Liking an Ideal or Familiar Face: The Relative Influence of Evolution and the Mere Exposure Effect

Shamell Brandon

Candidate for the degree

Bachelor of Arts

Submitted in partial fulfilment of the requirements for

College Honors

Departmental Distinction in Psychology

Andrea E. Chapdelaine, Ph.D.

Ronald G. Green, Ph.D.

Alberto J. Cacicedo, Ph.D.

F. Wilbur Gingrich Library
Special Collections Department
Albright College

Release of the Senior Thesis

I hereby deliver, give, and transfer property, rights, interest in and legal rights thereto which I had, have, or may have concerning the Senior Honors Thesis described below to the Special Collections Department of the F. Wilbur Gingrich Library at Albright College as an unrestricted gift. While copyright privileges will remain with me, the author, all privileges to reproduce, disseminate, or otherwise preserve the Senior Honors Thesis are given to the Special Collections Department of the Gingrich Library. I place no restrictions on this gift and hereby indicate this by signing below.

Title: Liking an Ideal or Familiar Face: The Relative Influence of Evolution and the Mere Exposure Effect

Signature of Author: Shamell Brandon Date: 5/9/06

Printed Name of Author: Shamell Brandon

Current Home Address: 63 Shoshoni Trail

City, State, Zip Code: Gouldsboro, PA 18424

Running head: EXPOSURE AND EVOLUTION'S EFFECT ON LIKING

Liking an Ideal or Familiar Face: The Relative Influence of Evolution and the Mere Exposure Effect

Shamell T. Brandon

Albright College

Abstract

The mere exposure effect states that repeated exposure to stimuli (familiarity) increases the liking for those stimuli. Psychological research on evolution states that individuals who are above average in attractiveness are also well liked. This study attempted to determine the relative influence of a female's level of familiarity and attractiveness on how much she is liked. Participants (n = 103) viewed and rated female faces that varied in the number of times they were seen and were either average or above average in attractiveness. Results showed that, regardless of their frequency of exposure, the faces that were above average in attractiveness were significantly liked more than faces that were average in attractiveness. An evolutionary explanation of the results is discussed.

Liking an Ideal or Familiar Face: The Relative Influence of Evolution and the Mere Exposure Effect

Throughout human history, physical attractiveness has consistently been a topic of great interest to humanity. From every era and culture, painters, sculptors, and writers have dedicated much of their efforts to depicting the human form in its most physically attractive state. The value societies give to physical attractiveness can be seen in the qualities that are associated with very attractive individuals. Physically attractive people are commonly perceived as dominant, smart, and mentally healthy (Feingold, 1992). Research credits evolution for the worth that societies give to the ideal physically attractive form. Physical attractiveness is evolutionarily valuable because attractiveness symbolizes the degree of health and reproductive opportunities that are needed to assure genes' presence in later generations (Buss, 1994; Rhodes, Simmons, & Peters, 2005). While evolution states that individuals who are above average in attractiveness would be liked more than individuals who are average in attractiveness, the mere exposure effect states the opposite. The mere exposure effect states that repeated exposure to a stimulus increased liking for that stimulus (Zajonc, 1968). Features that are above average in attractiveness are, by definition, less prevalent in society than features that are average in attractiveness. The prevalence of average features in society provides frequent exposure that should increase liking for the features' level of attractiveness. According to the mere exposure effect, individuals who are average in attractiveness would be liked more than individuals who are above average in attractiveness. Both the evolutionary basis of attractiveness and the mere exposure effect are robust theories. Each theory has received strong empirical support, but the theories appear to make conflicting predictions regarding relative liking of and the tendency to approach persons of great or average attractiveness. By further exploring the mere exposure

effect and evolutionary theories of attractiveness, the following research will try to determine the relative influence of familiarity and attractiveness on ratings of liking of female targets.

Evolutionary Basis of Attractiveness

Application of evolutionary theory in psychology has been especially prevalent in the study of human mating strategies. Buss (1994) distributed a collection of surveys worldwide that investigated evolution's role in human mating strategies. The findings of his exhaustive surveys suggested that humans as a whole are powerfully driven to secure the presence of their genes in future generations. Common techniques for attracting and selecting mates of high evolutionary value were found amongst people from various cultures, races, religions, and socioeconomic statuses around the world. According to Buss (1994), women sought men of high levels of status and men desired women of high levels of physical attractiveness. Status and attractiveness provide the opportunity to mate and also benefits offspring. Both reproductive success and survival are central goals of evolution that status and attractiveness fulfill. Males' status provides offspring with resources necessary for survival (Buss, 1994). Woman's physical attractiveness supplies offspring with traits of beauty that facilitates successful reproduction. Beauty acts as an advertisement for the quality of reproductive abilities because it provides clues to youth, fertility, and health (Buss, 1994; Singh, 1993).

Facial traits of beauty have been found to be consistent across cultures (Cunningham, Roberts, Barbee, Druen, & Wu, 1995). Facial features that displayed neonatal, sexually mature and expressive features were consistently correlated with high ratings of female attractiveness by Asian, Hispanic, Black, and White men. Neonatal features refer to traits that are typical of infants, such as large eyes and small noses. Sexually mature features are physical traits in the face that are often affected by the increase in hormone levels from puberty. Examples of these

traits are high cheekbones and thin cheeks. Expressive features, like dilated pupils and large smiles suggest happiness, approachability, and arousal and also add to the attractiveness of the face (Cunningham, Roberts, Barbee, Druen, & Wu, 1995).

