

Sex differences in mate preferences: Testing some predictions from evolutionary theory

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Hypotheses of evolutionary psychologists concerning the mate choice and sex differences in preferred mate characteristics have been tested in various cultures. In this paper some of the basic assumptions that can be drawn from famous Trivers' theory of parental investment and sexual selection are tested on a Croatian sample. The theory predicts sex differences when it comes to choosing a mate due to different parental investment in offspring. Females are expected to be choosier than males and to seek a reliable partner who has the resources and is willing to invest them in potential offspring (in order to increase their survival), while males should mostly seek a healthy and reproductively capable partner. The basic assumptions derived from the theory received empirical support: men seek short-term mates more than women do; sex differences were found in rankings of desirability of certain characteristics of a potential mate, as well as in his/her preferred age; more men than women would express sexual vs. emotional jealousy.

Keywords: mate preferences, sex differences, evolutionary psychology

The main topics of investigations in evolutionary psychology are evolved psychological mechanisms - adaptations, constructed by natural selection over evolutionary time. It is assumed that the evolved structure of human mind is adapted to the way of life of Pleistocene hunter-gatherers, and not to our modern circumstances, due to the fact that the evolution of complex design is a slow process when contrasted with historical time (Cosmides, Tooby, & Barkow, 1992). In order to consider the specific behaviors, it is necessary to analyze what selection pressures are most relevant for understanding the adaptive problem, and what psychological mechanisms have evolved to solve that adaptive problem.

In recent years there has been a surge of interest among evolutionary psychologists in the topic of human mate choice. Trivers' theory of parental investment (1972), derived from Darwin's theory of sexual selection (1871), heavily influenced the research in this field, primarily by launching the strong theoretical and empirical focus on sex differences in human mating strategies. Mating strategies

are integrated sets of adaptations that organize and guide an individual's reproductive effort. They influence how individuals select mates, how much mating effort they expend, etc. Those strategies are not necessarily formulated consciously or even accessible to awareness. Buss and Schmitt (1993; pp. 206) define them as "*evolved solutions to adaptive problems, with no consciousness or awareness on the part of the strategist implied*". Due to different selective pressures and adaptive problems posed to men and women, their strategies tended to evolve differently. The main difference stems from the fact that women's investment in offspring is larger than men's, starting from conception, through potentially risky pregnancy, to breastfeeding and upbringing the children. Therefore, it can be assumed that women will be more discriminating or selective about mating, while men will be more competitive for sexual access to women.

Many studies found differences between the sexes in the relative importance they place on specific traits in long-term partners (Kenrick, Sadalla, Groth, & Trost, 1990; Buss & Schmitt, 1993; Buss, 1999). It has been repeatedly shown that women exhibit a stronger preference than men for attributes of ambition, social status and financial wealth in partner, as well as for a desire for children and commitment to family, which are indicative of the partner's ability to acquire and invest the resources necessary for the survival of offspring). Men exhibit a stronger preference than women for indicators of youthfulness, health and physical

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attractiveness, which are indicative of high reproductive potential, as well as for indicators of sexual fidelity, which are important because of the high costs for men who are cuckolded (Feingold, 1992; Buss & Schmitt, 1993; Waynforth & Dunbar, 1995; Buss, 1999). The later also seems to be the cause of sex differences in jealousy: men are more often jealous about their partner's potential sexual infidelity, while women are more concerned with their partner's emotional infidelity. A woman's sexual infidelity could reduce her partner's reproductive success, either because of his losing the opportunity to reproduce or because of his investment in genetically unrelated offspring ("cuckoo's egg" effect).

