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Pers Soc Psychol Bull published online 22 February 2011
DOI: 10.1177/0146167211399584

Article

Personality and Social Psychology Bulletin
XX(X) 1–13

DOI: 10.1177/0146167211399584
http://pspb.sagepub.com

Heterosexual Romantic Couples Mate Assortatively for Facial Symmetry, But Not Masculinity

Robert P. Burriss[1,2], S. Craig Roberts[3,4], Lisa L. M. Welling[1], David A. Puts[1], and Anthony C. Little[4]

Abstract

Preferences for partners with symmetric and sex-typical faces are well documented and considered evidence for the good-genes theory of mate choice. However, it is unclear whether preferences for these traits drive the real-world selection of mates. In two samples of young heterosexual couples from the United Kingdom (Study 1) and the United States (Study 2), the authors found assortment for facial symmetry but not for sex typicality or independently rated attractiveness. Within-couple similarity in these traits did not predict relationship duration or quality, although female attractiveness and relationship duration were negatively correlated among couples in which the woman was the more attractive partner. The authors conclude that humans may mate assortatively on facial symmetry, but this remains just one of the many physical and nonphysical traits to which people likely attend when forming romantic partnerships. This is also the first evidence that preferences for symmetry transfer from the laboratory to a real-world setting.

Keywords

assortative mating, facial attractiveness, masculinity, mate choice, symmetry

Received July 28, 2009; revision accepted November 14, 2010

Physical appearance affects the outcome of real-world social situations, such as a person's chances of being convicted of a crime (Sigall & Ostrove, 1975), being offered a job (Watkins & Johnston, 2000), securing investment in a product or business (Baron, Markman, & Bollinger, 2006), and winning votes in an election (Little, Burriss, Jones, & Roberts, 2007). Appearance is particularly important in the domain of mate choice (Buss, 1989), with physically attractive persons valued more highly as potential mates. However, much of the research in this area has focused on preferences (e.g., Little, Jones, Penton-Voak, Burt, & Perrett, 2002; Perrett, May, & Yoshikawa, 1994) and has not addressed whether these preferences drive the real-world selection of mates. In this article we investigate two traits—symmetry and sex typicality of face shape—that are known to affect judgments of attractiveness. We look at whether heterosexual romantic partners share these traits, a pattern that would suggest assortative mating.

Assortative Mating for Face Shape

Assortative mating is the pairing of individuals who are similar or dissimilar in the case of negative assortment (Thiessen & Gregg, 1980). A number of authors have explored how humans select partners on the basis of complementary traits (reviewed in S. C. Roberts & Little, 2008). A great deal of this literature documents similarities between partners in terms of attitudes and personality traits (Buston & Emlen, 2003; D'Onofrio, Eaves, Murrelle, Maes, & Spilka, 1999; Feng & Baker, 1994; Luo & Klohnen, 2005), whereas other studies have highlighted the importance of physical characteristics such as age and height (Feng & Baker, 1994; Luo & Klohnen, 2005; D. F. Roberts, 1977). In addition, several authors have shown that partners share sufficient facial similarities for them to be identified with reasonable accuracy as belonging to the same couple (Griffiths & Kunz, 1973; Hinsz, 1989; Zajonc, Adelmann, Murphy, & Niendenthal, 1987). However, these authors did not objectively measure

[1]Pennsylvania State University, State College, PA, USA
[2]University of Chester, Chester, UK
[3]University of Liverpool, Liverpool, UK
[4]University of Stirling, Stirling, UK

Corresponding Author:
Robert P. Burriss, University of Chester, Psychology Department, Parkgate Road, Chester CH1 4BJ, United Kingdom
Email: rob@oraclelab.co.uk

facial similarity but instead depended on third-party observers to match individuals to their partners using unspecified criteria (DeBruine, 2005). Two persons may be identifiable as partners or rated as similar because they exhibit any number of matching or compatible physical traits. Little, Burt, and Perrett (2006) obtained personality trait ratings of photographs of couples; they found that partners were rated as similar in apparent neuroticism and openness to experience, suggesting one method by which couples might be matched. However, there are likely to be others.

Facial similarity between partners may also be driven by assortment for genetic compatibility, given that women express a preference for the faces of men with whom they share major histocompatibility complex (MHC) alleles (S. C. Roberts, Little, Gosling, Jones, et al., 2005) and that women and men express preferences for (and tend to pair with) individuals who appear similar to their other-sex parent (Bereczkei, Gyuris, Koves, & Bernath, 2002; Bereczkei, Gyuris, & Weisfeld, 2004; Little, Penton-Voak, Burt, & Perrett, 2003). Since we share half of our genes with each of our parents, preferences for parental traits will necessarily result in couples that share facial similarities. Although computer graphics studies of facial preferences have suggested that overall self-resemblance is not attractive in other-sex faces (DeBruine, 2004, 2005; Penton-Voak, Perrett, & Pierce, 1999), this may be because humans seek to achieve an optimal level of complementarity; a high degree of self-resemblance may indicate probable kinship and therefore unsuitability as a mate.