Cunningham et al. (1995) assessed the advantage that neonatal, sexually mature, and expressive features all may provide in acquiring a mate and successfully reproducing. In Cunningham's (1995) experiment, male participants rated the attractiveness, personalities and the likelihood that they would date or have sex with women depicted in 50 photographs. The photographs included women of different races. Researchers measured the facial structures of the women in the photographs that represented neonatal, sexually mature, and expressive features. Results showed that ratings of attractiveness, sexual interest, and mature personality traits significantly correlated with measurements from prominent neonatal, sexually mature, and expressive features. Cunningham (1995) reasoned from the results that neonatal features suggest the desirable qualities of youth; sexually mature features suggest the ability to reproduce has been achieved; and expressive features suggest interest and a warm personality. The perception of possessing all of these evolutionarily valuable traits certainly benefits attractive women.

Buss (1994) stated that health is also popularly perceived to accompany attractive features. Research has found that this perceived connection between attractiveness and actual and/or future health actually exists (Roberts, Little, Gosling, Perett, Carter, Jones, Penton-Voak, & Petrie, 2005). Roberts et al. (2005) defined quality male genetics as possessing MHC-heterozygosity, which are involved in immunological responses. Then Roberts et al. (2005) tested if the quality of males' genetics correlated with their ratings of attractiveness. Male participants had a sample of their blood drawn and tested for genetic quality. Female participants then rated the pictures of the males' faces for attractiveness (Rhodes et al, 2005).

Roberts et al. (2005) found a significant correlation between ratings of facial attractiveness and the possession of quality genes. This finding of a relationship between health and attractiveness provides further support for beauty's basis in evolution.

But beauty does not just provide its possessors with the evolutionary benefits of mating success, it also provides mating advantages for individuals who associate with very attractive individuals in the name of friendship. So, not only will extraordinarily beautiful people elicit the approach of suitors of the opposite-sex for mating, they will also attract many members of the same-sex as friends. Feingold (1988) conducted a meta-analysis of various studies on the similarities among romantic partners and same-sex friends. Results showed that the levels of attractiveness between romantic partners correlated and that the levels of attractiveness of female same-sex friends did not. This reveals that very attractive people have the power to choose mates of high levels of attractiveness, but do not use this power to homogenize their friends' levels of attractiveness (Feingold, 1998). Acceptance for friends of diverse levels of attractiveness provides females who are low in attractiveness with the evolutionary benefit of associating with females who are high in attractiveness (Buss, 1994).

Association provides benefits because close proximity to very attractive members of the same-sex will often lead to close proximity to the opposite-sex partners that they will attract (Buss, 1994). Another important finding of Feingold's (1998) study was that individuals did not prefer to date people of the same level of attractiveness. Instead, people generally desired dates that were higher in attractiveness, but this finding interacted with people's self-ratings of attractiveness. Results showed that individuals' low self-ratings of attractiveness did not inhibit the desire for very attractive partners, but did increase the interest in partners of low attractiveness. Low self-esteem was correlated with low self-ratings of attractiveness. This may

suggest that such individuals expand their preferences in order to accommodate their perceived handicap in attaining a very attractive mate (Feingold, 1988). The expanded preferences then allow nearby females of lower attractiveness the chance to be considered as potential mates. Thus, the desire for the most attractive partner and the perceived chances of attaining that partner is reconciled through association. People can increase their chances of gaining a very attractive mate by gravitating to or befriending same-sex individuals of high attractiveness (Buss, 1994).

In sum, according to evolutionary theory, physically attractive women will engender approaches from others because they offer direct or indirect reproductive or genetic benefits. Many people would approach and highly like females with evolutionarily ideal attractive traits. Thus, given the choice between a highly attractive female and a female of average attractiveness, persons should prefer the highly attractive female, even if the female of average attractiveness is more familiar.

The Mere Exposure Effect

The mere exposure effect occurs when a subject experiences an increase in attraction for a stimulus that has been repeatedly exposed to the subject (Zajonc, 1968). Experiments on this subject have determined that the effect of mere exposure applies to various stimuli and situations (Saegert, Swap, & Zajonc, 1971; Zajonc, Markus, & Wilson, 1974). Zajonc et al. (1974) conducted a study to determine if the personal characteristics of a stimulus affected the outcome of mere exposure. The stimuli were images of Asian men's faces. One group of participants thought that they were viewing the faces of scientists and another group thought that they were viewing faces of criminals. All participants viewed the images a different number of times. The participants then rated the stimuli. Participants showed an increase in liking for frequently exposed stimuli regardless of their label (Zajonc et al., 1974). The results showed that the mere

exposure effect applies to stimuli with positive and negative characteristics. Seagert et al. (1971) created an experiment that tested if positive or negative contexts during exposure had any effect on the increases in liking. The participants served as the stimuli for each other. They tasted pleasant or unpleasant solutions. The context was negative or positive depending on the taste of the solution. The participants tasted the solutions at various cubicles with partners that varied at different cubicles. Researchers manipulated the frequency of participant exposure by having participants pair up in varying frequencies. The results of the experiment showed that liking increased regardless of the context of exposure.