Studies also report of men's greater tendency to pursue short-term relationships, as compared to females', which is also considered to be a consequence of females' larger investment in the offspring, meaning that women's engagement in a short-term relationship carries a higher risk (Clarke & Hatfield, 1989; Buss & Schmitt, 1993). Women in evolutionary history risked getting pregnant as a result of such a relationship, suffering a severe cost of raising a child on their own in harsh circumstances, which could result in lower probability of their children surviving to reproductive age. Modern birth control enables women to have short-term sexual encounters with less fear of pregnancy, however, although the current environment has changed, we still possess the adaptive mechanisms evolved for coping with the adaptive problems of our ancestors.

The aim of this study was to test some of the basic assumptions of evolutionary theories of mate selection, such as:

- 1) Men will more often than women seek short-term relationships;
- 2) Rankings of desirability of some characteristics of a potential mate will differ between sexes; women will place greater value on financial prospects of a potential partner, while men will place greater value on physical attractiveness;
- 3) Irrespective of their own age, men will prefer women still in reproductive age;
- 4) Men will more often express sexual, and women emotional jealousy, irrespective of the level of commitment that they have made to their current partner.

METHOD

Instruments and procedure

To test these assumptions, we have used a questionnaire partly based on the well-known Buss' instrument (Buss, et al., 1990). It consists of three parts. The first part requested

biographical data, including age, sex, income, marital status, self-rating of physical attractiveness, sexual orientation, preference for a long-term vs. short-term relationship and preference for a potential partner's age.

In the second section subjects were asked to rank 13 characteristics (*Intelligent, Physically attractive, Kind and understanding, Exciting personality, Healthy, Easygoing, Creative and artistic, Wants children, Good housekeeper, College graduate, Good heredity, Good earning capacity, Religious*) regarding the importance or desirability of each of them in choosing a mate.

The third section included a hypothetical situation which could provoke either emotional or sexual jealousy, and the subject was asked to choose between one of those outcomes. The instruction was: "Think of a relationship that you have had in the past, have now, or would like to have. Imagine that you have just discovered that your partner is interested in someone else. Which would upset or hurt you more: a) the thought of your partner being emotionally involved with that person, or b) the thought of your partner being sexually involved with that person?"

This questionnaire was presented on the internet, to collect relevant information on factors in choosing a mate on a broad Croatian sample.

Participants

2987 subjects completed the questionnaire. For the purpose of this article, only the results of those who reported themselves as being heterosexual were included in subsequent analyses (2636 subjects, 1672 of them female and 964 male). Their age span was 14-62 years, mean age being 27.8 ($SD=6.6$) years. 18.5 % of our respondents have only high-school education, 30% of them are students, 43.8% have a university degree, and 7.6% have a Master's degree or PhD.

RESULTS

Our first hypothesis was that men would more often than women seek short-term relationships. To test this hypothesis we conducted a chi-square test to determine whether the proportions of men and women currently seeking those two types of relationships were different. The results are shown in Table 1.

As can be seen from the table, although more of both men and women reported their greater interest in long-term relationship, proportions of males and females within a category of certain type of relationship were different ($\chi^2(1, N=2627) = 77.329; p < .001$).

Table 1

Sex differences in current preferences for long-term vs. short-term relationship

	Male	Female	Total
Short-term	23.5% (n=226)	10.6% (n=177)	15.3% (n=403)
Long-term	76.5% (n=737)	89.4% (n=1487)	84.7% (n=2224)

To test the second hypothesis we conducted an ANOVA on the mean rankings of 13 characteristics of a potential partner. The results are shown in Table 2.

The mean rankings of the 9 of 13 characteristics of a potential mate significantly differed between the sexes ($F(1,2514) = 31.89, p < .001$). The rankings of all the characteristics are shown in Table 3, for men and women separately.

Regarding the third hypothesis about the preferred age difference between oneself and a partner, we conducted ANOVA which showed the significant main effects of age ($F(4,2608) = 151.42, p < .001$), sex ($F(1,2608) = 749.23, p < .001$), as well as the significant interaction age x sex ($F(4,2608) = 66.98, p < .001$), which is shown in Figure 1.

