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The Effect of Facial Attractiveness on Recognition Memory

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Abstract

The ability to recognize the faces of others has been significant throughout human history. The in-group and out-group bias show that humans remember more faces of people in their own group in most circumstances. This study focused on gender of perceiver and target effects in recognition when faces vary in attractiveness. There were 15 white male and 15 white female participants who engaged in a facial recognition task with a manipulation of target attractiveness. This consisted of the participant encoding 15 male and 15 female computer generated faces for future recognition. The participants saw the same 30 faces randomly mixed with 15 new male and 15 new female faces making a total of 60 faces. They were asked to recognize the faces that they saw in the first set and rate how confident they felt about their answers. The faces used ranged from highly attractive, average, and highly unattractive for both male and female faces. The findings supported the hypothesis that the more attractive or unattractive the faces, the more they will be remembered. Also the findings showed a gender difference in the recognition of faces of the same and other gender.

The Effect of Facial Attractiveness on Recognition Memory

The ability of a person to recognize faces they have seen serves an important social role and has generated a large body of research. The Other Race effect shows that across race there is greater recognition memory for the in-group than the out-group (Hugenberg, Young, Berstein, & Sacco, 2010). The Other Sex effect is the enhanced ability of a person to recognize a face of the same sex (in-group) than of the opposite sex (out-group); however, the other sex effect has less of a research foundation compared with the other race effect. There has been controversy about the other sex effect; some argue that both men and women show their own sex bias (Wright & Sladden, 2003). Others show only women have an own sex bias and recognize the in-group over the out-group, whereas men do not have any bias (Lovén, Herlitz, & Rehnman, 2011). Rehnman and Herlits (2006) also found women to show an own-sex bias, and also found men to have an own-sex bias. Their findings also point out that women are significantly better at recognizing faces of both males and females of different ethnicities. Herlitz and Lovén (2013) also gave evidence from a meta analysis that shows women out perform men when it comes to recognition of faces.

The in-group and out-group effect on face recognition described above is consistent with evolutionary psychology's view of human survival. The survival of a group depends on the actions and decisions of the group and its members. This is also true when picking a potential mate. The Social Value Theory (Sugiyama, 2005) helps to explain the way a group would think of reproduction, kin, cooperative and coalitional relationships. The Social Value Theory begins with the assumption that humans are highly social. Human survival depends on the ability of the species to learn from others and adapt to situations. Situations could be anything from adapting to a colder or hotter environment, to finding new food sources, even merging with a new group

of people. Valuing allies can help to expand the group's valuable resources by joining forces with other groups. Also, valuing kin and mates is important to ensure that strong genetics are shared from one generation to the next.

Mate Value Theory and Recognition Memory

The Mate Value Theory (Sugiyama, 2005) explains the process by which humans identify and acquire mates. The theory proposes that humans take many different variables into consideration before they select a mate. This includes many phenotypic qualities such as fertility, health, age, status, parenting skills, intelligence, and the ability to invest in the next generation. Every individual places a different degree of importance on each of these qualities. The person takes each quality and weights it in the current situation and then makes a more or less conscious decision.

The symmetry and developmental stability of a person's body can show potential mates that there may have been a problem with genetics as the person developed (Sugiyama, 2005). If there was a disturbance in the development of a person, it could affect the way the body was able to develop leading to a deformity. The slightest deformity or asymmetry a person has can show a potential mate that the person has a weakness, and they should find a better-suited mate with better genetics. This may also produce movement difficulties and provides an observable cue to move on to a higher valued mate. This shows the importance symmetry has on facial attractiveness from the perspective of evolutionary psychology, linking health and genetics with the most valuable mate (Sugiyama, 2005; Grammer &Thronhill, 1994). All physical qualities of a person can tell something about the person's health and ultimately attractiveness. This study will look at the effect facial attractiveness has on a person's ability to recognize faces of the same and the other gender.