Also, researchers used individuals as stimuli in a more natural setting to test the impact of the mere exposure effect on attraction. Moreland and Beach (1992) selected four equally attractive women and enrolled them in a psychology class of 191 students. Exposures varied by having the women attend the class a different number of times. When the term ended, the students indicated their feelings of attraction, familiarity, and similarity to all four of the women. The results showed that feelings of attraction and similarity towards the women increased with frequent exposure. These findings indicate that the mere exposure effect is a phenomenon that is active in realistic settings (Moreland & Beach, 1990).

Biological measures of the effects of mere exposure provide further strength to the theory. Dimberg (1990) found a significant correlation between zygomatic muscle region activity and the experience of positive affective states. Harmon-Jones and Allen (2001) used zygomatic muscle region activity to measure participants' emotional responses under the conditions of mere exposure. Because earlier research showed that activity in the frontal cortex correlated to motivation to approach or withdraw from stimuli of various levels of familiarity (Harmon-Jones & Allen, 1997; Sutton & Davidson, 1997), Harmon-Jones and Allen (2001) also

classified participants based on their "differences in resting asymmetries in the frontal brain regions" (p. 891). First, participants repeatedly observed images of female faces and then they viewed new faces along with the familiar ones. Before participants viewed any images and while they viewed the second set of images, researchers tested participants with an electromyograph (EMG) and an electroencephalogram (EEG). Harmon-Jones and Allen's (2001) results showed that zygomatic muscle region activity was significantly higher when participants viewed familiar rather than unfamiliar images. Also, participants higher in withdrawal tendencies showed a preference for familiar over unfamiliar images. These findings showed that familiarity is powerful enough to elicit positive responses from individuals who are prone to avoid most stimuli (Harmon-Jones & Allen, 2001).

The mere exposure effect has also been shown to elicit preferences for subliminally exposed stimuli (Bornstein, 1989; Bornstein & D'Agostino, 1992; Bornstein, Leone & Galley, 1987). Bornstein et al. (1987) found that frequent subliminal exposure increased liking for the actual people in the images when participants encountered them later. Bornstein and D'Agostino (1992) compared the exposure effects of subliminally and consciously observed stimuli. They found greater ratings of liking for stimuli that were repeatedly observed subliminally than for consciously observed stimuli (Bornstein & D'Agostino, 1992). Also, Bornstein (1989) conducted a meta-analysis of experiments that explored the relationship between familiarity and affective judgments of stimuli. He found that subliminally exposed stimuli consistently produced robust mere exposure effects (Bornstein, 1989). These findings suggest that conscious recognition or processing of the frequently exposed stimuli is not needed to experience an increase in liking.

Not only can individuals experience affective responses to subliminally exposed stimuli, but those responses can generalize to other stimuli that are structurally similar. That phenomenon is called the structural mere exposure effect (Gordan & Holyoak, 1983; Newell & Bright, 2001; Zizak and Reber, 2004). Gordon and Holyoak (1983) observed this event in a mere exposure study that used English consonants as stimuli. The consonants were ordered in letter strings according to a rule system that the researchers created, i.e. an artificial grammar. Participants viewed the letter strings in a slideshow and then they later rated how much they liked a different set of letter strings. None of the old letter strings were in the rating phase, but some of the new letter strings obeyed the same artificial grammar of the old strings. Results showed that participants showed greater liking for letter strings that obeyed the familiar grammar even though they were not told of the existence of the grammar.

This principle, of carrying over the effects of the frequent exposure to one set of stimuli over to other stimuli that are structurally similar, has been found to occur with female faces that were merged into one averaged face (Langlois & Roggrman, 1990; Langlois, Roggmen, & Musselman, 1994; Rhodes, Sumich, & Byatt, 1999; Rhodes, Halberstadt, & Brajkovich, 2001; Rhodes, Halberstadt, Jeffery, & Palermo, 2005). Rhodes et al. (2001) found that participants' liking is actually greater for the composite face than the individual faces that composed it. Consistent with the evolutionary basis of attractiveness, symmetry improves when faces are averaged. However, symmetry was not responsible for the results of the study. Participants rated composite faces that were made from unfamiliar individual faces as well as composite faces made from familiar individual faces, thus symmetry was controlled for. Participants consistently liked composite faces made from familiar individual faces more. This finding

indicates that the familiarity of composite faces accounts for liking more than does symmetry (Rhodes et al., 2001).

Furthermore, participants did not like the averaged faces more because their attractiveness increased (Rhodes et al., 2001; Rhodes et al., 2005). Rhodes et al., (2005) found no increases in ratings of attractiveness for the composite faces made from familiar individual faces, even though Bornstein's (1989) meta-analysis found that mere exposure can produce some increases in stimuli's attractiveness. The fact that the averaged faces represented other familiar faces proved to be a greater influence to liking than did the faces' attractiveness (Rhodes et al., 2005).