Assortment for Attractiveness

Another possibility is that individuals are judged as similar because they assort on facial attractiveness. When compared to their less attractive peers, individuals judged to be attractive tend to find others generally less attractive and to expect their own dating partners to be more attractive (Montoya, 2008). Also, men invest more effort in interactions with women whom they match in attractiveness (van Straaten, Engels, Finkenauer, & Holland, 2009). These preferences and behaviors are reflected in real partnerships: A meta-analysis by Feingold (1988) showed that attractiveness ratings of individuals who are romantically involved are positively correlated. However, because attractiveness is not determined by a single trait, two individuals could be similar in attractiveness but have a dissimilar facial morphology. To determine why couples appear to match in attractiveness, we should consider the individual traits that influence judgments of attractiveness.

Good-Genes Indicator Traits

Much of the recent research on human facial attractiveness has focused on specific components of attractiveness that are putative indicators of good genes (Trivers, 1972). These include a symmetric and sex-typical (sometimes termed masculine–feminine or sexually dimorphic) shape (for a recent review, see S. C. Roberts & Little, 2008). Fluctuating asymmetry is thought to be an honest indicator of phenotypic condition and genotypic quality because developmental stressors such as illness can cause deviations from perfect bilateral symmetry (Mealey, Bridgestock, & Townsend, 1999; Møller & Swaddle, 1997). Facial symmetry might therefore be an indicator of long-term health. Although the link between fluctuating asymmetry and health remains controversial, there is a good deal of support for symmetry as a measure of mate quality. Facial asymmetry is negatively correlated with perceived health (Fink, Neave, Manning, & Grammer, 2006; Grammer & Thornhill, 1994; Noor & Evans, 2003), and body asymmetry is positively related to the incidence of low back pain, stress, and a number of genetic disorders (Al-Eisa, Egan, & Wassersug, 2004; Milne et al., 2003; Shackelford & Larsen, 1997; Thornhill & Møller, 1997; Waynforth, 1998). Persons with less symmetric faces and bodies tend to experience longer and more frequent respiratory infections (Thornhill & Gangestad, 2006). Earlier work produced equivocal results (e.g., Kowner, 1996; Langlois, Roggman, & Musselman, 1994; Mealey et al., 1999), but more recently researchers have employed better-controlled methods to confirm that symmetry is attractive to both men and women in Western (Little & Jones, 2003; Perrett et al., 1999) and select non-Western (Little, Apicella, & Marlowe, 2007; Rhodes et al., 2001) populations.

Facial sex typicality (by which we mean an exaggerated, rather than an average, male–masculine or female–feminine face shape) is implicated in attractiveness because sex hormones not only govern sex-typical appearance (Burriss, Little, & Nelson, 2007; Enlow, 1990; Fink et al., 2005; Law Smith et al., 2006; Penton-Voak & Chen, 2004) but also suppress the immune system (Duckworth, Mendonca, & Hill, 2001; Hasselquist, March, Sherman, & Wingfield, 1999; Hillgarth & Wingfield, 1997; Kanda, Tsuchida, & Tamaki, 1996; Thornhill & Møller, 1997). This suggests that persons with a strong immune system are better able to bear the burden imposed by high levels of sex hormones (Følstad & Karter, 1992) and that sex-typical face shape is a costly signal of quality. Thornhill and Gangestad (2006) have shown that facially masculine men and feminine women tend to experience fewer instances of respiratory disease, and Rhodes, Chan, Zebrowitz, and Simmons (2003) found that men's facial masculinity is positively associated with long-term health estimated from medical records.

In humans, sex-typical facial appearance is valued, with feminine-faced women and masculine-faced men preferred by other-sex judges (see, e.g., DeBruine et al., 2006; Little, Jones, DeBruine, & Feinberg, 2008), although it is noteworthy that studies of preferences for sex typicality in male faces have generated varying results (Berry & McArthur, 1985;

Cornwell & Perrett, 2008; Keating, 1985; Penton-Voak, Perrett, Castles, et al., 1999; Perrett et al., 1998; Rhodes et al., 2003). Although women's preferences for sex typicality in men are variable and subject to individual differences, it is known that attractive women (as identified by self- or other-ratings or by measurements of fertility-related traits such as waist-to-hip ratio) tend to express stronger preferences for masculine faces (Little, Burt, Penton-Voak, & Perrett, 2001; Little & Mannion, 2006; Penton-Voak et al., 2003; Smith et al., 2009) and voices (Vukovic et al., 2008, 2010), suggesting that these are valuable traits. Because women's preferences for sex typicality are positively related to the actual sex typicality of their partners (as judged by the female participants; DeBruine et al., 2006), we expect masculine men to be paired with women who possess attractive traits.

