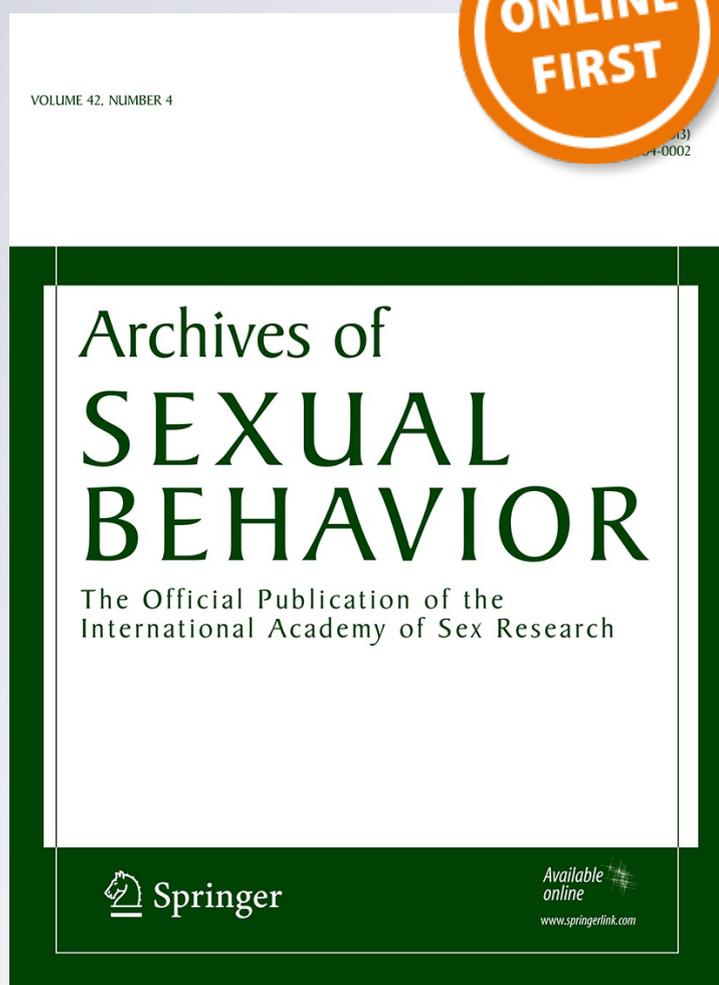# Sex Differences in Attraction to Familiar and Unfamiliar Opposite-Sex Faces: Men Prefer Novelty and Women Prefer Familiarity

Anthony C. Little, Lisa M. DeBruine & Benedict C. Jones

VOLUME 42, NUMBER 4

ONLINE FIRST

Archives of
SEXUAL
BEHAVIOR

The Official Publication of the
International Academy of Sex Research

Springer

Available
online
www.springerlink.com

Springer

Springer

ORIGINAL PAPER

Sex Differences in Attraction to Familiar and Unfamiliar Opposite-Sex Faces: Men Prefer Novelty and Women Prefer Familiarity

Anthony C. Little · Lisa M. DeBruine · Benedict C. Jones

Abstract Familiarity is attractive in many types of stimuli and exposure generally increases feelings of liking. However, men desire a greater number of sexual partners than women, suggesting a preference for novelty. We examined sex differences in preferences for familiarity. In Study 1 ($N = 83$ women, 63 men), we exposed individuals to faces twice and found that faces were judged as more attractive on the second rating, reflecting attraction to familiar faces, with the exception that men's ratings of female faces decreased on the second rating, demonstrating attraction to novelty. In Studies 2 ($N = 42$ women, 28 men) and 3 ($N = 51$ women, 25 men), exposure particularly decreased men's ratings of women's attractiveness for short-term relationships and their sexiness. In Study 4 ($N = 64$ women, 50 men), women's attraction to faces was positively related to self-rated similarity to their current partner's face, while the effect was significantly weaker for men. Potentially, men's attraction to novelty may reflect an adaptation promoting the acquisition of a high number of sexual partners.

A. C. Little (✉)
School of Natural Sciences, University of Stirling, Stirling
FK9 4LA, UK
e-mail: anthony.little@stir.ac.uk

L. M. DeBruine · B. C. Jones
Institute of Neuroscience and Psychology, University of Glasgow,
Glasgow, UK

Introduction

Generally, humans like familiar individuals and stimuli (Moreland & Zajonc, 1982; Zajonc, 1968), although in some studies such effects may depend on the complexity of the stimuli, with complex stimuli becoming more pleasant with familiarity and low complexity stimuli becoming less pleasant (Berlyne, 1970). Many studies have demonstrated that average faces (i.e., faces that are mathematically close to the mean shape of a population of faces) are attractive. For example, averageness has been found to be positively correlated with attractiveness ratings of real faces (Light, Hollander, & Kayra-Stuart, 1981) and studies that have used computer graphic methods to manipulate the averageness of face images have also demonstrated attraction to average faces (Galton, 1878; Jones, DeBruine, & Little, 2007; Langlois & Roggman, 1990; Langlois, Roggman, & Musselman, 1994; Little & Hancock, 2002; Rhodes, Sumich, & Byatt, 1999; Rhodes & Tremewan, 1996). One explanation for attraction to average faces is derived from theories of prototype formation (Langlois & Roggman, 1990). For each class of stimuli, it is possible that the visual system develops an internal prototype with the average of the characteristics of all the different stimuli of that type that have been seen. When novel stimuli are encountered, they are compared against this prototype and similarity to the prototype is positively related to how familiar and attractive we find the new stimuli (e.g., Halberstadt & Rhodes, 2000). Average faces may then be attractive because they are perceived as looking familiar (Halberstadt & Rhodes, 2000).