A study by Pheterson and Horai (1976) also suggested that the attractiveness of stimuli may play less of a role in increasing liking than does frequent exposure. Pheterson and Horai (1976) used a sensation seeking scale to divide their participants into high and low sensation seeking groups. High sensation seeking individuals desired high levels of arousal and stimulation; while low sensation seeking individuals preferred low levels of stimulation and arousal. The researchers found that, under the mere exposure parameters, participants who were low sensation seekers did not like familiar physically attractive or unattractive stimuli differently. High sensation seekers liked familiar physically attractive stimuli significantly more than familiar unattractive stimuli. In this study, the level of participants' sensation seeking influenced liking more than the attractiveness of the stimuli. The researchers hypothesized that this finding may be attributed to the association of being physically attractive with living exciting and successful lives and the appeal that would have had to high sensation seekers (Pheterson & Horai, 1976).

Patterson and Horai's (1976) participants were on the extreme ends of the sensation seeking continuum. Also, the researchers utilized stimuli that were on the extreme ends of the attractiveness continuum. Research on the relationship between average and above average attractive stimuli has yet to be done. Since unattractiveness is a very costly evolutionary burden, frequent exposure may not be able to increase liking due to familiarity to a sufficient extent that would equate or exceed liking for very attractive traits. In comparison, average attractiveness is less of an evolutionary burden, thus familiarity may have a stronger impact on liking. Also, very unattractive traits are not frequently seen in natural environments, so it is more ecologically valid to explore a comparison between individuals who are high versus average in attractiveness, instead of with unattractive individuals. Extreme attractiveness has its innate genetic benefits, but it is unknown if they are overshadowed by average attractiveness' advantage due to frequent exposure.

The Current Study

According to the theory of mere exposure, persons would prefer females who possessed evolutionarily ideal attractive traits only if such traits were common enough to make them familiar. However, females who, by the standards of evolutionary theory are extremely attractive are also, by definition, not as prevalent in society as females who are average in attractiveness (Buss, 1994). Thus, the two theories make competing predictions with regard to which female will be preferred one who is average in attractiveness or one who is extremely attractive. The problem that the mere exposure effect poses for the evolutionary basis for attractiveness must be legitimately explored because the mere exposure effect is a well supported phenomenon (Harmon-Jones and Allen, 2001; Moreland and Beach, 1992; Zajonc, 1968). Research has been done to define and describe the evolutionarily ideal human form (Buss, 1994;

Cunningham, 1995; Cunningham, Roberts, Barbee, Druen, Wu, 1995; Singh, 1993), but it has not been shown if the unfamiliar ideal is actually liked more than the familiar average. The following study is an effort to address this limitation. This study will attempt to determine the relative influence of attractiveness and familiarity on how much females are liked and the likelihood that they would be approached in social situations. It will try to assess whether there is a stronger preference for female faces average in attractiveness because of their prevalence in society, as predicted by the mere exposure effect, or if there is a stronger preference for female faces above average in attractiveness, as predicted by evolutionary theory.

To test this research question, I varied participants' exposure to female faces that were above average and average in attractiveness. I hypothesized that if mere exposure plays a more prominent role in liking than evolution, then participants would show greater liking for repeatedly viewed faces of average attractiveness than for infrequently viewed faces of above average attractiveness. I also hypothesized that participants would show greater liking for faces of above average attractiveness over faces of average attractiveness, regardless of their frequency of exposure, if evolution plays a more prominent role in liking than mere exposure. In addition, prior research has shown that a participant's perceived similarity in attractiveness to a target person will influence his or her rating of liking and personality inferences (Horton, 2003). Participants gave self-ratings of attractiveness to assess the impact of self-perceptions of attraction.

Method

Pretest Method

Participants

Ten men and women between the ages of 18 to 22 participated as volunteers. They were all undergraduate students from a small liberal arts college in Pennsylvania.

Materials

The stimuli consisted of 72 digital images of female faces. I collected various color headshots of Caucasian women who varied in their level of attractiveness. I did not use images of women of color because research shows ratings of attractiveness are influenced by race (Beck, Ward-Hull, & McLear, 1976; lliffe, 1960). The ages of the individuals in the images ranged from 18 to 27 years old. For uniformity, no individuals had glasses or a facial piercing, all individuals were smiling, and I cropped the backgrounds behind every individual to the same size. I used Adobe Photoshop to crop images and adjust their brightness to a common level. I also used Microsoft Powerpoint to center the images on slides that participants would later view. To assess the attractiveness of the images, I created a 10-point scale (1=lowest level of attractiveness, 10=highest level of attractiveness) for each image.

Procedure

Participants viewed and rated all of the images on a Powerpoint slideshow.

Results

The average rating of each image determined if it was placed in a high or average attractiveness category. I selected ten images with the highest average ratings ($M = 6.5$, $SD = 0.8$) and ten images with the lowest average ratings ($M = 2.9$, $SD = 1.2$). Participants significantly rated the two groups of images differently ($t(9) = 9.40$, $p = .000$).

Main Study Method

Participants

One hundred and three students (80 women and 23 men) between the ages of 18 to 22 years participated in this study. They were all undergraduate students from a small liberal arts college in Pennsylvania. Participants earned extra credit in a course or had a chance to win a $25 gift certificate to the college's bookstore for their participation.

Materials

I created a consent form that described participants' rights and the experimental procedures. Rating scales for attractiveness determined participants' level of liking for each image. Scales ranged from 1 to 7, with higher numbers indicating greater liking (see Appendix A). The items assessed variables that research has shown to correlate with liking, such as feelings of similarity (Moreland & Zajonc, 1980). The packet of rating scales included an item that asked participants to rate themselves in physical attractiveness from 1 to 10 (1 = lowest level of attractiveness, 10 = highest level of attractiveness). Microsoft Powerpoint and an image projector displayed images on a screen for participants to view and rate.

