, 'black-dark blue' and 'black-gray' were labeled as correct. For blue, 'black-dark blue' and 'dark blue' were labeled as correct. For red, no other answers than 'red' were labeled as correct. For silver, 'gray', 'blue-gray', 'dark gray', 'black-gray' and 'anthracene' were

labeled as correct. An incorrect answer on 'color check' could indicate color blindness or lack of attention during the experiment, this could bias the results.

Results

Sexual Attraction. A one-way ANOVA with color condition (black, blue, red or silver laptop) as independent variable and scores on the sexual attraction question was used to assess the first hypothesis. The results showed no significant effect, $F(3, 269) = 1.024$, $p = .382$. The sexual orientation sample had no effect, $F(3, 253) = 0.910$, $p = .437$. The color check sample also had no effect, $F(3, 174) = 1.399$, $p = .245$. Neither did the combined filter sample, $F(3, 165) = 1.283$, $p = .282$. A Bayesian ANOVA was performed on the entire dataset. Results show that it is 15.933 times more likely that the data have occurred under the null hypothesis compared to the alternative hypothesis, $1/BF_{10} = 15.933$.

Sex Appeal. To assess the second hypothesis, a one-way ANOVA with sex appeal as independent variable was performed. The ANOVA showed a non-significant result, $F(3, 269) = 1.602$, $p = .189$. However, the Levene's test for homogeneity of variance was significant, $F(3, 269) = 3.188$, $p = .024$. Because of this violation of the assumption, a non-parametric test was performed. This Kruskal-Wallis H test also showed a non-significant result, $\chi2(3) = 5.896$, $p = .117$. The Levene's tests for the sexual orientation sample also showed a significant result, $F(3, 253) = 2.862$, $p = .039$. Hence, a Kruskal-Wallis H test was performed for this sample, which showed no significant result, $\chi2(3) = 5.125$, $p = .163$. For the color check sample and the combined filter sample, the Levene's test was non-significant, $p > .05$. Hence, for these samples one-way ANOVA's were performed. These showed non-significant effects for both the color check sample,

$F(3, 174) = 1.180$, $p = .319$ and the combined filter sample, $F(3, 165) = 0.978$, $p = .405$. The performed Bayesian ANOVA on the complete dataset indicated that it is 7.631 times more likely that the data have occurred under the null hypothesis than under the alternative hypothesis, $1/BF_{10} = 7.631$.

Sexual Activity. A one-way ANOVA with sexual activity as dependent variable was performed to assess the second hypothesis. This did not show a significant effect, $F(3, 269) = 1.739$, $p = .159$. The Levene's test for equality of variances did show a significant result, $F(3, 269) = 3.452$, $p = .017$. Hence, a Kruskal-Wallis H test was performed for this variable, showing no significant result, $\chi2(3) = 2.910$, $p = .406$. The Levene's test was also significant in the sexual orientation sample, $F(3, 253) = 4.195$, $p = .006$. Therefore, a non-parametric test was performed for this sample as well. The Kruskal Wallis showed a non-significant result, $\chi2(3) = 3,812$, $p = .282$. The one-way ANOVA's did not show any significant results in the color check sample, $F(3, 174) = 1.023$, $p = .384$, and in the combined filter sample, $F(3, 165) = 1.215$, $p = .306$. The Bayesian ANOVA for this analysis, performed on the entire dataset, indicated that the data occurring under the null hypothesis is 6.387 times more likely than under the alternative hypothesis, $1/BF_{10} = 6.387$.

Assertiveness. Several one-way ANOVA's were performed on the different samples. The ANOVA for the complete sample produced a non-significant result, $F(3, 269) = 0.362$, $p = .780$. Filtering the data did not produce any significant results; sexual orientation sample, $F(3, 253) = 0.378$, $p = .769$, color check sample, $F(3, 174) = 0.224$, $p = .880$, combined filter sample, $F(3, 165) = 0.205$, $p = .893$. Results of the Bayesian ANOVA, performed on the complete dataset, show that it is 37.088 times more likely

that the data have occurred under the null hypothesis compared to the alternative hypothesis, $1/BF_{10} = 37.088$.

Healthiness. The one-way ANOVA performed with healthiness as dependent variable did not produce a significant result, $F(3, 269) = 0.374$, $p = .772$. Applying filters to the sample did not result in significant effects; sexual orientation sample, $F(3, 253) = 0.644$, $p = .588$, color check sample, $F(3, 174) = 1.202$, $p = .311$, combined filter sample, $F(3, 165) = 1.069$, $p = .364$. The performed Bayesian ANOVA on the entire dataset indicated that it is 36.518 times more likely that the data have occurred under the null hypothesis than under the alternative hypothesis, $1/BF_{10} = 36.518$.

Discussion

We hypothesized that a woman carrying a red laptop is perceived as more attractive and more sexually appealing than a woman carrying a black, blue or silver laptop. The results did not support our hypotheses: no significant difference was found between attractiveness and sex appeal ratings of the woman in the four color conditions. Additionally, when looking at the boxplots (Figure 2 – 4), there is no pattern to be seen concerning the red condition. In conclusion, the outcomes of this experiment support the null-hypothesis, suggesting that there is no red effect. Moreover, we did not find the additional effects found in the study by Lin (2014); no effect was found of higher assertiveness ratings when wearing a silver laptop as opposed to a black laptop. Neither did we find the effect of a higher perceived health when the woman was wearing a silver laptop as opposed to a blue one. So, if we follow the results found in here then red products do not seem to enhance the attractiveness of the consumer.

In the second experiment of Lin's research (2014), female participants rated the same stimulus as used in experiment 1, with the female holding a laptop. As predicted, the outcomes found in that first experiment were gender-specific and were not replicated in their second experiment. In the second experiment of this paper, we elaborated on this topic. Since Lin (2014) found a gender-specific effect for males rating a female, perhaps this effect also exists in the opposite situation with females rating a male. In the first experiment the model holds an electronic device (laptop), replicated from Lin's study (2014). Several other studies that focused on color versus attractiveness used wearable products like shirts or lipstick (i.a., Andrew J Elliot & Niesta, 2008; Guéguen & Jacob, 2012; Guéguen & Jacob, 2013; Meier et al., 2012; Roberts et al., 2010). In this experiment the two are combined to test the influence of different colored wearable electronic devices. Here, a blue, black, red and green watch will be used. Results of the first experiment show that in many cases the colors were perceived incorrectly. Brighter shades of color were selected for the second experiment to prevent this.