We also postulated the differences in the type of jealousy more frequently experienced by men and women. As

Table 2

Sex differences in mean rankings of the characteristics of potential mates

	Mean Rank				F
	Males		Females		
	M	SD	M	SD	
Intelligent	3.26	2.22	3.00	2.07	9.42*
Physically attractive	3.39	2.43	4.29	2.72	71.5**
Kind and understanding	3.60	2.68	2.84	2.39	56.66**
Exciting personality	4.45	3.05	4.64	3.23	2.34
Healthy	5.63	3.21	6.08	3.34	11.69**
Easygoing	6.05	2.93	6.42	2.96	10.02*
Creative and artistic	6.93	3.31	7.50	3.39	17.29*
Wants children	7.49	3.46	7.32	3.3	1.43
Good housekeeper	8.49	3.1	9.42	2.96	57.37**
College graduate	8.47	4.25	7.65	3.1	32.28**
Good heredity	9.10	3.0	9.31	3.0	3.06
Good earning capacity	9.53	4.15	8.32	2.92	75.71**
Religious	10.46	4.85	10.24	3.66	1.73

* $p < .01$; ** $p < .001$

Table 3

The rank order of the characteristics of potential mates

Rank	Rankings by Males	Rankings by Females
1	Intelligent	Kind and understanding
2	Physically attractive	Intelligent
3	Kind and understanding	Physically attractive
4	Exciting personality	Exciting personality
5	Healthy	Healthy
6	Easygoing	Easygoing
7	Creative and artistic	Wants children
8	Wants children	Creative and artistic
9	Good housekeeper	College graduate
10	College graduate	Good earning capacity
11	Good heredity	Good heredity
12	Good earning capacity	Good housekeeper
13	Religious	Religious

can be seen from Table 4, although the subjects of both sexes will more often express emotional jealousy, the proportions of males and females within a category of certain type of jealousy were different ($\chi^2(1, N=2627) = 179.327, p < .001$).

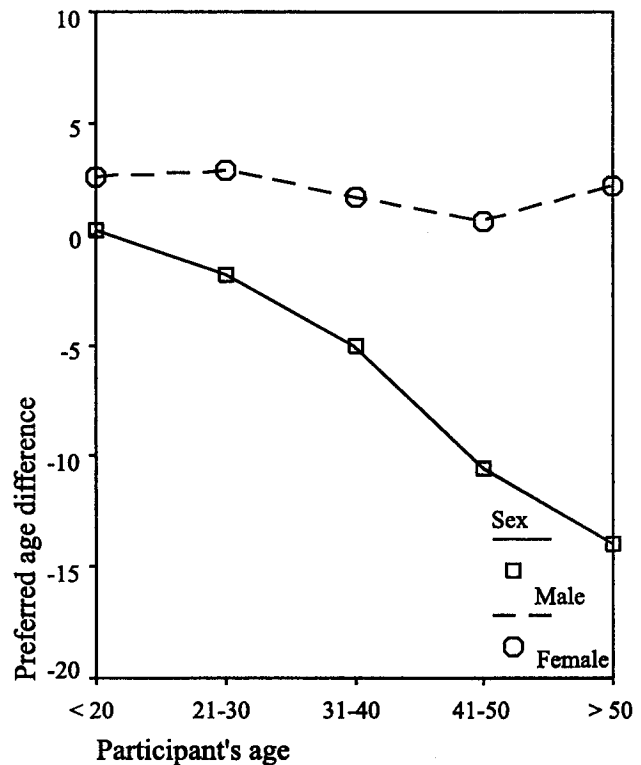


Figure 1. Sex differences in preferred age of a potential partner

Table 4
The expression of emotional vs. sexual jealousy
by males and females

	Male	Female	Total
Emotional jealousy	70.7% (n=682)	90.8% (n=1519)	83.5% (n=2201)
Sexual jealousy	29.3% (n=282)	9.2% (n=153)	16.5% (n=435)