Procedure

The experiment was a 2 (Level of Attractiveness of Image: high/low) x 2 (Frequency of Exposure: single/ repeated) within group design. In groups of 2 to 11, participants sat in front of a projector screen. They then read and signed an informed consent form. Next, I instructed participants to attend to the faces that would appear on the screen.

In the slideshow, participants viewed five faces of low attractiveness and five faces of high attractiveness once. Also in the same slideshow, participants saw five other faces of low attractiveness and five other faces of high attractiveness five times. I used a random number table to randomize the order of the images in all of the slideshows. Each face appeared for one sec on the screen. A blank screen following every image appeared for one sec.

After viewing the slideshow, participants rated themselves in attractiveness and then observed each of the 20 faces again while they completed the liking questionnaire for every face. For this step, a second slideshow displayed each image on the screen for 10 seconds, followed by a blank slide for 15 seconds. When each blank slide was displayed, participants rated the previous face on the liking questionnaire. After participants rated all 20 faces, I collected the questionnaires and debriefed all participants.

Results

Liking Scale

The questionnaire, to assess participants' liking for each image in the slideshow contained five questions for every image. Participants rated all 20 images by using the same set of five questions. The five questions tested for internal consistency estimates of reliability to determine if all items measured the same construct, liking.

First, I calculated the average rating on each question. A reliability analysis revealed that the items had a coefficient alpha of $r = .84$. I deleted question two, which increased the alpha coefficient to $r = .85$. Because the reliability among the four remaining items was statistically strong enough to reason that they all measured the same construct, I averaged the scores of the four items into a single liking score for every image.

The images needed to go through the same statistical process as the questionnaire items because they provided measurements of four constructs (average attractiveness and single exposure, average attractiveness and repeated exposure, above average attractiveness and single exposure, above average attractiveness and repeated exposure). The liking scores for the five images that were above average in attractiveness and exposed repeatedly had a coefficient alpha of $r = .81$. I then averaged the liking scores of these five images into a single score (arlike). The

liking scores for the five other images that were above average in attractiveness and exposed once had a coefficient alpha of $r = .82$. I also averaged the liking scores of these five images into a single score (aslike). The coefficient alpha of the five images that were average in attractiveness and exposed repeatedly was $r = .85$. I averaged these scores into a single score (brlike). Lastly, the coefficient alpha of the five images that were average in attractiveness and exposed once was $r = .85$ and I also averaged their scores into a single score (bslike). I then used the average scores from arlike, aslike, brlike, and bslike to test the main hypotheses (see Table 1).

Hypothesis Testing

The dependent variable was the average liking scores for the images of different levels of attractiveness and frequency of exposure (arlike, aslike, brlike, and bslike). I derived these scores from liking scales that ranged from one to seven, where seven equaled extreme liking and one equaled extreme disliking. The independent variables were the level of attractiveness and frequency of exposure of the images. I hypothesized that if mere exposure plays a more prominent role in liking than evolution, then participants would show greater liking for repeatedly viewed faces of average attractiveness than for infrequently viewed faces of above average attractiveness. I also hypothesized that participants would show greater liking for faces of above average attractiveness over faces of average attractiveness, regardless of their frequency of exposure, if evolution plays a more prominent role in liking than mere exposure.

I used a 2 (level of attractiveness) x 2 (frequency of exposure) repeated measures analysis of covariance (ANCOVA) to test the above hypotheses. Participants' self-ratings of attractiveness were held constant because past research has shown that it influences ratings of liking (Horton, 2003). Table 2 shows the mean liking for the images when self-ratings of

attractiveness were controlled. There was a significant main effect for the attractiveness of the images, $F(1, 102) = 5.58$, $p = .020$, partial $\eta^2 = .05$. Participants liked faces that were above average in attractiveness (M= 4.79, SD= .08) significantly more than faces that were average in attractiveness (M= 4.32, SD= .08). There was also a significant main effect for the frequency of exposure of the images, $F(1, 102) = 7.18$, $p = .009$, partial $\eta^2 = .07$. Participants liked faces that they saw once (M= 4.56, SD= .06) more than faces they saw repeatedly (M= 4.55, SD= .06). Though there was no significant interaction, $F(1, 102) = .029$, $p = .865$, partial $\eta^2 = .00$, the effect of exposure on participants' liking appeared to vary according to the level of attractiveness of the faces (see Table 2). Participants' liking decreased with repeated exposure to faces that were above average in attractiveness and participants' liking increased slightly with repeated exposure to faces that were average in attractiveness.

Discussion

The results supported the hypothesis that evolution plays a more prominent role in liking than does mere exposure. Both male and female participants preferred female faces that were above average in attractiveness. Familiarity did not cause faces that were average in attractiveness to be liked more than unfamiliar faces that were above average in attractiveness. According to this study, the reproductive benefits of attractiveness had a larger influence on participants' liking than the benefits from familiarity. This finding agrees with the emphasis Buss (1994) placed on the evolutionary importance of beauty. Beauty is a key indicator of reproductive success and it plays a role in whether or not a female is liked (Buss, 1994; Cunningham, 1995; Feingold, 1992; Rhodes, Simmons, & Peters, 2005;). Figure 1 clearly shows that the images that were above average in attractiveness were significantly liked more than images that were average in attractiveness, regardless of their level of exposure.

