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Abstract

This study investigated the influence of attractiveness contrast effects on individual and prototypical faces. In two experimental conditions, males (N = 38, M age = 19.21 years) and females (N = 78, M age = 19.13 years) were adapted to high or low attractive opposite-sex faces. Following adaptation, participants responded to a mate selection questionnaire and rated individual faces on attractiveness. Participants also rated prototypes on attractiveness and familiarity, either during the same session (males and females) or after a 1 week delay (females). Results indicated a weak contrast effect for male participants' attractiveness ratings for individual faces but not for prototypes. For females, a weak contrast effect was found for individual faces and prototypes in the low attractive adaptation condition only. Participants found a majority of the prototypes familiar with high degrees of confidence, even after a delay. Mate selection factors, consisting of ability to compete and mate attractiveness standards, were related to participants' self-assessed attractiveness.

Influence of Contrast Effects on Attractiveness of Individual Faces and Facial Prototypes

Introduction

The large body of research investigating attractiveness reflects the importance of physical appearance in society. Despite common phrases such as 'beauty is only skin deep,' there is no longer any doubt that being attractive has societal benefits (Udry & Eckland, 1984). Attractive individuals are consistently treated significantly better than their unattractive counterparts (Berscheid & Gangestad, 1982). Social benefits of attractiveness begin early in life, as indicated by a study of 5th- and 6th-graders reporting that attractive males and attractive females influenced peers' behavior better than less attractive classmates (Dion & Stein, 1978). Additionally, attractive adults are judged more positively in occupational competence than unattractive counterparts, and are perceived as higher in social appeal, psychological adjustment, and interpersonal competence. Furthermore, attractive adults actually do experience greater occupational success, popularity, sexual and dating experience, better physical health, and higher self-confidence. These results hold true even when familiarity is taken into account (Langlois, 2000).

Not only are opinions influenced by attractiveness, but behavior towards attractive children and adults echo the importance of being physically attractive (Berscheid & Gangestad, 1982). Taken together, these findings indicate that attractiveness is a salient factor in attitudes and behaviors for both familiar and stranger encounters, making the old adage 'never judge a book by its cover' more applicable to books than to people. Even 'impartial' judicial proceedings are imbedded with attractiveness bias. Stewart (1980) tracked the court case verdicts of 67 defendants and concluded that for those receiving sentences, less severe sentences were imposed on attractive defendants. The potential for attractiveness to affect so many areas of an individual's life makes it important to determine why attractiveness has such an effect on humans, and how one's experience influences perceptions of attractiveness.

Evolution and Attractiveness

Evolutionary psychologists theorize that the importance of physical attractiveness originated from mate selection processes. Selecting a mate that will provide healthy offspring represents the goal of evolutionary mate selection. Therefore, choosing mates with appropriate reproductive capabilities provides individuals with a selective advantage (Buss & Barnes, 1986). As a tribute to the long-standing importance of mate selection, Buss (1994) noted that many elaborate rituals across cultures focus on human mating behaviors, and that human evolution shapes physical preference. Attractive individuals experienced greater mate selection success and appeared to have benefits in the sexual marketplace (Udry & Eckland, 1984). Ford and Beach (1951) identified some universal cues that provided observable evidence of a female's reproductive capacity, which also fit with evolutionary tenets about attractiveness. Cross-culturally, attractive traits, such as such unblemished skin and the absence of sores, indicate youth and health. Youth and health contributed to reproductive success, making the observable characteristics of these qualities particularly important to mate selection and mate attraction.

Averageness is a biologically based beauty standard due to its importance in attractiveness ratings in both Western and non-Western cultures. As in Western cultures, studies with Chinese and Japanese participants indicated that both facial averageness and facial symmetry are positively correlated with attractiveness (Rhodes et al., 2001). Facial averageness represents the mean of a distribution of faces, and average faces are rated higher in attractiveness and symmetry than individual faces (Langlois & Roggman, 1990). Average faces are created from blending individual faces, which changes feature size and placement on the face. For example, blending large eyes and small eyes produces average sized eyes. Individuals with average faces are more attractive than individuals who have features that vary from the mean. Evolutionary psychologists proposed that averageness is self-selected through mating patterns (Grammer & Thornhill, 1994).

Because the right and left halves of the face contain the same facial features, asymmetry in the face can be measured by vertically cutting the face down the middle and comparing how much feature size and placements vary in each half. Fluctuating asymmetry (FA) is random variation from perfect vertical bilateral symmetry in which the mean population asymmetry is zero. When the mean differences between the right and left halves of the face is zero, the right and left halves are perfect mirror images and asymmetry is absent (Van Valen, 1962). FA occurs during development when the immune system can not cope with perturbations caused by viruses, parasites, and excess hormones. Fluctuating asymmetry is negatively related to facial attractiveness (Grammer & Thornhill, 1994), and facial symmetry positively correlates with attractiveness (Rhodes et al., 2001; Shackleford & Larsen, 1997). Shackleford and Larsen (1997) found that greater facial asymmetry correlated with being less active, less extraverted, less conscientious, less emotionally stable, and less intelligent than more symmetric counterparts for both men and women. Individuals who exhibited more fluctuating asymmetry also reported more psychological and physiological problems (Shackleford &

Larsen, 1997), thus corroborating the evolutionary hypothesis that facial symmetry is an informant for potential mates regarding an individuals' health. Average facial features reflect a continuous distribution of traits over generations, which is associated with parasite resistance, making those with average facial attractiveness attractive due to their superior gene expression (Grammer & Thornhill, 1994). From an evolutionary standpoint, individuals' cognitive ability to detect fluctuating asymmetry increases chances of producing healthy offspring. Average faces are naturally symmetric and inherently attractive because of their central location in a distribution of faces. Therefore, the ability to perceive averageness in the faces of potential mates aligns with evolutionary benefits for mating.

Men and women have little conscious awareness of averageness, symmetry, and biological influences such as FA (Perrett et al., 1999; Simmons et al., 2004). Although both men and women *say* that personality characteristics, like kindness, are the primary factor in mate selection (Buss, 1989) actual *behavior* is inconsistent with this perception; rather, physical attractiveness strongly predicts dating desirability (Walster, Aronson, Abrahams, & Rottmann, 1966). Despite some cultural variation, men across cultures consistently place a higher value on attractiveness when selecting a long-term partner than women. In contrast, women place a higher value on financial resources (Buss & Schmitt, 1993). These long-term preferences are primarily for producing healthy offspring and ensuring their survival. Short-term mating preferences are similar but slightly relaxed since producing offspring is not a principal goal. Attractiveness does not predict men's likelihood of marrying, but does predict women's likelihood of entering a marriage (Udry & Eckland, 1984). Supporting evolutionary mate selection preferences, research determined that men look for healthy and reproductively capable mates, and women look for mates with resources (Buss & Barnes, 1986). Cross-cultural data provided strong evidence that even though attractiveness is important to both sexes, males value physical attractiveness in a mate more than females (Buss, 1989). As evidence of this preference, less attractive women are ten times as likely to remain unmarried than more attractive women. Additionally, attractive men and women marry at younger ages (Udry & Eckland, 1984).

Intrasexual selection, in which members of the same sex compete with each other for the best mate, also capitalizes on physical appearance as a means of judging individuals (Buss & Barnes, 1986). Actual mating practice follows this preference, with attractive women marrying partners with more resources, as judged by husbands' occupational status (Udry & Eckland, 1984). With these behaviors in mind, an individual needs to understand the mating preferences of the opposite sex in order to fulfill these expectations and gain access to the best possible mate. By being the best example of preferred mate characteristics, an individual increases his or her ability to secure the best mate. In order to do this, individuals of the same sex compete through display of the opposite sex's preferred mate choices. Buss (1988) confirmed that tactics of intrasexual competition align with preferential mating choice of the opposite sex, with women more likely to make efforts to enhance their physical appearance, and men more likely to make their resources known. For women, attractiveness is the chief intrasexual competition factor, whereas resource display (and not merely resource boasting) is the most important intrasexual competition factor for men.