Experiment 2

This experiment focused on women rating men with a red, blue, black or green watch. The questions are similar to the ones in experiment 1. However, an additional domain was added: social status. Research shows that perceived attractiveness in men is positively linked to social status (Anderson, John, Keltner, & Kring, 2001). With red products positively linked to attractiveness (Lin, 2014) and attractiveness positively linked to social status(Anderson et al., 2001). One could argue that wearing red products

could, at least indirectly, be positively linked to social status. The theories argued above leads us to the following hypotheses:

1. A man with a red watch is perceived as more attractive than a man with a black, blue or green watch.

2. A man with a red watch is perceived as more sexually appealing than a man with a black, blue or green watch.

3. A man with a red watch is perceived to have a higher social status than a man with a black, blue or green watch.

Method

Participants. Two-hundred and seventy-nine participants participated in this experiment. Two participants reported to be other than female; one agender and one male. Given the fact that this experiment focusses on females, these two cases were removed, leaving 277 female participants. Their mean age was 21.19 years (SD = 3.51 years; range = 16-42 years). 96.6% of participants indicated their sexual orientation incorporated sexual attraction to males; hetero-, bi- and pansexual (other include homosexual and 'prefer not say'). 92.8% of all participants were student at the time of the data collection.

As a compensation for their participation, participants could take part in a raffle. After signing up, participants had a chance of winning one of the 10 cinema tickets (worth €15,- each). This experiment was approved by the psychology ethics committee of the university where it was conducted.

Design, Procedure, and Materials. To prevent the experiment from being biased by positive or negative valence of emotional expression, a neutral face was selected for the

survey (Figure 5). The picture of the male model was selected from the Radboud Faces Database (Langner et al., 2010). In a study by Langner and colleagues (2010) the selected picture got rated on percentage of agreement on emotion categorization (% Agr.), in this case 'neutral', mean intensity rating for the facial expression (Int.), mean clarity for the facial expression (Cla.), mean genuineness for the facial expression (Gen.) and mean valence for the facial expression (Val.). The ratings are expressed on a 5-point scale. The rating for the image used in this experiment are as follows: % Agr.: 100, Int.: 3.62, Cla.: 4.00, Gen.: 4.14 and Val: 3.33. These rating generally indicate that the face of the model is neutral. Concerning attractiveness, the model was rated as moderately attractive ($M =$ 2.36, $SD = 0.53$).
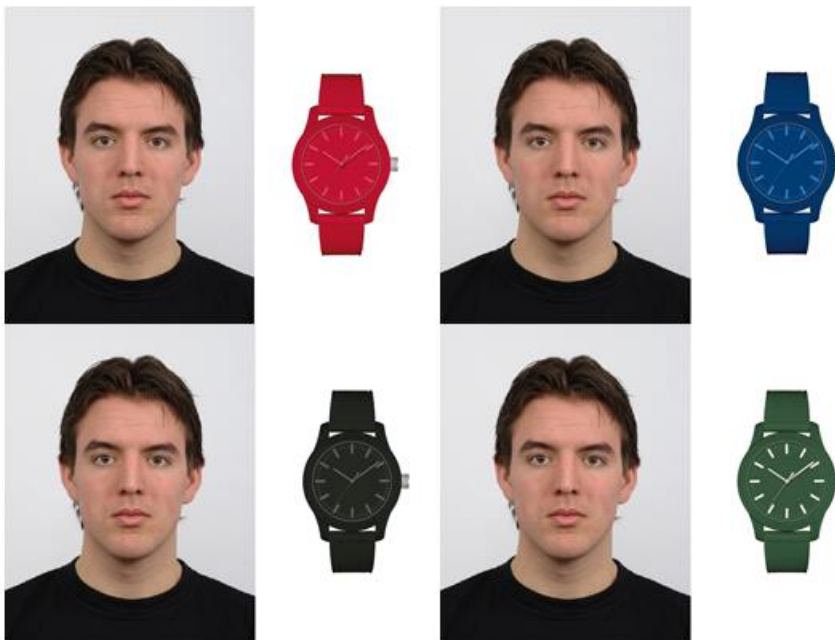

Figure 5: Stimuli of the four conditions, experiment 2

In a pilot study 78 participants rated a black watch on attractiveness (ugly versus beautiful) and perceived price (cheap versus expensive) using a 10-point Likert-scale. On

attractiveness the watch scored an average of 6.12 (SD = 1.92), on perceived price the watch scored an average of 4.90 (SD = 1.75). Given the fact that the watch was not rated extremely low or high, this watch was chosen to use in the experiment (Figure 5).

Participants were randomly assigned to one of four between-subjects conditions; red watch (N = 69), blue watch (N = 70), green watch (N = 70) or black watch (N = 67). First, participants provided informed consent and indicated whether they wanted to take part in the raffle for the cinema tickets (Appendix 5 & 7). Then, the participants were given an envelope containing the survey with the photo of the man (Appendix 6 & 8). After providing their demographic information; Age, Gender ('male', 'female' or 'other'), Ethnicity ('Dutch' or 'other'), if they were currently a student ('student' or 'non-student') and Sexual Orientation ('heterosexual', 'homosexual', 'bisexual', 'prefer not say' or 'other'), participants rated the male model combined with one of the watches (Figure 5) on perceived- sexual attractiveness, assertiveness, health and status by answering the corresponding questions. The two pictures were placed next to each other at the top of the page with the male model at the left and the watch at the right.

Participants were recruited at various faculties of universities in Leiden, Netherlands (Universiteit Leiden and Hogeschool Leiden). The data were collected by two experimenters: Jo (1) and, Lotte (2). The collection took place on week days in March 2017, between 11am and 5pm. Every collected questionnaire was marked by the experimenter who collected it with their corresponding number (1 or, 2). The same procedure for filling out the questionnaires was used as in experiment 1. Participants were asked to individually fill out the questionnaire, without any consultation of others.

The questionnaires were developed with Microsoft Word, written in Calibri font, size 12. This font size is two points smaller than in the previous experiment; to keep the structure of pages the same in both experiments, it was necessary to use a smaller font size in this experiment due to a higher amount of questions and text on the second page. The picture of the man had a 9.45 cm width and a 10.45cm height. The picture of the watch had a 5.32 cm width and a 8.28 cm height. To prevent possible biases due to differences in color displays on varying digital screens, the questionnaire could only be filled out on paper. Additionally, all questionnaires were printed in color from the same printer.

