

THE RELATIONSHIP BETWEEN PERSONALITY CHARACTERISTICS AND
CREATIVITY ON JUDGEMENTS OF FACIAL ATTRACTIVENESS

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Abstract

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People may or may not realize that when they meet a physically attractive person, they are more likely to evaluate him or her as a smart and positive person compared to a less attractive person in the absence of other features besides physical attractiveness. This attractive halo effect has influenced multiple areas that include the job market, dating, and academic success. However, it is possible for other factors, such as one's creativity and personality to affect one's judged attractiveness level. The purpose of this study is to investigate the impact of facial attractiveness, creativity, and warm-cold personality characteristics when judging female attractiveness. This research expands on Watkin's (2017) where he found that with attractive females, their creative abilities didn't affect the score of their overall attractiveness, but with less attractive females, their highly creative abilities were detrimental to their overall attractiveness from raters' perspective.

In addition, warm-cold personality might affect the perception of people's attractiveness. Past research suggested that people with warm personality characteristics might be rated higher on attractiveness than people with cold personality characteristics. This study employed a 2 (Attractiveness) x 2 (Creativity) x 2 (Personality characteristics) mixed factorial design. Facial attractiveness and creativity are within subjects, and warm-

cold personality description is a between-subjects design. I hypothesize that females who are attractive and have warm personality characteristics will receive the highest attractiveness rating regardless of the creativity level, followed attractive and cold females. However, a 3-way interaction is expected for less attractive females. Less attractive females, with high creativity and cold personality characteristics will receive the lowest attractiveness scores overall, while those with low creativity and warm personality characteristics will receive higher attractiveness scores. The results showed there was no interaction between facial attractiveness, creativity, and personality characteristics, however, the interaction between facial attractiveness and creativity was discovered. The current study shows that creativity does not matter for attractive females on attractiveness score, whereas creativity increases attractiveness score on females who are low in facial attractiveness.

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The Relationship between Personality Characteristics and Creativity on Judgements of Facial Attractiveness

You may or may not realize that when you meet an attractive person, you are more likely to evaluate him or her as a smart (Prokosch, Coss, Scheib, & Blozis, 2009; Moore, Filippou, & Perrett, 2011; Talamas, Mavor, & Perrett, 2016a) and positive person (Zhang, Kong, Zhong & Kou, 2014) compared to a less attractive person. This is a bias, known as the *halo effect*, and is part of our everyday life when making judgements and engaging in decision making. In fact, even people aware of this bias are unable to avoid it (Talamas et al., 2016a). Therefore, it is necessary to know how other characteristics may influence one's judgements of attractiveness, particularly for women, who are judged more biased on physical appearance than men (Karbowski, Deja, & Zawisza, 2016). Because males are asymmetrically favored over women in the job market (Desrumaux, Bosscher, & Léoni, 2009), the current study may provide a chance to explore more on sexual inequality as influenced by attractiveness.

It is possible that other characteristics interact with attractiveness when making attractiveness judgments. For example, people may also take into account the personality of a person when making attractiveness judgements. Generally, it is the case that people with warm personalities are rated as more attractive than people with cold personalities (Markey & Markey, 2011; Wang, Yao & Zhou, 2015; Zhang et al., 2014). Similarly, people who are attractive are be rated as warmer than people who are not attractive. In addition, people might also weigh the impact of one's intelligence or creativity when

making attractiveness judgements (Watkin, 2017; Prokosch et al., 2009; Moore et al., 2011; Talamas et al., 2016b). Specifically, it has been found that, surprisingly, when considering female attractiveness, females are considered to be more attractive if they are low in creativity compared to women high in creativity (Watkin, 2017). The current research aims to identify whether a relationship exists between attractiveness, personality, and creativity on judgements of female attractiveness.

Facial Attractiveness

Judgments of facial attractiveness cannot be attributed to one's facial attractiveness alone. Past studies suggest that the level of one's facial attractiveness is impacted by other factors such as personality characteristics (Zhang et al., 2014), intelligence (Prokosch et al., 2009), and other aspects such as voice quality (Valentova, Varella, Havlíček, & Kleisner, 2017), and vice versa. Thus, multiple factors may affect one's judgements on others' facial attractiveness level, and one's facial attractiveness level may affect how other factors are judged, in a phenomenon known as the *halo effect*. The current study aims to examine how the combination of perceived personality traits and creativity affect one's judgements of a target person's facial attractiveness

Halo effect. The *halo effect* is a cognitive bias in which the evaluation of one's ability, traits or attractiveness is impacted by other irrelevant information about this person. Thorndike (1920) first coined the term *halo effect* when he asked commanding officers to evaluate soldiers in the military. They evaluated soldiers based on a variety of traits such as intelligence, physical qualities, leadership, personal qualities, and so on.

The results showed that there were high positive correlations between most of traits they evaluated. For instance, good-looking people received higher scores on other traits, such as positive personal qualities. In addition, people with a high intelligence score also received high scores on leadership and personality. Thorndike concluded that the judgements people made on others in general were impacted by non-related qualities (e.g. a good personality means you are competent) and that all humans are prone to this type of error in judgement. Thus, this suggests that people may evaluate good-looking people, compared to people who are not good-looking, as having higher creative ability, as having more positive personality characteristics, and consider them to be more attractive.

Fisicaro and Lance (1990) investigated why people are susceptible to the halo effect. They proposed three causal models (general impression, salient dimension, and inadequate discrimination) to explain the occurrence of halo errors. Firstly, the *general impression* (GI) model proposes that people's judgements on a specific trait of a person will be affected by general impressions or any previous information related to that person. For example, judging one's attractiveness might be affected by the general impression of this person's background information such as "this person is good at writing", "this person is very warm", where this generally positive background information may lead to positive judgements overall on various dimensions. Secondly, the *salient dimension* (SD) model suggests that a salient trait of a person may influence the judgement of other traits of this person. For example, people might believe good-looking people are also intelligent, even though one's appearance and one's intelligence are two abilities that should be independent from each other. The third model, *inadequate*

discrimination (ID) model, suggests that categorization errors may contribute to the halo effect. For example, people like the smell of perfume more after they read the description of the smell, which suggests the imagination of the smell contributed to the real smell, when the description of the smell is sea, people tended to smell sea even though the perfume is not real sea smell. The GI and SD will be emphasized for the purpose of the current study, as they can better predict and explain the expected results.

The GI model suggests that the judgement of other traits will be affected by the general impression of a person. In my study, participants' perception of attractiveness might be affected by the general impression created of the target person, in other words, participants might inform their judgement of attractiveness after they have seen or read the information of the person. This information combined together might create a general impression, which then might influence judgements on facial attractiveness. The other model, the SD model, suggests that a salient feature of a person will affect other less salient features of that person. Thus, in my study, it is possible that participants might emphasize a single salient feature (e.g. attractiveness, personality, or creativity) compared to creating a general impression. For participants who emphasize more on facial attractiveness, their judgement of creativity and personal characteristics could be affected by facial attractiveness. For participants who pay more attention to creativity, the judgement of facial attractiveness and personal characteristics could be affected by creativity. For participants who pay more attention on personal characteristics, the judgement of facial attractiveness and creativity could be affected by personal characteristics. Therefore, participants' judgement on other less salient features might be

affected by the salient feature, in other words, for participants who pay more attention on facial attractiveness, the judgement on creativity and personality characteristics might be affected by the facial attractiveness. However, in the current thesis, the impact on attractiveness judgements will be emphasized exclusively.