Contrast Effects and Attractiveness

Individuals' perceptions of their ability to compete for mates may be influenced by the number of potential available mates; such perceptions can be altered through exposure (Gutierres, Kenrick, & Partch, 1999). Researchers proposed that repeated exposure to attractive individuals alters perceptions of the actual number of attractive individuals in a distribution. Such exposure to attractive individuals also alters standards of beauty. Contrast effects occur when extreme stimuli shift value perceptions along a stimulus dimension. For example, after viewing magazine centerfolds, an average stranger is rated as less attractive (Kenrick & Gutierres, 1980). For men, self-evaluations of desirability as a marriage partner indicated a decrease in perceived desirability after exposure to socially dominant men. However, women's self-evaluations of desirability as a marriage partner were not influenced by socially dominant women, but instead were diminished after exposure to physically attractive women. These findings suggested that self-evaluation reflected the evaluation criteria of the opposite sex. An explanation for these findings could be that exposure to highly attractive or dominant individuals alter the perceived distribution of persons along these dimensions. Therefore, experience with others may not change one's self-evaluation of attractiveness, but it may change how that self-perception is compared to others (Gutierres, Kenrick, & Partch, 1999).

In addition to attractiveness, altered perceptions of distributions occurred for perceptions of normalcy in faces. In a study of face attractiveness adaptation, Rhodes, Jeffery, Watson, Clifford, and Nakayama (2003) found that faces rated as most 'normal' in a distribution of distorted faces received higher attractiveness ratings than highly distorted faces. Participants in two conditions were adapted to distorted faces that were either 50% narrower or 50% wider than a central image. Following the adaptation phase, participants' perception of normal faces followed the direction of adaptation, with a wider face preferred after viewing the wide adaptation phase and vice versa. The researchers also asked participants to provide attractiveness ratings following adaptation, and the attractiveness ratings mirrored the shift in what was considered 'normal.' This pattern suggests that facial attractiveness is linked with averageness, and that averageness is influenced by experience.

Cognition and Attractiveness: Formation of Facial Prototype from Experience

Averageness as a measure of central tendency of feature size and placement can be described in terms of 'face space'. Face space is a computationally derived framework that represents faces as points in space with the average of all faces located at the center, consistent with potential prototype effects (Leopold, O'Toole, Vetter, & Blanz, 2001). Rhodes et al. (2003) observed that the 'average face' depends on the population of faces that an individual experiences. Mathematically averaged faces are not necessarily rated as average in attractiveness. Indeed, Langlois, Roggman, and Musselman (1994) clarified this common misinterpretation by noting that a physically average face is *highly* attractive. They further suggested that averageness can be considered a quality of attractive faces. Although both youth and symmetry were also considered attributes of attractive faces, neither youthfulness nor symmetry predicted attractiveness ratings as well as averageness.

A prototype is a focal example of a category that is used as the basis for the category characteristics (Rosch, 1973). Mental representations of faces create a face prototype that is not identical to any particular face experience, but represents a composite of multiple experiences (Kagan, 1985). This idea suggests that the cognitive process of pattern matching mentally morphs facial features to determine the central tendency of a distribution of faces. As individuals view faces, they mentally match the features of the distal face with the mental prototype of previously viewed faces. The ability to create prototypes is present at birth. Walton and Bower (1993) found that newborns can rapidly form face prototypes with a limited number of faces. The role of experience in prototype formation is also evident in literature that considers how prototypes change. Exposure to distorted faces altered the perception of the prototype, as evidenced by shifts in perceptions of normalcy and attractiveness (Rhodes et al., 2003). The idea of 'face space' is created around a central face prototype made from averaging faces together. The center, or prototypical face, is important to the interpretation of face structure of subsequent faces in 'face space,' and aids in identification of individual faces (Leopold, O'Toole, Vetter, & Blanz, 2001). Identity trajectories radiate from the prototypical face, with resemblance to the prototype decreasing with distance from the prototype. Walton and Bower (1993) proposed that formation of prototypes in human newborns help them to identify their mother.

Although prototypes are used for face identification, they are also mistaken as familiar. Solso and McCarthy (1981) found that participants' memory for a never-before-seen prototype created with features from previously presented faces was considered familiar with more confidence than individual faces that were actually presented previously. Thus, central tendency facilitates recognition of the prototype while providing a comparison for individual examples of faces. Ultimately, the prototype mentally incorporates individual faces through pattern matching. Although it is difficult to determine when prototypes are created, it is clear that prototypical faces are considered more attractive than non-prototypical faces. Therefore, attractive faces should be nearer to the average configuration of a population of faces than unattractive faces (Langolis, Roggman, & Musselman, 1994).

The Present Study

Social, cognitive, and evolutionary psychologists agree that a current need exists to integrate theoretical approaches in mate selection research. Attraction is one of the more extensively researched topics across cognitive, social, and evolutionary psychology, particularly facial attractiveness. An intersection of approaches would give researchers a more thorough and integrated view of human mate selection and attraction, and shed additional light on cultural factors mediating social, cognitive and evolutionary processes. Contrast effects represent a disturbing influence of cultural factors. Winkler and Rhodes (2005) found that even short durations of exposure to distorted bodies influenced participants' view of what was normal. Viewing narrow bodies for 5 minutes shifted participants' perception of what was normal and attractive to a significantly narrower body. Investigating contrast effects with faces may have the same socially negative effect; similar perceptual adaptation has been found with distorted faces (Rhodes, 2003).

The present study investigates the influence of contrast effects on individual and prototypical faces. Past research indicated that attractiveness ratings of opposite-sex others were influenced by exposure to attractive media. For example, men rated a woman as less attractive while questioned during an episode of Charlie's Angels than men who were not exposed to attractive females in the media (Kenrick & Gutierres, 1980). Researchers have not investigated whether contrast effects can enhance perceptions of others, such as when participants are exposed to unattractive individuals prior to rating a normal distribution of faces. From an evolutionary standpoint, the literature addresses self-assessments after exposure to the same sex and its role in mate selection, but no research has been conducted investigating self-assessments after exposure to the opposite sex. Gutierres et al. (1999) hypothesized that perception of the available pool of potential mates shifted after exposure to attractive same-sex competitors by distorting the relative number of attractive versus unattractive mates available. The effect of contrast effects on the opposite-sex and the relationship to mate selection factors warrants further investigation.

Prototypes are included in this study because of their central tendency in the distribution of faces viewed, their typically high attractiveness ratings, and their creation from experience. If prototypes are subject to contrast effects, then attractiveness ratings should change based on attractive or unattractive facial experience. The lingering effects of the proposed contrast effects is unknown, although novel prototypes created from individual face presentation has been documented to last up to 6 weeks from initial face presentation (Solso & McCarthy, 1981).

In the present study, participants in the experimental conditions will first be exposed to an adaptation phase. Half of the participants will view highly attractive faces and the other half will view unattractive faces. This manipulation is designed to produce the contrast effect, similar to Kenrick and Gutierres' (1980) Charlie's Angels effect. The participants will then view a distribution of faces intermediate in attractiveness and will be asked to rate these faces on attractiveness. The first hypothesis predicts that contrast effects will decrease attractiveness ratings for participants who view the highly attractive adaptation phase compared to the control condition, who will not be exposed to an adaptation phase. Conversely, participants viewing the low attractive adaptation phase will rate faces as more attractive than control participants. It is not expected that current monogamous relationship status will influence attractiveness ratings.

Several predictions relate to mate selection factors for short- and long-term mates, including the participants' ability to compete for mates and standards for mate attractiveness. For females, competition for short- and long-term mates is influenced by their level of attractiveness (Gutierres et al., 1999). Because male attractiveness is less important to females in mate selection, it is not expected that the attractiveness of faces in the adaptation phases will affect their perceived competitiveness. For male participants, a relationship will not exist between ability to compete for short- and long-term mates and their self-assessed attractiveness; past research found that competition for female mates is influenced by other socially dominant males, not other attractive males (Gutierres et al., 1999).

Another prediction addresses minimum acceptable attractiveness standards for short- and long-term mates. Female participants' minimum acceptable attractiveness for short- and long-term mates should not be influenced by adaptation phase, because females do not focus on male attractiveness. Because males rank attractiveness as a primary factor in mate selection, males viewing the high attractive adaptation phase should increase their minimum acceptable attractiveness. Conversely, males viewing the low attractive adaptation phase should decrease their minimum acceptable attractiveness.