Measures. After looking at the photo, participants were asked to rate the man on eight different items:

1. How much does the man in the photo attract you?

2. How strong is his sex appeal?

3. How strong is your desire to engage in sexual activity with him?

4. How assertive do you find him?

5. How healthy do you think he is?

6. How economically successful do you think he is?

7. How well-educated do you think he is?

8. How prestigious do you think his job is?

The participants were asked to express their answers using a Likert-scale ranging from 1 (not a lot) to 7 (a lot) with 4 as 'neutral'. An end-defined format was used; only the extreme answer options (1 and 7), and the neutral option (4) were verbally anchored. The intermediate options were merely labeled with their appropriate number. Research

shows that labeling all the items on a scale detracts the interval nature of the scale, in contrast to an end-defined format (Cummins & Gullone, 2000). There were multiple reasons to switch from a 5-point scale (experiment 1) to a 7-point scale for this experiment. Neutral responses are reduced when using a 7-point scale compared to a 3- or 5-point scale (Matell & Jocoby, 1972), hence providing more valuable information. Changing the number of items will not impair the comparability of the data; 5- and 7-point scales can easily be rescaled (Dawes, 2008). In a study by Cummins & Gullone (2000) results show that it is proposed that a higher amount of items on a scale is advisable because this provides a more sensitive measurement. Cummins & Gullone state that the ideal amount of items to use is a 10-point scale. However, comparing a 10- to a 5-point scale (experiment 1) is complex due to the fact that these two scales produce different mean scores (Dawes, 2008). Hence, a 7-point scale was selected for this experiment.

Question 1 to 5 were selected from the study conducted by Lin (2014). These questions will be used to compare the results to those of experiment 1. Question 6 to 8 were selected to form a scale to measure status. This 'perceived status' scale was created by Fiske, Cuddy, Glick, & Xu (2002) based on a pilot study among 111 participants rating 23 different stereotypes on warmth, competence, competition and status. An earlier study focused on the items to present in order to determine which ones to use (Fiske, Xu, Cuddy, & Glick, 1999). Using a factor analysis, the appropriate questions for the 'perceived status' scale were determined. Then, a reliability analysis was conducted on these three status questions ($\alpha = .732$). After this, a combined scale for status was created to use in further analyses (Fiske et al., 2002).

After rating the image on the eight questions, the participants were asked to answer one last question; 'What color watch did you see?'. This question was asked to check for colorblindness and if they paid attention to the experiment.

Statistical Analyses. As in experiment 1, one-way ANOVA's were performed with color condition (color of the watch) as independent variable and perceived attractiveness, sex appeal, assertiveness, level of health and the status scale as dependent variables. For the analyses various variables were selected from the demographic information to check if any of these were of influence on the results. IBM SPSS Statistics 23 and JASP 8.0.1.1. were used for analyzing the data.

First, the complete dataset, without any filters was used for analysis. Then, another set of ANOVA's was performed where only the sexual orientations that incorporate sexual attraction to males were included; heterosexual and bisexual (others include homosexual and 'prefer not say') (Black N = 66, Blue N = 69, Green N= 70, Red N = 67). The reason for this is that participants without any interest in males could bias the outcomes when rating a male on perceived sexual attraction. After this, another set of ANOVA's was performed, only including the participants who got the color check question (almost) correct, controlling for possible colorblindness or lack of attention (Black N = 70, Blue N = 68, Green N= 51, Red N = 66). Finally, these two filters were combined; only including hetero- and bisexual participants who got the color check question correct (Black N = 66, Blue N = 67, Green N= 51, Red N = 64). In line with experiment 1, the filtered samples will respectively be referred to as complete sample, sexual orientation sample, color check sample and combined filter sample.

To analyze status, a status scale was created from the three status questions. First, Cronbach's Alpha's were calculated for this scale in all four samples; complete sample, α = .732, sexual orientation sample, α = .736, color check sample, α = .739, combined filter sample α = .743. A Cronbach's Alpha higher than .7 is an acceptable reliability for a scale (Gliem & Gliem, 2003). Since the samples all meet this requirement, the combined status scale was used for the entire analysis. The combined scale was created by adding up the three status questions and dividing it by three.

Preliminary Screening. As in experiment 1, for all ANOVA's assumptions were checked. No influential outliers were found after inspecting the boxplots (Figure 6, 7, 8 & 9) and calculating Cook's Distance, standardized residuals and Leverage. Kolmogorov-Smirnov tests were performed to check for normality. These results showed a violation of the assumption for normality in all conditions and variables, $p < .05$, as displayed in the boxplots (Figure 6 – 9). However, as mentioned earlier, the empirical type I error and the empirical type II error remain constant under violation of this assumption (Schmider et al., 2010). As in experiment 1, in this experiment the sample size was large. Consequently, the test-statistic will be fairly robust against non-normality, given the central limit theorem. By calculating Levene's test, the assumption for homogeneity of variance was tested for every variable. For the variables where the assumption was violated (Levene's Test, $p < .05$), a non-parametric test was performed.
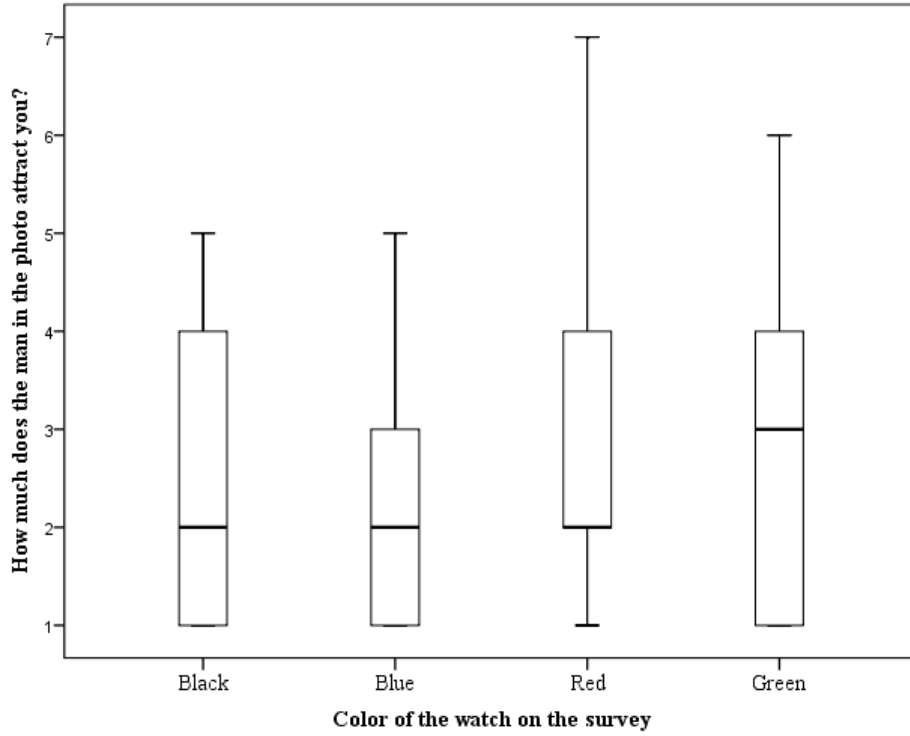
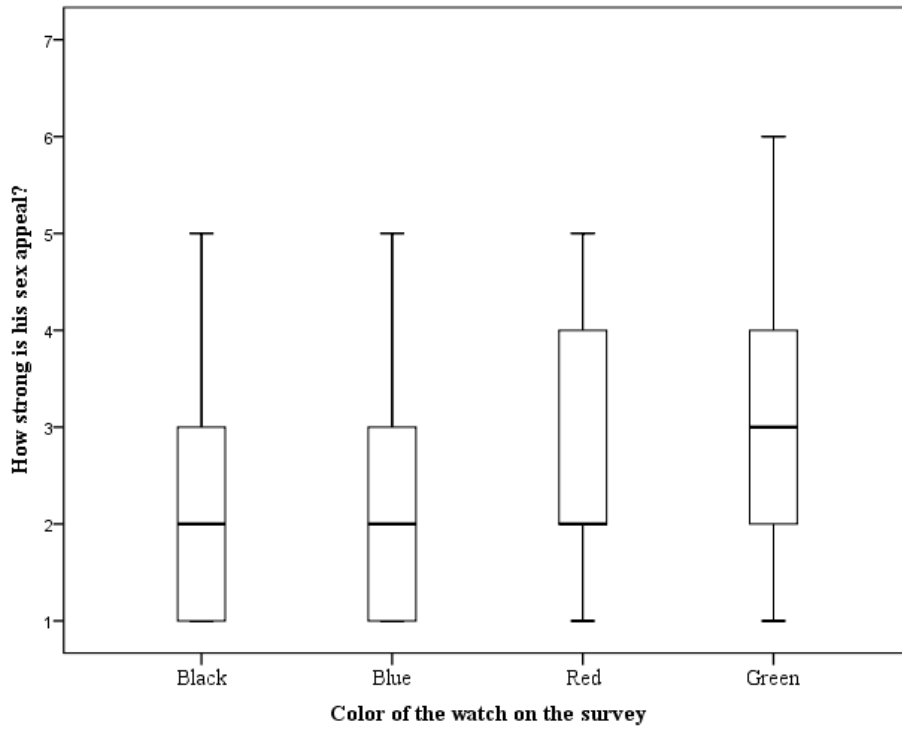Figure 6: Boxplots of perceived attractiveness for every color condition.