Attractive halo. *Attractive halo* is defined as a tendency that people have to believe attractive people are more likely to possess positive personalities or other positive traits than less attractive people in the absence of information beyond a person's physical appearance. This phenomenon is supported by research that consistently finds that people are likely to give higher intelligence scores (Moore et al., 2011; Talamas, et al., 2016b) and assign positive personality characteristics (Dion & Dion, 1987; Markey & Markey, 2011; Wang et al., 2015; Zhang et al., 2014) to someone who is attractive, which suggests that people might automatically think a good looking person is creative or has warm personality characteristics.

The *attractive halo effect* affects multiple areas in our life. For instance, people with attractive faces not only have more freedom to choose a partner but they also have higher reproductive success than less attractive people (Miller, 2000a). In addition, people with attractive faces also have more opportunities and choices in other domains, such as in the classroom and the job market. For example, when judging the intelligence of children, participants rated attractive faces as much more intelligent than less attractive faces (Talamas et al., 2016b). This suggests that good-looking people might possess more privileges than others. Furthermore, attractiveness may play a role in hiring decisions, as Pansu and Dubois (2002) found that when controlling for qualification of each applicant,

people with attractive faces on the resume were regarded as more favorable than people with less attractive faces on a resume. This suggests that good-looking people might benefit in job opportunities compared to less attractive people.

The *attractive halo effect* not only plays a role in different domains in life, but also affects males and females differently. This difference can potentially contribute to unequal opportunities for success amongst men and women. For example, Ruffle and Shtudiner (2015) found that men and women with attractive faces had significantly higher callbacks than less attractive faces. However, if women did not include a photo, they had significant lower callbacks than women who had pictures, regardless of their attractiveness level. In addition, Karbowski et al. (2016) found that attractiveness is the primary factor that affects the successful rate of dating in women, but not in men. For example, people would like to date attractive women than less attractive women in speed dating situations, even though the less attractive women from the study were more intelligent than the attractive women. Therefore, this study suggests that facial attractiveness could be a factor that determines the overall attractiveness level in women, but not men. Similarly, Watkin (2017) found that males benefit more from creativity than females in terms of attractiveness. Watkin found that creative men received higher attractiveness scores than uncreative men. However, creative but unattractive women received lower attractiveness scores than uncreative and unattractive women. This gender difference is surprising. The current study aims to extend this research by highlighting the effect on females while introducing other components, such as personality (e.g. warm versus cold).

Creativity

Creativity is a topic that spans many different task domains. Creativity can be defined in multiple ways, in general, creativity is producing something in both novel and applicable ways (Harland & Kinder, 1995). For the purposes of this study we will emphasize creativity in terms of divergent thinking. Divergent thinking is a type of creativity where one is faced with producing multiple solutions or ideas. Guilford (1950) was the first person to address divergent thinking and believed that people differ in the sensitivity of investigation when they encountered problems, in other words, they look into problems in different angles. Some people can catch the core of the problem, while some people cannot. In addition, Guilford believed that *fluency* differed among people, some people can quickly come up with many different ideas in limited time than others. Lastly, Guilford (1967) suggests that novelty or *originality* is an important aspect of divergent thinking. The current study uses creative writing to ascribe the creativeness level of target persons. In the current study, subjects will be presented with high and low creative writing examples, where the target was allegedly asked to engage in a divergent thinking task. Given the halo effect literature, it is predicted that one's creativity level and one's facial attractiveness level may both serve to influence one's attractiveness judgements.

Creativity and attractiveness. Creativity and attractiveness together and independently may have an evolutionary basis when it comes to the *halo effect*. For example, attractiveness (via face symmetry) particularly during childhood leads to higher

ratings of intelligence compared to less attractive children (Gangestad & Scheyd, 2005). According to the relationship between facial symmetry and intelligence, attractive faces may be considered a cue of “good genes” that may increase reproductive successful rate of the next generation. Therefore, attractive individuals would be more effective in attracting mates to pass their good genes to their offsprings, which is primarily shaped by sexual selection (Miller, 1999; Miller, 2000a).

Similarly, creativity plays a part in attractiveness and sexual selection. High creativity may also suggest “good genes”, which would then make people more likely to find creative people as more attractive and “fit”. For example, Haselton and Miller (2006) found that when women have to choose between a rich but uncreative man or a poor but creative man, women near peak fertility prefer the poor but creative man for a short-term relationship. In addition, Griskevicius, Cialdini, and Kendrick (2006) found that priming men with sexually attractive mate cues in either a short-term or a long-term relationship enhanced their creative outputs. In women, creativity was increased when primed with a high-quality long-term relationship. These studies suggest that high creativity may play a role in sexual selection and may be an indicator of “good genes” that serve to attract a mate. Interestingly, it is possible for creativity to enhance someone’s desirability in the face of negative traits. For example, Beaussart, Kaufman, and Kaufman (2012) found that creativity mediated the relationship between schizotypy and mating success in both males and females, where those with high creativity were deemed as more attractive partners. Thus, it is possible that both facial attractiveness and creativity level may play roles in determining the attractiveness of an individual.

However, the relationship between creativity and attractiveness may be different between the sexes. Watkin (2017) paired creative writing samples (high and low) with male and female faces varying in attractiveness (high and low). Watkin found that males benefit more from creativity than females in terms of attractiveness ratings. Surprisingly, women with high creativity did not benefit, but instead suffered in their attractiveness rating in the first two studies. However, across experiments, although the male findings were consistent, the female findings were less consistent. Specifically, for unattractive females, it is unclear whether high creativity helps or hinders one's attractiveness, though it was found that attractive females received equally perceived attractiveness either with high creativity or low creativity. The current study aims to address female attractiveness and creativity by using a similar methodology as Watkin, but goes further by adding personality as a component to the relationship.

Personality Characteristics

Each individual has their own personality characteristics according to personality psychologists, and these characteristics are related to other factors in one's daily life. For instance, during the hiring process, human resources might ask applicants to take a personality test as a reference of working abilities; people with desired personality characteristics such as humor, honesty, and politeness received higher physical attractiveness scores than others (Lewandowski, Aron, & Gee, 2007). Personality can be defined in different dimensions, but for the purpose of the current study, the dimensions warm and cold will be emphasized. Asch (1946) suggests that not all qualities have the

same weight in forming impressions of a person, but the warm-cold dimension leads to a great influence when judging the quality of a person. He found that in general, people would form a much more positive impression of the warm person than the cold person. In addition, it was found that people tended to think the warm person was also more generous, happy, humorous, social, popular, imaginative, humane, and better-natured, while the cold person was described as more shrewd, irritable, and ruthless. This kind of *halo effect* could affect our judgement on people's other abilities or characteristics when we receive warm or cold cues concerning their personality, suggesting that warm-cold personality characteristics could also affect attractiveness and creativity. For example, people tend to judge people with positive personality characteristics as more attractive (Zhang et al., 2014; Markey & Markey, 2006). In addition, warm and cold dimensions were related to different types of creativity - relational creativity and referential creativity. This study will use creative writing samples, which is a type of relational creativity, related to warm characteristics (Ijzerman, Leung, and Ong, 2014). These studies propose that personality characteristics could be related to creativity and attractiveness.

Personality and attractiveness. Personality characteristics might influence attractiveness. Some research suggests that positive personality characteristics enhance one's overall attractiveness (Zhang et al., 2014; Markey & Markey, 2006). For example, Zhang et al. (2014) found that when people rated the attractiveness of unfamiliar female faces with three different personality conditions (positive personality, negative personality, and no information-control), those ascribed a positive personality were

perceived as more attractive than those in the other conditions. This means that the relationship between personality characteristics and attractiveness explain and lead to the idea of the stereotype content model.