However, figure 1 does not illustrate the mere exposure effect. Unlike the findings by numerous researchers (Bornstein, 1989; Harmon-Jones & Allen, 2001; Moreland & Beach, 1992; Saegert, Swap, & Zajonc, 1971; Zajonc, 1968), participants preferred images they saw once to images they saw repeatedly. Research suggested that both familiarity and attractiveness could increase liking for female faces (Buss, 1994; Bornstein, 1989; Cunningham, 1995; Zajonc, 1968). The relative increases in liking caused by these two variables could not be tested in the absence of the mere exposure effect. Thus, because familiarity did not increase liking, the hypothesis that familiarity influences liking more than attractiveness does was not sufficiently tested.

Though the absence of the mere exposure effect prevented a comparison of it and evolution's influence on liking, the study contributed to the overall body of research on liking. This study was the first attempt to study the influence of evolution and the mere exposure effect together and the first to compare the effects of mere exposure on stimuli of average and above average attractiveness. Though Horai and Pheterson (1976) observed the mere exposure effect with images of high attractiveness, the current study failed to replicate their findings. While there was no significant interaction between levels of attractiveness and frequency of exposure, figure 1 shows that decreased liking with repeated exposure primarily occurred with faces that were above average in attractiveness. Faces that were average in attractiveness showed a slight increase in liking when they were familiar. This study showed that mere exposure does not provide benefits of increased liking for very attractive faces.

Evolution may explain why familiarity had a negative effect on the liking of faces that were above average in attractiveness. It may be the rarity of the facial traits of extreme attractiveness that determined their great evolutionary worth. If the traits were common, then

they would not have set the individual who possessed them apart from the masses. The value of the traits indicating very high levels of health and reproductive fitness may significantly decrease when they become common, and thus are frequently seen. The scarcity of extremely attractive features permitted those who possessed them with the ability to exercise some reproductive exclusivity. Both the representation of health by attractive features and the fact that such highly demanded traits were in small supply would have evolutionarily justified their special attention.

This preference for the rare and evolutionarily valuable is illustrated by the current study's results. Participants preferred faces that were above average in attractiveness though they are infrequent in society. Also, the most liked faces by participants were the faces that were above average in attractiveness and least seen in the study (see Table 2). Overall, participants favored the "rarest" faces the most. In the current study, the exclusivity of the faces justified participants' preference of them.

The effect of familiarity on the liking of very attractive people needs more investigation. Pheterson and Horai (1976) observed the mere exposure effect with stimuli that was very attractive, but their participants' ratings were influenced by individual differences in sensation seeking. Though they found that familiar and attractive stimuli were liked more than unfamiliar and attractive stimuli respectfully, it is unclear if factors like participants' self-ratings of attractiveness affected the findings. Also, it is uncertain how similar the definitions of attractive stimuli are among the studies on the mere exposure effect. In this study, the images that represented average attractiveness had a mean attractiveness rating of 3 and the images of above average attractiveness had a rating of 6.5 on a scale of 1 to 10. On the whole, none of the images that were collected for this study were especially unattractive and participants were rather

conservative with their ratings, even for the images that they found to be most attractive. This made it difficult to determine the exact level of attractiveness of the stimuli.

Future research on the subject needs to clearly define stimuli's levels of attractiveness. This problem may be resolved if researches' scales had standard anchors that clearly designate multiple levels of attractiveness. Also, racial and ethnic diversity among the stimuli and participants must be addressed in future research. Support for the influence of evolution would be strengthened by finding similar results with images and participants across races and ethnicities. Research on mere exposure, evolution, and attractiveness needs to address the influence of mass media on participants. Because the mass media frequently exposes large audiences to the most exclusive traits of beauty, participants' perceptions of stimuli that are above average in attractiveness may be skewed.

It is important to continue research in this area because significant attention from the media is paid to extreme attractiveness and the effects of frequent exposure to this unrepresentative population is not fully understood.

References

Barbee, A. P., Cunningham, M. R., Druen, P. B., Roberts, A. R. & Wu, C. H. (1995). "Their ideas of beauty are, on the whole, the same as ours": Consistency and variability in the cross-cultural perception of female physical attractiveness. *Journal of Personality and Social Psychology*, *68*, 261-279.

Beck, S. P., Ward-Hull, C. I. & McLear, P. M. (1976). Variables related to women's somatic preferences of the male and female body. *Journal of Personality and Social Psychology, 34*, 1200-1210.

Bornstein, R. F. (1989). Exposure and affect: Overview and meta-analysis of research, 1968-1987. *Psychological Bulletin, 106*, 265-289.

Bornstein, R. F. & D'Agostino, P. R. (1992). Stimulus recognition and the mere exposure effect. *Journal of Personality and Social Psychology, 63*, 545-552.

Bornstein, R. F., Leone, D. R., & Galley, D. J. (1987). The generalizability of subliminal mere exposure effects: Influence of stimuli perceived without awareness on social behavior. *Journal of Personality and Social Pyschology, 53*, 1070-1079.