Other evidence for attraction to familiarity comes from studies demonstrating that visual exposure to certain face types can influence facial attractiveness judgments (Buckingham et al., 2006; Little, DeBruine, & Jones, 2005; Rhodes, Jeffery, Watson, Clifford, & Nakayama, 2003), with individuals demonstrating increased attraction to faces that are similar to those they have previously seen. It may be noteworthy, however, that few

studies have explicitly tested for possible sex differences in human preferences for novelty versus familiarity.

While much research demonstrates preferences for familiarity (Bornstein, 1989; Zajonc, 1968), there are theoretical reasons to expect preferences for novelty under certain circumstances. One example of preference for novelty is the "Coolidge effect," named after the 30th U. S. president, Calvin Coolidge. While it may not be historical fact, the often-cited anecdote suggests that the President and Mrs. Coolidge were visiting a farm and were shown a yard with hens and a cockerel. Mrs. Coolidge asked why there was only one cockerel and was told that the cockerel could copulate many times a day. She replied "Tell that to Mr. Coolidge." When informed of this, the President asked whether it was the same hen each time, to which the answer was no. The President replied "Tell that to Mrs. Coolidge" (Kelley, Graves, & Magurran, 1999; Wilson, Kuehn, & Beach, 1963).

The Coolidge effect refers to the tendency for males to be aroused by sexual novelty to a greater extent than females are. This effect has been observed in several species. For example, in male Norway rats (*Rattus norvegicus*), sexual satiation is reached after about 1.5 h when housed with a single female, but males can be kept sexually active for almost 8 h with the introduction of novel females at regular intervals (Fisher, 1962). Another example comes from fish, in which male guppies that were familiarized with a set of females subsequently directed courtship behavior at unfamiliar females (Kelley et al., 1999).

The Coolidge effect is thought to reflect an adaptation to the asymmetric investment in reproduction between males and females. It has been long noted that males invest less in reproduction than females and that this has led to males generally being ardent and less discriminating while females are more choosy (Trivers, 1972). There is then a tendency for males to pursue a large number of partners, as they can dramatically increase their reproductive success by mating with multiple females. However, a female's reproductive success is less closely tied to her number of partners, as generally she can be inseminated by only one male at a time.

In humans, where paternal investment is high, women may best secure investment from males that they encounter on a regular basis. Conversely, unfamiliar men are unlikely to make best candidates for long-term relationships because their behavior is unknown. In contrast, men may increase their reproductive success by mating with a variety of women without strong concerns over securing parental investment, meaning a lack of familiarity is unlikely to be an issue and indeed may be seen as a positive. Generally, familiarity would likely be seen as a positive trait in all dealings involving extended cooperation, leading to a relative dislike of unfamiliar or strange individuals. This general preference for familiarity, however, may be overridden in the case of men by preferences for sexual novelty. Theoretically, then, we might expect men to express preferences for novelty in potential sexual partners and women to express preferences for familiarity. Certainly, men express greater interest in short-term sexual encounters and desire a greater number of lifetime partners (Buss & Schmitt, 1993; Clark & Hatfield, 1989; Simpson & Gangestad, 1991). Following findings in other species that individuals may prefer novelty under certain circumstances, particularly findings showing that males are relatively more attracted to novelty in sexual partners than females, we investigated preferences for familiarity and novelty in men and women.

In Study 1, we examined preferences for familiarity by using exposure to both male and female faces. Following previous findings, we predicted preferences to increase for seen faces but also that men would show weaker attraction to familiarity for women's faces. In Studies 2 and 3, we also used exposure but asked different questions distinguishing short- versus long-term preferences and sexiness versus trustworthiness. We predicted that, if familiarity is less attractive to men because of the potential benefits of pursuing multiple sexual partners, the positive effects of familiarity would be weakest for men rating women's faces in short-term relationship contexts. We also predicted that familiarity would impact differently on sexiness and trustworthiness across sex, such that while both men and women would find familiar faces more trustworthy, men would find familiar opposite-sex faces less sexy than women. Finally, in Study 4, we used participant's ratings of attractiveness and ratings of partner similarity of a set of faces to examine partner attraction. We predicted that, if men value novelty more than women, they would show a weaker correlation between attractiveness and current partner similarity than women would.

Study 1

In Study 1, we examined the effect of familiarizing men and women with novel faces and measured their attraction on first and second viewing of the same male and female faces.

Participants

Participants were 83 women (M age = 23.7 years, SD = 3.0) and 65 men (M age = 23.4 years, SD = 3.1). The majority of participants were British/European (62 %) or North American (26 %) and White (78 %). Other nationalities (African = 1 %, Asian = 6 %, Australian = 1 %, South American = 4 %) and ethnicities (Asian = 1 %, Chinese = 3 %, Black = 3 %, Hispanic = 3 %, Indian = 6 %, Other = 6 %) were represented in the sample. All participants were volunteers and were selected for reporting to be heterosexual and between the ages of 17–45. Participants were recruited via a research-based website and the experiments were administered online using custom presentation software without an experimenter present.