The second hypothesis considers susceptibility of the prototypes to contrast effects. Because cognitive theories propose that prototypes are formed from experience, they should be influenced by experience (Rhodes et al., 2003). Prototypes will be created with varying levels of familiarity by including 32, 16, or zero faces that have previously been presented to participants. Prototypes that are most familiar to participants should exhibit stronger contrast effects than less familiar prototypes. Attractiveness scores will be influenced by adaptation phase in immediate ratings and after a 1 week delay for all prototypes regardless of the faces used to comprise them.

The third hypothesis predicts that prototypes will be considered familiar due to their average characteristics. Past research indicated that prototypes are judged as familiar even after a substantial delay; this will be reflected by high confidence ratings of familiarity after a delay of 1 week (Solso & McCarthy, 1981). In particular, the prototype that contains the most previously seen individual faces will obtain the highest confidence ratings by participants. Prototypes created from fewer previously seen faces will be considered familiar, but receive lower confidence ratings. Past research (Solso & McCarthy, 1981) did not indicate gender differences in memory for prototypes; none are expected in this study.

Methods

Participants

Participants included male and female undergraduate students at Illinois Wesleyan University. Seventy-eight females participated in this study (*M* age =19.13 years, *SD* =1.23; 86.1% White, 7.6% Black, 2.5% Hispanic, 1.3% Asian/Pacific Islander, and 1.3% Other). Forty-four of the female participants returned after a one week delay, and 34 participated in one session. Thirty-eight males participated in this study (*M* age = 19.21 years, *SD* = 1.04; 94.7% White, 5.3% Black). All 38 male participants participated in one session only. There was no monetary compensation for participation in this study. Students who were recruited from general psychology courses received course credit for participation.

Stimuli

All faces used in this study were photographed in similar lighting conditions and without shadows on the face using a F460 Finepix 5.1 megapixel digital camera. The images of 160 individual faces were cropped (removing the hairline and body). To assure that each photo had the same dimensions, the resolution of each image was 640 X 480 pixels. A mirror image of each face was made using Adobe Photoshop (v. 6). Individual faces were made symmetric using Gryphon morphing software (Burns, 1994) by morphing the original face and its mirror image. Individual symmetric faces were then morphed by matching the following features: face outline, eyes, pupil outline, eyebrows, nose outline, nostrils, outer lip line, and inner lip line. From these individual faces, 6 face prototypes were created (3 male and 3 female) by combining 32 symmetric faces. Prototypes were created with Gryphon morphing software using a spatially warped cross-fade that blends common points on two photographs. Common points for morphing prototypes were the same as listed for morphing individual symmetric faces. One female face prototype was created from 16 individual symmetric faces shown in the high attractive adaptation phase and 16 faces distributed mid-range in attractiveness level. Another female face prototype was created using 16 individual symmetric faces from the low attractive adaptation phase and the 16 faces distributed mid-range in attractiveness level. A third female face prototype was created with 32 symmetric faces that were not presented in the experiment and were therefore unfamiliar. The three male face prototypes were created in the same way.

Procedures

At prearranged times groups of 10 participants came to the Psychology computer lab in the Center for Natural Sciences to participate in the study. There were no mixed-gender groups. After arriving at the testing location, participants read and signed the informed consent. Participants were each seated at an individual computer station for stimuli presentation and data collection. Data collected during the session was stored in an individual MediaLab file. MediaLab is a computer program that was programmed to present the stimuli and survey questions, record responses, and store data for use in a statistical program. This study included 2 rating conditions (1 male, 1 female), 2 control conditions (1 male, 1 female) and 4 experimental conditions (2 male, 2 female).

Participants sat in front of the computer monitor and responded to questions by typing on the keyboard. Participants were asked for relevant demographic information including age, gender, ethnicity, and year in school. Additionally, participants indicated if they were currently in a committed relationship; if they were, they were asked to report the length of that relationship. To control for a possible comparison standard confound (Gutierres et al., 1999), participants were then presented with an attractiveness scale from 1 to 10 (1 = very unattractive and 10 = very attractive), and were asked to rate their own facial attractiveness.

Rating Conditions. The purpose of the rating conditions was to provide mean attractiveness ratings for each symmetric face; raters provided attractiveness ratings for faces of the opposite gender. A total of 80 male and 80 female faces were rated. The first face presented in the rating phase was average in attractiveness as determined by the experimenters, after which order of presentation of the faces was random. All attractiveness ratings were on a scale from 1 to 10 (1 = very unattractive and 10 = very attractive). These attractiveness ratings determined the faces used in the high attractive adaptation phase, low attractive adaptation phase, the intermediate distribution of faces used for rating, and the unfamiliar faces used for unfamiliar prototypes. Sixteen faces with the highest mean attractiveness ratings (from 6 to 10) became the high attractive adaptation phase. Sixteen faces with the lowest mean attractiveness ratings (from 4 and below) comprised the low attractive adaptation phase. Sixteen faces with intermediate attractiveness ratings (4 to 6) comprised the faces that were rated for attractiveness.

Control Condition 1: Female participants. At the beginning of the experimental session, participants viewed 16 neutral stimuli consisting of black and white Mandela designs on a grey background. The 16 neutral stimuli were viewed twice in random order to make the adaptation phase 320 seconds or approximately 5 minutes. Then, participants completed the Competitive Ability and Acceptable Attractiveness Survey consisting of the following questions:

(1) My ability to compete with other females for a short-term dating partner is... (select from: much lower than most, somewhat lower than most, equal to others, somewhat higher than most, much higher than most) (See Table 2 and Table 5, CAAAS1).

(2) My ability to compete with other females for a long-term marriage partner is... (select from: much lower than most, somewhat lower than most, equal to others, somewhat higher than most, much higher than most). (See Table 2 and Table 5, CAAAS2).

(3) On a scale from 1 to 10, my minimum acceptable attractiveness rating for a short-term dating partner is… (1 being very unattractive and 10 being very attractive). (See Table 2 and Table 5, CAAAS3).

(4) On a scale from 1 to 10, my minimum acceptable attractiveness rating for a long-term marriage partner is… (1 being very unattractive and 10 being very attractive). (See Table 2 and Table 5, CAAAS4).

Then participants randomly rated the same 16 symmetric male faces on attractiveness that the experimental conditions rated. Half of the participants also rated the 3 male prototypes on attractiveness, coded the prototypes as "old" or "new," and provided a familiarity confidence rating on a scale of 1 to 5, with 1 being unconfident and 5 being highly confident. The other half of the participants did not perform the prototype identification task at this time, and were instead asked to return for an additional 10 minutes of testing at a date one week from the day of initial testing. Upon returning to the laboratory 1 week later, participants performed the prototype identification and rating task exactly as the other participants did during the original testing, and were then debriefed.

Control Condition 2: Male Participants. The male participants followed the same procedure as female participants in the control condition except that male participants rated female faces and prototypes. Following completion of the Competitive Ability and Acceptable Attractiveness Survey regarding female partners, participants provided attractiveness ratings for 16 randomly presented female faces (Figure 1). Due to time constraints and lack of participants, no delay condition was performed.

High attractive adaptation Condition 1: Female Participants. Participants viewed 16 randomly presented high attractive symmetric male faces twice for 10 seconds each during the adaptation phase, and were instructed to concentrate on the faces and try to remember them. Following the adaptation phase, participants completed the Competitive Ability and Acceptable Attractiveness Survey in reference to male partners.

Participants were re-familiarized with the attractiveness scale by viewing it on the computer screen, and began the rating phase. Participants viewed 16 unfamiliar symmetric faces, presented randomly, and were asked to rate the attractiveness of each male face. The attractiveness rating scale was available for reference every time that the participant rated a face. After the rating phase was completed, half of the participants proceeded to a prototype identification task. Participants sequentially viewed 3 prototypes in random order. The 32 faces viewed in the adaptation and rating phases comprised one prototype. The second prototype was comprised of the faces used in experimental condition 3, which are 16 male low attractive faces and 16 male faces that were rated in each condition. Thirty-two unfamiliar faces of average attractiveness comprised the third prototype. Participants rated the faces on attractiveness, coded the prototypes as "old" or "new", and gave a familiarity confidence rating on a scale of 1 to 5, with 1 being unconfident and 5 being highly confident. Following completion of the prototype identification and rating task, participants were debriefed.