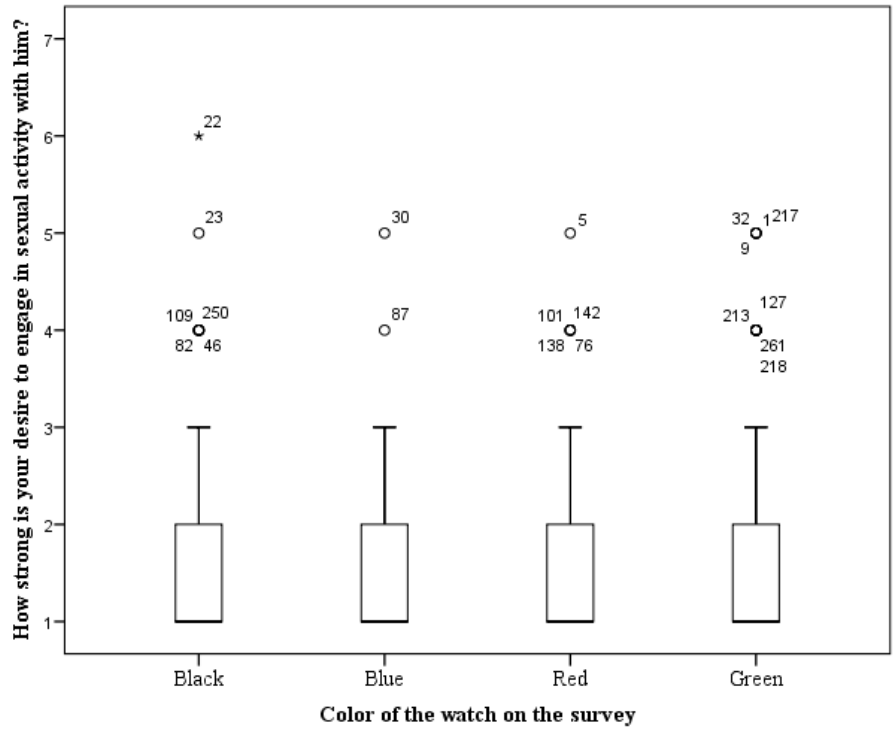Figure 7: Boxplots of sex appeal for every color condition.

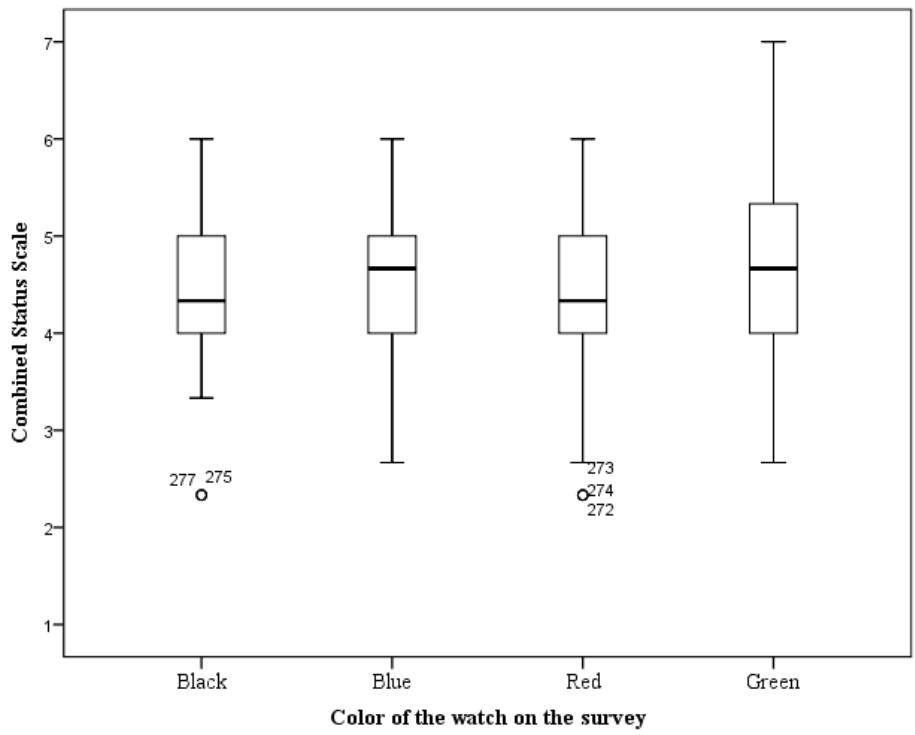Figure 8: Boxplots of sexual activity for every color condition.

Figure 9: Boxplots of status scale for every color condition.