Procedure

Stimuli were composites, made from multiple images, of unfamiliar young male and female faces. Original faces were selected from a database collected by the authors from individuals who had taken part in previous studies and given permission to use their photographs. The database consisted of face photographs of young (<25 years old) White Europeans. Photographs were taken under standardized lighting conditions and with a neutral posed expression. Composite images were made by combining two individual photographs (Benson & Perrett, 1993) and were cropped around the outside of the face so that hair and clothing were not visible. All images were standardized on interpupillary distance.

Participants were exposed to a set of faces and then presented with the same faces alongside new distracter faces in a second test. Participants rated the same faces twice and our interest was in the change in rating from first to second exposure. The test was administered over the internet. Participants reported their age, sex, and sexuality. Participants were then first shown five male and five female faces and asked to rate the faces for attractiveness on a 7-point scale (rating 1). Following this, they were then asked to repeat the test but this time they saw the same faces as before plus five new male and five new female faces that acted as filler trials to prevent participants overtly guessing the study was simply about repeated exposure (rating 2). Faces were shown in a random order. Participants were randomly allocated into one of two conditions; the conditions served to counterbalance the five rated faces and the five novel faces in the second test. In Condition 1, participants saw face set A followed by face sets A and B. In Condition 2, participants saw face set B followed by face sets A and B.

Results

For male and female faces, we calculated the mean score for each set of faces separately at each rating which resulted in four mean scores (i.e., we calculated separate means for the first rating of male faces, the first rating of female faces, the second rating of male faces, and the second rating of female faces). We calculated the difference between attractiveness scores given to faces in the first rating and the second rating for male and female faces as the dependent measures (rating 2 minus rating 1). Positive scores indicated that attractiveness increased on second rating and negative scores indicated that attractiveness decreased on the second rating. We include age as a covariate in the ANOVA below because of the range of ages tested but note that the pattern of data is the same when age is not included in the model.

A 2 (Sex of Rater) $\times$ 2 (Sex of Face) $\times$ 2 (Condition: Set A vs. Set B) mixed model analysis of covariance (ANCOVA) was conducted on the facial attractiveness rating difference score with age as a covariate (see Fig. 1). The ANCOVA

yielded a significant Sex of Rater $\times$ Sex of Face interaction, $F(1, 143) = 5.17$, $p = .024$, $\eta p^2 = .035$. To follow up the Sex of Rater $\times$ Sex of Face interaction, paired sample t-tests were carried out between change in attractiveness ratings for male faces versus female faces split by sex of rater. These revealed that, for women, there was no significant difference between change in ratings for male and female faces, $t(82) < 1$, $d = 0.20$, whereas men showed a significant difference, $t(64) = 3.51$, $p < .001$, $d = 0.88$, with men rating female faces as less attractive and male faces as more attractive on the second rating. Additional independent sample t-tests comparing male and female difference scores for male and female faces revealed that there was a significant difference for female faces, $t(146) = 2.91$, $p = .004$, $d = 0.48$, in which men's scores were lower than women's scores, but not for male faces, $t(146) < 1$, $d = 0.01$.

In the ANCOVA, there was a significant main effect of Sex of Rater, $F(1, 143) = 4.69$, $p = .032$, $\eta p^2 = .032$, although this effect was superseded by the interaction above. A significant Sex of Face $\times$ Condition interaction, $F(1, 143) = 5.84$, $p = .017$, $\eta p^2 = .039$, reflected a theoretically unrelated effect of the average attractiveness change of male and female faces being different between conditions by which female faces scored lower in Condition A than B whereas male faces scored lower in Condition B than A. No other within or between participants effects or interactions were significant, all Fs(1, 143) < 1.55, $\eta p^2 < .011$.

We additionally conducted one-sample t-tests against no change (0) to address overall changes in preferences split by sex of rater and sex of face. These revealed that there was a significant increase on the second rating for women rating both male, $t(82) = 3.38$, $p < .001$, $d = 0.75$, and female faces, $t(82) = 2.18$, $p = .032$, $d = 0.49$, and for men rating male
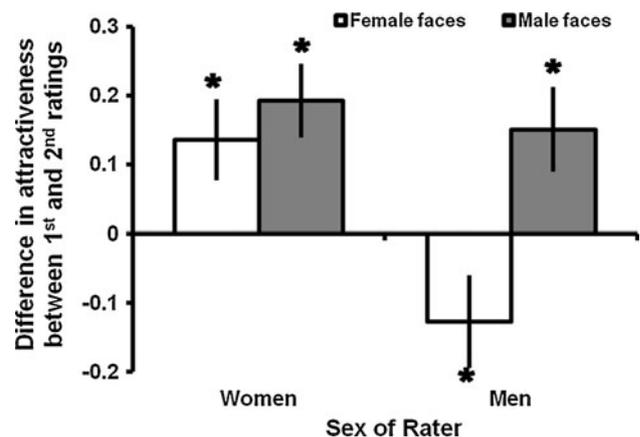

Fig. 1 Study 1: Difference in preference for faces rated twice (+1 SE of the mean). Positive scores indicate attractiveness increased on second viewing while negative scores indicate attractiveness decreased on second viewing. *Significantly different from no change (0)

faces, $t(64) = 2.58$, $p = .012$, $d = 0.65$. Men demonstrated a significant decrease in attractiveness on the second rating of female faces, $t(64) = -2.00$, $p = .049$, $d = 0.50$.

These results demonstrated that faces were perceived as more attractive on second rating, except when female images were judged by men.

Study 2

In Study 2, we examined changes in rating of long-term versus short-term attractiveness ratings for opposite-sex faces according to exposure.