Face Recognition

Some research in the area of facial recognition includes the ability to recall faces of criminals by eyewitnesses. MacLin and MacLin (2004) had an independent group of judges rate mug shots from the local police department. Based on the judge's ratings of targets' high or low criminality, they found that if a mug shot had high stereotypical criminal appearance (based on the judges own experience), the person would be more memorable. Wright and Stroud (2002) show evidence that in lineup identifications, a person is better at identifying the criminal when both the criminal and the eyewitness were close in age, and this supports the own age bias. Continuing with criminality and eyewitness reports, there are many studies that also show evidence to support the own race bias (Shaw & Skolnick, 1994).

The own race bias, also called the other race effect, shows that a person of one race will recognize the face of a person of the same race better than a face of the other race (Walker & Hewstone, 2008). This is a problem with eyewitness reports due to the evidence that suggests the other race effect is linked to implicit racial bias. The implicit racial bias effect was explained as in-group favoritism by Zebrowitz, Bronstad, and Lee (2007). The Other Race effect also gives evidence explaining that someone of one race is more likely to rate someone of the same race (the in-group) as more familiar than someone of a different race (the out-group).

The emotion displayed by the person from the out-group has an effect on the other race effect (Ackerman, Shapiro, Newberg, Kenrick, Becker, Griskevicius, Maner & Schaller, 2006). Ackerman et. al. (2006) showed that on a task that had participants look at neutral white faces and neutral black faces, white participants would recognize more white faces. This was not the case when the faces showed an angry emotion. It was shown that if a white participant looked at angry white faces and angry black faces that they would recognize more of the angry black faces.

The underlying cause can be linked to the in-group and out-group theories. A white person will perceive an angry black man (out-group) as a threat and avoid that person. After feeling threatened, the white person will spend time and energy to commit the black man's face to memory. By doing so, the white man will continue to protect himself and the group by continuing to avoid the angry black man. Face recognition, then, is linked to the relevance of the target face for the perceiver; more relevant faces are more memorable.

The in-group and out-group theory can be seen as the evolutionary foundation of all the different own group biases (own age, own race, and own gender). From the perspective of the evolutionary psychological theory of mate value, the out-group is the potential mates, while the in-group is members of the same gender in the group. Shaw and Skolnick (1994) show evidence that there is an own-sex identification bias explaining that a person will identify a criminal better if they were of the same sex. The proposed experiment tried to find evidence to show the effect attractiveness has on recognition for the same and other gender faces. It also attempted to look at the relationship between the abilities of men and women to recognize faces of the same gender (in-group) and the other gender (out-group). This study also examined if this bias is affected by facial attractiveness.

Facial Attractiveness and Recognition Memory

Attractiveness has been described as symmetry of the face in several studies. These studies showed evidence to support that symmetry in a face is significant for perceived attractiveness for both male and female faces. Mealy, Bridgstock and Townsend (1999) experimented with attractiveness; the researchers took pictures of pairs of twins and manipulated the facial structure of them. The symmetry of the faces presented to the participants in the study was the determinant of perceived attractiveness. This finding showed that the symmetry of a

face is closely related to attractiveness. Rhodes, Proffitt, Grady, and Sumich's (1998) study of the perception of beauty explains that the more symmetric the face, the more appealing and attractive the face is perceived. Rhodes et. al. (1998) took individual faces and manipulated the symmetry of them and found that when the symmetry was increased, the attractiveness rating also increased.

There has been little done to bring these theoretical models and empirical programs together; that is, to take the other sex effect and facial attractiveness effect and connect them to each other. One study conducted by Wickham and Morris (2005) showed evidence that not only does a face need to be at least average in attractiveness, but the face also needs to be distinctive for someone to reliably recall it. Wickham and Morris (2005) showed that attractiveness alone is not a reliable predictor of the ability to recognize the face. Distinctiveness was the factor that showed to be a reliable predictor; which was explained as a deviation from the average, and the ease of being picked out in the crowd for an example.

A study published in 2003 gave evidence to support that attractiveness, particularly higher attractive female faces, would be recognized more (Maner, Kenrick, Becker, Delton, Hofer, Wilber & Neuberg, 2003). Maner et. al. (2003) showed that female faces were recognized more when attractive and recognized more than attractive male faces for both male and female participants.