The stereotype-content model (Fiske, Cuddy, Glick, & Xu, 2002) provides a possibility that people like warm women more because they fulfill the stereotype that women should be warm and kind. Two stereotype content models should be considered in this study: paternalistic stereotypes and envious stereotypes. The paternalistic stereotype model describes women who are warm but low in competency, such as housewives. Those in line with this stereotype are considered kind and easy to approach. The warm personality description in the current study might fulfill the paternalistic stereotype of females and lead to higher attractiveness scores. The other model: the envious stereotypes model, describes women who are high in competency but cold, such as women in leadership positions. Those in line with this stereotype are considered tough to connect to and tough to approach. People usually dislike them because they do not fulfill the social stereotypes of females. The cold personality description when combined with high creativity might fulfill the envious stereotype which may lead to lower attractiveness scores.

It is also possible that warm-cold personality characteristics differently affect males and females. For example, Markey and Markey (2006) found that people tend to prefer women with purely warm characteristics compared to other types of characteristics. Currently, there is no study that has examined the relationship between warm-cold personality characteristics, creativity, and attractiveness together. As

mentioned, females are often rated higher in attractiveness when ascribed warm personality traits. However, when taking into consideration the role of creativity (e.g. intelligence) the relationship is unclear, and is addressed below.

Personality and creativity. The relationship between warm-cold personality and creativity is mixed. Research has shown that the personality characteristics, warm and cold are related to different types of creativity. For example, Ijzerman et al. (2014) found that warm cues elicit relational creativity. Relational creativity involves focusing on connections between things. For example, when using relation thinking one may be more likely to consider the similarities of atypical category members (e.g. Camel) as conforming to the typical group (e.g. Vehicles, which is most likely to include cars, trucks, trains, and boats, but would rarely include camels as a typical member). Ijzerman et al. also found that cold cues elicit a different type of creativity, referential creativity. Referential creativity involves novel ways of thinking and is what some may call “thinking outside the box”. When using referential creativity, one can disconnect from automatic ways of processing information. For example, ordinarily, when presented with patterns of dots, typical perceptual organization rules would lead someone to forming a box or square out of the pattern of dots (e.g. three rows of three dots, making a 9-dot grid). When using referential creativity, one is able to go beyond that interpretation and manipulate it in more creative ways. Ijzerman et al. tested participants’ relational and referential creativity on four different experiments and found that warm cues are related to higher rates of relational creativity, while cold cues are related to higher rates of referential creativity. The current study will use relational creativity productions to

ascribe high and low creativity of target persons. Specifically, it will use creative writing samples (high and low) from Watkin (2017) and Griskevicius et al. (2006), where the writing samples were created by subjects whose writings were inspired by paintings and pictures. This is a type of relational creativity procedure because these writing samples build the connections between the inner emotion from these writers and the pictures. Research by Taft (1971) further supports the notion that creative writing is linked to a warm dimension. In his study, he named artistic-literary creativity such as art, music, painting, and importantly, writing as “hot creativity”, while scientific creativity, such as problem solving, as “cold creativity”. Thus, we would expect that those who are labeled as having a warm personality would benefit from creativity because warm is an indicator of high relational creativity. Thus, attractiveness scores might go up if someone has warm personal characteristics and high creativity.

Current Study

The current study examines the relationship between facial attractiveness, creativity, and personality characteristics in females. It is argued that the *halo effect* affects people’s judgements on attractiveness when other factors are present. Fisičaro and Lance’s (1990) three models demonstrated that people’s judgement on a person’s ability will be affected by general impression, other abilities that may or may not related to the ability they are going to judge, and also other factors that are not related to the person. GI and SD models will guide the current study. In this study, participants will rate the overall attractiveness according to the attractiveness of their faces, the creativity level of

their stories, and either warm or cold personality characteristics. These three factors together can make a general impression (GI) that might affect the attractiveness score as revealed by the anticipated three-way and two-way interactions. However, failing to find an interaction would lend more support to the SD model. People might judge females with good-looking faces, or creative writing or have more positive personality characteristics more attractive according to SD model.

The purpose of this study is to investigate the impact of facial attractiveness, creativity and warm-cold personality characteristics in overall female attractiveness. To examine the role of facial attractiveness, creativity, and personality characteristics in attractiveness ratings, participants will rate the facial attractiveness of individuals. Like Watkin (2017), the current study will pair a creative writing work (high or low) with the face of the author (high or low attractiveness), but unlike Watkin, the current study will also ascribe a personality description to the author (warm or cold), and ask participants to rate both the attractiveness and competency of the person described on the screen. The literature suggests that creativity, although generally seen as a positive characteristic, can have a detrimental effect of attractive women's perceived attractiveness. In addition, Watkin (2017) found that highly creative but less attractive females received the lowest attractiveness scores as compared to those with different levels of creativity and attractiveness. However, past research (Ijzerman et al., 2014) found that warm cues elicit relational creativity, which means that warm traits and high creativity are related to higher levels of attractiveness. Because this study uses relational creativity, it is expected that females with high creativity and warm personality characteristics will receive higher

scores on overall attractiveness compared to females with low creativity but warm personality characteristics. Past research (Fiske et al., 2002) also suggests that people tended to like warm females because they fulfilled the social stereotype of females. Therefore, high creativity might demonstrate high competency which fulfilled the envious stereotype model. Past research looked into the relationship between facial attractiveness, personality characteristics, and creativity, but currently, there is no study that has investigated the relationship between all three of these factors.

Hypothesis 1a: Facial attractiveness x personality characteristics x creative ability interaction. If the rating of one's attractiveness is influenced by one's current level of attractiveness, personality characteristics, and creative ability, then differences in facial attractiveness ratings should be observed when varying attractiveness, personality characteristics, and creative ability. It is expected that those who are physically attractive and have warm personality characteristics will receive the highest attractiveness rating scores, regardless of creativity level and will be rated the highest in attractiveness overall conditions. However, those who are not physically attractive and have warm personality characteristics who differ on creativity will reveal differences; those who are low in creativity will receive higher attractiveness ratings than those who are high in creativity. It is expected that those who are physically attractive and have cold personality characteristics will receive equivalent attractiveness rating scores, regardless of creativity level. However, those who are not physically attractive and have cold personality characteristics who differ on creativity will reveal differences; those who are low in creativity will receive higher attractiveness ratings than those who are high in creativity.

This study is in line with previous research that warm personality characteristics is positively related to attractiveness (Fiske et al., 2002; Markey & Markey, 2011; Wang et al., 2015; Zhang et al., 2014), while creativity is negatively related to attractiveness for females (Watkin, 2017).

Hypothesis 1b: Facial attractiveness x personality characteristics interaction.

If the rating of one's attractiveness is influenced by one's current level of attractiveness and personality characteristics, then it is expected that those who are high in attractiveness and possess warm personality characteristics will receive higher attractiveness ratings than those who are low in attractiveness and possess warm personality characteristics. Those who are high in attractiveness and possess warm personality characteristics are expected to be the highest rated group in attractiveness overall. Similarly, those who are high in attractiveness and possess cold personality characteristics will also be rated higher than those who are low in attractiveness and possess cold personality characteristics. Those who are low in attractiveness and possess cold personality characteristics are expected to be the lowest rated group in attractiveness overall. This is in line with previous research that warm personalities may enhance facial attractiveness (Markey & Markey, 2011; Wang et al., 2015; Zhang et al., 2014)

Hypothesis 1c: Facial attractiveness x creative ability interaction. If the rating of one's attractiveness is influenced by one's current level of attractiveness and creative ability, then it is expected that those who are high in attractiveness will receive higher attractiveness ratings than those who are low in attractiveness regardless of creative ability. Those who are high in attractiveness are expected to be the highest rated group in

attractiveness. However, creativity is expected to influence attractiveness ratings for those low on attractiveness; those who are low in creativity will receive higher attractiveness ratings than those who are high in creativity. This prediction is in line with previous research that has found high creative ability may weaken facial attractiveness in females who are not physically attractive (Watkin, 2017).