Research Overview

Given that symmetric and sex-typical faces are attractive, the question we address here is whether women with a feminine and symmetric appearance tend to pair up with men who are masculine and symmetric. Alternatively, quality-based assortative preferences may be outweighed by stronger preferences for matching values and physical traits, leading individuals to pair up randomly on these measures of facial attractiveness or causing the correlations to be too small to detect in moderate-sized samples without controlling for these other variables. As far as we are aware, only one other study has investigated assortment for facial masculinity: Cornwell and Perrett (2008) demonstrated that middle-aged married couples are similar in attractiveness but that feminine-faced women are not paired systematically with masculine-faced men. We concentrate our attention here on younger couples, whose members are less likely to have converged on a similar facial appearance through shared experiences, diet, and lifestyle. We report on two studies of two independent samples of men and women belonging to heterosexual romantic couples. We used correlation and linear regression techniques to describe the relationships between measures of symmetry and sex typicality in the faces of these men and women. In addition, as complementary traits may be associated with positive relationship outcomes such as relationship quality or satisfaction (Blum & Mehrabian, 1999; Robins, Caspi, & Moffitt, 2000; but see Luo, 2009), within-couple similarity on measures of facial attractiveness was used to predict a simple index of relationship quality: relationship length. In Study 2, we also sought to draw a link between similarity and reported relationship quality. We predicted that our participants would assort for valued facial traits, such that men and women would tend toward similar levels of symmetry and rated attractiveness and dissimilar levels of measured and rated sex typicality (with feminine women tending to be paired with masculine men).

Study 1

Materials and Method

Participants. We photographed 86 persons, representing 43 heterosexual couples. After discarding substandard images, the sample comprised 34 men (28 reported age: M = 22.00 years, SD = 3.14, range = 18–30) and 34 women (28 reported age: M = 20.71 years, SD = 1.46, range = 18–24). Participants were recruited via advertisements on a computer-network messaging system at a northwestern U.K. university, so at least one partner in each couple was a student or employee at that university. Participants were paid UK£10 per couple.

Procedure. We photographed seated participants in a windowless laboratory with consistent overhead lighting, set the focal distance at approximately 2 meters, and did not use a flash. We directed participants to maintain a neutral facial expression. We sometimes, but not always, photographed participants in the presence of their partner. We discarded a number of images because of excessive head tilting or manifest facial expressions. If we discarded a participant's image, we also discarded the image of that person's partner. Figure 1 shows composite images made from the faces of participants in the two studies described in this article. These images reflect the average face shape of participants in each study. Note that we measured individual faces and not the composite images shown in Figure 1, which are provided for illustrative purposes only.

Participants reported their age in years and relationship length to the nearest month. Both partners provided relationship length estimates in 25 of the 34 couples; their reports were averaged to give each couple a mean relationship length value (M = 21.61 months, SD = 19.26, range = 1–66).

Using specialist software, we placed landmarks on the facial photographs and from these made nine measurements that may capture physical masculinity (Burriss et al., 2007; Hennessy, McLearie, Kinsella, & Waddington, 2005; Koehler, Simmons, Rhodes, & Peters, 2004; Penton-Voak et al., 2001). The same person placed all landmarks. We measured mean eye width (what Penton-Voak et al., 2001, term eye size), lower face/face height, cheekbone prominence, and face width/lower face height following the methods of Penton-Voak et al. (2001) and mean eye height, mean jaw angle, upper lip height, lower lip height, and nose width following Burriss et al. (2007). Linear measurements (all except ratio measurements and jaw angle) were rendered as a percentage of interpupilary distance, which prevents the possibility of variation in zoom settings or focal distance affecting the accuracy of measurements. In addition, we calculated measures of horizontal and vertical asymmetry after Scheib, Gangestad, and Thornhill (1999) and summed these to give an index of overall facial asymmetry (Asymmetry Index, or AI). A face with perfect symmetry would receive a score on this index of 0, with greater scores signifying increasing asymmetry.

Figure 1. Composite images made from participants in the two studies
Note: Women are on the top row, men on the bottom row. Participants in Study 1 (left) and Study 2 (right). Note that these images were not used in the current research and are provided for illustrative purposes only.