Buss, D. M. (1994). The evolution of desire: Strategies of human mating. New York, NY, US: Basic Books, Inc.

Cunningham, M. R. (1986). Measuring the physical in physical attractiveness: Quasi-experiments on the sociobiology of female facial beauty. *Journal of Personality and Social Psychology, 50*, 925-935.

Cunningham, M. R., Roberts, A. R., Barbee, A. P., Druen, P. B., & Wu, C. (1995). "Their ideas of beauty are, on the whole, the same as ours": Consistency and variability in the cross-

cultural perception of female physical attractiveness. *Journal of Personality and Social Psychology, 68*, 261-279.

Dimberg, U. (1990). Facial electromyography and emotional reactions, *Psychophysiology, 27,* 481-494.

Feingold, A. (1988). Matching for Attractiveness in Romantic Partners and Same-Sex Friends: A meta-analysis and theoretical critique. *Psychological Bulletin, 104*, 226-235.

Feingold, A. (1992). Good-looking people are not what we think. *Psychological Bulletin, 111*, 304-341.

Geary, D. C. (2005). Evolution of life-history trade-offs in mate attractiveness and health. *Psychological Bulletin, 131*, 654-657.

Gordan, P. C. & Holoak, K. J. (1983). Implicit learning and generalization of the mere exposure effect. *Journal of Personality and Social Psychology, 45*, 492-500.

Harmon-Jones, E. & Allen, J. J. (2001). The role of affect in the mere exposure effect: Evidence from psychophysiological and individual differences approaches. *Personality & Social Psychology Bulletin, 27,* 889-898.

Harmon-Jones, E & Allen, J.J.B. (1997). Behavioral activation sensitivity and resting frontal EEG asymmetry: Covariation of putative indicators related to risk for mood disorders. *Journal of Abnormal Psychology, 106,* 159-163.

Langlois, J. H. & Roggman, L. A. (1990). Attractive faces are only average. *Psychological Science, 1*, 115-121.

Langlois, J. H., Roggman, L. A., & Musselman, L. (1994). What is average and what is not average about attractive faces? *Psychological Science, 5*, 214-220.

Lliffe, A. H. (1960). A study of preferences in the female body. *British Journal of Psychology, 51*, 267-273.

Moreland, R. L., & Beach, S. R. (1992). Exposure effects in the classroom: The development of affinity among students. *Journal of Experimental Social Psychology, 28*, 255-276.

Moreland, R. L., & Zajonc, R. B. (1980). Exposure effects in person perception: Familiarity, similarity, and attraction. *Journal of Experimental Social Psychology, 18*, 395-415.

Newell, B. R. & Bright, J. E. H. (2001). The relationship between the structural mere exposure effect and the implicit learning process. *The Quarterly Journal of Experimental Psychology, 54*, 1087-1104.

Pheterson, M. & Horai, J. (1976). The effects of sensation seeking, physical attractiveness of stimuli, and exposure frequency on liking. *Social Behavior and Personality, 4*, 241-247.

Rand, C. S. & Hall, J. A. (1983). Sex Differences in the Accuracy of Self-Perceived Attractiveness. *Social Psychology Quarterly, 46,* 359-363.

Rhodes, G., Halberstadt, J., & Brajkovich, G. (2001). Generalization of mere exposure effects to averaged composite faces. *Social Cognition, 19*, 57-70.

Rhodes, G., Halberstadt, J., Jeffery, L., Palermo, R. (2005). The attractiveness of average faces is not a generalized mere exposure effect. *Social Cognition, 23*, 205-218.

Rhodes, G., Simmons, L. W., & Peters, M. (2005). Attractiveness and sexual behavior: Does attractiveness enhance mating success? *Evolution and Human Behavior, 26*, 186-201.

Roberts, S. C., Little, A. C., Gosling, L. M., Perrett, D. I., Carter, V., Jones, B. C., Penton-Voak, I., & Petrie, M. (2005). MHC-heterozygosity and human facial attractiveness. *Evolution and Human Behavior, 26*, 213-226.

Robinson, B. M. & Elias, L. J. (2005). Novel stimuli are negative stimuli: Evidence that negative affect is reduced in the mere exposure effect. *Perceptual and Motor Skills, 100*, 365-372.

Saegert, S., Swap, W., & Zajonc, R. B. (1973). Exposure, context, and interpersonal attraction. *Journal of Personality & Social Psychology*, *25*, 234-242.

Singh, D. (1993). Adaptive significance of female physical attractiveness: Role of waist-to-hip ratio. *Journal of Personality and Social Psychology, 65*, 293-307.

Zaidel, D. W., Aarde, S. M., & Baig, K. (2005). Appearance of symmetry, beauty, and health in human faces. *Brain and Cognition, 57*, 261-263.

Zajonc, R. B. (1968). Attitudinal effects of mere exposure. *Journal of Personality and Social Psychology Monographs*, *9*, 1-27.

Zizak, D. M. & Reber, A. S. (2004). Implicit preferences: The role(s) of familiarity in the structural mere exposure effect. *Consciousness and Cognition, 13*, 336-362.