Participants

Participants were 42 women (M age = 23.8 years, SD = 7.3) and 28 men (M age = 27.0 years, SD = 7.9). The majority of participants were British/European (52 %) or North American (38 %) and White (73 %). Other nationalities (Asian = 6 %, Australian = 4 %) and ethnicities (Asian = 2 %, Chinese = 2 %, Japanese = 2 %, Black = 3 %, Hispanic = 6 %, Indian = 3 %, Other = 9 %) were represented in the sample. All participants were volunteers and were selected for reporting to be heterosexual and between the ages of 17–45. Participants were recruited via a research-based website and the experiments were administered online using custom presentation software without an experimenter present.

Procedure

The stimuli were identical to Study 1.

Participants only saw opposite-sex faces. The procedure was otherwise identical to Study 1 except that two statements were presented below each face: Attractiveness as a long-term partner and attractiveness as a short-term partner. Participants were asked to rate the faces for both short-term and long-term attractiveness on a 7-point scale.

Instructions also included the following definitions:

Short-term: You are looking for the type of person who would be attractive in a short-term relationship. This implies that the relationship may not last a long time. Examples of this type of relationship would include a single date accepted on the spur of the moment, an affair within a long-term relationship, and possibility of a one-night stand.

Long-term: You are looking for the type of person who would be attractive in a long-term relationship. Examples of this type of relationship would include someone you may want to move in with, someone you may consider leaving a current partner to be with, and someone you may, at some point, wish to marry (or enter into a relationship on similar grounds as marriage).

Results

We used the same means of calculating a difference score as in Study 1 but here had change for short-term and change for long-term attractiveness. We again included age as a covariate in the ANOVA but note that the pattern of data was the same when age was not included in the model.

A 2 (Sex of Rater) × 2 (Rating) mixed model ANOVA was conducted on the attractiveness rating difference scores with age as a covariate (see Fig. 2). The ANCOVA yielded a significant Sex of Rater × Rating interaction, $F(1, 67) = 5.93$, $p = .018$, $\eta p^2 = .081$. To follow up the Sex of Rater × Rating interaction, paired sample t-tests were carried out between change in attractiveness ratings for short-term versus long-term ratings split by sex of rater. These revealed that, for women, there was no significant difference between change in ratings of male faces for short-term and long-term attractiveness, $t(41) = <1$, $d = 0.23$, but that men showed a significant difference, $t(27) = 2.30$, $p = .029$, $d = 0.89$, rating female faces as less attractive for short-term more than long-term on second rating. Additional independent sample t-tests comparing male and female scores revealed that, for both short-term, $t(68) = 4.28$, $p < .001$, $d = 1.04$, and long-term, $t(68) = 3.04$, $p = .003$, $d = 0.74$, difference scores, men scored significantly lower than women.

In the ANCOVA, there was a significant effect of Sex of Rater, $F(1, 67) = 13.84$, $p < .001$, $\eta p^2 = .171$, although this effect was superseded by the interaction described above. No other within or between participants effects or interactions were significant, all $Fs(1, 67) < 1$, $\eta p^2 < .008$. We did not enter Condition as it did not interact with Sex of Rater in Study 1.

We additionally conducted one-sample t-tests against no change (0) to address overall changes in preferences split by sex of rater and rating. These revealed a significant increase on the second rating for women rating both short-term
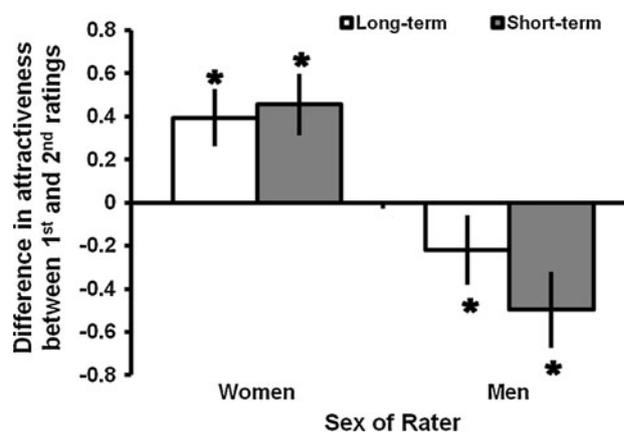

Fig. 2 Study 2: Difference in ratings of short- and long-term attractiveness for faces rated twice (+1 SE of the mean). *Significantly different from no change (0)

attractiveness, $t(41) = 3.02$, $p = .004$, $d = 0.94$, and long-term attractiveness, $t(41) = 2.90$, $p = .006$, $d = 0.91$. Men demonstrated a significant decrease in attractiveness on second rating for short-term, $t(27) = -3.66$, $p = .001$, $d = 1.41$, and a non-significant decrease for long-term, $t(27) = -1.46$, $d = 0.56$, attractiveness.

These results demonstrated that opposite-sex faces were rated as more attractive on the second rating by women but less attractive by men, particularly for short-term ratings.

Study 3

In Study 3, we examined changes in rating of sexiness and trustworthiness of opposite-sex faces according to exposure.

Participants

Participants were 51 women (M age = 28.0 years, SD = 8.8) and 25 men (M age = 29.4 years, SD = 9.2). The majority of participants were British/European (45 %) or North American (42 %) and White (90 %). Other nationalities (Australian = 4 %, South American = 8 %, Other = 1 %) and ethnicities (Black = 3 %, Hispanic = 3 %, Other = 4 %) were represented in the sample. All participants were volunteers and were selected for reporting to be heterosexual and between the ages of 17–45. Participants were recruited via a research-based website and the experiments were administered online using custom presentation software without an experimenter present.