In the current study attractiveness was manipulated to show the effect of facial attractiveness on recognition memory. This study gathered evidence to show that attractiveness has a significant role in recognition memory. It was theorized that the findings should support hypothesis one, that highly attractive faces and highly unattractive faces will be recognized more than average faces (shown best with a quadratic function). Hypothesis two: remembering highly

unattractive and highly attractive faces more should lead the participant to be more confident in the recognition of these faces (also shown best with a quadratic function). This is based on the theory that attractive faces are highly valued potential mates and unattractive faces are low valued mates to avoid. Each should be more memorable than the average. This study also examined evidence for hypothesis three, that both males and females show the other sex effect.

Method

Participants

Thirty students were recruited from the general population at Rhode Island College and the RIC Participant Pool. The participants consisted of 15 males and 15 females. The race and age of the participants were controlled; race being Caucasian and age being 18 – 35. Age was controlled due to the time in human life when much mating occurs, which is consistent with the mating value theory in evolutionary psychology. The participants were not paid. Participants from the participant pool were credited in their Introduction of Psychology class for the research participation portion of the course.

Stimulus Faces

Using the computer program FaceGen Modeller 3.5, 300 white male faces and 300 white female faces were generated. FaceGen software allows the user to manipulate faces for gender, age, caricature, and asymmetry. This study used the symmetry and caricature of the facial features to manipulate the faces for attractiveness. There is evidence to suggest that the more symmetric the face, the more attractive it will be perceived (Rhodes, Proffitt, Grady, & Sumich, 1998; Mealy, Bridgstock & Townsend, 1999; Grammer & Thronhill, 1994).

Caricature in the FaceGen software is the title of a slide that manipulates the distortion of the face. This ranges from the average face (not distorted), attractive, typical, caricature (very

distorted) and continues to a category of monster (major distortion); this was held constant at typical. The asymmetry slide distorts symmetry from symmetric, continues to typical, then ends at warped; this was allowed to vary. Any face that did not appear to be a realistic human face was not included. Highly unattractive and average faces were created easily with the software and did not require special attention when created. Highly attractive faces were created to be able to get the most attractive faces that were different from one another. When highly attractive faces were created the same way as the other faces, they did not vary enough to tell them apart so special attention was taken.

The features for male faces were as follows; gender constant at male, the age constant at 25 years of age. For highly unattractive and average faces the caricature was locked at typical and the asymmetry was allowed to vary. For highly attractive faces, the asymmetry was locked at symmetric and caricature was allowed to vary from attractive to typical.

The feature of the female face were as follow; gender constant at female, the age constant at 25 years of age. For highly unattractive and average faces the caricature was locked at typical and the asymmetry was allowed to vary. For highly attractive faces, the asymmetry was locked at symmetric and caricature was allowed to vary from attractive to typical.

After all 600 faces were generated, 300 white male and 300 white female, there were six groups of faces. Three groups for each gender consisting of highly attractive, average, and highly unattractive faces based on the parameters provided above. After the faces were placed in these groups, ten faces were chosen at random from each group using a random numbers chart from the website www.random.org. The faces were as follows, 10 white male highly attractive, 10 white male average, 10 white male highly unattractive, 10 white female highly attractive, 10 white female average, and 10 white female highly unattractive for a total of 60 faces. Each

group of ten was broken down randomly into two groups of 5 so that only half were used in the encoding phase, and all faces were used in the recognition phase. The faces were placed in the encoding and recognition phases randomly.

Rater Participants and Ratings of Stimulus Faces

After the faces had been chosen, four raters were recruited from the general population at Rhode Island College. These raters participated in a manipulation check to assess the effectiveness of the manipulation of attractiveness. Two male and two female raters came into the lab and were briefed on what to expect. They were asked to use a 1-9 point scale to rate the attractiveness for each of the 60 faces. These ratings were used to get the mean attractiveness for the male and female faces that were included in the study. The mean for both males and females was calculated from the scores of all four raters. This gave one rating for each face, and we were able to determine that the facial attractiveness of each face was as intended. The mean attractiveness for highly attractive faces was 6.025 for female faces and 5.975 for male faces. The mean attractiveness for average female faces was 3.3 and average male faces was 2.8, for highly unattractive faces the female faces was 2.125 and highly unattractive male faces was 2.025. After this was completed and the experiment was set up in E-prime, the software that was used to conduct the experiment, recruitment of participants began.