Table 1. Facialmetric Measures

	Study 1					Study 2				
	M	*SD*	*t* (*df* = 66)	*p*	*r*	*M*	*SD*	*t* (*df* = 218)	*p*	*r*
Eye width										
Female	40.12	1.12	–2.01	.049	.24	44.73	2.14	2.69	.008	.18
Male	39.39	1.83				43.94	2.19			
Eye height										
Female	15.97	1.39	–2.35	.022	.28	17.81	1.76	9.08	<.001	.52
Male	14.94	2.16				15.6	1.85			
Lower face height/face height										
Female	–0.6	0.02	–2.34	.022	.28	–0.6	0.02	8.36	<.001	.49
Male	–0.61	0.02				–0.62	0.02			
Cheekbone prominence										
Female	1.16	0.05	–3.26	.002	.37	1.18	0.05	9.02	<.001	.52
Male	1.13	0.04				1.13	0.04			
Face width/lower face height										
Female	1.24	0.08	–2.1	.04	.25	1.24	0.06	5.64	<.001	.36
Male	1.2	0.08				1.19	0.07			
Upper lip height										
Female	10.19	2.03	–1.34	.185	.11	9.25	1.92	–1.25	.212	.1
Male	10.95	2.62				9.6	2.16			
Lower lip height										
Female	15.76	2.34	–1.26	.211	.10	17.86	2.04	1.52	.131	.12
Male	16.58	3				17.39	2.57			
Nose width										
Female	57.68	4.57	2.01	.049	.24	57.03	3.48	–5.94	<.001	.37
Male	60.02	5.03				59.96	3.84			
Jaw angle (degrees)										
Female	11.14	2.64	–3.4	.001	.39	11.5	2.16	8.81	<.001	.51
Male	9.21	1.99				8.86	2.29			

Results

We used *t* tests to determine whether each of the facialmetric measures was sexually dimorphic in this sample (see Table 1). In line with previous findings, women tended to have larger eyes (both width and height), a lower ratio of lower face height to face height, more prominent cheekbones, a greater ratio of face width to lower face height, a narrower nose, and a larger jaw angle. Lip height (both upper and lower lips) was not sexually dimorphic in this sample.

We calculated an index of standardized dimorphic measures (Masculinity Index, or MI) after a method used by Penton-Voak et al. (2001) to give an indication of the extent to which each face exhibited typically masculine traits. First, we standardized all measurements across the whole sample, including men and women. We then summed traits that had significantly higher values in men and subtracted from that sum the traits that tended toward higher values in women, thus: Z(lower face height/face height) + Z(nose width) – Z(eye height) – Z(eye width) – Z(cheekbone prominence) – Z(face width/lower face height) – Z(jaw angle). We log transformed male and female MI and AI to ensure normality. We added a constant of 35 to MI before transformation, as MI values were sometimes negative, and chose the value of 35 because no participant received a score on the MI that was lower than –35. As expected, men tended toward a larger MI than women, $t(66) = –3.21$, $p = .002$, $r = .36$. There was no significant sex difference in AI, $t(66) = –0.2$, $p = .843$, $r = .02$.

Assortment and appearance. Female MI was not correlated with male MI, $r = .140$, $p = .429$, or male AI, $r = .107$, $p = .546$. Female AI was also not correlated with male MI, $r = .084$, $p = .638$, although it was significantly and positively correlated with male AI, $r = .392$, $p = .022$: Symmetric women tended to be paired with symmetric men.

Similarity and relationship length. Greater facial similarity (or dissimilarity in the case of traits such as facial sex typicality, where masculinity is valued in men and femininity in women) may be associated with desired relationship outcomes, such as a durable relationship. To test this hypothesis, we used the piecewise linear regression method described by Griffin, Murray, and Gonzalez (1999). This method involves computing two regressions rather than one, with each analyzing the data of one of two subsets of participants. The first subset would include couples in which the male partner has a higher score on the predictor variable of interest (say, AI) than the female partner, and the second would include couples in which the female partner has the higher score. The results of these two regressions are used to determine whether one of several possible hypotheses best describes the data (Griffin et al., 1999). For example, if the analysis on the first subset yielded a negative coefficient for men's AI and a positive coefficient for women's whereas the second analysis yielded coefficients of the opposite sign, the hypothesis that facial similarity predicts relationship length would be supported.

Because men are more facially masculine than women, it is likely that a large majority of the couples would fall into Subset 1. We therefore standardized data within sexes so that roughly equal numbers of men and women would have high and low scores. Although we did not find that symmetry varied as a function of sex in this sample, we also chose to standardize AI within sexes to permit equivalent tests.

Male and female AI did not significantly predict relationship length in couples in which the man had the higher score, $R^2 = .11$, $F(2, 13) = 0.71$, $p = .51$, or the lower score, $R^2 = .19$, $F(2, 10) = 0.93$, $p = .43$. Univariate analyses did not reach significance in either analysis. For MI, the same was true. In neither the first, $R^2 = .29$, $F(2, 13) = 2.27$, $p = .15$, nor the second case, $R^2 = .11$, $F(2, 10) = 0.51$, $p = .62$, was the regression significant. Again, in neither case did the univariate analyses reach significance.