The answers participants gave at the 'color check' question were compared to the actual color of the watch. As in experiment 1, answers that were close to the color of the watch (black, blue, green or red) were labeled as 'correct'. The correct answers were determined for all four conditions. For black, blue, and red, no 'almost correct' answers were given. For green, only 'dark green' was labeled as correct. As in the first experiment, an incorrect answer could indicate lack of attention during the experiment or color blindness, which in turn could bias the results. Hence, the color check filter was created to test for this possible bias.

Results

Sexual Attraction. To assess the first hypothesis one-way ANOVA's were performed with sexual attraction as dependent variable. However, the Levene's test for equality of variances revealed a significant result for the complete sample, $F(3, 273) = 2.677$, $p = .047$. Hence, a Kruskal-Wallis H test was performed which did not show a significant result, $\chi2(3) = 6.627$, $p = .085$. For the same reason, Kruskal-Wallis H tests were performed for the other three samples resulting in non-significant effects; sexual orientation sample, $\chi2(3) = 5.783$, $p = .123$, color check sample, $\chi2(3) = 4.807$, $p = .186$, combined filter sample, $\chi2(3) = 4.124$, $p = .248$. A Bayesian ANOVA was performed on the entire dataset. Results show that it is 3.788 times more likely that the data have occurred under the null hypothesis compared to the alternative hypothesis, $1/BF_{10} = 3.788$.

Sex Appeal. One-way ANOVA's with sex appeal as dependent variable were performed for the different samples to assess the second hypothesis. The analysis on the

complete sample revealed a significant effect, $F(3, 272) = 3.494$, $p = .016$. Tukey post hoc tests showed that participants in the green condition ($M = 2.914$) rated the man's sex appeal significantly higher than those in the black condition ($M = 2.284$, $p = .028$) and the blue condition ($M = 2.329$, $p = .044$). Additionally, in the sexual orientation sample a significant effect was found, $F(3, 267) = 3.329$, $p = .020$. Here, Tukey post hoc tests revealed similar results. In the color check sample, the ANOVA showed no significant result, $F(3, 250) = 2.366$, $p = .071$, nor did it in the combined filter sample, $F(3, 243) = 2.465$, $p = .063$. The performed Bayesian ANOVA on the complete dataset indicated that it is 1.457 times more likely that the data have occurred under the alternative hypothesis than under the null hypothesis, $1/BF_{10} = 1.457$.

Sexual Activity. For the complete sample, the Levene's test for equality of variances showed a significant effect, $F(3, 272) = 4.942$, $p = .002$. For this reason, a Kruskal-Wallis H test was performed which did not reveal a significant effect, $\chi2(3) = 3.207$, $p = .361$. Levene's tests for the other three samples also showed significant results, $p < .05$. Hence, Kruskal-Wallis H tests were performed but these also did not show any significant results; sexual orientation sample, $\chi2(3) = 3.207$, $p = .361$, color check sample, $\chi2(3) = 2.522$, $p = .471$, combined filter sample, $\chi2(3) = 2.265$, $p = .519$. The Bayesian ANOVA on the entire dataset indicated that the data occurring under the null hypothesis is 4.584 times more likely than under the alternative hypothesis, $1/BF_{10} = 4.584$.

Assertiveness. One-way ANOVA's with assertiveness as dependent variable were performed for all four samples. The analysis revealed a non-significant result for the complete sample, $F(3, 273) = 1.411$, $p = .240$. Applying the various filters did not have a

significant effect on this outcome, $p > .05$. Results of the Bayesian ANOVA on the complete dataset show that it is 9.851 times more likely that the data have occurred under the null hypothesis compared to the alternative hypothesis, $1/BF_{10} = 9.851$.

Healthiness. A one-way ANOVA was performed with healthiness as dependent variable for the complete sample. The analysis did not show a significant effect, $F(3, 272) = 1.490$, $p = .218$. The sexual orientation-, color check-, and combined filter sample did not produce any additional significant effects, $p > .05$. The performed Bayesian ANOVA on the complete dataset indicated that it is 8.900 times more likely that the data have occurred under the null hypothesis than under the alternative hypothesis, $1/BF_{10} = 8.900$.

Status. To assess the third hypothesis, a one-way ANOVA with the status scale as a dependent variable showed a non-significant effect for the complete sample, $F(3, 273) = 1.144$, $p = .332$. Separate ANOVA's were performed for the three status questions. The ANOVA with economic success as dependent variable did not reveal a significant effect, $F(3, 273) = 1.928$, $p = .125$. Nor did the ANOVA with level of education as dependent variable, $F(3, 273) = 1.065$, $p = .364$, and the ANOVA with job prestige as dependent variable, $F(3, 273) = 0.955$, $p = .414$. Applying the sexual orientation-, color check-, or combined filter did not produce any significant effects for any of the analyses described above, $p > .05$. Since no direct effect of color on status was found, the mediation analysis was not performed. The Bayesian ANOVA on the entire dataset for the combined status scale indicated that it is 13.889 times more likely that the data have occurred under the null hypothesis than under the alternative hypothesis, $1/BF_{10} = 13.889$.

Discussion

We hypothesized that a man with a red watch is perceived as more attractive and more sexually appealing than a man with a black, blue or green watch. The results for these hypotheses did not reveal any evidence for the red effect. No difference was found between perceived attractiveness of the man in the four color conditions. We did, however, find a color effect of perceived sex appeal: participants in the green condition rated the man's sex appeal significantly higher than those in the black condition and the blue condition. Finally, we hypothesized that a man with a red watch is perceived to have a higher social status than a man with a black, blue or green watch. The results did not provide any support for this hypothesis. This prediction was based on the idea that perceived attractiveness in men is positively linked to social status (Anderson et al., 2001). Hence, when evidence would have been found for red products having a positive effect on perceived attractiveness, this could in turn have increased perceived social status. For this reason, we argued that perceived social status could mediate the direct effect of color and perceived attractiveness. However, since we did not find any direct effects of perceived attractiveness and color or perceived social status and color, we could not substantiate this theory with any evidence. For a mediation analysis to work, there needs to be a main effect on the paths of the mediation model (color condition – status – attractiveness) (Baron & Kenny, 1986). Considering these effects were not found, no mediation analysis was performed.

Additionally, when looking at the boxplots of perceived attractiveness (Figure 6), the whisker at the top of the plot in de red condition is higher than the other three plots. This is a pattern that is in line with our hypotheses. In the remaining boxplots (Figure 7 – 9) there is no pattern to be seen that could provide any evidence of the red effect. In

summary, the outcomes of this experiment, as of the first experiment, support the null-hypothesis, suggesting that there is no red effect.

