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ARTICLE

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Self seeks like: many humans choose their dog pets following rules used for assortative mating

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Abstract Theoretical and experimental studies suggest that mating and pair formation are not likely to be random. Assortative mating, characterized as "self seeking like", seems to be widely practiced in nature. Experimental evidence for it is strong among humans seeking a mate. Assortative mating increases the probability of finding a genetically similar mate, without fomenting inbreeding, achieving assortative mating without hindering the working of other mate-selection strategies that aim to maximize the search for "good genes", optimizing the working of sex in evolutionary terms. Self seeking like seems to be a behavioural inborn trait among humans, and here we present evidence that the same behavioural mechanism seems to be at work when humans choose a pet. We show that in a significant proportion of human–pet pairs, sampled in pet beauty contests, the partners show much higher facial resemblances than can be expected by random pair formation.

Key words Pets · Mate selection · Assortative mating · Sex · Evolution

Introduction

What do we look for when choosing a pet? Are the psychological mechanisms guiding our pet choice based on more primitive mechanisms tailored by evolution for other, more basic functions? Dog pets and humans have many features in common (Benezech 2003) and thus, dog owners might choose their dog pets because they resemble themselves.

Computer simulations showed that random mating is very unlikely to occur in nature (Kalick and Hamilton 1986; Jaffe 1996, 1998). Specifically, theoretical studies have suggested that assortative mating seems to be highly adaptive (Thiessen and Gregg 1980; Davis 1995), as it reduces excessive allelic variance induced by recombination and sex, especially among diploids with a large genome (Jaffe 1998, 1999, 2000). These studies showed that assortative mating, defined as "self seeking like", has a strong stabilizing effect on sex, is evolutionary stable, and has an evolutionary dynamics analogous to kin selection (Jaffe 2000, 2002). In addition, assortative mating affects the genetic structure of populations, influencing the evolutionary dynamics of sexual organisms significantly (Dieckmann and Doebeli 1999; Kondrashov and Kondrashov 1999, but see Ochoa and Jaffe 1999) and, thus, is a feature that has very likely influenced our psychological tool box.

The rationale of the importance for assortative mating is that living organisms seem to optimize rather than maximize outbreeding (Bateson 1983). That is, mate choice mechanisms avoid maximizing outbreeding and inbreeding at the same time (Jaffe 2002). A complementary theory to an incest-avoidance-outbreeding equilibrium is the optimization of the working of sex (Jaffe 1999, 2000). This theory accepts that genetic similarity is not only achieved through familiar proximity, and recognizes that genetic relatedness may exist among individuals with no familiar relationship between them. Therefore, assortative mating of the kind self seeking like might achieve reproduction between genetically similar mates, favouring the stabilization of genes supporting social behaviour, with no kin relationship between them (Jaffe 2001). Experimental evidence for assortative pairing has been produced at the molecular level (Tregenza and Wedell 2000), for reptiles (Dickinson and Koenig 2003; Sinervo and Clobert 2003) and for humans (Buston and Emlen 2003; Buss 1989; Epstein and Guttman 1984; Garrison et al. 1968; Ho 1986; Jaffe and Chacon 1995, Spuhler 1968; Rushton 1989; but see Genin et al. 2000; Isles et al. 2001). Yet, assortative mating is evidently limited by very well-known mechanisms of inbreeding avoidance among humans (see for example reviews in van den Berghe 1983; Wolf 1993).

Imprinting, i.e. memorizing in early age, the visual images of parents and then using these images for mate

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choice, as first discovered in birds (Lorenz 1935), also seems to guide assortative mating in humans (Todd and Miller 1993; Penton-Voak and Perret 2000; Bereczkei et al. 2002; Little et al. 2003). Other evidence, pointing to the existence of parts of the mechanism needed to allow humans to "imprint" the faces of their parents, was provided by Le Grand et al. (2001). They showed the need of "early" visual input to develop normal face recognitions later. Children resemble their parents (Nesse et al. 1990; Bredart and French 1999; McLain et al. 2000; Oda et al. 2002; Bressan and Grassi 2004), sometimes even in odd ways: they seem first to resemble more their fathers (see also Daly and Wilson 1982; Regalski and Gaulin 1993). Facial child–parent resemblance mechanisms seem to exist even among chimpanzees (Parr and de Waal 1999). This visual memory may then be used to establish criteria for beauty, which in turn are used to select a mate, producing as a consequence assortative mating. These and other evolutionary effects of parental imprinting have been discussed by Todd and Miller (1993).