Hypothesis 2a: The main effect of facial attractiveness. If the rating of one's attractiveness is influenced by one's current level of attractiveness, then those who are high in attractiveness will be rated as more attractive than those who are low in attractiveness. This is in line with research that has found that facial attractiveness may influence the current level of attractiveness (Markey & Markey, 2011; Watkin, 2017; Wang et al., 2015; Zhang et al., 2014).

Hypothesis 2b: The main effect of personality characteristics. If the rating of one's attractiveness is influenced by personality characteristics, then those who possess warm personality characteristics will be rated as more attractive than those who possess cold personality characteristics. This is in line with what research that found the rating of ones' facial attractiveness is influenced by personality characteristics (Markey & Markey, 2011; Wang et al., 2015; Zhang et al., 2014).

Hypothesis 2c: The main effect of creativity. If the rating of one's attractiveness is influenced by one's creative ability, then those who are high in creativity will be rated as less attractive than those who are low in creativity. This is in line with what research that found that the rating of one's attractiveness is influenced by one's creative ability (Watkin, 2017).

Method

Participants

Participants aged 18 years-old or above without any visual impaired through online data collection such as Amazon mechanical Turk, online programs that reach out college students. 290 people participated in the study. There were 85 women whose average age was 37.76 ($SD = 11.64$), 134 men whose average age was 37.80 ($SD = 13.12$), and one person who chose the other biological sex participated in the study. The study gained Institutional Review Board (IRB) approval. The number is 18-055.

Materials

Face stimuli. 4 photos of white female faces aged 18-35 from Hahn, Wang, Fisher, DeBruine, and Jones's (2014) 3dsk face database were used. All photos were taken in a standardized manner that the pictures were taken in full-face view directly facing the camera in front of a plain white background, the full face was visible with both eyes open, and without any head cover, faces showed neutral expression. This database had attractiveness ratings from 100 heterosexual men and 100 heterosexual women for each face. The faces with the highest and lowest ratings would be used to select the 4 high attractive and 4 low attractive faces for this experiment. Faces used in the current study can be found in Appendix A.

Story extracts. Four story extracts were used in this study to represent two high and two low creativity works. One high creative story extract and two low creative story extracts were from Watkins's (2017). One creative story extract was from Griskevicius et al.(2006). The extracts used in the current study can be found in Appendix B.

Personality characteristics. Asch's (1964) description of personality would be used in the current study. The descriptions would be identical except for the word warm/cold, i.e. intelligent—skillful—industrious—warm/cold—determined—practical—cautious.

Design

This study was a 2 (facial attractiveness) x 2 (creativity) x 2 (personality characteristics) mixed subjects design. The variable facial attractiveness was a within-subjects factor with two levels, attractive and less attractive. The variable creativity was a within-subjects factor with two levels, creative and less creative. The variable personality characteristics was a between subjects factor with two levels, warm and cold.

The dependent variable in this experiment was overall attractiveness rating from Watkins (2017). In this scale, attractiveness was rated by the following rating scale: 1 = *much less attractive than average*, 2 = *less attractive than average*, 3 = *slightly less attractive than average*, 4 = *average attractiveness*, 5 = *slightly more attractive than average*, 6 = *more attractive than average*, 7 = *much more attractive than average*. The other dependent variable in this experiment was competency score is created from the author according to the attractiveness rating scale. In this scale, competency score is rated

by the following rating scale: 1 = *very poor*, 2 = *below average*, 3 = *average*, 4 = *above average*, 5 = *excellent*.

Procedure

Participants were instructed to make attractiveness and competency judgements on four individuals via a computerized online survey through Qualtrics (Qualtrics, Provo, UT). Each experimental session was as follows: Participants would first be presented with a personality description of the person they were going to rate on an attractiveness score and a competency score scale. They would press the “NEXT” button after they finished reading. A paragraph of a creative writing sample would be presented after they pressed the button. They would then press the “NEXT” button after they finished reading. A description of personal characteristics would be presented at the top of the screen, as well as a photo of a face (center left display) would be presented simultaneously with a creative writing sample (center right display) (see appendix A for an example). After participants reviewed all three factors, they would rate the attractiveness of this person and the competency of this person. Once the participant made a selection, a screen would appear to prepare for the next trial, i.e. “Thank you. If you are ready to make the next decision, please click on the “NEXT” button”. There are two trials of the study and participants will be randomly assigned to the experimental conditions. One trial is with warm personality description, and the other is with cold personality description. The experimental conditions will be counterbalanced.

Results and Discussion

Data Cleaning

290 people participated in the survey, but 12 people did not complete the survey and not included in the analysis. The analysis omitted another 58 participants who finished the survey under 60 seconds according to the survey duration, which is a time limit that suggests the participants simply sped through the experiment without following the directions of the experiment. Therefore, the remaining data from 220 participants were included in the data analysis. All response data was automatically collected and stored in Qualtrics (Qualtrics, Provo, UT). The survey also collected demographic information such as “age” and “biological sex”.

Outliers in the data were determined by being two standard deviations away from the mean. One outlier was detected in the age group, but we retain the outlier because the main focus here is the relationship between facial attractiveness, creativity, and personality characteristics and doesn't have direct implications on age per se. 14 outliers were detected in the competency scorings. The analyses only removed the 14 outliers when the variable “competency score” was included in the analysis, in other words, these 14 outliers exist during the analysis regarding “attractiveness score”. Three high leverage points were detected from the leverage plots for attractiveness ratings (dependent variable). One high leverage point was removed for all models that predict *attractiveness ratings* because it was not normally distributed in the standardized residual plot, and it

shifted the coefficient too much. Three high leverage points were detected from the leverage plots for competency ratings (dependent variable). However, the analysis didn't remove any of them because these points were normally distributed.

Analysis

The data set met homoscedasticity and normality assumptions according to the residual plots for each model. All analyses were processed in R with psych (Revelle, 2018), dplyr (Wickham, François, Henry, & Müller, 2018), sjstats (Lüdtke, 2018) and Hmisc (Harrell & contributions from Charles Dupont, 2019) packages. All graphs were made by the “ggplot2” package (Wickham, 2016). A three-way mixed factorial ANOVA was used to compare the effect of facial attractiveness (attractive vs. less attractive), creativity level (high vs. low), and personality characteristics (warm vs. cold). Follow-up analyses addressed significant relationships, identifying where the differences exist in the three-way ANOVA, with motivated follow-up two-way ANOVAs for the two-way interactions, and t-tests for the main effects.

Hypothesis 1a. Facial attractiveness x personality characteristics x creative ability interaction. It was expected that those who are physically attractive and have warm personality characteristics would receive the highest attractiveness rating scores, regardless of creativity level and would be rated the highest in attractiveness overall conditions. However, it was also expected that those who are not physically attractive and have warm personality characteristics who differ on creativity would reveal differences; those low in creativity were expected to receive higher attractiveness ratings than those

who are high in creativity. It was also expected that those who are physically attractive and have cold personality characteristics would receive equivalent attractiveness rating scores, regardless of creativity level. However, those who are *not* physically attractive and have cold personality characteristics who differ on creativity were expected to reveal differences; those with low creativity were expected to receive higher attractiveness ratings than those who with high creativity.

A three-way ANOVA was conducted to test the effect of facial attractiveness, creativity, and personality characteristics on overall attractiveness. The results of the 3-way ANOVA was not significant (see Table 1). However, the omnibus results suggested significant 2-way interactions and main effects, which are reported in with the headings “Hypothesis 1b, 2a and 2c”.