General Discussion

In summary, we did not find any evidence for the existence of the red effect. Although there are many researches that suggest the red effect is real (e.g. Andrew J Elliot & Niesta, 2008; Guéguen & Jacob, 2012; Lin, 2014; Pazda et al., 2012), there are also findings that do not support this theory (Peperkoorn, Roberts, & Pollet, 2016). We designed this study to replicate the study by Lin (2014) about the red effect and to further explore this phenomenon in experiment 2. In contrast to our expectation, we did not replicate the findings of Lin (2014) in experiment 1 nor did we find any of the predicted outcomes in experiment 2.

First, we predicted that men would perceive a woman carrying a red laptop as more (sexually) attractive than a woman carrying a black, blue or silver laptop. The results of the first experiment do not support this hypothesis. No significant differences were present between the attractiveness ratings of the woman in the four different color conditions. Second, a woman carrying a red laptop was expected to be perceived as more sexually appealing by male participants than a woman carrying a black, blue or silver laptop. However, no differences were found between the sex appeal ratings male participants reported in the four color conditions.

Third, we hypothesized that a man with a red watch would be perceived as more attractive by females than a man with a black, blue or green watch. The results of experiment 2 did not provide any evidence for this hypothesis: there is no difference

between the attractiveness ratings that female participants reported in the four color conditions. Fourth, we predicted that a man with a red watch would be perceived as more sexually appealing by women than a man with a black, blue or green watch. The outcomes of experiment 2 contradicted this hypothesis: no differences were found between the sex appeal ratings in de red condition, compared to the black, blue or green condition. However, there was a color effect present within the sex appeal ratings of experiment 2: the sex appeal ratings of the man in the green condition were significantly higher compared to those in the black and in the blue condition. This unexpected outcome hints at the possible existence of a 'green-effect'. Although the color green is often used as a contrast color in research, the hypotheses are often focused on red (e.g., Elliot et al., 2007; Elliot & Niesta, 2008; Roberts et al., 2010; Tanaka & Tokuno, 2011). Moreover, the experiments often include male participants rating females (e.g., Elliot & Niesta, 2008; Guéguen & Jacob, 2012, 2013; Pazda et al., 2012). Future research might further investigate this possible 'green-effect' by focusing on the color green, rather than the color red. Additionally, future research could extend the existing knowledge by further investigating color effects with females rating males.

Finally, we predicted that a man with a red watch would be perceived to have a higher social status by women than a man with a black, blue or green watch. The results of experiment 2 did not provide any evidence to support this prediction: no significant differences were found between the ratings of status in the four color conditions. The outcomes of both experiments support the null hypothesis of no red effect. The current study has several potential limitations which we will discuss here.

For experiment 1, a possible explanation for the lack of evidence in this experiment could be the colors of the used stimuli. A study investigating the effect of a red versus a blue shirt on perceived attractiveness found evidence for the red effect (Andrew J Elliot & Niesta, 2008, Experiment 5). Perhaps because of the dark shade, 63.2% of participants in the blue condition of this study did not recognize the laptop as being blue. Half of participants in the blue condition reported to have seen a black laptop. There seemed to be a similar problem with the silver laptop: 33.8% of participants in this condition reported to have seen a black laptop and 41.2% answered grey. One could argue that the blue and silver colors used in this experiment did not provide enough contrast to be perceived as the intended contrast colors. Prior studies provide evidence for the red effect on perceived (sexual) attractiveness with green as a contrast color (Andrew J Elliot & Niesta, 2008, Experiment 4; Pazda, Elliot, & Greitemeyer, 2012, Experiment 2). Possibly green would have been a more suitable contrast color for this experiment. Based on the findings described above, different (shades of) colors were used in experiment 2. We selected a brighter shade of blue, a darker shade of black and replaced the silver condition (experiment 1) with a green condition. These changes seem to have had a positive effect. In total, 89.4% of participants recognized the intended color in experiment 2, in contrast to only 65.6% in experiment 1.

The woman in the photo used in experiment 1 has several facial characteristics that could be associated with an Asian appearance (Kaw, 1993). In the original study, participants were recruited at a university in Taiwan, so it is likely that most of these participants were Asian, although this was not reported in the paper (Lin, 2014). However, in this study the main nationalities of participants were European (93.5%),

against only 1.9% Asian nationalities. There is a possibility that the lack of evidence found in this study is due to a discrepancy between the romantic preferences of European and Asian males. Probably, the majority of European males prefer a romantic partner with a Caucasian appearance instead of an Asian appearance. The fact that in this experiment an Asian woman was used, could have had a negative effect on the attraction-related questions.

For experiment 2, we asked participants to imagine the model was wearing the watch. Since this was specifically asked, the idea that the watch related to the purpose of the experiment could have become salient for participants. In real life, if a person would be wearing a watch, observing the watch would happen more unconsciously. Hence, the possible effect that the color of the watch could have, would also be more discreet. Moreover, imagining the model wearing the watch could have a weaker effect than actually seeing the model wearing the watch. These implications could have had an effect on the outcomes of experiment 2. Future research might further investigate this topic by using a more realistic stimulus where the independent variable, in this case color condition, is integrated in the image of the person.

In both experiments, a floor effect was present in the sexual activity variable. As can be seen in both the boxplots of experiment 1 and 2 (Figure 4 & 8), the data are positively skewed. The majority of participants rated their desire to engage in sexual activity with the model on the picture low. A floor effect can be detected in these data; the means of the sexual activity variables of both experiments are relatively low; experiment 1, $M = 1.92$, experiment 2, $M = 1.63$. If the distributions of perceived attractiveness (Figure 2 & 6) and sex appeal (Figure 3 & 7) would have been similar to

the sexual activity distribution, then a possible explanation could have been that the models were perceived as very unattractive. However, no similar floor effect is detected in the attractiveness and sex appeal variables. A possible explanation for this floor effect could be the personal nature of this question. Participants could have gotten startled or shy due to the straight forward tone of the question. In turn, this emotional reaction could have evoked avoidance motivation, which then led to negative answers. For further research we would suggest to delete this question from the experiment or to formulate it more discreet. It is, however, notable that this floor effect cannot be observed in the data of the original study by Lin (2014), this could be due to the nationalities of the participants as described above.

The lack of evidence in this research leads us to question the robustness of the evidence supporting the red effect theory. We therefore call for more empirical research on the red effect in the romantic context, ideally implementing the suggested improvements from this discussion. Knowledge about this topic can have important implications in domains such as marketing, sales, fashion and advertising. In these domains, this knowledge could have an applied value. Finally, we want to emphasize that null findings are also very important and contribute a lot to our understanding of this topic. We hope further research will step by step provide us a better understanding of our (unconscious) reaction to the colors around us.

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Appendices

Appendix 1: Informed Consent Experiment 1, English

Dear participant,

You are about to participate in the study 'Person Perception 2017'. Before the study begins, it is important that you take notice of the procedure being followed in this study.

Research Purpose

The aim of this research is to see how individuals make a first impression of other people. We are specifically interested in interpersonal, sexual attraction.