Overview of the Design and Procedures of the Study

During the encoding phase, the male and female participants, a between subjects variable, were exposed to 15 white male and 15 white female faces (5 at each of the three levels of attractiveness), and each face was exposed for 10 seconds. After the encoding phase each participant participated in a distractor task, which involved playing Tetris for 10 minutes. The recognition phase of the experiment followed; the male and female participants were exposed to

the same 30 white faces from the encoding phase with an additional 30 white faces. Of the 60 white faces in the recognition phase, there were two groups, 30 white male and 30 white female. Each group of 30 faces broke down into two groups of 15 faces; 15 old (from encoding) and 15 new. Each set of 15 included 5 highly attractive, 5 average, and 5 highly unattractive.

The faces are a repeated factor; nested within the faces is the target gender, and nested within the target gender is facial attractiveness. Thus, the design is a mixed factorial with one between factor (gender of participant) and three repeated factors (target faces, gender of target faces, and attractiveness of target faces with the nesting described previously). The recognition data were analyzed using the analysis of variance for a mixed model design.

Experimental Procedure and Measures

Participants came to the Intergroup Relations Laboratory at Rhode Island College to participate individually in the experiment. Each participant was asked to read and sign the informed consent document as they entered the lab. They were also briefed on the procedures of the study and what was expected while participating. They were then escorted to a computer and asked if they had any questions. If there were no questions they began the study by seeing a total of 30 white faces during the encoding phase and continued with 60 white faces in the recognition phase. All faces were shown without hair and shown completely randomly using the E-prime software. To summarize briefly, the experiment was as follows:

Encoding task

The participants started the encoding task, which involved the participants being shown the first 30 faces. To insure all participants have the same encoding experience, each face was exposed for an equal amount of time (10 seconds). The faces were shown in a random order for each participant. After all 30 faces were shown the encoding task was complete.

Distracter task

After the encoding set was shown, the experimenter instructed the participant to start the distracter task. This task involved playing Tetris for 10 minutes. This took place without the participant leaving the lab after encoding but utilized a different computer.

Recognition task

Following the distracter task, the participants began the recognition task. In addition to the 30 faces seen during encoding, participants saw an additional 30 faces in the recognition task, totaling 60 faces. Faces in this phase had the same mean facial attractiveness as the faces in the encoding set but with double the faces. Again, there were half white male and half white female faces. After each face was shown, the participant was asked whether they recognized the face or not. The participants were asked to respond yes (Y on the keyboard) or no (N on the keyboard) to the recognition question. Response time was measured from the start of the slide until the participant answered by the E-prime software. This was accompanied by a confidence rating. They were asked how confident they were about their answer and gave a rating of 1-9, 1 being low and 9 being high level of confidence. Each face was shown for 10 seconds to ensure all faces were shown for an equal amount of time. After the 10 seconds are up the face disappeared from the screen and the questions appeared. After all the faces, questions, and ratings were completed the participant was done with the study and debrief by the researcher.

Base Rating

After the last set was completed and all answers and confidence ratings were recorded, the participant was asked to rate all 60 faces on attractiveness to get a base rating of attractiveness of each face for each participant. This allowed us to compare the results with the participant's own idea of attractiveness.

Ethical Management for the Study

Due to concerns for the confidentiality of the participant, each participant was assigned a number as they participated in the study. This prevented the need for the use of their names to distinguish the data. Each participant was informed in writing and verbally that participation was completely voluntary and they were able to choose to cease participation at any time during the study without any adverse consequences. This was contained in the informed consent forms that were read together by the experimenter, and each participant was asked if she/he completely understood and if they had questions. Their concerns were addressed before continuing and then the forms were signed. After the participants completed the informed consent forms, the forms were kept in a locked container and were maintained separate from the lab and all data. At the end of the study, the participants were fully debriefed by asking if there were any questions or concerns. If there was a question or concern it was addressed and the participant was thanked.

Results

The following statistical analyses were completed using SPSS software version 21.