Procedure

The stimuli were identical to Study 1.

The procedure was identical to Study 2 except that the two statements presented below each face were trustworthiness and sexiness. Participants were asked to rate the faces for trustworthiness and sexiness on a 7-point scale.

Results

A 2 (Sex of Rater) × 2 (Rating) mixed model ANCOVA was conducted on the rating difference scores with age as a covariate (see Fig. 3). The ANCOVA yielded a significant Sex of Rater × Rating interaction, $F(1, 73) = 6.65$, $p = .012$, $\eta p^2 = .083$. To follow up the Sex of Rater × Rating interaction, paired sample t-tests were carried out between change in attractiveness ratings for male faces versus female faces split by sex of rater. These revealed that there was a significant difference between change in ratings for trustworthiness and sexiness ratings for women, $t(50) = -2.29$, $p = .025$, $d = 0.65$, and men, $t(24) = -3.76$, $p = .001$, $d = 1.54$. For both men and women, difference scores were lower for sexy than trustworthy ratings. Additional independent sample t-tests comparing male

and female scores revealed a significant difference for differences scores for sexiness ratings, $t(74) = 3.51$, $p = .001$, $d = 0.82$, in which men had lower scores than women, and no significant difference for scores of trustworthiness, $t(74) < 1$, $d = 0.12$.

In the ANCOVA, there was a significant effect of Rating, $F(1, 73) = 6.76$, $p = .011$, $\eta p^2 = .085$, and Sex of Rater, $F(1, 73) = 5.85$, $p = .018$, $\eta p^2 = .074$, although these effects were superseded by the interaction described above. Age had no significant main effect or interaction with sex of rater, both $F S(1, 73) < 1.68$, $\eta p^2 < .022$.

We additionally conducted one-sample t-tests against no change (0) to address overall changes in preferences split by sex of rater and rating. These revealed that there was a significant increase on the second rating for women rating trustworthiness, $t(50) = 3.15$, $p = .003$, $d = 0.89$, but a non-significant increase for sexiness, $t(50) = 1.08$, $d = 0.31$. Men demonstrated a significant decrease in sexiness on second rating, $t(24) = -3.06$, $p = .005$, $d = 1.25$, and a non-significant increase in trustworthiness ratings, $t(24) = 1.66$, $d = 0.68$.

These results demonstrated that women and men rated opposite-sex faces as more trustworthy on the second rating compared to changes in sexiness; however, men decreased their ratings of sexiness on second rating whereas women non-significantly increased their ratings of sexiness on second rating.

Study 4

In Study 4, we examined how ratings of facial similarity to a current or past partner were related to attractiveness ratings of opposite-sex faces.

Participants

Participants were 64 women (M age = 21.9 years, SD = 3.1, 39 with and 25 without a current partner) and 50 men (M

Fig. 3 Study 3: Difference in ratings of trustworthiness and sexiness for faces rated twice (+1 SE of the mean). *Significantly different from no change (0)

age = 22.9 years, SD = 3.4, 28 with and 22 without a current partner). The majority of participants were British/European (48 %) or North American (36 %) and White (71 %). Other nationalities (African = 3 %, Asian = 6 %, Australian = 2 %, South American = 5 %) and ethnicities (Asian = 2 %, Chinese = 4 %, Japanese = 1 %, Black = 3 %, Hispanic = 11 %, Other = 8 %) were represented in the sample. All participants were volunteers and were selected for reporting to be heterosexual and between the ages of 17–45. Participants were recruited both via an internal online psychology participant management system and a research based website. The experiments were administered online using custom presentation software without an experimenter present.

Procedure

The stimuli were 30 male and 30 female white European faces drawn from the same database of young adult faces as Study 1. Photographs were taken under standardized lighting conditions and with a neutral posed expression. Images were cropped around the outside of the face so that hair and clothing were not visible. All images were standardized on inter-pupillary distance.

Participants were asked to rate the 30 opposite-sex faces twice, firstly for attractiveness and secondly for partner similarity. Participants were asked to: "Please rate the person for attractiveness" and "Please rate the person for how closely they resemble your current/most recent partner." A 7-point Likert was presented below the image anchored with "low" and "high." Images were presented individually and in a random order. The image remained on screen until the image was rated, which moved the test on to the next trial.

Results

For each participant, we computed the r value for the correlation between rated attractiveness and rated partner-similarity. This was used as a measure of positive attraction towards partner similarity (which we call *partner attraction*). Higher scores indicate individuals found partner similar faces more attractive. Individuals with a current partner rated similarity to this partner and those without a partner rated similarity to their most recent partner and we call these groups current partner and past partner. We again included age as a covariate in the ANOVA but note that the pattern of data is the same when age is not included in the model.

A 2 (Sex of Rater) × 2 (Partner) mixed model ANCOVA was conducted on partner attraction with age as a covariate (see Fig. 4). The ANOVA yielded a significant Sex of Rater × Partner interaction, $F(1, 109) = 5.69$, $p = .019$, $\eta p^2 = .050$. There was a significant effect of Partner, $F(1, 109) = 7.61$, $p = .007, \eta p^2 = .065$, reflecting a greater partner attraction for those rating past partners though this was superseded by the

interaction. No other main effect or interactions were significant, all $Fs(1, 109) < 1$, $\eta p^2 < .002$.