The result of the analysis for the rating of attractiveness is not consistent with hypothesis 1a, where we assumed that there was a three-way interaction between facial attractiveness, creativity and personality characteristics. Previous research looked into the relationship between personality characteristics and attractiveness, but not the relationship between facial attractiveness, creativity, and personality characteristics. The result of this study suggested that there is no relationship between these three variables, which was inconsistent with past research which suggests that there is an effect of personality characteristics on attractiveness. For example, Markey and Markey (2011) suggested that people prefer women with purely warm characteristics compared to other types of characteristics, both Wang et al. (2015) and Zhang et al. (2014) found that females with positive personality characteristics would have higher attractiveness score

than females with negative personality characteristics. (Markey & Markey, 2011, Wang et al., 2015; Zhang et al., 2014). It seems to be the case that the variable of personality characteristic was not significant in any analysis in the current study. However, the results suggest an interaction between facial attractiveness and creativity on attractiveness score, and the main effect of facial attractiveness and creativity on attractiveness score, which is described in the following.

Table 1.

*Three-way ANOVA: Attractiveness~Creativity*Facial*Personality*

| | <i>df</i> | Sum of Squares | Mean Squares | <i>F</i> | <i>p</i> | η^2 |
|---------------------------------|-----------|----------------|--------------|----------|-----------|----------|
| Creativity | 1 | 53.2 | 53.2 | 43.47 | < .001*** | .03 |
| Facial | 1 | 789.8 | 789.8 | 605.01 | < .001*** | .40 |
| Personality | 1 | 1.5 | 1.5 | 1.242 | .27 | .00 |
| Creativity: Facial | 1 | 12.6 | 12.6 | 10.33 | .001** | .01 |
| Creativity: Personality | 1 | 0.0 | 0.0 | 0.01 | .92 | .00 |
| Facial: Personality | 1 | 0.0 | 0.0 | 0.04 | .84 | .00 |
| Creativity: Facial: Personality | 1 | 0.6 | 0.6 | 0.48 | .49 | .00 |
| Residuals | 871 | 1065 | 1.2 | | | |

Note. Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

$R^2 = 0.4313$

Hypothesis 1b: Facial attractiveness x personality characteristics interaction.

It was expected that those who are high in attractiveness and possess warm personality characteristics would receive the highest attractiveness ratings overall. Similarly, those who are high in attractiveness and possess cold personality characteristics were expected to be rated higher than those who are low in attractiveness and possess cold personality characteristics. Those low in attractiveness and possess cold personality characteristics were expected to be the lowest rated group in attractiveness overall. A two-way ANOVA for the interaction between facial attractiveness and personality characteristics was conducted, but was found to be non-significant (see Table 1).

The result of the analysis for the rating of attractiveness is not consistent with hypothesis 1b, where we assumed that there was an interaction between facial attractiveness and personality characteristics. It was not consistent with the past research that found that personality characteristics influenced attractiveness (Markey & Markey, 2011; Wang et al., 2015; Zhang et al., 2014). Wang et al. (2015) suggested that people with positive personality characteristics receive higher attractiveness scores than people with negative personality characteristics, and that one's personality characteristics benefit those who are high in facial attractiveness more than those with low levels of facial attractiveness. However, the current study did not find a significant effect with regard to personality characteristics and facial attractiveness.

Hypothesis 1c: Facial attractiveness x creative ability interaction. It was expected that those who are high in attractiveness would receive higher attractiveness ratings than those who are low in attractiveness regardless of creative ability. However,

those who are low in attractiveness but creative were expected to receive lower attractiveness ratings than those who were low in attractiveness and not creative.

Results from a two-way ANOVA and follow up post hoc tests yielded a significant interaction between creative ability and facial attractiveness on attractiveness ratings (see Table 1, Figure 1). Post hoc Tukey HSD tests were conducted on all possible pairwise contrasts. The result showed the following pairs of groups were found to be significantly different ($p < .05$) (See Table 2): females who are high in facial attractiveness and high in creativity ($M = 4.90$, $SD = .07$) were rated as more attractive than females who are low in facial attractiveness and high in creativity ($M = 3.30$, $SD = .07$). Females who are high in facial attractiveness and high in creativity ($M = 4.90$, $SD = .07$) were also rated as more attractive than females low in facial attractiveness and low in creativity ($M = 2.57$, $SD = .07$). However, no significant difference was found between females high in facial attractiveness and high in creativity ($M = 4.90$, $SD = .07$) and females who are high in facial attractiveness and low in creativity ($M = 4.64$, $SD = .07$).

Table 2.

Tukey test: Facial attractiveness x Creativity

| | High in Facial attractiveness x High in Creativity | Low in Facial attractiveness x High in Creativity | High in Facial attractiveness x Low in Creativity | Low in Facial attractiveness x Low in Creativity |
|---------------------|--|---|---|--|
| Attractive Score | 4.90(.07) _a | 3.30(.074) _b | 4.90(.07) _a | 2.57(.07) _c |

Note. Means with differing subscripts differ significantly at $\alpha = .05$ using Tukey HSD.

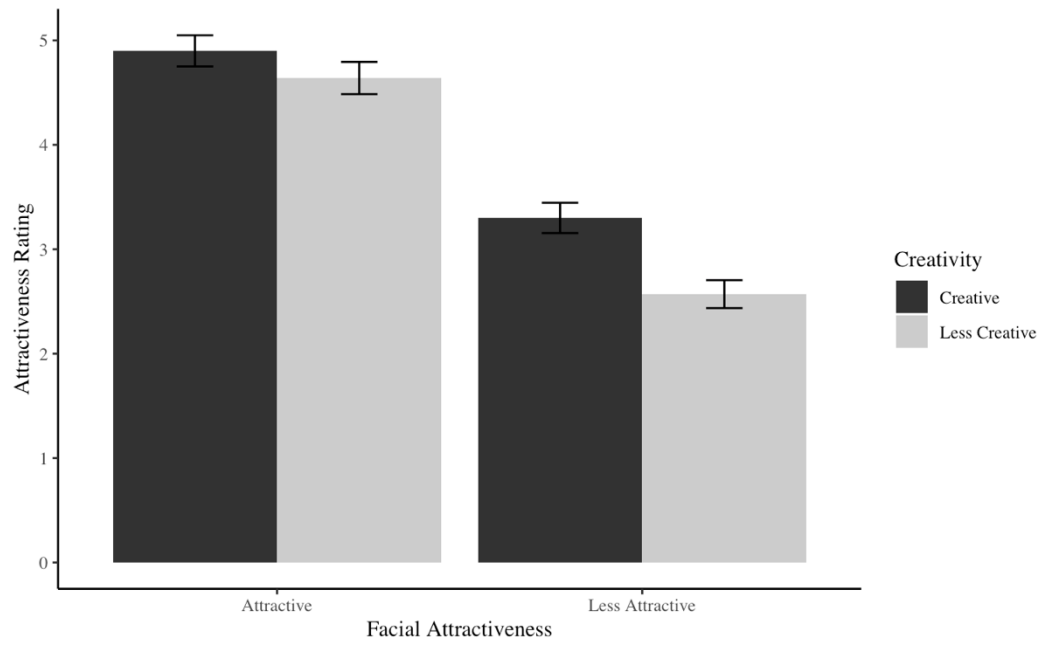


Figure 1. Interaction between Facial attractiveness and Creativity

In addition, females high in facial attractiveness and low in creativity ($M = 4.64$, $SD = .07$) were rated as more attractive than females low in facial attractiveness and low in creativity ($M = 2.57$, $SD = .07$). Females high in facial attractiveness and low in creativity ($M = 4.64$, $SD = .07$) were also rated as more attractive than females low in facial attractiveness and high in creativity ($M = 3.30$, $SD = .07$). Females low in facial attractiveness and high in creativity ($M = 3.30$, $SD = 0.074$) were rated as more attractive than females low in facial attractiveness and low in creativity ($M = 2.57$, $SD = 0.07$).