Highly attractive adaptation condition 2: male participants. Male participants followed the same procedure as the female participants in the high attractive adaptation condition, except male participants viewed and rated symmetric individual female faces and prototypes. Following the adaptation phase, but before beginning the rating phase, participants completed the Competitive Ability and Acceptable Attractiveness Survey in reference to female partners. Participants then proceeded to the rating task as indicated above.

Low attractive adaptation condition 3: female participants. Participants viewed 16 low attractive symmetric faces for 10 seconds during the adaptation phase, and were instructed to concentrate on the faces and try to remember them. Following the adaptation phase, participants responded to the Competitive Ability and Acceptable Attractiveness Survey in reference to male partners.

Participants were re-familiarized with the attractiveness scale by viewing it on the computer screen, and began the rating phase. Participants viewed 16 unfamiliar faces (made symmetric), presented in random order, and were asked to rate the attractiveness of each male face. The attractiveness rating scale was available for reference every time that the participant rated a face. After the rating phase was completed, half of the participants proceeded to a prototype identification task. Participants sequentially viewed 3 male prototypes in random order. One prototype was comprised of the 32 faces viewed in the adaptation and rating phases. The second prototype was comprised of the faces used in high attractive experimental condition, which are 16 male high attractive faces and 16 male faces that are rated in each condition. The third prototype was comprised of 32 unfamiliar, but symmetric, faces of average attractiveness. Participants rated each face on attractiveness, coded the prototypes as "old" or "new", and gave a confidence rating of familiarity on a scale of 1 to 5, with 1 being unconfident and 5 being highly confident.

Following completion of the prototype identification and rating task, participants were debriefed. The other half of the participants did not perform the prototype identification task at this time, and were instead asked to return for an additional 10 minutes of testing at a date 1 week from the day of initial testing. Upon returning to the laboratory one week later, participants performed the prototype identification and rating task exactly as the other participants did during the original testing and were then debriefed.

Low attractive adaptation condition 4: male participants. The male participants followed the same procedure as female participants in the low attractive adaptation condition except male participants viewed and rated individual symmetric female faces and prototypes. Following the adaptation phase and before the rating session participants completed the Competitive Ability and Acceptable Attractiveness Survey in reference to female partners. Participants then proceeded with the rating task as indicated above.

Results

Female Participants

The first hypothesis predicted that contrast effects would decrease attractiveness ratings for participants viewing the high attractive adaptation phase compared to the control condition. Participants viewing the low attractive adaptation phase were predicted to have inflated ratings compared to control participants. On a scale from 1 to 10, higher means reflect higher attractiveness ratings for all analyses. A one-way analysis of variance (ANOVA) evaluated differences in attractiveness scores between the control, high attractive adaptation, and low attractive adaptation conditions. The results were not significant [$F(2, 75) = .87, p < .42$], but a trend in the results suggested that this hypothesis maintained some support for mean differences between the control and high attractive adaptation condition (see Table 1 for *M*s and *SD*s). The mean attractiveness scores for the low attractive adaptation phase were lower than the control condition; this aspect of the hypothesis was not supported (see Figure 2).

It was predicted that self-assessed attractiveness ratings would be related to the ability to compete for short- and long-term mates. For the control condition, a significant positive correlation was found between self-assessed attractiveness ratings and ability to compete for a short-term mate ($r = 0.40, p < 0.05$, see Table 2). In the low attractive adaptation condition, a significant positive correlation occurred for participants' attractiveness and ability to compete for a long-term mate ($r = 0.42, p < 0.05$). The second prediction was supported only for long-term mates in the low attractive adaptation condition. A significant correlation was not found for the high attractive adaptation condition; the hypothesis was not supported. The second prediction also stated that competition across attractiveness adaptation conditions would not change. This prediction was supported; the adaptation phase did not influence perceived competitiveness. A comparison of means using a one-way ANOVA yielded no significant differences for short- and long-term competitiveness across conditions.

It was also predicted that females' mate attractiveness standards would not be influenced by attractiveness adaptation condition. A one-way ANOVA supported this expectation; there were no significant differences in means for minimum acceptable attractiveness scores for short- or long-term mates across conditions. Means are reported here for each condition because the survey questions for minimum acceptable standards for short-and long-term mates were presented after the adaptation phase of the experiment, which could have an effect on standards. The overall mean self-assessed attractiveness rating on a scale of 1 to 10 was 6.79 ($SD = 1.11, N = 78$) for female participants. The mean minimum acceptable attractiveness rating for a short-term partner was 6.19 (*SD* = 1.33) for the control condition, 5.78 (*SD* = 1.40) for the high attractive adaptation condition, and 5.60 (*SD* = 1.80) for the low attractive adaptation condition. The mean minimum acceptable attractiveness rating for a long-term partner was 6.27 (*SD* = 1.37) for the control condition, 6.41 (SD = 1.82) for the high attractive adaptation condition, and 6.00 (SD = 2.10) for the low attractive adaptation condition. An interesting result emerged that was not expected but may have influenced the results. Participants rated their own faces on attractiveness much higher than the faces they rated (see Figure 3). Mean self-assessed attractiveness ratings were higher than the means for the faces that the participants rated. Participants' self-ratings were reported before exposure to any of the faces. An unexpected significant correlation occurred between participants' self-assessed attractiveness and mate attractiveness standards in the high attractive adaptation condition (see Table 2).

Hypothesis 2 predicted that prototypes, which are based on experience, would be subject to contrast effects. Differences in attractiveness scores between conditions were evaluated using a repeated measures ANOVA, with condition as the between-subjects factor and type of prototype (3 levels: high attractive prototype, low attractive prototype and unfamiliar prototype) as the within subjects factor. The between-subjects analysis yielded insignificant results. Upon immediate rating following the adaptation phase, prototypes in both experimental conditions received higher attractiveness ratings (*M* range = 5.75 – 6.33) than in the control condition (*M* range = 5.09 – 5.36), indicating a contrast effect for the low attractive adaptation condition. These findings contradict the hypothesis that prototypes are subject to contrast effects for the high adaptation condition; these ratings were higher than the controls (see Table 3 for *M*s and *SD*s). Attractiveness ratings following the delay indicated that contrast effects did not persist for the low attractive adaptation condition. Independent samples *t*-tests comparing the mean attractiveness ratings for each type of prototype (high, low, and unfamiliar) upon immediate ratings versus the 1 week delay were not significant. Attractiveness ratings after the delay period indicated that prototypes in the high attractive adaptation condition were rated the highest, followed by the control, and then low attractive adaptation condition. These findings suggested that prototypes were rated based on the attractiveness level of the faces that comprised them. Familiarity level of the prototypes did not affect the strength of the contrast effect as predicted.

As hypothesis 3 predicted, the majority of responses across prototypes (69.6%) were scored as familiar immediately following the rating task, and 65.9% were scored as familiar even after the 1 week delay. Of the prototypes scored as familiar, mean confidence ratings are included in Table 4. Mean confidence ratings ranged from 3.40 – 4.56 (1 = unconfident, 5 = highly confident). Confidence ratings did not vary in the expected direction with prototype familiarity, except for the one session low attractive adaptation condition.

Male Participants

The first hypothesis predicted that contrast effects would decrease attractiveness ratings for participants viewing the high attractive adaptation phase compared to the control condition. Participants viewing the low attractive adaptation phase were predicted to have inflated ratings compared to control participants. A one-way ANOVA evaluated whether or not there were significant differences between the condition means for attractiveness ratings. The results were not significant [$F(2, 35) = .51, p < .61$]. Despite the insignificant results, a trend in the results consistent with the hypothesis indicated a small contrast effect for both adaptation conditions (see Table 1 for *M*s and *SD*s).

It was predicted that self-assessed attractiveness would not be related to perceived ability to compete for a short- or long-term mate. Across conditions the prediction was unsupported; self-assessed attractiveness was positively correlated with perceived ability to compete for a short-term mate (see Table 5). There was a moderately positive, but insignificant, correlation between self-assessed attractiveness and ability to compete for a long-term mate in the high attractive adaptation condition. A smaller negative correlation existed for self-assessed attractiveness and ability to compete for a long-term mate in the low attractive adaptation.

