

MATE CHOICE TRADE-OFFS AND WOMEN'S PREFERENCE FOR PHYSICALLY ATTRACTIVE MEN

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Researchers studying human sexuality have repeatedly concluded that men place more emphasis on the physical attractiveness of potential mates than women do, particularly in long-term sexual relationships. Evolutionary theorists have suggested that this is the case because male mate value (the total value of the characteristics that an individual possesses in terms of the potential contribution to his or her mate's reproductive success) is better predicted by social status and economic resources, whereas women's mate value hinges on signals conveyed by their physical appearance. This pattern may imply that women trade off attractiveness for resources in mate choice. Here I test whether a trade-off between resources and attractiveness seems to be occurring in the mate choice decisions of women in the United States. In addition, the possibility that the risk of mate desertion drives women to choose less attractive men as long-term mates is tested. The results were that women rated physically attractive men as more likely to cheat or desert a long-term relationship, whereas men did not consider attractive women to be more likely to cheat. However, women showed no aversion to the idea of forming long-term relationships with attractive men. Evidence for a trade-off between resources and attractiveness was found for women, who traded off attractiveness, but not other traits, for resources. The potential meaning of these findings, as well as how they relate to broader issues in the study of sex differences in the evolution of human mate choice for physical traits, is discussed.

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Men have been shown to focus on a number of cues inherent in a woman's physical appearance when choosing mates, including facial averageness, waist-to-hip ratio, and extreme secondary sexual traits (Johnston and Franklin 1993; Langlois and Roggman 1990; Singh 1993). Many of these features are theorized to be markers of good genes (e.g., Thornhill and Gangestad 1999a). The abundance of such cues in women has led researchers to suggest that they have shaped men's preference for physically attractive mates, and that this is the underlying cause of the sex difference in the importance of physical attractiveness in humans (Buss 1999; Symons 1979). This sex difference is well documented: men have been found to value the physical attractiveness of potential mates more than women do in a large number of studies conducted in varying geographical contexts (e.g., Bersheid and Walster 1974; Buss 1989; Waynforth and Dunbar 1995; Weiderman 1994; cf. Oda 2001).

Some attractive female traits appear to be markers of age or reproductive value, and given this, it is possible that female physical attractiveness is especially important to males for the information that it contains about age. However, women also have clear preferences for male age in mate choice, and they tend to prefer men who are older than themselves (e.g., Kenrick and Keefe 1992; Waynforth and Dunbar 1995). Ultimately, it is unclear whether the female body form contains significantly more useful information about mate value than the male body form does.

Studies concerning women's mate-choice preferences overwhelmingly suggest choice for economic or food resources (e.g., Buss 1989), which, in traditional human societies in particular, are significantly associated with high reproductive success (e.g., Borgerhoff Mulder 1987; Hill and Hurtado 1996). Studies underlining the importance to women of certain aspects of male physical attractiveness have also been steadily emerging. For example, one component of physical attractiveness is low fluctuating asymmetry (FA), which signals resistance to antisymmetrical forces in the form of environmental and genetic perturbations during growth and development (Parsons 1990). Low levels of FA are associated with ratings of physical attractiveness (Gangestad et al. 1993; Mealey et al. 1999; Singh 1995), mating and reproductive success in human males (e.g., Thornhill and Gangestad 1993; Waynforth 1998), as well as disease resistance (Waynforth 1998). Among other traits, women have also been shown to have mating preferences for male stature—specifically, a preference for tall men (Husain and Firdous 1990; Pawlowski et al. 2000)—and for men with mascu-

line (testosterone-rich) facial features (Cunningham et al. 1990; cf. Perrett et al. 1998).