In other words, females who were high in facial attractiveness and high in creativity received the highest attractiveness rating scores, followed by females who were high in facial attractiveness but low in creativity, but there is no significant difference between these two groups. However, for the females who were low in facial attractiveness, creativity made a significant enhancement in the attractiveness rating: females who were high in creativity but low in facial attractiveness received higher attractiveness scores than females who were low in creativity and low in facial attractiveness.

These results are partially consistent with hypothesis 1c, where we assumed that there was a two-way interaction between facial attractiveness and creativity. Although an interaction was observed, it was contrary to our prediction. Our prediction was based off of the results observed by Watkin (2017), which found that creativity level altered the attractiveness scores given to females low in attractiveness, where those who were high in creativity received lower attractiveness scores than those who were low in creativity, but creative levels did not affect the attractiveness scores of females high in

attractiveness. The current study differs on the direction of the relationship between creativity and attractiveness compared to Watkin's (2017) study. The current study suggests that high creativity increases (instead of decreases) the attractiveness scores of less attractive females compared to less attractive females with low creativity. However, for females high in attractiveness, like Watkin found, creativity did not significantly influence attractiveness ratings. Suggesting that creativity only plays a role in the perception of females low in attractiveness.

Hypothesis 2a: The main effect of facial attractiveness. It was expected that those high in facial attractiveness would receive higher attractiveness scores than those low in facial attractiveness. Results of simple main effects from a three-way ANOVA showed that there was a main effect of facial attractiveness on attractiveness ratings. Those high in facial attractiveness ($M = 4.77$, $SD = 1.16$) received higher attractiveness scores than those low in facial attractiveness ($M = 2.94$, $SD = 1.13$) (see Table 1).

The result is consistent with hypothesis 2a, where we assumed that there was a main effect of facial attractiveness on the attractiveness rating. It is consistent with past research that has found that facial attractiveness may influence the current level of attractiveness (Markey & Markey, 2011; Watkin, 2017; Wang et al., 2015; Zhang et al., 2014). The result showed that attractiveness scores varied significantly due to the facial attractiveness condition, and in the expected direction, suggesting that our stimuli were effective in this study.

Hypothesis 2b: The main effect of personality characteristics. It was expected that those who possess warm personality characteristics would be rated as more attractive than those who possess cold personality characteristics on attractiveness scores. Results from the three-way ANOVA showed that there was no main effect of personality characteristics on attractiveness ratings (see Table 1).

This result is not consistent with hypothesis 2b, where we assumed that there was a main effect of personality characteristics on the attractiveness rating. Unlike past research (Wang et al., 2015; Zhang et al., 2014) that found positive and negative personality characteristics affect the judgement of one's overall attractiveness level, this study did not find a relationship between personality characteristics and attractiveness scores. Suggesting that warm-cold personality characteristics did not play a role in the perception of females' attractiveness. It might be because personality characteristics did not play an important role when it appears with both facial attractiveness and creativity. The past research (Wang et al., 2015; Zhang et al., 2014) only observed the relationship between personality characteristics and attractiveness but not with both facial attractiveness and creativity. In addition, this study arranged the personality description, writing samples, and faces in a way that participants were presented with the content in a specific order, which might have also influenced the results.

Hypothesis 2c: The main effect of creativity. It was expected that those who possess warm personality characteristics would be rated as more attractive than those who possess cold personality characteristics on attractiveness scores. It was also expected that those high in creativity would receive higher competency scores than those who are

low in creativity. Results from the three-way ANOVA showed that there was a main effect of creativity on attractiveness ratings. Those who were high in creativity ($M = 4.10$, $SD = 1.37$) received higher attractiveness rating than those low in creativity ($M = 3.61$, $SD = 1.51$) (see Table 1).

This result is consistent with hypothesis 2c and is in line and differs from past research (Watkin, 2017). Specifically, like Watkin (2017), the current study found a significant relationship between creativity and attractiveness ratings for unattractive females. However, the current study found an opposite effect to Watkin. In the current study, unattractive females benefitted from high levels of creativity on the attractiveness rating, while Watkin found that unattractive females with high creativity resulted in a decrease in their attractiveness rating.

Exploratory Analysis

This study collected data through Amazon mechanical Turk, a data collecting system that attracts a wide age range of participants. Most participants in Watkin (2017)'s study were undergraduates (M age = 23.01 years, SD age = 8.18 years), and the current study collected data that includes a wide age range of participants from 19 years-old to 75 years-old, which lead us to question a relationship between participant age and attractiveness ratings. Past research (Foos & Clark, 2011) suggested that people in different age groups rate the attractiveness differently. Therefore, it is necessary to look into the relationship between participant age and attractiveness ratings in case there is an effect of age on attractiveness score.

To test this idea, a polynomial regression was conducted to examine the relationship between age and attractiveness by using the formula: y (*attractiveness*) = x (*age*) + x^2 (*age*²). The rationale of the test was motivated by the plot of age which showed that the relationship between age and attractiveness score was not linear. Plus, using a polynomial regression in the formula would increase the R squared from 0.004 to 0.009, which indicated that the polynomial regression is a better model than a linear regression model. The result from the model showed that older people tended to rate attractiveness higher than younger people (see Table 3), which means it might have inflated the overall attractiveness scores. However, age only explained 0.9% variance of attractiveness scores. Therefore, age did not play an essential role in this study, suggesting our overall result is still valid.

Interestingly, the results of the analysis suggest that older people tended to give higher scores on attractiveness than younger people, however, it did not occupy a large amount of explanation variance of attractiveness. Past research (Foos & Clark, 2011) suggests that older participants tend to rate equally for both young and aged faces, while younger participants tend to rate higher in attractiveness ratings for younger faces compared to aged faces. The current study used all young white female faces that should be considered equally attractive for both of age groups. This additional finding might be considered as a randomness, and probably needs more research to be done on the relationship between participants' age and attractiveness.

Table 3

Polynomial regression: the main effect of age: $y = age + age^2$

| | <i>df</i> | Sum of Squares | Mean Squares | <i>F</i> | <i>p</i> | η^2 |
|-----------|-----------|-------------------|--------------|----------|----------|----------|
| Age | 1 | 11.6 | 11.57 | 5.40 | < .01* | .01 |
| Residuals | 854 | 1829.0 | 2.14 | | | |

Note. Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

$R^2 = 0.028$

General Discussion

The purpose of this study was to examine the effect of the combination of facial attractiveness, creativity, and personality characteristics on attractiveness ratings. Results from this experiment showed that some variables, such as facial attractiveness and creativity, plays a significant role in attractiveness ratings. Facial attractiveness is one of the main features we are using to judge people's overall attractiveness. The study suggested that people tend to rate people with attractive faces as higher in attractiveness compared to people with less attractive faces, which is not surprising. However, overall attractiveness is also affected by creativity. The study found that high creativity will raise the attractiveness scores for less attractive females, but not for attractive females.

This study was an extension of a study conducted by Watkin (2017) which examined the relationship between facial attractiveness, creativity, and biological sex on the ratings of attractiveness. The current study added the role of personality characteristics and removed the role of biological sex. The results of the current study demonstrated that there was no interaction between facial attractiveness, creativity, and personality characteristics. However, an interaction between facial attractiveness and creativity on attractiveness scores was observed. We suggest that creativity plays a significant role in enhancing attractiveness for females for those who are low in facial attractiveness. The role of personality characteristics was not found to play a role in our study.