It was also predicted that males' mate attractiveness standards would change depending on the attractiveness adaptation. A one-way ANOVA was conducted comparing the mean attractiveness standards across conditions. The results between conditions for the short-term attractiveness standards were approaching significance [$F(2,35) = 3.09, p < .058$]. Post-hoc comparisons using the Tukey HSD test indicated that differences existed between the low ($M = 6.25$, $SD = 1.06$) and high ($M = 6.92$, $SD = .95$) attractive adaptation conditions. The effect size calculated using eta squared was .15, indicating a large effect. No other comparisons, including long-term mate attractiveness standards, were close to achieving significance. Participants' mean self-assessed attractiveness rating on a scale of 1 to 10 was 7.18 ($SD = 1.09$, $N = 38$). The mean minimum acceptable attractiveness rating for a short-term partner was 6.92 ($SD = .95$) for the control condition, 6.25 ($SD = 1.06$) for the high attractive adaptation condition, and

7.15 (*SD* = .80) for the low attractive adaptation condition. The mean minimum acceptable attractiveness rating for a long-term partner was 7.38 (*SD* = 1.12) for the control condition, 6.83 (SD = .94) for the high attractive adaptation conditions, and 7.23 (SD = 1.36) for the low attractive adaptation conditions. Mirroring the females' unexpected discrepancy between self-assessed attractiveness and attractiveness ratings for faces, males' self-assessed attractiveness ratings were high compared to rated faces (see Figure 3).

Hypothesis 2 predicted that prototypes, which are based on experience, would be subject to contrast effects. Differences in attractiveness scores between conditions were evaluated using a repeated measures ANOVA, with condition as the between-subjects factor and type of prototype (3 levels: high attractive prototype, low attractive prototype and unfamiliar prototype) as the within subjects factor. Upon immediate rating following the adaptation phase, the between-subjects analysis yielded insignificant results (see Table 6 for *M*s and *SD*s). The mean range for prototype attractiveness in the experimental conditions (*M* range = 4.77-6.46) overlapped that of the control condition (*M* range = 4.46-5.54). The overall pattern of mean attractiveness responses indicates that participants were responding to the attractiveness of the individual faces comprising the prototypes, which was not the predicted trend.

Hypothesis 3 predicted that all prototypes would be considered familiar; 62.3% of all possible responses indicated that participants considered the prototypes to be familiar. Mean confidence ratings of familiar responses ranged from 3.44-4.71, (1 = unconfident and 5 = highly confident). Contrary to the hypothesis, confidence ratings did not vary in the expected directions with prototype familiarity. Due to time constraints only one session was conducted with male participants.

Discussion

Female Participants

The first hypothesis predicted that contrast effects for facial attractiveness would occur after viewing either high or low attractive adaptations. If contrast effects impacted ratings, then diminished attractiveness ratings after adaptation to highly attractive faces compared to controls would be expected. An inflated effect on attractiveness ratings would be expected after adaptation to unattractive faces. Results indicated that participants in the high attractive condition rated faces lower than controls, which was consistent with the prediction but failed to reach significance. The high attractive adaptation included the 16 most attractive faces from 80 male faces photographed in Illinois and Missouri, and were rated by college students prior to the beginning of this study. It is likely that the most attractive faces in this condition were not attractive enough to induce contrast effects in participants' attractiveness ratings. Participants also commented that it was unusual to look at faces without the hairline, suggesting that the cropping process may have decreased the attractiveness of faces used in this study. Female participants did not exhibit the expected contrast effects after adaptation to low attractive faces. Participants in the low attractive condition rated faces lower than the control condition, which was opposite of the predicted direction. In the control condition, it is important to note that attractiveness ratings of faces were slightly higher than those obtained for the same stimuli during the pre-experimental base rating condition. This may indicate that there was an unforeseen effect of the neutral adaptation stimuli.

Sixteen black and white geometric Mandela shapes comprised the neutral stimuli set. These designs were selected as neutral stimuli for symmetry and intricacy. Despite efforts to find interesting symmetric designs, it is possible that participants in the control condition were uninterested in the stimuli and were excited to see face stimuli during the rating phase, potentially causing inflated attractiveness ratings. In the future, color geometric designs instead of black and white designs or faces rated average in attractiveness should be considered as neutral stimuli. In both the high and low attractive adaptation conditions, contrast effects may have been diluted by small sample sizes. The other plausible explanation is that there was no contrast effect present because evolutionarily females are less attentive to facial attractiveness.

The prediction that perceived ability to compete for mates would not change across attractiveness adaptation conditions was supported. Participants mean competitiveness scores did not change across attractiveness adaptation conditions. Two possible explanations exist for this finding; either participants perceived ability to compete does not vary depending on the potential mates they see, or participants did not consider the faces they viewed to be potential mates. It is more probable that perceived ability to compete for short- or long-term mates would vary when viewing same-sex competitors (Gutierres et al., 1999). Evolutionary psychology predicts that self-assessed attractiveness ratings are important for females because attractiveness ranks highest in male's mate selection criteria. This prediction leads to the hypothesis that females' ability to compete for mates correlates positively with their self-assessed attractiveness. As predicted, female participants' self-assessed attractiveness ratings in the control condition were positively correlated with perceived ability to compete for a short-term mate. This finding is consistent with the idea that females know that potential male mates use attractiveness as a mate selection factor (Gutierres et al., 1999). A relationship between self-assessed attractiveness and ability to compete for a long-term mate was found in the low attractive adaptation condition. Participants in the low attractive adaptation condition exhibited a positive correlation between self-assessed attractiveness and long-term mate competitiveness. In the high attractive adaptation condition, a significant positive correlation was found between short- and long-term mate competitiveness. Self-assessed attractiveness did not significantly correlate with either short- or long-term ability to compete for a mate in the high attractive adaptation condition.

Attractiveness adaptation condition did not influence mate attractiveness standards. Mean mate attractiveness standards for a short- and long-term partner did not vary across conditions. As with mate competitiveness, an interesting correlation was found for participants' self-assessed attractiveness and minimum acceptable mate attractiveness standards. The female participants in all conditions reported high self-assessed attractiveness ratings. Across the literature, mean attractiveness ratings are in the 4 to 5 point range on 9 and 10 point scales (Rhodes et al., 2005). Females seemed to have relaxed mate attractiveness standards compared to their own attractiveness, but also reported wanting short- and long-term mates to be in the top half of the attractiveness scale. These results are best explained by evolutionary psychology. Attractiveness, in this case facial attractiveness, is important as an indicator of good health which explains why desired attractiveness is at or above average (Buss, 1994). Evolutionarily, females do not use attractiveness as the main mate selection factor instead favoring resources.

Therefore females are willing to accept a mate that is less attractive than the level of their own perceived attractiveness (e.g., Donald Trump and wife).

The second hypothesis predicted that prototypes, which are formed from experience, will exhibit contrast effects. This hypothesis was not supported for the high attractive adaptation condition. Although insignificant, a trend in the results indicated a weak contrast effect in the low attractive adaptation condition; the means for all prototypes were higher than the control. The lack of a contrast effect in the high attractive adaptation condition indicates the robustness of the attractiveness of average faces. After the delay, there was no contrast effect found for either attractiveness adaptation condition. When contrast effects occur, they seem to be limited to immediate presentation of individual faces.

The third hypothesis predicted that prototypes will be considered familiar based on the average characteristic of prototypical faces. This prediction was supported and confidence ratings suggested that participants actually thought that they had seen the prototype faces earlier in the study. This finding aligns with Solso and McCarthy's (1981) reported memory for novel prototypes after a delay. Averageness and familiarity with the individual faces comprising the prototypes contributes to the prototypes' familiarity. More familiar prototypes were expected to be remembered with a higher degree of confidence compared to a novel prototype. This only occurred in the low attractive adaptation. The low attractive adaptation was the only experimental condition that had any influence on ratings of attractiveness and familiarity, perhaps making participants better able to remember the faces and prototypes in the condition. An intervening variable could be the disparity between the participants' self-assessed attractiveness and the low attractiveness of the faces.