Instruction and Procedure

The study consists of providing ratings of a woman's photo. To begin with, we ask you to fill out some questions about yourself, such as your age and sexual orientation (you can leave this question blank, if you don't want to provide this information). In total, participation will typically take between 2 and 5 minutes.

Voluntary Participation

If you decide not to participate in this study, this will have no consequences whatsoever. Also, you can stop your cooperation at any time during the study. Just return the survey to the researcher and say that you no longer want to take part.

You are free to do so without giving reasons. Given that data are processed anonymously it is not possible to withdraw your data after you returned a completed questionnaire.

You can be included in a raffle to win one of 10 cinema vouchers (€15,-) in compensation of your participation (only winners be notified).

Confidentiality of Research Data

The research data you provide will be used for master thesis and may be published in a scientific journal. During the study you won't be required to fill out your name or other directly identifiable information. Should you want to be included in the raffle you can include your email on this form. This consent form will be stored separately from the survey you complete.

If you have any further questions, you can ask the researcher or contact Dr. Thomas Pollet (t.v.pollet@fsw.leidenuniv.nl)

I have read and understood the above well and I agree to participate in this study.

_____

Date: _____

E-mail (if you want to be included in raffle): _____

I would like to receive information via e-mail on this study (after data collection is finalized):   Yes / No

Appendix 2: Questionnaire Experiment 1, English

Please answer the following questions:

What is your gender?
- o Male
- o Female
- o Other _____

What is your age?

_____years

What is your nationality?
- o Dutch
- o Other _____

Are you currently a student?
- o Yes
- o No

What is your sexual orientation?
- o Heterosexual
- o Homosexual
- o Bisexual
- o Prefer not say
- o Other _____

	1 Not at all	2 Not much	3 Neutral	4 Somewhat	5 Very much
How much does the woman in the photo attract you?	○	○	○	○	○
How strong is her sex appeal?	○	○	○	○	○
How strong is your desire to engage in sexual activity with her?	○	○	○	○	○
How assertive do you find her?	○	○	○	○	○
How healthy do you think she is?	○	○	○	○	○

Please turn the page over and answer the final question.

What color was the laptop?

_____

This is the end of the questionnaire. Please put your forms in the envelope, seal it and give it back to the researcher. Thank you for your participation.

Appendix 3: Informed Consent Experiment 1, Dutch

Beste participant,

U staat op het punt deel te nemen aan het onderzoek 'Persoonsperceptie 2017'. Voordat het onderzoek begint is het belangrijk dat op de hoogte bent van de procedure van dit onderzoek.

Onderzoeksdoel

Het doel van dit experiment is te onderzoeken hoe men een eerste impressie vormt over andere mensen. We zijn specifiek geïnteresseerd in interpersoonlijke, seksuele aantrekkingskracht.

Instructie & Procedure

Het onderzoek bestaat uit het beoordelen van een vrouw op een foto. Allereerst zal wordt u verzocht een aantal vragen over uzelf in te vullen zoals uw leeftijd en seksuele voorkeur (u kunt deze vraag overslaan als u die informatie niet wilt verstrekken). In totaal zal het onderzoek ongeveer 2 tot 5 minuten duren.

Vrijwillige Deelname

Als u besluit niet te willen deelnemen aan dit onderzoek heeft dit geen enkele consequenties. U kunt op ieder moment tijdens het onderzoek besluiten te stoppen. Geef simpelweg de vragenlijst terug aan de onderzoeker en vertel dat u niet langer wenst deel te nemen. U bent vrij dit te doen zonder een reden op te geven. Aangezien de gegevens anoniem worden verwerkt is het niet mogelijk uw gegevens terug te trekken nadat u de voltooide vragenlijst heeft ingeleverd.

U kunt deelnemen aan een loting en kans maken op een van de 10 bioscoopbonnen (€15,-) als compensatie voor uw deelname (er wordt alleen contact opgenomen met de winnaars).

Vertrouwelijkheid van Onderzoeksgegevens

De onderzoeksgegevens die u aanlevert worden gebruikt voor een masterscriptie en zouden gepubliceerd kunnen worden in een wetenschappelijk blad. Tijdens het onderzoek hoeft u niet uw naam of andere direct identificeerbare informatie op te geven.

Als u mee wilt doen in de loting, kunt u uw e-mailadres noteren op dit formulier. Dit toestemmingsformulier wordt apart van uw vragenlijst opgeslagen in verband met anonimiteit.

Als u verdere vragen heeft, kunt u deze stellen aan de onderzoeker of contact opnemen met Dr. Thomas Pollet (t.v.pollet@fsw.leidenuniv.nl)

Ik heb bovenstaande goed gelezen en begrepen en bevestig mee te willen doen aan dit onderzoek.

_____

Datum: _____

E-mail (als u mee wilt doen in de loting): _____

Ik zou, via e-mail, graag informatie ontvangen over dit onderzoek (na het afronden van de

dataverzameling). Antwoord omcirkelen: Ja / Nee

Appendix 4: Questionnaire Experiment 1, Dutch

Beantwoord de volgende vragen alstublieft:

Wat is uw geslacht?
- o Man
- o Vrouw
- o Anders _____

Wat is uw leeftijd?   _____ jaar

Wat is uw nationaliteit?
- o Nederlands
- o Anders _____

Bent u momenteel student?
- o Ja
- o Nee

Wat is uw seksuele geaardheid?
- o Heteroseksueel
- o Homoseksueel
- o Biseksueel
- o Zeg ik liever niet
- o Anders _____

	1 Helemaal niet	2 Niet echt	3 Neutraal	4 Een beetje	5 Heel erg
In hoeverre voelt u zich aangetrokken tot de vrouw op de foto?	○	○	○	○	○
Hoe sterk is haar sexappeal?	○	○	○	○	○
Hoe sterk is uw behoefte om seksuele activiteiten met haar te ondernemen?	○	○	○	○	○
Hoe assertief vindt u haar?	○	○	○	○	○
Hoe gezond denkt u dat zij is?	○	○	○	○	○

Sla de pagina om en beantwoord de laatste vraag, alstublieft.

Welke kleur was de laptop?

_____

Dit is het einde van de vragenlijst. Doe deze formulieren in de envelop, sluit deze en geef deze terug aan de onderzoeker, alstublieft. Dank u wel voor uw deelname.

Appendix 5: Informed Consent Experiment 2, English

Dear participant,

You are about to participate in the study 'Person Perception 2017'. Before the study begins, it is important that you take notice of the procedure being followed in this study.

<u>Research Purpose</u>

The aim of this research is to see how individuals make a first impression of other people. We are specifically interested in interpersonal, sexual attraction.