Facial Attractiveness

Facial attractiveness plays an essential role in the relationship between creativity, personality characteristics, and overall attractiveness. Facial attractiveness is considered an important feature when making attractiveness ratings, which is supported by the result of the current study that people with attractive face will gain higher attractiveness scores than people with less attractive faces.

Halo effect. The halo effect that Thorndike coined in 1972 was the main supported theory of this study. There were two models (Fisicaro and Lance, 1990) that were presented as possible explanations for the current study with respect to the halo effect. The result of the current study did not support the GI (general impression) model. The GI (general impression) model, which explained that people tend to judge one's certain ability by judging the general impression of this person, where this kind of general impression might not be related to the ability being judged. For example, participants in the current study read one's creative writing samples, saw a person's face, and personality description before the judgement of attractiveness. The combination of facial attractiveness, creativity, and personality characteristics might create a halo effect toward the overall attractiveness if GI model exists. However, the result of the study showed that only facial attractiveness and creativity matters when it comes to attractiveness ratings, and that there is no significant relationship between personality characteristics and attractiveness rating. Thus, the GI model was not supported in the current study. The reason that the GI model was not supported might be that the

personality description did not play an important role when it appears with both facial attractiveness and creativity at same time. Participants might not be able to deal with multiple types of information (e.g, face information, writing samples, and personality description). What's more, the study gave participants each type of information separately instead of all three types of information at one time. For example, this study starts with personality description followed by a writing sample, which might lead participants to focus on one type of information at once each time. It means that participants will not be able to deal with three types of information at once to form an impression of the stimuli. Therefore, GI model is not working here.

The other model, SD (salient dimension) model, suggested that people tended to judge others' abilities based on a single salient dimension. The interaction between creativity and facial attractiveness in the current study suggested that creativity served as a salient feature for less attractive females because those who were creative were rated as more attractive than those who were not creative. For attractive females, creativity did not impact attractive females. Thus, facial attractiveness is the most salient feature for attractive females in the current study.

Creativity

Results from this study suggested a relationship between facial attractiveness and creativity on attractiveness scores for females low in attractiveness. Specifically that low attractive females benefit from higher creativity compared to lower creativity on attractiveness ratings. This was inconsistent with Watkin (2017)'s study who found that

high level of creativity was detrimental to females low in attractiveness compared to low levels of creativity. The reason behind this could be the faces the current study using compared to Watkin (2017)'s study. Watkin (2017) selected less attractive faces which were around mid-point attractiveness level of all faces in the dataset, however, less attractive faces in the current study used faces which had the lowest attractiveness scores compared to all faces in the dataset. Therefore, the attractiveness level of the less attractive faces in Watkin (2017)'s study might be in the middle between attractive and less attractive levels in the current study. It might imply that for females who are moderately attractive, creativity might hurt them on attractiveness scores, however, for females who are least attractive, creativity might help them on attractiveness scores.

In addition, the main effect of creativity on attractiveness score was consistent with past research (Griskevicius, Cialdini, & Kendrick, 2006; Haselton & Miller, 2006; Miller, 1999) concerning the "good gene theory". This research found that creativity plays an essential role in mating selection, and high creativity might indicate "good genes" which benefits offspring. However, there are no other studies that have investigated the relationship between creativity and attractiveness except for Watkin's (2017) and the current study (to my knowledge). The different result between this study and Watkin (2017) on the relationship between creativity and attractiveness score among females may suggest there are other factors that affect the influence of creativity on attractiveness.

Studies that examined the relationship between facial attractiveness and creativity are very rare. Past research (Moore, et al., 2011; Talamas et al., 2016b ; Zebrowitz, Hall,

Murphy, & Rhodes, 2002) has focused more on the relationship between intelligence and attractiveness. Most researchers (e.g. Kim, 2005) agree with the threshold theory, which assumes that there is no correlation between creativity and intelligence when the intelligence score is above a critical level, but there might be some correlation between creativity and intelligence when the intelligent score is below that critical level. The critical level in most research is an IQ of 120. However, in a meta-analysis Kim (2005) suggested that the relationship between creativity and intelligence is negligible, and this threshold theory cannot explain the variance of the correlation coefficient between creativity and intelligence. Therefore, it may suggest that the influence of creativity on attractiveness rating is independent from the effect of intelligence level. The result from the current study shows that high creativity enhances attractiveness of females who are low in facial attractiveness and this might not be moderated by her intelligence level.

Personality Characteristics

Unlike past research (Zhang et al., 2014) that found a relationship between personality characteristics and facial attractiveness, the current study did not. It is possible that the words used to describe the personality characteristics might be too mild in the current study. For example, Zhang et al., (2014) used positive words such as decent and honest, and negative words such as mean and evil to describe the personality characteristics. These words are stronger than the words we used, which came from Asch's (1946) study, which might be more ambiguous except for the words warm and cold. In addition, it was possible that the personality information was overlooked in the

current study because personality was a between subjects factor, making the information possibly discounted in the judgements of participants.

In addition, according to Wang et al. (2015), personality characteristics had less influence when rating females who were low in attractiveness, especially if their attractiveness was under a critical level. Wang et al. (2015) found that people tended to believe attractive females were more positive and warmer, which was consistent with SD model mentioned above. If participants considered facial attractiveness as a more salient feature than personality characteristics, then those high in attractiveness would be considered in a positive light and warm without attending to the personality description in the experiment. Therefore, the personality description in the current study might not have made a strong enough impression.

Implications

The result of the research suggest that not only does facial attractiveness play an important role when it comes to attractiveness ratings, but creativity might be able to enhance one's attractiveness, especially for those low in attractiveness. This research also provides a piece of evidence that it is necessary to be conscious about the *attractive halo effect* when one is judging the attractiveness of others. People might be affected by one's attractiveness level when they are judging someone's other abilities which is independent from the facial attractiveness feature. For example, this study demonstrates that for those who are low in facial attractiveness, creativity level will affect their attractiveness rating,

however, for those who are high in facial attractiveness, creativity level did not influence their attractiveness rating.

This bias appears stronger towards women, who are judged more on physical attractiveness than men. For example, past research (Karbowski et al., 2016) suggests that men held more positive attitudes toward attractive women compared to unattractive women when taking part in speed dating. However, women's judgments of men were not found to be based solely on attractiveness level, as they might also factor in other characteristics, like intelligence, which was not found to be part of the decision criteria for men's judgements of women. In addition, women also receive more biased judgement due to physical attractiveness in the job market compared to men. Past research (Ruffle & Shtudiner, 2015) suggested that both women and men who look attractive on their resume (via photos) were more favored by hiring companies. However, if women did not include a self-photo on the resume, they would receive less callbacks than other women regardless of the attractiveness level. The current study suggests that this kind of gender discrimination could occur in both dating and job market. For example, females who are high in facial attractiveness might have more chances than females who are low in facial attractiveness. However, females who are low in facial attractiveness might be able to improve their chances and evaluations if their creativity is high compared to low. In addition, Watkin (2017) found that all males, regardless of attractiveness level benefit from being high in creativity, compared to low in creativity. However, the female results are not so straightforward. First, females did not similarly benefit like their male counterparts when it came to benefiting from high creativity levels, as creativity level did

not matter for females high in attractiveness in both Watkin's and the current study. Second, for low attractive females, our results show the opposite from Watkin's results for females low in attractiveness. In the current study, low attractive females benefit from high creativity, while Watkin found that low attractive females benefit from low creativity. Therefore, gender discrimination should be taken into account in both the dating and job market and other areas where males and females might compete for the same position or roles. This suggests that females who are low in attractiveness are less likely to receive callbacks compared to males, because for females, facial attractiveness plays an important role in overall attractiveness, and past research suggests a positive significant relationship between attractiveness and job opportunities (Pansu & Dubois, 2002).