To follow up the Sex of Rater × Partner interaction, independent sample t-tests were carried out between partner attraction for those with and without partners split by sex of rater. These revealed that there was a significant difference in partner attraction between men rating current versus past partners, $t(48) = 4.08$, $p < .001$, $d = 1.18$, in which men rating their current partner had lower partner attraction than those rating their past partner, but no difference for women rating current versus past partners, $t(62) < 1$, $d = 0.12$. Additional independent samples t-tests comparing partner attraction for males and females split by partner revealed that there was a significant difference in partner attraction between men and women rating their current partners, $t(65) = 2.28$, $p = .026$, $d = 0.57$, in which men scored lower in partner attraction than women, but no difference for men and women rating past partners, $t(45) = 1.22$, $d = 0.36$.

We additionally conducted one-sample t-tests against no correlation (0) to address overall partner attraction split by sex of rater and partner. These revealed that there was significant positive partner attraction for women with partners, $t(38) = 6.48$, $p < .001$, $d = 2.10$, and without partners, $t(24) = 5.65$, $p < .001$, $d = 2.31$. For men, there was significant partner attraction for those with partners, $t(27) = 3.42$, $p = .002$, $d = 1.32$, and without partners, $t(21) = 7.47$, $p < .001$, $d = 3.26$.

These results demonstrated that women and men rated faces as more attractive when they were seen as similar to a partner and this was the same for individuals rating past partners. The main effect of partner reflected that, for both men and women, rated similarity to a past partner was more positively related to attractiveness than rated similarity to a current partner. The interaction between sex of rater and partner indicated that for participants rating their similarity to their current partner,
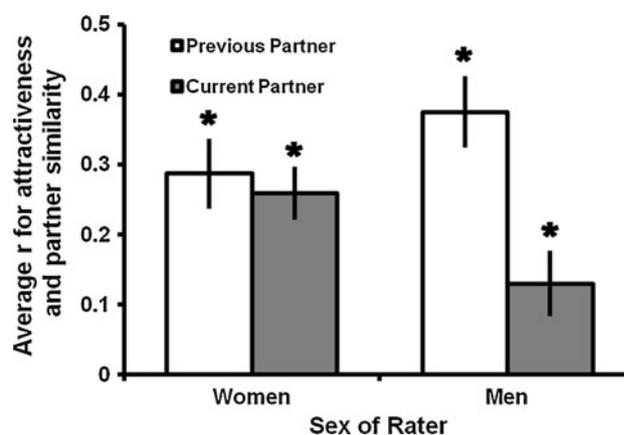

Fig. 4 Study 4: Mean correlation (r) between attractiveness and partner similarity ratings (+1 SE of the mean) split by ratings of current versus past partner. *Significantly different from no correlation (0)

women demonstrated greater partner attraction than did men (i.e. men were less attracted to images similar to their current partner than were women).

Discussion

Our data demonstrated that experience with faces influenced perceptions of attractiveness differently for men and women. Studies 1–3 demonstrated that only limited exposure was sufficient to generate preferences for familiar stimuli, a phenomenon seen in many previous studies (Bornstein, 1989; Zajonc, 1968). The critical exception was that men actually lowered their preference for previously seen female faces (Study 1), found seen female faces particularly less attractive for short-term relationships (Study 2), and, while finding seen female faces more trustworthy, found seen female faces as less sexy (Study 3). Study 4 moved beyond experimental exposure to examine the relationship between perceptions of attractiveness and similarity to current or past partners. While there was generally a positive impact of partner similarity on ratings of opposite-sex attractiveness, the strength of partner attraction was weakest for men rating similarity to their current partner, again indicating that men have weaker preferences for familiarity/greater preferences for novelty in opposite-sex faces than women do. There are theories that suggest individuals are motivated to seek out novelty (Berlyne, 1960), in some circumstances, and studies show that, while familiarity increases the pleasantness of complex shapes, for simple shapes, familiarity decreases pleasantness (Berlyne, 1970). Our data suggest that even using the same complex social stimuli (faces), exposure can result in similar preferences for familiarity across men and women judging male faces, but divergent preferences for novelty when men and women judge the attractiveness of female faces.

Visual preferences for novelty in opposite-sex stimuli in men are consistent with a male preference for a greater number of partners and a greater interest in short-term relationships than women (Buss & Schmitt, 1993; Clark & Hatfield, 1989; Simpson & Gangestad, 1991). Our data are also consistent with men and women having different attitudes towards desiring sexual intercourse based on how long they have known someone. When asked, "If the conditions were right, would you consider having sexual intercourse with someone you viewed as desirable if you had known that person for…", at range of different times, from 1 h to 5 years, men were more likely to be positive about saying yes than women, but this difference in positive attitude decreased as the length of time increased and at 5 years women were equally as positively inclined to say yes as men (Buss & Schmitt, 1993). While based on self-reported projected sexual interest, this finding is in line with the idea that men are more interested in intercourse with novel partners than women,

or women's greater preference for familiar partners, because the sex difference in desiring intercourse is strongest for unfamiliar partners (known for 1 h) but absent for very familiar potential partners (known for 5 years). Overall, our data are consistent with the idea that familiarity is a positive trait with both men and women disliking unfamiliar individuals. This general preference for familiarity, however, appears to be overridden in the case of men by preferences for novelty when it comes to judging potential sexual partners.