Male Participants

Male participants' attractiveness ratings of female faces following high or low attractive adaptation followed the predicted trend without reaching significance. It is likely that contrast effects were present for males' ratings of facial attractiveness, but that these effects are diminished by stimuli and sample size issues. The 16 female faces comprising the high attractive adaptation phase were probably not attractive enough to provide clear contrast effects. Lack of hair and embellishments such as make-up in the photographs could have decreased the stimuli attractiveness because males are used to seeing females with these additional elements. The Charlie's Angels effect was found with beautiful actresses, who were often scantily clad, a factor that could have heightened contrast effects (Kenrick & Gutierres, 1980). Also, small sample size may have deflated contrast effects. It is possible that contrast effects were not present because the mean attractiveness ratings were not significantly different between conditions; however, the data trend indicates that both the high and low adaptations produced changes in mean attractiveness ratings in predicted directions. Therefore, a contrast effect may be revealed if stimuli and sample issues are addressed. Based on the trend, it seems that experience with highly attractive female faces in the media could have an effect on males' perceptions of attractiveness, which would in turn diminish their perceptions of 'average' females' attractiveness; however, the degree of this effect is unknown.

Contrary to the prediction that self-assessed attractiveness is not a factor that males consider when determining their ability to compete for mates, a strong, positive correlation was found between male participants' self-assessed attractiveness and short-term mate competitiveness in all conditions. The relationship between males' ratings of their own facial attractiveness and their ability to compete for a short-term mate (e.g., a dating partner) indicates that higher ratings of self-assessed attractiveness were associated with a better perceived ability to compete in the short-term. Evolutionary theory supports this finding by emphasizing the importance resources for long-term offspring producing relationships and not as much for short-term mating (Buss & Schmitt, 1993). Therefore, without the worry of finding a resourceful mate in the short-term, females can focus more on physical attractiveness. Self-assessed attractiveness was not significantly related to long-term mate competitiveness in any of the conditions. In fact, the correlation between male self-assessed attractiveness and long-term mate competitiveness were close to zero in the control condition and weak in the low attractive adaptation condition. There was an insignificant but moderate correlation in the high attractive adaptation condition. Evolutionary psychology emphasizes the quantity of procreative partners for men, rather than relationship duration (Buss, 1994). The difference between short- and long-term mate competitiveness in relation to self-assessed attractiveness may be explained by a dichotomy in thinking. The primary mating focus for male college students is likely restricted to the short-term time frame. If long-term mate selection was considered a remote issue, then it is possible that male participants did not conceptualize how their ability to compete for a long-term mate compared to other males' abilities. Competitiveness in general did not vary across conditions perhaps because competitiveness was more closely related to self-assessed attractiveness (and they all thought they were attractive) as opposed to the faces that they viewed.

It was predicted that the attractiveness adaptation condition would influence the minimum acceptable mate attractiveness responses. This prediction was not supported in any condition for long- term mate attractiveness standards. The differences in means between attractiveness adaptation condition and short-term mate attractiveness standards were approaching significance. Participants in the high attractive adaptation phase may have lowered their short-term mate attractiveness standards to match the attractiveness of the faces viewed in the high attractive adaptation phase; males may have been willing to consider this pool of females as acceptable short-term partners. Buss (1994) reported that males relax their attractiveness standards when they consider short-term sexual partners.

Despite the decreased mate attractiveness standards in the high attractive adaptation condition, males' mate attractiveness standards remained quite high. There was a significant positive correlation between self-assessed attractiveness and short-term mate standards. Evolutionary psychology theory supports this finding by emphasizing the importance of attractiveness and physical appearance in males' assessment of female mates in order to produce healthy offspring. In addition, both the self-assessed attractiveness and mate attractiveness standards were high; these findings supported and are explained by the matching phenomenon in mate selection. The matching hypothesis suggests that people select mates that are approximately the same attractiveness level as themselves (Feingold, 1988). Curiously, minimum acceptable attractiveness levels for short- and long-term mates were high compared to mean attractiveness ratings in the literature. Therefore, if participants overestimate their own attractiveness, then they are likely to also have high standards for their mates.

The second hypothesis investigated prototypes' susceptibility to contrast effects. This hypothesis was not supported. The lack of a contrast effect reflects either an inadequate adaptation or males' focus on attractiveness. Instead of rating prototypes' attractiveness based on adaptation, male participants rated prototypes based on the attractiveness of the faces that comprised the prototypes.

The third hypothesis predicted that prototypes would be considered familiar. This prediction was supported due to the average nature of prototypes and the familiarity with some or all of the faces composing the prototype. The prediction that prototypes containing more previously viewed faces would be considered familiar with more confidence than prototypes that contained fewer previously viewed faces was not supported. The pattern of confidence ratings for prototypes considered familiar mimics that of attractiveness ratings. Confidence ratings were higher for prototypes judged more attractive. Research demonstrated that attractive faces are easier to remember (Moreland & Zajonc, 1982). For male participants, attractiveness persisted as a salient feature of female faces more so than familiarity.

Limitations of the Present Study

The main limitation of the present study is the small distribution of attractive and unattractive faces used to create the experimental adaptations. More robust findings would be likely if male and female models' faces were used as stimuli. Stimuli at the outer edges of the distribution used in Rhodes' et al. (2003) study of distorted faces were highly unusual and would not occur in the normal population. This range may have created the contrast necessary to produce significant effects. Using hyper-attractive media or model face images would be particularly relevant due to the extreme nature of the stimuli, and would explore how retouched images affect the context of attractiveness.

A second limitation of the study is sample size. The small sample for both male and female participants diminished statistical power across the entire study, making it difficult to draw firm conclusions. Additional participants in the current conditions, as well as male participants in the delayed prototype condition would provide more decisive results.

The face stimuli that was used in this study was exclusively faces that appeared to be Caucasian/White. Although a majority of participants were of the same ethnicity there could be 'other race' effects in attractiveness judgments of non-White participants. Therefore, a variety of participant and stimuli races should be tested to see if attractiveness ratings are equally influenced by contrast effects.

Implications and Directions for Future Research

Evolutionary psychology found a cross-cultural basis for mate selection and attractiveness phenomena. This study used both participants and stimuli from the Midwestern United States who were primarily White. Future research should consider locations and participants that are diverse in nationality and race. In order to address stimulus limitations, including hairline and full body images as stimuli would increase the social relevance of the findings, making the conclusions more directly related to media influence on perceptions of attractiveness. If contrast effects are found with hyper-attractive media stimuli, the implications would include the ethics of retouching photos for magazines, development of 'healthy' face and body images in youth, and procedures for plastic surgery. However, if clear contrast effects are not found with a more conclusive sample, then media practices of retouching photographs may not be as important as they seem. Contrast effects on prototypes are particularly important in the debate about misrepresentations of attractiveness in the media. If individuals' perceptions of attractiveness are created from experience with faces, including unattainable levels of attractiveness portrayed in the media, there are potential harmful effects. Hyper-attractive faces inflate prototypical ideas of attractiveness and averageness.

Using realistic face stimuli for adaptation and rating may have underestimated the potential contrast effect between media face images and faces that are average in attractiveness, especially for female faces. However, the use of non-distorted faces is an improvement over previous studies that used unrealistic face stimuli. This feature makes the correlations and trends found in this study more applicable to real life experience with media and average faces. Although using model faces as adaptation stimuli does not simulate the face to face encounters that an ordinary person experiences every day, model face stimuli would better address the pervasive media influence that is part of face perception experience. The fact that contrast effect trends were obtained in the predicted direction using realistic faces, encourages future research on contrast effects with individual and prototypical faces within the broader context of media influences.