Discussion

As one would expect, MI was greater in men than in women, and there was no sex difference in AI. The hypothesis of assortment for valued traits was only partially supported. Female AI was significantly positively correlated with male AI. If facial symmetry is attractive, as previous studies have suggested (e.g., Little, Apicella, et al., 2007; Perrett et al., 1999), then we would expect individuals to assort positively for this trait. However, we would also expect individuals to mate disassortatively for facial sex typicality, with feminine women tending to pair up with masculine men, not only because these traits are attractive but also because facial sex typicality and symmetry are known to correlate (Little, Jones, Waitt, et al., 2008); we did not find evidence for this pattern. Couples did not assort across traits: Masculine men and feminine women did not tend to have more symmetric partners. Furthermore, there was no evidence that relationship length could be accounted for by within-couple similarity in valued facial traits.

The findings of this study may be the result of limitations with our photographic methods that resulted in invalid or unreliable measurements. Although we instructed participants to maintain a neutral expression, there appeared to be a slight tendency for women to express smiles, which can be seen in the composite images of participants (Figure 1, left). Photographing participants in the presence of their partners may also have affected their expressions or head posture. Previous research has shown that even a change of clothing can affect facial appearance in participants instructed to maintain a neutral expression (Lõhmus, Sundström, & Björklund, 2009; S. C. Roberts, Owen, & Havlíček, 2010). Emotional expressions are more intense on the left side of the face (Sackeim, Gur, & Saucy, 1978), so if participants mimic their partner's expression or posture, this may cause couple members' asymmetry measurements to artificially covary. Previous studies have shown that the identification of the landmark positions on which our measurements were dependent is reliable (Scheib et al., 1999), but landmark placement may in some cases have been inaccurate because participants were not instructed to tie back long hair, thereby obscuring some landmark locations. Shadows on the face may also have adversely affected landmark placement. Lighting was consistently more intense on the right side of the image, which may have allowed more accurate identification of landmark locations on the left side of the face.

In Study 2 we sought to rectify these limitations and to recruit a larger sample of participants. We also widened the aims of the study, incorporating a measure of relationship satisfaction and collecting ratings of participant facial appearance from external judges. Again, we predicted that participants would mate assortatively for valued traits and that couples characterized by similarity in trait scores would tend toward more stable and durable relationships.

Study 2

Materials and Method

Participants. Representing 117 couples, 234 heterosexual men and women participated in this study. One man did not consent to having his photograph taken, three men and two women opted to withdraw from the study after completing the tasks, and one man exhibited injury-related facial swelling that would have affected facial measurements. After excluding these persons and their partners, the sample comprised 110 men (age $M = 20.76$ years, $SD = 3.37$, range = 18–45) and 110 women (age $M = 20.12$ years, $SD = 1.92$, range = 18–28). Of the men, 108 identified as White, 1 as Filipino, and 1 as Hispanic; 104 of the women identified as White, 1 as American Indian, 1 as Asian Indian, 1 as Hispanic, 1 as Native Hawaiian , and 2 did not specify ethnicity. We recruited participants via advertisements on a psychology subject pool website at a northeastern U.S. university, so at least one partner in each couple was enrolled in an introductory psychology class. Compensation was US$14 per person or equivalent course credit.

Procedure. We photographed participants in a windowless laboratory with consistent overhead lighting. We used a camera-mounted flash, set the focal distance at approximately 2 meters, and used standardized white balance. We did not photograph participants in the presence of their partner. Participants removed spectacles and facial jewelry, maintained a neutral expression with mouth closed, and ensured that their heads were not tilted on any axis. Participants used hair bands to keep hair off their forehead and ears. The person taking the photograph immediately inspected it on a computer monitor, then deleted and retook it if judging it to be substandard. Participants returned to the laboratory for additional tasks a week later; we retook a number of photographs during the second session to maintain a high standard of image quality. We made the same facialmetric measurements on the faces as in Study 1. Two persons placed landmarks on one half of the images each. Both partners in a couple were always landmarked by the same person.

Participants completed a questionnaire using a computer at a private workstation. They reported their date of birth, which we used to calculate age. Participants also reported relationship length to the nearest month during both test sessions. If the reports of the two partners differed, we calculated the mean. If the two reports differed by 6 months or more, we assumed that the participant had made a mistake and discarded those data (2 women and 5 men). Both partners provided relationship length estimates in 103 of the 110 couples (M = 14.61 months, SD = 15.24, range = 1–89.5). During the second test session, participants completed the Relationship Assessment Scale (RAS; C. Hendrick, 1988; S. S. Hendrick, Dicke, & Hendrick, 1998), a seven-item measure of relationship satisfaction. The scale correlates significantly with measures of love, commitment, and investment in a relationship (C. Hendrick, 1988).