Here, we test the hypothesis that algorithms evolved for assortative mating are applied to other realms of human behaviour, showing that humans choose pets that resemble themselves significantly more than what a random pet-choice strategy would predict.

Materials and methods

During the National Canine Exposition in Caracas 2002, we took photographs of 48 dogs (purebreds) and photos of their 48 respective owners, who agreed to participate in this study. The owners were a typical selection of Venezuelan races, a mixture of hybrids between African, Caucasian and American Indian races. The photos were processed with PhotoIpact 5.0 so as to remove any background to the dogs and subjects and any clothing of the owners. The final photo was produced with CorelDraw 7.0 so that each photo of the human owner was 7.2×5.5 cm, and that of their dog pet 6×7.2 cm. The 48 pairs photographed were then reduced to 36, filtering out those pairs where background or clothing could not be eliminated by editing, without affecting the faces of the dogs or their human pet owners. The photos were printed, code-numbered, and grouped into six groups of six pairs each (see Fig. 1).

We chose six pairs per group as this number was found to be sufficient for detecting statistically significant choice patterns of human subjects guessing human couples, without tiring the test subjects. Groups A and B had only male pet owners, groups C and D had only female pet- owners, and groups E and F consisted of both female and male pet owners. In each group, all dogs were of different races. Otherwise, pairs were assigned randomly to each group.

To assess a possible resemblance between the faces of the dogs and their human owners, the photographs of the six dogs were placed on a table. The photos of the six corresponding human subjects were randomly shuffled and handed over to a test subject. The test subject had to assign each of the photographs of humans to a dog. Test subjects were checked for their knowledge of any of the target subjects photographed. The test was performed double blind, as neither the experimenter nor the test subject knew the correspondence of the photos to the real pair. Test subjects were recruited in Caracas in different environments, ensuring that 50% were female, 50% male, and that ten subjects of each sex fell into each of four age categories previously defined as: (1) ages between 11 and 19 years; (2) 20 and 29 years; (3) 30 and 39 years; and (4) more than 40 years of age.

The statistical analyses performed on the data were applied to the number of correct pairs guessed by the test subjects. The analyses were made using a Pearson correlation coefficient to assess correlations between age and scoring and sex and scoring, and an χ^2-test to compare the total number of scores obtained for a given experimental setting with those expected from random guessing. The test involved each test subject matching all photos for all couples. Random guessing under this scenario for six pairs gives on average one correct guess per test subject. Another more sensitive way to look at the results was to assess the number of times a given pair was correctly identified as such by test subjects. This distribution of guesses (see Fig. 2) was then compared with an expected distribution obtained by random guessing. The outcome of random pair formation plus random guessing was estimated using a simple Monte Carlo simulation model written in basic.