Manipulation Check for Facial Attractiveness

In order to determine that the manipulation of facial attractiveness was accomplished successfully we asked the participants to rate each face on attractiveness. Table 1 shows the means on perceived attractiveness of the target faces at each level of attractiveness. The means of the perceived attractiveness for the faces clearly show that the manipulation accurately represented the levels of attractiveness for the targets. The attractiveness main effect was $F(2,36) = 11.00$, $p < .000$ with $\eta^{2'}$ (partial eta squared) = .85.

Effect of Attractiveness on Recognition Memory

The attractiveness of the faces was manipulated to produce three levels of attractiveness, highly attractive faces, average faces, and highly unattractive faces. Attractiveness had a significant effect on face recognition with a main effect of $F(2,24) = 84.04$, $p < .000$ with $\eta^{2'}$ of .87. However, the attractiveness effect was moderated by target gender with $F(2,24) = 4.44$, $p = .023$ with $\eta^{2'} = .27$. There was a higher order moderation with a four way interaction of Target Gender x Attractiveness x Old Face _ New Face x Gender of Judge with $F(2,66) = 3.67$, $p = .03$ with ($\eta^{2'}$) of .10. To decompose this complex interaction the following analyses were done.

Gender of Perceiver Effects

Recognition accuracy data were analyzed separately for males and females perceivers. Table 2 shows the judgment accuracy quantified as proportion correct for male perceivers and female perceivers separately. The judgment accuracy for female targets was fit best by a curvilinear function for both male and female perceivers. This means that male and female judges recognized highly unattractive and highly attractive female faces more than average faces, which directly supported hypothesis one. Whereas for male faces, recognition accuracy was fit best by a linear function showing that highly attractive male targets were recognized more than highly unattractive and average faces for both male and female perceivers.

Accuracy of Face Recognition: Recognition and Encoding

Accuracy of judgment at recognition and encoding of new faces were moderated by attractiveness with $F(2,24) = 17.52$, $p < .000$ with $\eta^{2'} = .59$. Table 3 shows the recognition and encoding accuracy for both males and females separately for the different degrees of facial attractiveness. Higher attractiveness in faces enhanced the accuracy of judgment at both

encoding and recognition. For the unattractive and average faces, accuracy was greater at encoding (seeing a new face) than at recognition (determining if a face was see previously).

Confidence Ratings in Recognition Accuracy

During the study, participants were asked to rate their confidence in their judgments on a 9-point scale (1 = low to 9 = high). The confidence ratings showed an attractiveness main effect of $F(2,72) = 22.28$, $p < .000$ with $\eta^{2'} = .38$. Table 4 shows that the confidence ratings were best fit by a quadratic function with $F(1,36) = 57.64$, with $p < .000$ with $\eta^{2'} = .62$. Participants rated their confidence level the highest for unattractive faces and slightly lower for attractive faces. The lowest confidence rating was for the average faces. This finding directly supports hypothesis two stating that the confidence rating would be best fit by a quadratic function.

Table 5 shows the effects of attractiveness and target gender on confidence ratings. Both female and male targets' data are best fit by a quadratic function, which continues to support hypotheses two. There was greater confidence when judging unattractive male faces compared with unattractive female faces. There is also greater confidence when participants judge attractive female faces compared with attractive male faces. Table 6 breaks down the confidence ratings for the new faces (encoding) compared to the old faces (recognition). Unattractive and average faces at recognition were rated at a higher confidence then at encoding. The reverse is true for the attractive faces where confidence was higher at encoding than at recognition.

Speed of Information Processing

The reaction time data were analyzed in conjunction with explicit confidence ratings; reaction time was used as an implicit measure of confidence. The attractiveness main effect on reaction time was $F(2,37) = 3.45$, $p = .04$ with $\eta^{2'} = .11$. Table 7 shows the effects of attractiveness on reaction time that was best fit by a linear function with $F(1,38) = 4.80$, $p = .04$

with $\eta^{2'} = .11$. The reaction times for the unattractive faces were faster than for the attractive faces. This measurement was further broken down in Table 8 to show that male judges spent significantly more time reacting to attractive female targets than any other combination of targets and judges with $F(2,76) = 3.65$, $p = .03$, $\eta^{2'} = .09$. Furthermore, when judging male faces the reaction times were best fit by a linear function, while judging female faces data were best fit by a quadratic function; this was seen for both male and female perceivers.