We gave participants the option of consenting to their photograph being shown to others in the context of Internet-based research studies. Both partners consented in 70 of the couples. We rotated and scaled the photographs of these participants so that pupils lay on a horizontal line and the interpupilary distance was constant across all photographs. We then masked the photographs to obscure hair, neck, and clothes (see Figure 2). Nine women and nine men at a university in the northwestern United Kingdom rated the photographs for attractiveness (7-point scale: 1 = *very unattractive* and 7 = *very attractive*) and masculinity (1 = *very feminine* and 7 = *very masculine*). We instructed judges to rate each face's masculinity against that of other persons of the same sex, thereby promoting full use of the scale when rating both male and female faces. We randomized the order in which the stimuli appeared. We also randomized the order of the four rating tasks (female attractiveness, male attractiveness, female masculinity, male masculinity). We averaged ratings, giving each face a mean other-rated attractiveness and a mean other-rated masculinity score.

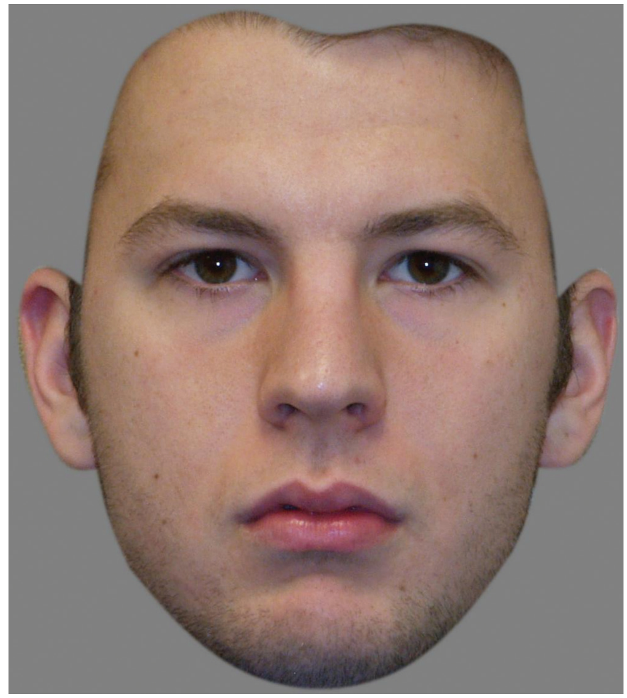

Figure 2. A masked photograph: How the photographs of participants in Study 2 appeared during the rating task

Results

We used t tests to determine which of the facialmetric measures were sexually dimorphic in this sample (see Table 1). Women tended to have larger eyes (both width and height), a lower ratio of lower face height to face height, more prominent cheekbones, a greater ratio of face width to lower face height, a narrower nose, and a larger jaw angle. Lip height was not sexually dimorphic in this sample.

We calculated MI by summing the measures that were sexually dimorphic: Z(lower face height/face height) + Z(nose width) – Z(eye height) – Z(eye width) – Z(cheekbone prominence) – Z(face width/lower face height) – Z(jaw angle). We also calculated AI as in Study 1. Male and female MI and AI were log transformed to ensure normality. As expected, men tended toward a larger MI than women, $t(218) = –9.77$, $p < .001$, $r = .55$. There was no significant sex difference in AI, $t(218) = –0.17$, $p = .862$, $r = .01$.

Assortment and appearance. Female MI was not correlated with male MI, $r = .081$, $p = .400$, or male AI, $r = –.036$, $p = .712$. Female AI was also not correlated with male MI, $r = .011$, $p = .906$, or male AI, $r = .187$, $p = .051$. The latter relationship was in the predicted direction and almost significant. Rated male attractiveness was not correlated with rated female attractiveness, $r = .194$, $p = .107$, and rated male masculinity was not correlated with rated female masculinity, $r = .222$, $p = .064$.

Similarity and relationship quality. As above, we carried out two regressions per predictor: one using data from couples in which the male partner had the higher score and another using data from couples in which the female partner had the higher score. We omitted from the analyses couples in which male and female scores were identical so that each couple could be allocated to one of the two subsets.

Male and female AI did not significantly predict relationship length in couples in which the male partner had the higher score (Subset 1), $R^2 = .022$, $F(2, 51) = 0.55$, $p = .58$, or the lower score (Subset 2), $R^2 = .022$, $F(2, 49) = 0.52$, $p = .60$. For MI, the regressions were nonsignificant for both Subset 1, $R^2 = .018$, $F(2, 49) = 0.43$, $p = .65$, and Subset 2, $R^2 = .017$, $F(2, 51) = 0.42$, $p = .66$. The same was true for other-rated masculinity, in both Subset 1, $R^2 = .015$, $F(2, 30) = 2.55$, $p = .096$, and Subset 2, $R^2 = .004$, $F(2, 31) = 0.064$, $p = .94$. No univariate relationship was significant for any of these models.