Within a long-term partnership, attraction to novelty could certainly foster an increase of reproductive success in men by increasing the chances of male philandering. Our data also indicated that such decreases in attraction occurred most strongly for short-term relationships (Study 2) and sexiness (Study 3), indicating that sexual attraction may be the key variable. That such novelty preferences carry over to women that males have not engaged in intercourse with could reflect a low cost by-product of such an adaptation. Of course, the very short exposure times required in Studies 1–3 to generate lowered attraction and sexiness ratings to encountered female faces may appear maladaptive in guiding males away from women who they have only seen rather than mated with. We note, however, the decrease in rating was small and that generally a visual preference for novelty based on the level of familiarity could be, on average, adaptive. We might also speculate that male preferences for novelty may increase further when sexual activity is involved, although this is difficult to test experimentally. The results of Study 4, however, were consistent with the idea that being with a partner may be important: men showed similar levels of partner attraction when rating a past partner while showing significantly lower levels of attraction to faces seen as more similar to their current partner than women.

Novelty preferences were specific to men judging female faces, as men found familiar male faces more attractive (Study 1). Likewise, exposure increased rated trustworthiness of opposite-sex faces in both men and women, but also increased ratings of sexiness in women while decreasing ratings of sexiness in men (Study 3). Such specificity is particularly interesting, as it suggests that exposure effects are not uniform across men and women or across type of judgment. The effect of visual familiarity in humans appears to show evidence of adaptive design, driving men to seek variety in their partners more than women. While there are clearly similarities in what men and women judge as attractive in same-sex and opposite-sex faces (Langlois et al., 2000), there is also evidence that men and women judge same-sex and opposite-sex stimuli differently in regard to preferences (e.g., Little, Jones, DeBruine, & Feinberg, 2008), potentially based on mate-choice relevance, and future studies should consider these sex of rater by sex of stimuli interactions.

Our data add to a burgeoning literature showing that exposure to faces biases subsequent perceptions of novel faces in the short-term (Leopold, O'Toole, Vetter, & Blanz, 2001;

Leopold, Rhodes, Muller, & Jeffery, 2005; Rhodes, Halberstadt, & Brajkovich, 2001; Rhodes et al., 2003, 2004; Webster, Kaping, Mizokami, & Duhamel, 2004). Although our results generally complement those demonstrating the attractiveness of average and familiar faces (Langlois & Roggman, 1990; Langlois et al., 1994; Little & Hancock, 2002; Rhodes et al., 1999) to some degree, our finding that men did not prefer faces they were previously exposed to supports the proposal that averageness and familiarity alone cannot fully explain face preferences (see also DeBruine, 2004; DeBruine, Jones, Unger, Little, & Feinberg, 2007; Perrett, May, & Yoshikawa, 1994).

In Study 4, we found a positive impact of partner similarity on ratings of opposite-sex attractiveness, but the strength of partner attraction was weakest for men rating similarity to their current partner. We relied on the participants rating of similarity to their current or previous partner. An improvement here would be to assess partner similarity more directly using photographs of current/past partners, though this may be more challenging for past partners. Additionally, comparing men's attractiveness ratings to their ratings of similarity to both a previous and current partner, or a longitudinal study of men's attraction to their partner over time could provide additional support for the ideas presented here. Lastly, while we did not measure it here, information on the length of participants' previous or current relationship would prove interesting as relationship length appears likely to influence the strength of preferences for partner similarity in novel faces.

Previous studies have shown that individuals have a tendency to partner with or prefer people who have similar traits (such as eye-color, hair color, and age) to their parent's, imprinting-like effects (Little, Penton-Voak, Burt, & Perrett, 2003; Perrett et al., 2002). Pairing based on attraction to parental traits may also indicate positive preferences for familiar face traits based on exposure. Preferences for self-similarity in faces also appear to differ between men and women, with data suggesting that men dislike similarity in opposite-sex faces more than women do (DeBruine, 2004). Potentially, the results of the current studies may demonstrate a mechanism via which such effects could come about, though our finding that men did not prefer familiar face shapes in female faces might suggest that imprinting-like effects and self-similarity preferences, at least in men, may occur via other specialized mechanisms.

In summary, our data demonstrated that while there were general preferences for familiarity in faces, men preferred more novel female faces. We found this effect in four studies. This relative interest in novelty in men may reflect the asymmetric investment in reproduction between men and women and the greater increase of reproductive success that can be gained by men by seeking multiple sexual partners. In this way, sex-specific preferences for novelty in partners may reflect evolved psychology that serves to maximise reproductive success in men and women.

References

Benson, P. J., & Perrett, D. I. (1993). Extracting prototypical facial images from exemplars. *Perception, 22*, 257–262.

Berlyne, D. E. (1960). *Conflict, arousal, and curiosity*. New York: McGraw Hill.

Berlyne, D. E. (1970). Novelty, complexity, and hedonic value. *Perception & Psychophysics, 8*, 279–286.

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

Buckingham, G., DeBruine, L. M., Little, A. C., Welling, L. L. M., Conway, C. A., Tiddeman, B. P., & Jones, B. C. (2006). Visual adaptation to masculine and feminine faces influences generalized preferences and perceptions of trustworthiness. *Evolution and Human Behavior, 27*, 381–389.

Buss, D. M., & Schmitt, D. P. (1993). Sexual strategies theory: An evolutionary perspective on human mating. *Psychological Review, 100*, 204–232.

Clark, R. D., & Hatfield, E. (1989). Gender differences in receptivity to sexual offers. *Journal of Psychology and Human Sexuality, 2*, 39–55.