<u>Instruction and Procedure</u>

The study consists of providing ratings of a man's photo. To begin with, we ask you to fill out some questions about yourself, such as your age and sexual orientation (you can leave this question blank, if you don't want to provide this information). In total, participation will typically take between 2 and 5 minutes.

<u>Voluntary Participation</u>

If you decide not to participate in this study, this will have no consequences whatsoever. Also, you can stop your cooperation at any time during the study. Just return the survey to the researcher and say that you no longer want to take part.

You are free to do so without giving reasons. Given that data are processed anonymously it is not possible to withdraw your data after you returned a completed questionnaire.

You can be included in a raffle to win one of 10 cinema vouchers (€15,-) in compensation of your participation (only winners be notified).

<u>Confidentiality of Research Data</u>

The research data you provide will be used for master thesis and may be published in a scientific journal. During the study you won't be required to fill out your name or other directly identifiable information. Should you want to be included in the raffle you can include your email on this form. This consent form will be stored separately from the survey you complete.

If you have any further questions, you can ask the researcher or contact Dr. Thomas Pollet (t.v.pollet@fsw.leidenuniv.nl)

I have read and understood the above well and I agree to participate in this study.

_____

Date: _____

E-mail (if you want to be included in raffle): _____

I would like to receive information via e-mail on this study (after data collection is finalized): Yes / No

Appendix 6: Questionnaire Experiment 2, English

Please answer the following questions:

What is your gender?
- o   Male
- o   Female
- o   Other _____

What is your age?
_____years

What is your nationality?
- o   Dutch
- o   Other _____

Are you currently a student?
- o   Yes
- o   No

What is your sexual orientation?
- o   Heterosexual
- o   Homosexual
- o   Bisexual
- o   Prefer not say
- o   Other _____

Imagine this man is wearing this watch. Please answer the following questions.

	Not a lot			Neutral			A lot
How much does the man in the photo attract you?	○	○	○	○	○	○	○
How strong is his sex appeal?	○	○	○	○	○	○	○
How strong is your desire to engage in sexual activity with him?	○	○	○	○	○	○	○
How assertive do you find him?	○	○	○	○	○	○	○
How healthy do you think he is?	○	○	○	○	○	○	○
How economically successful do you think he is?	○	○	○	○	○	○	○
How well-educated do you think he is?	○	○	○	○	○	○	○
How prestigious do you think his job is?	○	○	○	○	○	○	○

What color was the watch?

_____

This is the end of the questionnaire. Please put your forms in the envelope, seal it and give it back to the researcher. Thank you for your participation.

Appendix 7: Informed Consent Experiment 2, Dutch

Beste participant,

U staat op het punt deel te nemen aan het onderzoek 'Persoonsperceptie 2017'. Voordat het onderzoek begint is het belangrijk dat op de hoogte bent van de procedure van dit onderzoek.

Onderzoeksdoel

Het doel van dit experiment is te onderzoeken hoe men een eerste impressie vormt over andere mensen. We zijn specifiek geïnteresseerd in interpersoonlijke, seksuele aantrekkingskracht.

Instructie & Procedure

Het onderzoek bestaat uit het beoordelen van een man op een foto. Allereerst wordt u verzocht een aantal vragen over uzelf in te vullen zoals uw leeftijd en seksuele voorkeur (u kunt deze vraag overslaan als u die informatie niet wilt verstrekken). In totaal zal het onderzoek ongeveer 2 tot 5 minuten duren.

Vrijwillige Deelname

Als u besluit niet te willen deelnemen aan dit onderzoek heeft dit geen enkele consequenties. U kunt op ieder moment tijdens het onderzoek besluiten te stoppen. Geef simpelweg de vragenlijst terug aan de onderzoeker en vertel dat u niet langer wenst deel te nemen. U bent vrij dit te doen zonder een reden op te geven. Aangezien de gegevens anoniem worden verwerkt is het niet mogelijk uw gegevens terug te trekken nadat u de voltooide vragenlijst heeft ingeleverd.
U kunt deelnemen aan een loting en kans maken op een van de 10 bioscoopbonnen (€15,-) als compensatie voor uw deelname (er wordt alleen contact opgenomen met de winnaars).

Vertrouwelijkheid van Onderzoeksgegevens

De onderzoeksgegevens die u aanlevert worden gebruikt voor een masterscriptie en zouden gepubliceerd kunnen worden in een wetenschappelijk blad. Tijdens het onderzoek hoeft u niet uw naam of andere direct identificeerbare informatie op te geven.
Als u mee wilt doen in de loting, kunt u uw e-mailadres noteren op dit formulier. Dit toestemmingsformulier wordt apart van uw vragenlijst opgeslagen in verband met anonimiteit.

Als u verdere vragen heeft, kunt u deze stellen aan de onderzoeker of contact opnemen met Dr. Thomas Pollet (t.v.pollet@fsw.leidenuniv.nl)

Ik heb bovenstaande goed gelezen en begrepen en bevestig mee te willen doen aan dit onderzoek.

_____

Datum: _____

E-mail (als u mee wilt doen in de loting): _____

Ik zou, via e-mail, graag informatie ontvangen over dit onderzoek (na het afronden van de dataverzameling). Antwoord omcirkelen: Ja / Nee

Appendix 8: Questionnaire Experiment 2, Dutch

Beantwoord de volgende vragen alstublieft:

Wat is uw geslacht?
- o Man
- o Vrouw
- o Anders _____

Wat is uw leeftijd?   _____ jaar

Wat is uw nationaliteit?
- o Nederlands
- o Anders _____

Bent u momenteel student?
- o Ja
- o Nee

Wat is uw seksuele geaardheid?
- o Heteroseksueel
- o Homoseksueel
- o Biseksueel
- o Zeg ik liever niet
- o Anders _____

Stelt u zich voor dat deze man dit horloge draagt. Beantwoord de volgende vragen, alstublieft.

Helemaal niet			Neutraal			Helemaal wel
In hoeverre voelt u zich aangetrokken tot de man op de foto?	○	○	○	○	○	○ ○
Hoe sterk is zijn sexappeal?	○	○	○	○	○	○ ○
Hoe sterk is uw behoefte om seksuele activiteiten met hem te ondernemen?	○	○	○	○	○	○ ○
Hoe assertief vindt u hem?	○	○	○	○	○	○ ○
Hoe gezond denkt u dat hij is?	○	○	○	○	○	○ ○
Hoe economisch succesvol denkt u dat hij is?	○	○	○	○	○	○ ○
Hoe hoogopgeleid denkt u dat hij is?	○	○	○	○	○	○ ○
Hoe prestigieus denkt u dat zijn baan is?	○	○	○	○	○	○ ○

Welke kleur was het horloge?

_____

Dit is het einde van de vragenlijst. Doe deze formulieren in de envelop, sluit deze en geef deze terug aan de onderzoeker, alstublieft. Dank u wel voor uw deelname.