Table 1

Means of Participants' Liking

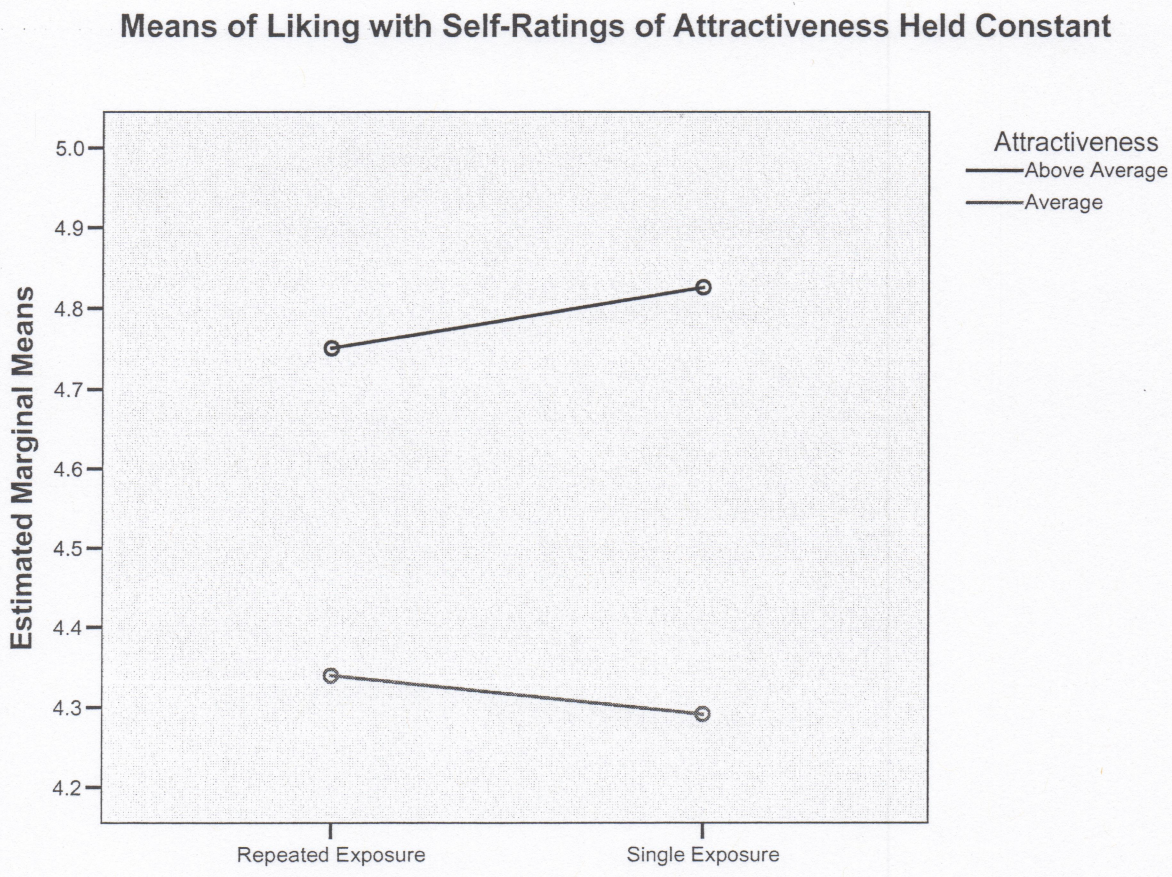
Image category	Mean	Standard deviation
Arlike	4.76	0.86
Aslike	4.83	0.83
Brlike	4.35	0.83
Bslike	4.30	0.80

Table 2

Means of Participants' Liking with Self-Ratings of Attractiveness Held Constant

	Level of Attractiveness			
	Above Average		Average	
Frequency of Exposure	M	SD	M	SD
Single	4.83	0.83	4.29	0.80
Repeated	4.75	0.86	4.34	0.83

Figure 1



Appendix A

Liking Questionnaire

Please observe the image that is currently on the screen. Then carefully read the following questions and circle the number that best describes how you feel.

1. Circle the number that best represents how much you <u>like</u> this image.

1	2	3	4	5	6	7
Dislike A Lot	Dislike Moderately	Dislike A Little	Neither Like Nor Dislike	Like A Little	Like Moderately	Like A Lot

2. Circle the number that best represents how much you think the person in this image is <u>similar</u> to you.

1	2	3	4	5	6	7
Extremely Dissimilar	Very Dissimilar	A Little Dissimilar	Neither Similar Nor Dissimilar	A Little Similar	Very Similar	Extremely Similar

3. Circle the number that best represents your level of comfort with <u>introducing yourself</u> to the person in this image.

1	2	3	4	5	6	7
Extremely Uncomfortable	Very Uncomfortable	Somewhat Uncomfortable	Neither Comfortable Nor Uncomfortable	Somewhat Comfortable	Very Comfortable	Extremely Comfortable

4. Circle the number that best represents the likelihood that you would <u>start a conversation</u> with the person in this image.

1	2	3	4	5	6	7
Extremely Unlikely	Unlikely	Somewhat Unlikely	Neither Likely Nor Unlikely	Somewhat Likely	Likely	Extremely Likely

5. Circle the number that best represents the likelihood that you would <u>socially interact</u> with the person in this image.

1	2	3	4	5	6	7
Extremely Unlikely	Unlikely	Somewhat Unlikely	Neither Likely Nor Unlikely	Somewhat Likely	Likely	Extremely Likely