Gender of Judge, Gender of Target and Attractiveness

The three-way interaction of Attractiveness x Target Gender x Gender of Judge produced $F(2,36) = 11.03$, $p < .000$ with $\eta^{2'} = .38$. To decompose this interaction data were analyzed separately for male and female judges shown in Table 9. This interaction shows that the Target Gender x Attractiveness interaction was significant for male judges with $F(2,13) = 18.21$, $p < .000$ with $\eta^{2'} = .74$ and females judges with $F(2,22) = 13.32$, $p < .000$ with $\eta^{2'} = .55$. Male judges were clearly reluctant to rate a male target as attractive. Among males judges, there was a significant target gender effect with mean attractiveness ratings of males at 2.83 and females at 4.42 with $F(1,14) = 36.77$, $p < .000$ with $\eta^{2'} = .72$. Among female judges there was no target gender effect with $F(1,23) = .009$, $p = .93$ and $\eta^{2'} = .00$ with mean attractiveness ratings for males at 3.54 and females at 3.53.

Discussion

This study examined the relationship between recognition of faces and attractiveness. Specifically, hypothesis one stated that highly attractive and highly unattractive faces would be recognized more than average faces (best fit by quadratic function). Hypothesis two stated that remembering highly unattractive and highly attractive faces more should lead the participant to be more confident in the recognition of these faces (also shown best with a quadratic function). Hypothesis three stated that males and females would both show the other sex effect.

The results show evidence to support hypothesis one because the highly attractive and highly unattractive female faces were recognized more than the average female faces. Results for the male faces did show evidence to partially support hypothesis one because the results show a linear pattern with highly attractive male faces recognized more, followed by average, then highly unattractive. This effect was shown for both male and female participants and suggested a more intricate process of recognition than previously observed; it was theorized that both males and females would show a quadratic function. Also, while females performed better than males at recognizing highly attractive and average faces, males out performed females in the recognition task for highly unattractive faces. The results show evidence that supports hypothesis two. There were better confidence ratings with the unattractive and attractive faces. The results fail to show evidence to support hypothesis three because there is no other sex effect bias shown in the data. Both females and males performed about the same with females slightly better with the average and highly attractive faces and males better with highly unattractive faces.

Until now, research has shown that women out perform men in facial recognition tasks such as the one done in this study (Herlitz & Lovén, 2013). Herlitz and Lovén (2013) performed

a meta-analysis examining the data for facial recognition tasks involving males and females. Their findings show that many studies gave evidence to support that females participants are better at recognizing female and male faces than males participants (Herlitz & Lovén, 2013). The data from the present study shows that while this may be the case for average and highly attractive faces, males out performed females for the highly unattractive faces. This piece of evidence shows that the manipulation of attractiveness done to the faces used in this study may affect the performance of participants on the recognition task.

Both male and female participants always remembered highly attractive faces more than any other face. This may be the result of sexual attractiveness and potential mates as described in the introduction of this paper. Average faces were remembered least, possibly forgotten to remember the best mate possible, a person would always look for and remember the most attractive potential mates. Highly unattractive faces were remembered more than average faces for female participants but males participants showed better recognition with average faces than female participants. This may show a difference in how males and females value these faces while looking for a potential mate.

This study was able to show a difference in performance between males and females that was not expected. Most studies have not been able to show males out performing females on a recognition task so it is very important to highlight this finding. In this study males were found to out perform females with more correct responses to unattractive faces. While most studies find that females out perform males in recognition, this study found that males could out perform females at recognition tasks when attractiveness was manipulated experimentally.

A limitation of this study is that attractiveness may be too closely related to distinctiveness. Distinctiveness was explained as the deviation from average (Wickham &

Morris, 2005) as explained in the introduction of the study. The relationship between attractiveness and probability of occurrence makes it hard to definitively say the cause of the results is the manipulation of attractiveness. The levels of attractiveness used in this study may have been confounded by the natural distribution of attractiveness in nature. Attractiveness in nature is best fit by a normal bell curve with the most common level of attractiveness at average. The highly unattractive and highly attractive faces are the least common level of attractiveness in nature. This fact may make the faces used very distinctive to the participants. The manipulation check does show that the faces were as intended in attractiveness and this may show that attractiveness could have been the causal variable, but it is confounded naturally with distinctiveness. Additional research to isolate the effect of each is needed.