Evolutionary, cognitive, and social psychologists agree that there needs to be integration between fields in studying attraction and mate selection processes. Each field has strengths to offer to the development of the knowledge base. Evolutionary psychology's strength lies in its accumulated knowledge of biological processes, including the effect of environmental perturbations on development and its relationship to fluctuating asymmetry. Additionally, evolutionary psychology contributes to strides in cross-cultural data collection and naturally selected psychological mechanisms. The approach from cognitive psychology integrates perceptual and cognitive processes involved in assessing attractiveness, particularly regarding prototype formation. Although evolutionary psychology explains prototype formation as a naturally selected phenomenon, evolutionary psychologists have little else to say about prototype formation, and research on prototype formation in social psychology is virtually absent. Investigation of cognitive mechanisms involved in prototype formation is a strength of cognitive psychology. Additionally, cognitive psychologists are moving towards an integration of face and body perceptual adaptation. The methodological control provided by cognitive psychology can be used by social psychologists in application to social contexts. Social psychology focuses on the cultural context in which attractiveness is judged and displayed. Comparison and competitiveness are social interactions that can be influenced by attractiveness. Social psychology cannot answer questions about adaptation to controlled perceptual stimuli about specific qualities of faces such as skin texture, 'face space,' and neuronal responses to facial stimuli. However, these cognitive factors are important to the social context of faces. By integrating these three disciplines, researchers can draw a more complete picture of how experience with faces influences perceptions of attractiveness within the context of modern mate selection.

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Table 1

Mean Attractiveness Ratings of Faces by Participant Sex and Condition

Condition	Participant Sex	
	Female	Male
Control		
M	4.65[a]	4.03[d]
SD	0.93	1.29
High Adaptation		
M	4.28[b]	3.77[e]
SD	1.18	0.89
Low Adaptation		
M	4.47[c]	4.20[d]
SD	0.84	1.03

[a] $n = 26$. [b] $n = 27$. [c] $n = 25$, [d]$n = 13$, [e]$n = 12$.

Table 2

Correlation Tables by Condition for Female Participants

	1	2	3	4	5	6
		Control Condition (n = 26)				
1. Age		.43*	.36	.19	.32	.30
2. Participant Attractiveness			.39*	.34	.30	.26
3. CAAAS1				.37	.03	.10
4. CAAAS2					.17	-.04
5. CAAAS3						.78**
6. CAAAS4						
	High Attractive Adaptation Condition (n = 27)					
1. Age		-.16	.04	-.30	-.28	-.27
2. Participant Attractiveness			.23	.20	.33	.49**
3. CAAAS1				.61**	.20	.18
4. CAAAS2					.30	.23
5. CAAAS3						.75**
6. CAAAS4						
	Low Attractive Adaptation Condition (n = 25)					
1. Age		.15	.36	.12	-.09	-.12
2. Participant Attractiveness			.14	.42*	.19	.12
3. CAAAS1				.16	-.49*	-.45*
4. CAAAS2					.06	-.25
5. CAAAS3						.79**
6. CAAAS4						

* $p < .05$, ** $p < .01$.

Table 3

Mean Attractiveness Ratings for Male Prototypes

Condition	Level of Attractiveness		
	High	Low	Unfamiliar
One Session			
Control (*n* = 11)			
M	5.36	5.27	5.09
SD	1.12	1.01	1.22
High Adaptation (*n* = 12)			
M	5.75	5.75	6.33
SD	1.06	0.87	0.98
Low Adaptation (*n* = 11)			
M	5.91	5.91	6.09
SD	1.58	1.58	1.38
After Delay			
Control (*n* = 15)			
M	5.87	5.73	5.87
SD	1.77	1.58	1.73
High Adaptation (*n* = 15)			
M	6.13	6.13	6.13
SD	1.41	1.41	1.19
Low Adaptation (*n* = 14)			
M	5.43	5.36	5.42
SD	1.09	1.69	1.4

Table 4

Mean Confidence Ratings for Male Prototypes Considered Familiar

Prototype	Condition		
	High Attractive Adaptation	Low Attractive Adaptation	Control
	One Session		
High Attractive			
M	4.00[c]	4.20[e]	4.56[d]
SD	0.93	0.92	0.73
Low Attractive			
M	4.00[b]	4.50[c]	3.44[d]
SD	1.15	0.76	1.59
Unfamiliar			
M	4.00[a]	4.13[c]	4.14[b]
SD	1.41	0.99	0.69
	Delay		
High Attractive			
M	3.83[g]	3.70[e]	4.31[h]
SD	1.27	0.95	0.63
Low Attractive			
M	3.91[f]	3.40[e]	4.00[f]
SD	0.94	1.07	1.18
Unfamiliar			
M	3.55[f]	3.50[c]	4.38[c]
SD	1.37	1.20	1.06

[a]$n = 5$, [b]$n = 7$, [c]$n = 8$, [d]$n = 9$, [e]$n = 10$, [f]$n = 11$, [g]$n = 12$, [h]$n = 13$.

Table 5

Correlation Tables by Condition for Male Participants

	1	2	3	4	5	6
Control Condition (n = 13)						
1. Age		-.05	-.32	-.15	-.34	-.11
2. Participant Attractiveness			.67*	.06	.62*	.58*
3. CAAAS1				.34	.38	.31
4. CAAAS2					-.27	-.03
5. CAAAS3						.73**
6. CAAAS4						
High Attractive Adaptation Condition (n = 12)						
1. Age		.42	.38	.05	.22	.11
2. Participant Attractiveness			.90**	.53	.61*	.17
3. CAAAS1				.69*	.45	.13
4. CAAAS2					.32	-.15
5. CAAAS3						.32
6. CAAAS4						
Low Attractive Adaptation Condition (n = 13)						
1. Age		-.21	-.32	-.18	.08	-.17
2. Participant Attractiveness			.64*	-.27	.30	.42
3. CAAAS1				.06	-.09	.25
4. CAAAS2					-.20	-.49
5. CAAAS3						.27
6. CAAAS4						

* $p < .05$, ** $p < .01$.

Table 6

Mean Attractiveness Ratings for Female Prototypes

Condition	Level of Attractiveness		
	High	Low	Unfamiliar
	One Session		
Control (*n* = 13)			
M	5.54	4.46	5.54
SD	1.90	2.03	1.81
High Adaptation (*n* = 12)			
M	6.08	5.17	5.58
SD	1.93	1.53	2.02
Low Adaptation (*n* = 13)			
M	6.46	4.77	6.23
SD	1.98	1.69	1.79

Table 7

Mean Confidence Ratings for Female Prototypes Considered Familiar

Prototype	Condition		
	High Attractive Adaptation	Low Attractive Adaptation	Control
	One Session		
High Attractive			
M	4.40[a]	4.13[c]	4.71[b]
SD	0.55	0.99	0.49
Low Attractive			
M	4.00[c]	3.44[d]	4.30[e]
SD	0.76	1.24	0.67
Unfamiliar			
M	3.78[d]	3.60[a]	4.10[e]
SD	0.97	1.14	0.99

[a] $n = 5$, [b] $n = 7$, [c] $n = 8$, [d] $n = 9$, [e] $n = 10$.

Figure Caption

Figure 1. Design and procedure of the control and experimental conditions.

Figure 1

Control and Experimental Condition Design

<table>
<tr><th rowspan="2">Condition</th><th rowspan="2">Participant Sex</th><th colspan="3">Procedure After Adaptation Phase</th></tr>
<tr><th>Survey</th><th>Rating Phase</th><th>Prototype Task</th></tr>
<tr><td rowspan="4">Control (No Adaptation Phase)</td><td rowspan="2">Female</td><td rowspan="12">All Participants complete the Competitive Ability and Acceptable Attractiveness Survey</td><td rowspan="2">Rate 16 symmetric, individual male faces on attractiveness</td><td>1/2 participants complete immediately</td></tr>
<tr><td>1/2 participants complete after 1 week delay</td></tr>
<tr><td rowspan="2">Male</td><td rowspan="2">Rate 16 symmetric, individual female faces on attractiveness</td><td>1/2 participants complete immediately</td></tr>
<tr><td>1/2 participants complete after 1 week delay</td></tr>
<tr><td rowspan="4">High Attractive Adaptation</td><td rowspan="2">Female</td><td rowspan="2">Rate 16 symmetric, individual male faces on attractiveness</td><td>1/2 participants complete immediately</td></tr>
<tr><td>1/2 participants complete after 1 week delay</td></tr>
<tr><td rowspan="2">Male</td><td rowspan="2">Rate 16 symmetric, individual female faces on attractiveness</td><td>1/2 participants complete immediately</td></tr>
<tr><td>1/2 participants complete after 1 week delay</td></tr>
<tr><td rowspan="4">Low Attractive Adaptation</td><td rowspan="2">Female</td><td rowspan="2">Rate 16 symmetric, individual male faces on attractiveness</td><td>1/2 participants complete immediately</td></tr>
<tr><td>1/2 participants complete after 1 week delay</td></tr>
<tr><td rowspan="2">Male</td><td rowspan="2">Rate 16 symmetric, individual female faces on attractiveness</td><td>1/2 participants complete immediately</td></tr>
<tr><td>1/2 participants complete after 1 week delay</td></tr>
</table>

Figure Caption

Figure 2. Mean attractiveness scores for rated faces in each condition for male and female faces.