DeBruine, L. M. (2004). Facial resemblance increases the attractiveness of same-sex faces more than other-sex faces. *Proceedings of the Royal Society of London Series B-Biological Sciences, 271*, 2085–2090.

DeBruine, L. M., Jones, B. C., Unger, L., Little, A. C., & Feinberg, D. R. (2007). Dissociating averageness and attractiveness: Attractive faces are not always average. *Journal of Experimental Psychology-Human Perception and Performance, 33*, 1420–1430.

Fisher, A. E. (1962). Effects of stimulus variation on sexual satiation in male rat. *Journal of Comparative and Physiological Psychology, 55*, 614–620.

Galton, F. J. (1878). Composite portraits. *Nature, 18*, 97–100.

Halberstadt, J., & Rhodes, G. (2000). The attractiveness of non-face averages: Implications for an evolutionary explanation of the attractiveness of average faces. *Psychological Science, 11*, 285–289.

Jones, B. C., DeBruine, L. M., & Little, A. C. (2007). The role of symmetry in attraction to average faces. *Perception & Psychophysics, 69*, 1273–1277.

Kelley, J. L., Graves, J. A., & Magurran, A. E. (1999). Familiarity breeds contempt in guppies. *Nature, 401*, 661–662.

Langlois, J. H., Kalakanis, L., Rubenstein, A. J., Larson, A., Hallamm, M., & Smoot, M. (2000). Maxims or myths of beauty? A meta-analytic and theoretical review. *Psychological Bulletin, 126*, 390–423.

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.

Leopold, D. A., O'Toole, A. J., Vetter, T., & Blanz, V. (2001). Prototype-referenced shape encoding revealed by high-level aftereffects. *Nature Neuroscience, 4*, 89–94.

Leopold, D. A., Rhodes, G., Muller, K. M., & Jeffery, L. (2005). The dynamics of visual adaptation to faces. *Proceedings of the Royal Society B-Biological Sciences, 272*, 897–904.

Light, L. L., Hollander, S., & Kayra-Stuart, F. (1981). Why attractive people are harder to remember. *Personality and Social Psychology Bulletin, 7*, 269–276.

Little, A. C., DeBruine, L. M., & Jones, B. C. (2005). Sex-contingent face after-effects suggest distinct neural populations code male and female faces. *Proceedings of the Royal Society B-Biological Sciences, 272*, 2283–2287.

Little, A. C., & Hancock, P. J. B. (2002). The role of masculinity and distinctiveness in judgments of human male facial attractiveness. *British Journal of Psychology, 93*, 451–464.

Little, A. C., Jones, B. C., DeBruine, L. M., & Feinberg, D. R. (2008). Symmetry and sexual dimorphism in human faces: Interrelated preferences suggest both signal quality. *Behavioral Ecology, 19*, 902–908.

Little, A. C., Penton-Voak, I. S., Burt, D. M., & Perrett, D. I. (2003). Investigating an imprinting-like phenomenon in humans: Partners and opposite-sex parents have similar hair and eye colour. *Evolution and Human Behavior, 24*, 43–51.

Moreland, R. L., & Zajonc, R. B. (1982). Exposure effects in person perception: Familiarity, similarity, and attraction. *Journal of Experimental Social Psychology, 18*, 395–415.

Perrett, D. I., May, K. A., & Yoshikawa, S. (1994). Facial shape and judgments of female attractiveness. *Nature, 368*, 239–242.

Perrett, D. I., Penton-Voak, I. S., Little, A. C., Tiddeman, B. P., Burt, D. M., Schmidt, N., … Barrett, L. (2002). Facial attractiveness judgements reflect learning of parental age characteristics. *Proceedings of the Royal Society of London, B, 269*, 873–880.

Rhodes, G., Halberstadt, J., & Brajkovich, G. (2001). Generalization of mere exposure effects in social stimuli. *Social Cognition, 19*, 57–70.

Rhodes, G., Jeffery, L., Watson, T. L., Clifford, C. W. G., & Nakayama, K. (2003). Fitting the mind to the world: Face adaptation and attractiveness aftereffects. *Psychological Science, 14*, 558–566.

Rhodes, G., Jeffery, L., Watson, T. L., Jaquet, E., Winkler, C., & Clifford, C. W. G. (2004). Orientation-contingent face aftereffects and implications for face-coding mechanisms. *Current Biology, 14*, 2119–2123.

Rhodes, G., Sumich, A., & Byatt, G. (1999). Are average facial configurations attractive only because of their symmetry? *Psychological Science, 10*, 52–58.

Rhodes, G., & Tremewan, T. (1996). Averageness, exaggeration, and facial attractiveness. *Psychological Science, 7*, 105–110.

Simpson, J. A., & Gangestad, S. W. (1991). Individual differences in sociosexuality: Evidence for convergent and discriminant validity. *Journal of Personality and Individual Differences, 60*, 870–883.

Trivers, R. L. (1972). Parental investment and sexual selection. In B. Campbell (Ed.), *Sexual selection and the descent of man, 1871–1971* (pp. 136–179). Chicago: Aldine.

Webster, M. A., Kaping, D., Mizokami, Y., & Duhamel, P. (2004). Adaptation to natural facial categories. *Nature, 428*, 557–561.

Wilson, J. R., Kuehn, R. E., & Beach, F. A. (1963). Modification in sexual behavior of male rats produced by changing stimulus female. *Journal of Comparative and Physiological Psychology, 56*, 636–644.

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