A future study should examine why male participants were shown to out perform females with the unattractive faces in this study. Maybe the underlying mechanism for face recognition varies for males and females. The function for females' judgment of male faces may be seen to be curvilinear if status, rather than attractiveness, in manipulated. A future study is also needed to examine the relationship of distinctiveness with attractiveness. The study should aim to make distinctiveness and attractiveness independent of one another. Attractiveness and distinctiveness are confounded because very few highly attractive and highly unattractive people actually exist in nature.

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Table 1

Perceived Attractiveness

Attractiveness	Perceived Attractiveness
Unattractive	2.04
Average	3.29
Attractive	5.42

Perceived attractiveness base on the 1-9 rating scale

Table 2

Judgment Accuracy: Proportion Correct

	Male Perceivers Facial Attractiveness			
	Unattractive	Average	Attractive	
Female Targets	.36	.25	.83	Curvilinear
Male Targets	.28	.42	.77	Linear
	Female Perceivers **Facial Attractiveness**			
	Unattractive	Average	Attractive	
Female Targets	.33	.28	.89	Curvilinear
Male Targets	.26	.45	.81	Linear

Table 3

Recognition and Encoding Accuracy

	Males Separately Facial Attractiveness			
	Unattractive	Average	Attractive	
Recognition (Old)	.12	.23	.76	Linear
Encoding (New)	.52	.44	.84	Curvilinear
	Female Separately Facial Attractiveness			
	Unattractive	Average	Attractive	
Recognition (Old)	.09	.24	.84	Linear
Encoding (New)	.50	.49	.86	Linear

Table 4

Facial Attractiveness and Confidence in Judgmental Accuracy

Facial Attractiveness	Confidence
Unattractive	7.32
Average	6.36
Attractive	6.91

Table 5

Attractiveness and Target Gender Effects on Confidence

	Facial Attractiveness		
	Unattractive	Average	Attractive
Female Target	7.18	6.28	7.17
Male Target	7.47	6.45	6.65

Table 6

Attractiveness Effects on Confidence at Recognition and Encoding

	Facial Attractiveness		
	Unattractive	Average	Attractive
Old (Recognition)	7.46	6.44	6.78
New (Encoding)	7.19	6.28	7.03

Table 7

Effect of Attractiveness on Reaction Time

	Mean Reaction Time
Unattractive	1.10 seconds
Average	1.18 seconds
Attractive	1.36 seconds

Table 8

Reaction Times as a Function of Target Gender, Attractiveness and Gender of Judge

	Facial Attractiveness					
	Unattractive		Average		Attractive	
	FT	MT	FT	MT	FT	MT
Male Judge	1.17	1.06	1.08	1.17	1.86	1.22
Female Judge	1.12	1.07	1.29	1.19	1.16	1.21
	FT = Female Target		MT = Male Target			

Table 9

Effects of Attractiveness and Target Gender on Perceived Attractiveness

	Male Judges Facial Attractiveness		
	Unattractive	Average	Attractive
Female Targets	2.27	4.44	6.55
Male Targets	1.99	2.52	3.99
	Female Judges Facial Attractiveness		
	Unattractive	Average	Attractive
Female Targets	1.78	3.25	5.58
Male Targets	2.13	2.95	5.55