Other-rated attractiveness did not significantly predict relationship length in couples in which men had higher scores than their partner, $R^2 = .014$, $F(2, 23) = 0.15$, $p = .87$, but it did when women were the more attractive, $R^2 = .16$, $F(2, 38) = 3.52$, $p = .04$. The only significant univariate effect was for the second model, where female attractiveness was found to be the significant predictor, $\beta = -.63$, $t = -2.54$, $p = .016$. The more attractive the female partner, the shorter the relationship length. Because this relationship held only in couples in which the female partner was the more attractive, it implies an interaction between the two predictors: Female attractiveness does not predict relationship length when women are less attractive (compared to others of their own sex) than are their male partners.

The analyses were repeated with mean female/male RAS as the response variable. (RAS and mean relationship length did not correlate, $r = -.057$, $p = .655$, suggesting that these variables tap different aspects of relationship quality or stability.) None of these analyses identified significant predictors of mean RAS.

Discussion

The photographic techniques used in Study 2 were an improvement over previous methods. We identified a trend toward assortative mating for facial symmetry, although this relationship fell just short of significance. We note that had we used a one-tailed test, the relationship would have been significant ($p = .026$). Given the significant result for the equivalent analysis in Study 1, we are reasonably confident that men and women do mate assortatively for symmetry. Preferences for symmetry in laboratory studies are well established (Little, Apicella, et al., 2007; Little & Jones, 2003; Perrett et al., 1999), but this is the first evidence that preferences may guide the formation of relationships.

Previous authors have demonstrated that men and women assort positively for rated attractiveness (Feingold, 1988), although this was not the case for the participants in this study. This may be because we were specifically interested in facial attractiveness and so masked all nonfacial information from the photographs we presented to our raters. Hairstyle, jewelry, and clothing have important effects on attractiveness (Diener, Wolsic, & Fujita, 1995; Hinsz, Matz, & Patience, 2001; S. C. Roberts et al., 2004) and possibly drive assortment for attractiveness of overall appearance. In many of the studies Feingold (1988) included in his meta-analysis that documented assortment for attractiveness, attractiveness was self-rated or assessed by judges in the presence of the person being judged. Self-ratings are less likely to be objective than ratings by others, which also have the advantage of reflecting a consensus when the responses of several raters are averaged. Self-ratings can also be influenced by nonfacial traits; in this study, nonfacial traits were not available to raters. Judges who assess participants in person are also privy to additional information, including important dynamic cues (S. C. Roberts et al., 2009) and the appearance of the participant's partner, which can indirectly influence ratings of the target individual and increase the likelihood of a spurious matching effect (Jones, DeBruine, Little, Burriss, & Feinberg, 2007; Little, Burriss, Jones, DeBruine, & Caldwell, 2008). For these reasons, we expect our results to be more valid than those of previous authors.

Our participants were young and reported relatively short relationships. Cornwell and Perrett (2008) showed that middle-aged couples match on attractiveness, perhaps because their appearances have converged because of shared experiences, or because their relationships are more serious and therefore required more stringent mate-assessment criteria. However, Feingold (1988) found that partner attractiveness correlations did not increase over relationship stages (casual dating, steady dating, committed relationship), suggesting that the age of our participants may not be especially important.

Also, because relationship duration may not be the best proxy for relationship quality, we had participants assess their relationship quality using a generic scale, the RAS. However, we found that relationship quality, whether estimated from relationship duration or RAS scores, was not predicted by most of our measures of facial appearance. The one exception was a significant negative relationship between female other-rated attractiveness and relationship length, though only in couples in which the woman was the more attractive partner. Because there was no significant positive relationship between male other-rated attractiveness and relationship length, there is no evidence for within-couple facial similarity being a good predictor of relationship length.

General Discussion

Facial sex typicality and symmetry are valued traits that are associated with judgments of attractiveness in laboratory studies (DeBruine et al., 2006; Little, Apicella, et al., 2007; Little & Jones, 2003; Little, Jones, DeBruine, et al., 2008; Perrett et al., 1999; Rhodes et al., 2001). Given that these traits are valued, we might expect individuals to pursue and pair up with others who possess them. One of the main goals for the future of attractiveness research identified by S. C. Roberts and Little (2008) in their recent review is determining how mate preferences, established in experimental laboratory studies, relate to actual mate choice. Laboratory studies reveal idealized preferences that are not constrained by the mating market, whereas in real life, individuals are compelled to make compromises and trade one valued trait against another. The key is to investigate genuine couples, as we have done here. In this way it is possible to determine whether preferred qualities, such as sex typicality and symmetry, guide mate choices and are detectable in genuine couples.