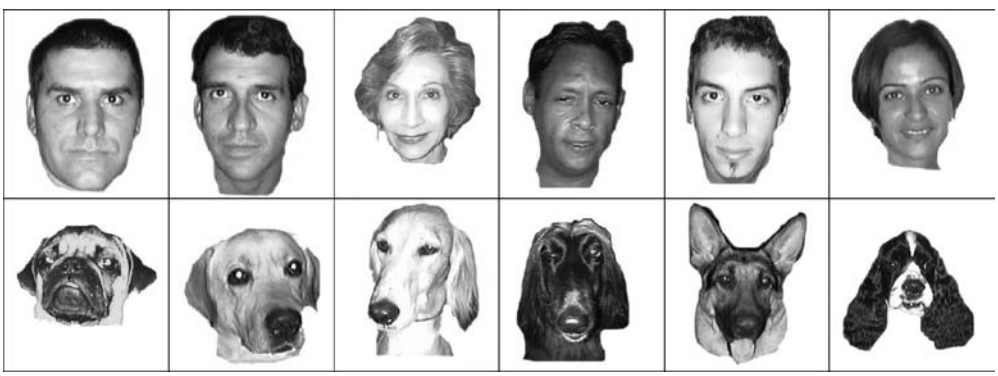

Fig. 1. Samples of photos of dogs and their owners used for this study

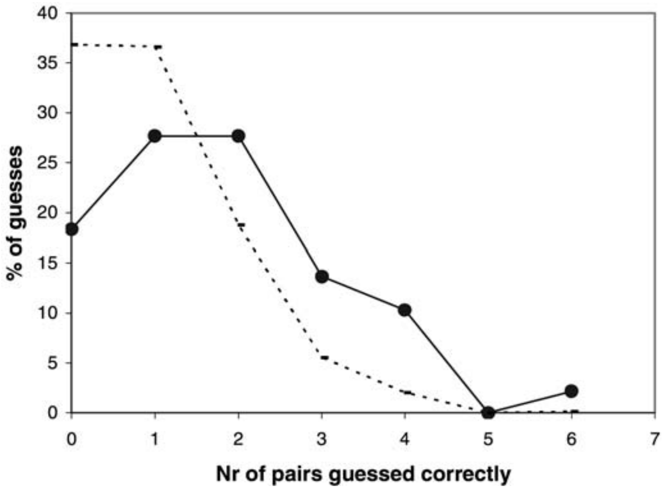

Fig. 2. Percentage of times (or number of times out of 100) test subjects scored 0, 1, 2, 3, 4, 5 or 6 pairs correctly. The *dotted line* indicates the outcome as calculated by a Monte Carlo simulation assuming random guessing. $\chi^2 = 118$, $df = 5$, $P < 0.0001$

Results

The number of correct guesses, i.e. guessed pairs of photographs corresponding to actual owner–dog pairs, was far larger than expected by random guessing in most experiments (Table 1). The exception was group C, composed of female owners, where test subjects were unable to guess owner–dog pairs above random. Guessing pairs when both female and male owners were presented was significantly higher than when only male or female owners were present in the photographic samples ($P < 0.001$, ANOVA with *t*-test). The more sophisticated statistical test, comparing the pattern of correct guesses achieved by our test subjects with that predicted for random guessing by a Monte Carlo simulation (Fig. 2), confirmed that test subjects were far better than random at guessing the ownership of dogs based exclusively on photos of dog and human faces (observed vs expected frequencies: $\chi^2 = 90.2$, $df = 5$, $P < 0.000001$).

No statistically significant differences could be found between the age and/or sex of the test subject and the number of pairs guessed correctly (ANOVA: not significant, $F_{3,199} = 0.07$).

Discussion

Our results show that human pet-owners and their dogs resemble each other significantly more than expected for random pair formation, and that this resemblance can be detected by neutral judges (test subjects). During the review process of the present article, Roy and Christenfeld (2004) published a similar study, examining whether the frequent casual reports of people resembling their pets are accurate by having observers attempt to match dogs with their owners. They found that observers were able to match only

Table 1. Statistical results, comparing the outcome of random guessing to that scored by test subjects guessing owner–dog pairs from photographs of dogs and faces of human owners

Group	χ^2	*P*	*df*
A: Males	31	<0.03	18
B: Males	45	<0.0005	18
C: Females	10	0.93	18
D: Females	42	<0.002	18
E: Both sexes	81	<0.0001	18
F: Both sexes	79	<0.0001	18
Total	288	<0.0001	113

purebred dogs – not mixed raced ones – with their owners, and that there was no relation between the ability to pair a person with his or her pet and the time they had cohabited. In our study, we used a much wider range of ages and races for both pet owners and judges, and used only the face of the dogs as signals for judges. Thus, both studies complement each other, as between both they cover a larger range of ages, human races and cultures. The addition of both studies make the suggestion that humans apply an algorithm of "self seeks like" a much stronger one. No biologically relevant explanation of the adaptive reasons for the use of this algorithm was provided by Ray and Christenfeld (2004).

Jaffe (2002) suggested that if assortative mating was indeed a winning evolutionary strategy, a testable prediction to possibly falsify the self seeking like hypothesis is that this narcissistic criterion should be applied to many other situations in human everyday life involving aesthetic or affective assessments. Clearly, the choice of pets seems to follow this criterion. Thus, narcissism is very likely to be an important base for mate selection and other derivate behaviours for human choices.

Contributing to the discussion if human mate-choice strategies are based on an algorithm of self seeking like, or rather the outcome of competition for the most attractive partner available, our results give support to the first alternative. The results presented here are completely compatible with the notion that humans develop a sense of beauty through imprint- like mechanisms. This sense of beauty must have a strong narcissistic component, as it is formed through the images of the parents, as was discussed in the introduction. When this sense of beauty is applied to mate selection, the outcome is assortative mating.

The present study and the fact that these narcissistic criteria seem to be applied not only to mate selection, but also to situations where no pairs for reproductive purposes are involved, such as in the choice of partners for business purposes (DeBruine 2002), strongly support this narcissist hypothesis.

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