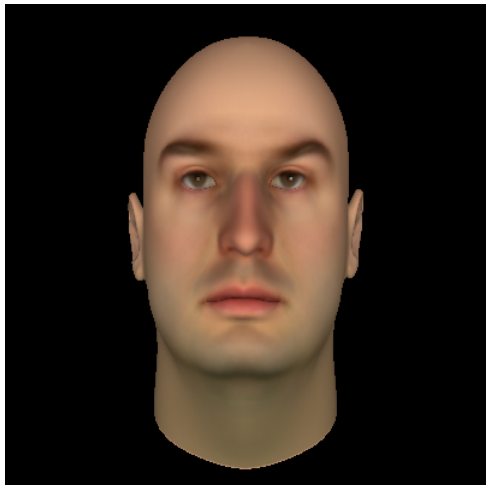
Appendix

Examples of Male faces

Highly Attractive Male

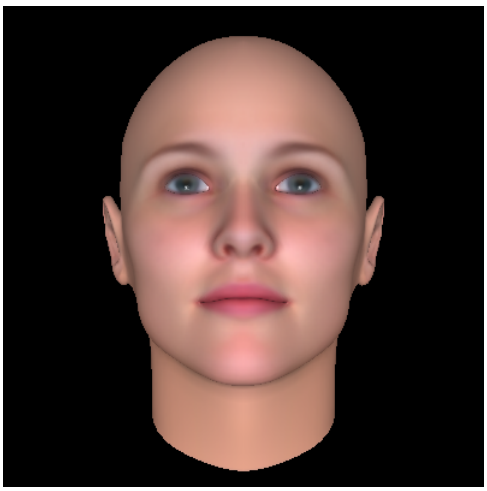
Average Male

Highly unattractive Male



Examples of Female faces

Highly attractive Female



Average Female

Highly unattractive Female

CONSENT DOCUMENT
Rhode Island College
Viewing Male and Female Faces

You are being asked to participate in a research study about visual attention to human faces. You were selected as a possible participant because you are an adult; that is, you are 18 years of age or older. Please read this form and ask any questions that you may have before deciding whether to be in the study.

Dr. Thomas E. Malloy, a professor at Rhode Island College, is conducting this study.

Background Information
The purpose of this research is to study how people respond when presented with human faces.

Procedures
If you choose to be a participant in this research, you will be asked to do the following things:

- Come to the laboratory at a pre-arranged time
- View a set of faces on a computer screen.
- Make a judgment about the faces you view
- The study will take approximately 1 hour to complete.
- If you are taking PSYC 110 (Introduction to Psychology), you will receive credit toward your research experience requirement.

Risks of Being in the Study
The risks of participating in this research are minimal, meaning that they are about the same as what you would experience in your normal daily activities. If you experience any discomfort and wish to stop the study, then tell the researcher immediately. If you experience discomfort and wish to discuss this with someone, you can contact the Rhode Island College Counseling Center at 401-456-8094.

Benefits to You
There are no direct benefits to you for being in this study.

Voluntary Participation
Your participation is completely voluntary. It is not required by your school, your employer, your instructor, or anyone else. You can choose not to participate in this research and it will have no effect on you or your grades. Also, you can change your mind about participating at any time with no negative consequences, and you will still get the research participation credit if you are taking Psychology 110. Also, you may choose not to respond to a face and you will still get the research participation credit.

_____ Initial here to indicate that you have read and understood this page.

Confidentiality
The records of this research will be kept private. In any sort of report that might be published, the

researcher will not include any information that will make it possible to identify you. Research records will be kept in a secured file, and access will be limited to the researchers. If there are problems with the study, the research records may be viewed by Rhode Island College review board responsible for protecting human participants and other government agencies that protect human participants in research. All data will be kept for a minimum of three years after completion of the study, after which it will be destroyed.

Contacts and Questions

The researcher conducting this study is Dr. Thomas E. Malloy. You may ask any questions you have now. If you have any questions later, you may contact him at tmalloy@ric.edu.

If you think you were treated unfairly or would like to talk to someone other than the researcher about your rights or safety as a research participant, please contact Dr. Christine Marco, Chair of the Rhode Island College Institutional Review Board at IRB@ric.edu, or by phone at 401-456-8598, or by writing to Dr. Christine Marco, Chair IRB; c/o Department of Psychology, Horace Mann Hall 311; Rhode Island College; 600 Mount Pleasant Avenue; Providence, RI 02908.

You will be given a copy of this form for your records.

Statement of Consent

I have read and understand the above information, and I agree to participate in the study Viewing Male and Female Faces. I understand that my participation is voluntary and can be withdrawn at any time with no negative consequences. I have received answers to the questions I asked, or I will contact the researcher with any future questions that arise. I am at least 18 years of age.

Print Name of Participant: _____

Signature of Participant: _____Date: _____

Name of Researcher Obtaining Consent: _____