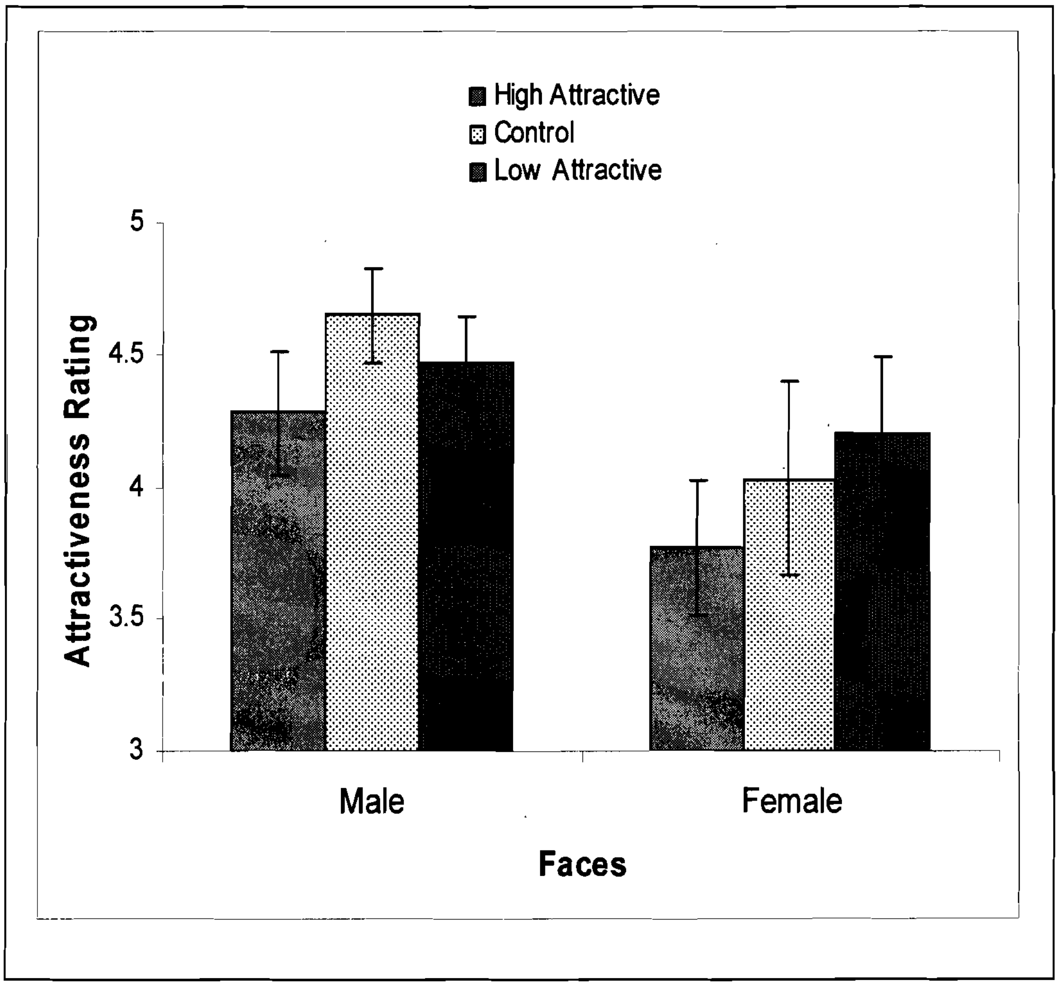
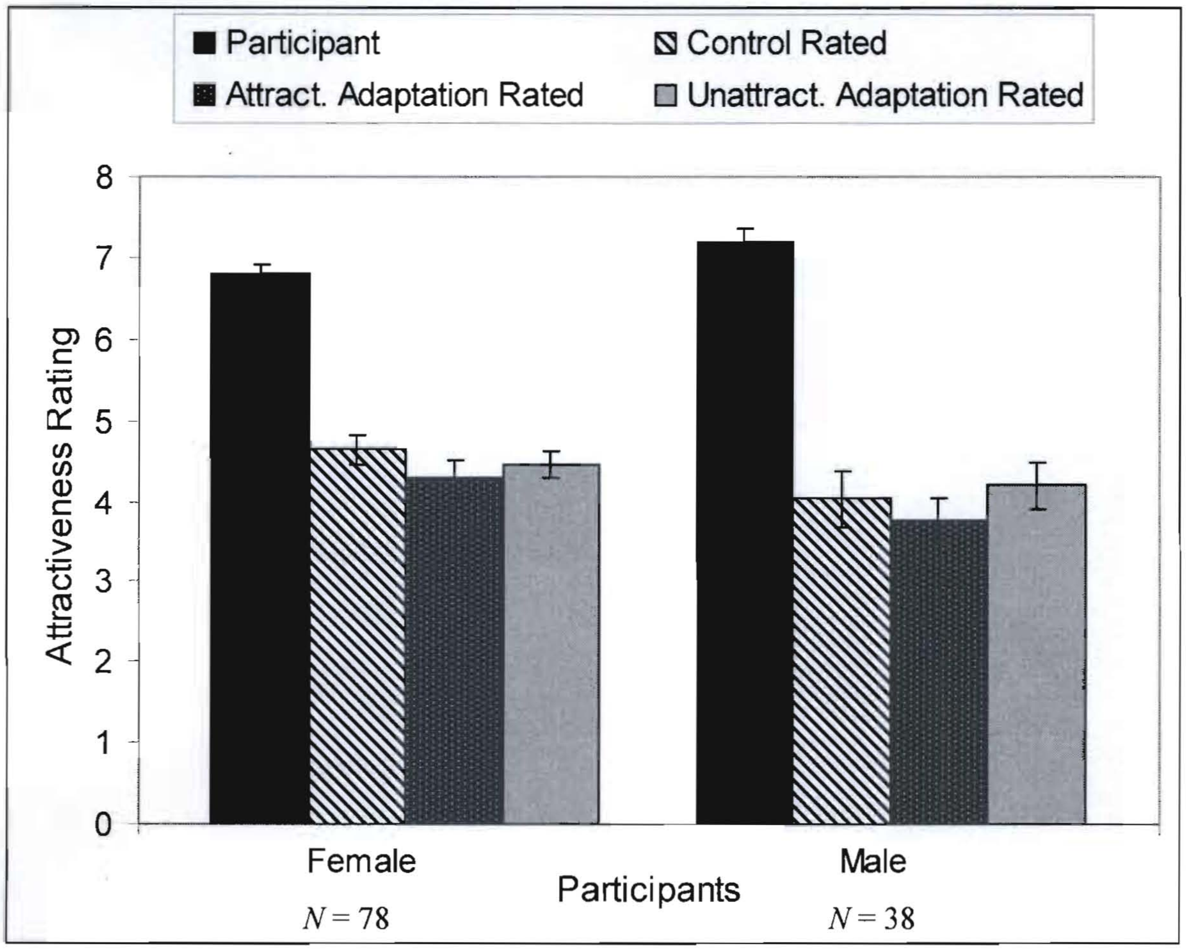

High Attractive
Control
Low Attractive
Attractiveness Rating
5
4.5
4
3.5
3
Male
Female
Faces

Figure Caption

Figure 3. Participants' overall mean self-assessed attractiveness ratings and mean attractiveness scores of rated faces by condition.


Participant
Control Rated
Attract. Adaptation Rated
Unattract. Adaptation Rated
Attractiveness Rating
8
7
6
5
4
3
2
1
0
Female
Male
Participants
N = 78
N = 38