Study 1 provided evidence of assortative mating for symmetry, suggesting that this preferred trait is indeed a driver of real-world choices. In the larger and better photographed sample in Study 2, this relationship fell just short of significance. With a p value of .051, the null hypothesis of no assortment was close to being rejected. Because the relationship was significant in Study 1, we are reasonably confident that there exists some assortment for facial symmetry. We also note that our measure of symmetry was calculated using two-dimensional position information for only seven bilateral landmarks (see Scheib et al., 1999, for more details). Had we employed a measure that represented more closely the total variance in symmetry, we believe that it is probable that the observed relationship would have been stronger.

There was no evidence for assortment for sex typicality, or for cross-trait assortment, where symmetric persons tend to pair up with feminine women or masculine men. Contrary to the findings of previous authors (e.g., Cornwell & Perrett, 2008; Feingold, 1988), we found in Study 2 that within-couple attractiveness ratings were not correlated. The same was true of masculinity ratings. These findings lead us to conclude that there is limited assortment for facial attractiveness, as judged from masked photographs of individuals adopting neutral expressions. We also did not find evidence that similar facial appearance predicts relationship stability and quality. We did find that female attractiveness was a negative predictor of relationship length in couples in which the female partner was more attractive, suggesting some interaction between male and female attractiveness. This may be because more attractive women can potentially afford to be choosier in their mate choice, given that they can presumably attract a new mate with more ease than relatively less attractive women. Therefore, more attractive women may be more willing to seek new partners generally or may be less tolerant of negative behavior from their current partners than relatively less attractive women. Further research in this area is needed to investigate these possibilities.

It remains possible that some of the relationships we investigated and did not find evidence for do exist but that we were unable to detect them because (a) discrete two-dimensional facial measurements are unlikely to fully represent sex typicality or symmetry as these traits are perceived, given that they do not take account of all available information on three-dimensional face shape (Hennessy et al., 2005); (b) sex typicality and symmetry are only two of the components that go together to make up overall facial attractiveness (there are several others, e.g., MHC heterozygosity and apparent healthiness of the skin; Jones, Little, Burt, & Perrett, 2004; Jones, Little, Feinberg, et al., 2004; S. C. Roberts, Little, Gosling, Perrett, et al., 2005); and (c) humans assortatively mate on a wide range of other traits, including other physical (Little et al., 2006; S. C. Roberts, Little, Gosling, Jones, et al., 2005) and nonphysical traits (Feng & Baker, 1994; Mascie-Taylor, 1989; Vandenberg, 1972), which may either be more important than facial sex typicality or symmetry or else restrict partner choice (thus forcing individuals to select partners with whom they are not matched on face shape to achieve a more favorable match on a preferred trait; see S. C. Roberts & Little, 2008; Saxton, Little, Rowland, Gao, & Roberts, 2009).

Conclusion

We have shown that heterosexual romantic couples assort for symmetry, a facial trait that advertises quality and is known to be attractive, but not for sex typicality, another trait shown by previous work to be valued. These findings are important because they build on previous work that has shown these traits to be preferred in controlled laboratory studies by demonstrating that facial symmetry drives real-world mate choice. Moreover, these findings connect work on preferences for the individual traits that contribute to attractiveness with the assortative mating literature, which has tended to characterize physical attractiveness and similarity as unitary, indivisible properties.

Other researchers have shown that couples tend to match in terms of overall physical attractiveness, but with our strictly independent measure of overall attractiveness we did not replicate these findings. This suggests that symmetry may be a better predictor of assortment than overall attractiveness. Future research may benefit from the use of three-dimensional photography, which permits the more representative measurement of both symmetry and sex typicality from three-dimensional landmarks and surfaces. In addition, by taking account of other aspects of facial and physical appearance that affect preferences, including apparent health, body build, hair style and quality, clothing, and other forms of ornamentation, authors may be able to determine the relative impact of these traits on real-world mate choice.

Acknowledgments

The authors express their gratitude to J. Armington, E. Barben, J. Barndt, S. Carlson, K. Cheney, C. Hassell, S. Melonas, D. Rosaleyra, C. Scheld, K. Singh, and H. Vanston for help with data collection and Professors R. I. M. Dunbar and D. I. Perrett for their helpful comments on an earlier version of this article. They also thank D. I. Perrett and B. P. Tiddeman for permitting use of the Psychomorph program. Study 1 was conducted while R.P.B. was a PhD student at the University of Liverpool.

Declaration of Conflicting Interests

The authors declared no potential conflicts of interests with respect to the authorship and/or publication of this article.

Financial Disclosure/Funding

A.C.L. is supported by a Royal Society University Research Fellowship.

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