Table 5
The expression of emotional vs. sexual jealousy by males
with different levels of commitment

	Married	Unmarried, with a partner	Unmarried, without a partner
Emotional jealousy	72.3% (n=107)	69.6% (n=265)	71.3% (n=296)
Sexual jealousy	27.7% (n=41)	30.4% (n=116)	28.7% (n=119)

To test the assumption that males with greater degree of commitment (who already invested more in a relationship) might express different pattern of jealousy compared to the one expressed by males with lesser degree of commitment, we compared men who are married with those who are unmarried with a partner and those without a partner. As can be seen in Table 5, these three groups showed no statistically significant differences ($\chi^2(2, N=953) = 501, p = .778$).

DISCUSSION

Short-term vs. long-term relationship

Although the vast majority of our participants of both sexes reported to be more interested in long-term relationship (84.7%), there were significant sex differences in proportions of males and females within a category of certain type of relationship: 89.4% females vs. 76.5% males reported to be interested in long-term relationship, which is in accordance with predictions of relatively greater male interest in short-term relationships. According to Symons (1979; cited in Buss & Schmitt, 1993; pp.208), "Men may have evolved over human evolutionary history a powerful

desire for sexual access to a large number of women", which is a prediction based on a cost-benefit analysis of what is optimal mating behavior for men and women during our evolutionary history: males can benefit more from attempting to attract multiple mates because it could enhance their reproductive success. This assumption received empirical support: men do, on average, desire and seek short-term mates more than women do. Those sex differences range from moderate to extreme, depending on the type of measure that is being used: questionnaires tend to show greater sex differences, but behavioral evidence of extramarital affairs (even in the most restrictive societies) show that women are not so unlikely to engage in short-term mating (Feingold, 1992; Buss, 1999). This can also be seen from our results: although the proportion of men who reported that they are currently interested in short-term relationship is significantly greater than that of women ($p < .001$), the extent of those differences is not so extreme (23.5% vs. 10.6%). This could be due to the fact that our sample consists mostly of the young adult participants (mean age 27.8 years), with completed higher education (51.4% with a university degree or higher) who have reached the stage in their lives in which they are supposed to find a long-term partner and start a family of their own.

Furthermore, it is not to be expected that evolved cognitive mechanisms that humans possess function in an "all or nothing" manner: stable, long-term relationships were necessary during human evolutionary history in order to increase survival of the offspring, but both males and females can gain certain benefits from occasional short-term relationships. Whereas for males there is an obvious benefit in spreading their genes through multiple partners, for women those benefits might have occurred through gaining protection and resources from several men, as long as there was a possibility of paternity (Blaffer Hrdy, 2000).

Desirability of a potential mate's characteristics

We expected sex differences in rankings of desirability of characteristics of a potential mate. The main predicted difference was that women will place greater value on financial prospects of a potential partner, while males will place greater value on partner's physical attractiveness. Those expectations were only partially confirmed: males do rank *Physical attractiveness* as more important (mean rank 3.39) than females (mean rank 4.29), but this trait was fairly highly ranked by both sexes. Similarly, *Good earning capacity* was ranked higher by females (mean rank 8.32) than by males (mean rank 9.53), but had relatively low rank in both sexes. As can be seen from Table 2, sex differences in mean rankings of potential mate's characteristics were statistically significant for 9 of 13 variables. The rankings of all the characteristics are shown in Table 3, for men and women separately: variables *Intelligent*, *Physically attractive*, *Kind and understanding* have the highest ranks in both

sexes, while the variable *Religious* is the least important for both sexes.