The Limitations of This Study

There were several limitations in this study. First, the design of this experiment may have contributed to the null results concerning personality characteristics. This study used shorter personality descriptions compared to the writing samples, which may have led to less attention from participants on the personality descriptions. In other words, participants would spend less time reading each personality description. It might be helpful to put the information about these three variables in a manner where participants would be able to process it equally. The design of the experiment also used personality characteristics as a between-subjects variable but facial attractiveness and creativity were two within-subjects variables. Thus, every set of faces the participants rated would have

either only warm personality characteristics or only cold personality characteristics, possibly making the role of personality characteristics noninformative in their decisions. Past research (Wang et al., 2015; Zhan et al., 2014) used personality description as a within-subjects variable. Using personality descriptions as within-subjects variable might be necessary to examine the relationship between personality characteristics and attractiveness rating. In addition, research (Wang et al., 2015; Zhang et al., 2014) examined the relationship between personality characteristics and facial attractiveness on attractiveness score used east Asian faces, however, the current study used western white faces. It potentially has cultural differences between using Asian faces and White faces in the study.

Second, the creative and less creative writing samples are different in overall length which might be a confounding variable. Creative writing samples tended to be longer than less creative writing samples. It might mislead participants to believe long writing samples mean high creative whereas short writing samples mean low creative. However, Watkin (2017) was the only study looked into the relationship between facial attractiveness and creativity on attractiveness score. There were few resources could be utilized as creativity materials. Therefore, length between creative and less creative writing samples should be considered by the future research.

Third, there were limited materials used in the study. The current study only used four pictures (two attractive photos and two less attractive photos), and four creative samples (two high and two low creativity samples). This means that for each participant, they only saw one trial of each condition. Therefore, the attractiveness ratings may

contain more bias because the result was based on one set of stimuli in each condition. In addition, the creative samples were potentially problematic as two writings mentioned “blinded love” and “kissing” which might sound sexually attractive compared to the other writing samples. Even though all conditions were counterbalanced, it may play some role that we did not realize.

In addition, the study also collected the data through Amazon mechanical Turk, which is a global company that attracts people worldwide to do surveys. The current study did not ask the nationality of each participant, but the relationship between warm-cold personality characteristics and attractiveness might not be generalized to all countries. Both Wang et al. (2015)’s and Zhang et al. (2014)’s studies on the relationship between positive personality characteristics and attractiveness rating were done in China, which might indicate that this significant relationship might not be able to generalize to United States.

Future Direction

Examining the relationship between facial attractiveness, creativity, and personality characteristics still has a way to go. The current study had warm-cold personality characteristics as a between-subjects variable, and the other two variables, creativity and facial attractiveness, as within-subjects variables. Rearranging the design of the study could change the result, which means that all variables could be designed as within-subjects variables.

Also, different types of attractiveness could be examined in the study. Facial attractiveness is not the only type that could be examined. Other attractiveness such as clothes, body shape, hair style or general attractiveness could be studied. This study only examined facial attractiveness. Other types of physical attractiveness might have interesting results.

In addition, we only used one type of creativity in the study. Different types of creativity may provide more pieces of evidence on the relationship between creativity and attractiveness. Past research (Kaufman et al., 2004) describe three types of creativity: ornamental/aesthetic creativity, applied/technological creativity, and everyday/domestic creativity. Ornamental/aesthetic creative includes activities such as playing sports, playing or writing music, writing poetry/short stories, etc., applied/technological creative activities such as applying math in an original way to solve a practical program, writing an original computer program, making websites, etc., and everyday/domestic creative activities such as interior decorating, growing and gardening, exterior decorating, etc. The writing samples in the study is considered as an aesthetic creativity, but technological creativity or domestic creativity might yield different results. Other domains in aesthetic creativity such as music and painting could be options in the future research (Kaufman et al., 2004). Past research also suggested that warm cues might enhance relational creativity, and cold cues might enhance referential creativity (IJzerman et al., 2014), and the writing samples are considered a type of relational creativity, which might lead to a stronger warmth attribute compared to cold. Future research may seek to differentiate the role of warmth and cold via creativity by also

including referential creativity. What's more, not only the different types of creativity should be investigated, but also the length of creative writing sample should be same as less creative writing sample. Using same length of writing samples should be considered for the future research.

Although the current study did not support the role of personality characteristics, it is possible that alternative ways to test this may yield significant results. For example, using stronger descriptors concerning positive and negative characteristics like Zhang, Kong, Zhong and Kou (2014) may be needed. Participants might be able to pay more attention on the personality characteristics when it is present with the other two variables. Therefore, the study would be able to examine the effect of the combination of facial attractiveness, creativity, and personality characteristics on attractiveness scores.

Conclusion

In conclusion, this study examined the relationship between facial attractiveness, creativity, and personality characteristics. However, a three-way interaction was not discovered in the study. The result of this study demonstrated that creativity and attractiveness can interact. Specifically for those low in facial attractiveness where high creativity enhances one's attractiveness rating compared to females who are low in creativity. These findings suggest that creative displays may strengthen one's attractiveness among females.

The results of present study add to the current body of research on social and cognitive psychology regarding the relationship between the combination of facial

attractiveness, creativity, and personality characteristics on the perception of overall attractiveness. The topic of creativity and attractiveness is important as only two studies (the current study and Watkin (2017)) have investigated this relationship. The relationship between creativity and attractiveness is a newer area for more scientists to discover and contribute.

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Appendices

Appendix A

4 photos of white female faces aged 18-35 from Hahn, Wang, Fisher, DeBruine, and Jones (2014)'s 3dsk face database. There are two sets of faces (attractive vs. less attractive).

Attractive Faces



Less Attractive Faces



Appendix B

Four story extracts are used in this study to represent two high and two low creativity works. One high creative story extract and two low creative story extracts are from Watkins's (2017). One creative story extract is from Griskevicius, Cialdini, and Kendrick (2006).

High Creative

“The first idea that this picture made me think of was “blind love”. It made me think about how in our society we spend a lot of time judging people by how they look. It conjures images of how single people can spend hours upon hours on dating websites scrolling through images of people and judging their physical appearance over substance. It is perhaps an indicator that looks fade and in the end it does not matter as you will always be left with the personality of someone. It also made me think that even if you are in a relationship with someone, perhaps you don't know who this person really is, what thoughts and feelings they have deep down may not be shown on the surface. The main imagery I get from this is that you perhaps shouldn't judge people at face value.”

“The setting is a seedy, underground jazz club, where bands have to compete with drug dealers for the patrons' attention. A good quintet is performing, with a tenor saxophone, two trumpets, a trombone and a drummer. The instruments are old and worn, but the music that they make is enough to turn the attention of the crack dealers and the

junkies. The music is haphazard and at times seems arrhythmic and amelodic, but it fits the scene like a velvet glove.”

Low creative:

“It seems they have white cloth/pillowcases over their heads to blind them from their environment. They are standing close to one another and appear to be kissing each other. It could be their final kiss and a goodbye gesture? Or is it the message that love is blind?”

“The man dressed in a suit looks like a professional or has he come back from a funeral as he is dressed in a black suit, white shirt and black tie?”

Appendix C

The following personality descriptions are from Asch (1946).

Warm condition: intelligent, skillful, warm

skillful, industrious, warm

determined, practical, warm

practical, cautious, warm

Cold condition: intelligent, skillful, cold

skillful, industrious, cold

determined, practical, cold

practical, cautious, cold

intelligent—skillful—industrious—warm/cold—determined—practical—cautious.