The greatest sex differences in mean rankings were found for the characteristics: *Good earning capacity*, *Kind and understanding* and *College graduate* ranked higher by women, and *Physically attractive* and *Good housekeeper*, ranked higher by men. Sex differences in mean rankings of characteristics *Intelligent* (ranked higher by women), *Healthy*, *Easygoing* and *Creative and artistic* (ranked higher by men) were also statistically significant, but effect sizes for those characteristics were rather small (Table 2). These rankings are in accordance with the predictions based on the evolutionary theory of mate preferences (Buss & Schmitt, 1993; Gangestad & Simpson, 2000). Women prefer men who are educated and financially prosperous (which indicates their high social status and possession of resources) and at the same time ready to share those resources with the partner and eventual offspring. As for the argument that women traditionally earn less than men, and that this could be a cause of such differences, it has been shown that this preference did not change if a woman had her own resources: female students who expected to have a high income in future placed greater value on partner's financial capacity than students who expected to have lower income (Wiederman & Allgeier, 1992). Men, on the other hand, prefer women who are physically attractive, which can be interpreted as a sign of youth, good health and fertility, and who are also good housekeepers, meaning that they will take good care of home and family and thus ensure the conditions for the survival of the offspring.

It can be argued that this preference evolved as the adaptation to the requirements of life in Pleistocene conditions, when men were out hunting, providing food, while women tended to home and children. According to Trivers' (1972) theory of parental investment, females should seek to mate with males who show the ability and willingness to invest resources (food, shelter, territory) and protection. Woman with such a partner has a selective advantage because of several factors: immediate material advantage to her and her offspring, increased reproductive advantage to offspring through acquired social and economic benefits, and genetic reproductive advantage for herself and her offspring if the partner's features (both genetic and economic) are partly heritable. As humans often mate at the age when man's potential resources are not fully known or developed, females often rely on cues predicting his economic success, such as ambition and intelligence. The ability to acquire resources, however, does not necessarily yield information about a male's willingness to devote those resources to a particular female and her offspring. It has been speculated that expressions of love and kindness (Buss, 1992) may provide reliable cues for such intentions.

The reproductive success of males is limited by sexual access to reproductively valuable or fertile mates. Therefore, selection should favor those males who prefer to mate

with reproductively capable females. As fertility is not directly observable, men should seek the cues such as youthfulness and physical features indicative of health (smooth and clear skin, healthy hair, white teeth, etc.). The physical attractiveness should therefore be of greater importance for men than for women, as women's reproductive success is not limited by the problem of obtaining fertile mates (Buss & Schmitt, 1993; Buss, 1999). But the woman's reproductive capability is not the only prerequisite for the man's reproductive success – he should also consider woman's characteristics important for the survival of his offspring, such as nurturance or fidelity, which will be discussed later.

Age preferences

Preference for a partner of certain age is probably one of the most striking sex differences in human mate preferences. It has been shown in various cultures (Kenrick & Keefe, 1992; Buss, 1999) and with a consistent pattern: males tend to choose partners younger than themselves, and as they grow older, the preferred age difference increases. As can be seen from Figure 1., our results are consistent with this: there are significant main effects of age and sex, as well as their interaction. Women of all ages prefer partners that are on average 2-3 years older than them, while males as they grow older prefer younger and younger partners. This preferred age difference becomes most apparent in age groups over 40, when males seek partners 10-15 years younger than themselves! Obviously, the question to be answered is why that is so, or, in terms of evolutionary functional analysis: what kind of adaptive problems (selection pressures) were these preferences designed to solve?

The answer probably lies in different age span during which males and females can be reproductively successful. While males can reproduce during most of their adult period (as far as biology is concerned, since they reach sexual maturity in puberty, and continue to be fertile until they die), females have a limited time period during which they can conceive and bear children. They are reproductively most fit in their early twenties and their fertile period ends when they reach menopause, which is for most women between their forties and fifties (Seeley, Stephens, & Tate, 1999). This is precisely the age span which males, irrespective of their own age, report to be the ideal age of the potential partner: she has to be in her reproductive period.

Females, on the other hand, prefer partners a few years older than themselves. It usually takes some time for males to reach certain position in social hierarchy and acquire resources that go with it, so the older the male, the greater are the chances that he has resources to invest in her and her (their) offspring (just for illustration, the Pearson correlation coefficient between age and income of men in our sample was $r=.56$; $p<.001$). On the other hand, as human

offspring need quite a long period of time to fully develop and become independent, she must ensure a partner who will be capable of investing and helping in raising the children during that time. Therefore, the partner who is too old wouldn't be the best choice. That's where the females' capability of detecting a male's potential for gaining the resources (e.g. financial prospects) steps in (as discussed previously, concerning the importance of potential partner's characteristics).

Jealousy

In a long-term relationship, sexual infidelity by a female might result in decreased paternity confidence for her partner, as it is possible that such infidelity might result in conception and pregnancy. In that case, her partner would risk investing time and resources in a genetically non-similar offspring, thus reducing his own reproductive success. Not only has he lost the considerable efforts he has devoted to this female, but the time spent courting her could have been better spent finding another. That is the reason for evolutionary theorists to posit that males should express greater sexual jealousy than females (e.g. Buss, Larsen, Westen, & Semmelroth, 1992). Females, on the other hand, can always be certain of their genetic similarity with the offspring, and should therefore express lesser sexual jealousy than men. However, if emotional affection can be an indicator of man's willingness to invest in woman and her children, it can also be the reason for females to be more upset by the possibility that their partner is being emotionally unfaithful. Sexual infidelity doesn't necessarily mean that a man is going to redirect his resources to the other partner, while emotional attachment with another woman could result in just that.

Our results are consistent with the prediction that more men (29.3%) than women (9.2%) would express sexual jealousy, but if we look at the whole sample, irrespective of sex, it can be seen that majority of our participants reported being more upset by the idea of their partner's emotional infidelity (83.5%).

This result is somewhat different from the Buss' report (1992) where 60% of men and only 17% of women reported being more upset by their partners' sexual infidelity. Our results are more similar to those obtained by Buunk, Angleitner, Oubaid and Buss (1996), or Schützwohl and Koch (2004) on German samples. It could be argued that cultural differences can influence the strength of the adaptive response, but we were also wondering about the structure of the sample considering their current commitment. One of the problems in jealousy research, as pointed out by some authors (Wiederman & Allgeier, 1993), is that most studies have used students rather than people in long-term romantic relationships. Indeed, it can be assumed that the amount of the resources already invested in a long-term partner

could influence the type of jealousy, meaning that males in long-term relationships would exhibit more sexual jealousy because they stand more to lose. To test this assumption we decided to compare the type of jealousy expressed by males with different degree of commitment: unmarried without a partner, unmarried with a partner or married. These three groups showed no differences whatsoever: the percentage of men expressing sexual jealousy varied from 27.7% to 30.4% and these differences were statistically insignificant (Table 5). This shows that the abovementioned objection about the methodological constraints considering the student samples does not stand.

It can be concluded that our results confirm the main prediction that males would be much more likely to choose the sexual infidelity as more upsetting. Although this response is found cross-culturally, the magnitude of the effect varies among cultures.

CONCLUSION

The results of this study confirmed some of the main predictions about sex differences in mate selection strategies and mate preferences that can be drawn from Darwin's theory of sexual selection (1871) and Trivers' theory of parental investment (1972) on a broad Croatian sample. As with other studies in which results are being collected via internet, there might be various methodological constraints, such as the bias in sampling process. Although such a bias surely exists, due to the relatively small proportion of Croatian population with access to internet, the participants in this study reported to be from various socio-economic backgrounds, having different levels of education, and their age span is wide. Evolutionary psychology postulates that some cognitive mechanisms should be universal (universality of sex differences is, in fact, one of the strongest arguments against social deterministic explanations of these differences!) and therefore the potential biases in sampling process shouldn't have affected these results. What should be done in future studies is to take into account behavioral measures and see how much the preferences existing in self-reports actually influence the mate choice.

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