A RESOURCES VERSUS ATTRACTIVENESS TRADE-OFF APPROACH TO FEMALE MATE CHOICE

Overall, mate-choice research shows that both male physical attractiveness and access to resources are favored by women and are linked to indicators of increased reproductive success. This suggests that women may have to trade off these characteristics when choosing a mate, while men do not. The purpose of the present research was to explore the potential trade-off between choosing a man with financial resources and one who is physically attractive. A simple test of whether the sex difference in the importance of finding a physically attractive mate results from a trade-off is to discover whether or not the sex difference disappears when the trade-off is experimentally removed from women's mate choice decisions. If women do indeed focus as much on physical attractiveness as men when the resources versus attractiveness trade-off is removed, it would imply that this trade-off is the underlying cause of the sex difference, and that women possess the flexibility to adjust their preferences in such a way that would be likely to maximize fitness. Women who are not able to adjust their focus toward seeking attractive mates should have lower reproductive success than women who place a premium on both, because they will lose the genetic benefits for their offspring of choosing the most physically attractive available man. This situation could occur if, for example, resources do not differ significantly between available men. Hence, the present study aims to address whether women seek attractiveness at a fixed level that is lower than that of males, regardless of conditions, or alternatively whether without a trade-off with resources women are able to raise their emphasis on physical attractiveness. This may illuminate whether the brain mechanisms that evolved to assess attractiveness contain flexibility likely to lead to fitness maximization under a number of conditions. The alternative is that women have evolved a fixed solution to the resources versus physical attractiveness trade-off which deemphasizes attractiveness (compared with men) in favor of resource seeking.

A number of researchers have found evidence for context-dependent mating preferences (e.g., Gangestad and Buss 1993; Low 1988; Waynforth and Dunbar 1995). Some prior evidence suggests that women can flexibly vary their emphasis on male physical attractiveness. Women's preference for facial masculinity changes over the course of the menstrual cycle (Penton-Voak et al. 1999). In the context of short-term relationships, which almost by definition contain less opportunity for resource flow to the

woman and her offspring, women adjust their demand for physical attractiveness in men upward (Buss and Schmitt 1993). However, a number of studies apparently contradict adaptive flexibility in mate choice preferences: two studies have shown that women who earn more money, or are likely to in the future, do not reduce their demand for resources in potential mates (Buss 1989; Weiderman and Allgeier 1992).

AVOIDANCE OF MEN WHO MAY DESERT A RELATIONSHIP

If women still place less importance on physical attractiveness despite removal of the attractiveness versus resources trade-off, past findings on sex differences in seeking physically attractive mates and women's focus on attractiveness in short-term relationships might be explained by an alternative hypothesis: women may avoid physically attractive men because attractive men may be more likely to desert the relationship, or have extra-pair sex partners. Therefore, the fitness gain of mating with a physically attractive man could be offset by the risk of loss of male parental support of offspring. As stated above, men with low FA tend to have higher mating success. This implies a higher likelihood of mate desertion. Other evidence suggests less investment by attractive men without actual mate desertion: in a sample of Mayan men in rural Belize, Waynforth (1999) found that facially attractive men spent less time with their family (and kin in general). Additionally, from an optimality modeling perspective, if attractive men get higher returns for the time they spend seeking copulations (i.e., more copulations per unit of time spent searching for mates), they should always devote more time to mating (than parenting) effort (Waynforth 1999). Men also have to consider the risk of mate desertion, and attractive women might be more likely to cuckold their husband. However, men employ a number of mate retention tactics to control female infidelity when they perceive it to be likely, whereas women do not or cannot (Buss and Shackelford 1997), which may produce a sex difference in mating strategies.

METHODS

A methodological approach which has been used to attempt to isolate the relative importance of mate choice variables uses limited budgets of "mate choice points" that can be assigned among characteristics (Li et al., under review). This approach is useful for attempting to find trade-offs. In this case, women can be asked to allocate mate choice points to the physical attractiveness of potential mates with male resources in their decision,

as well as without having to allocate points to male resources. Specifically, students enrolled in an undergraduate level anthropology class approached 93 female and 61 male acquaintances (mean age = 27.3) residing in Albuquerque, New Mexico. Subjects were asked first to assign a budget of 25 points among the following characteristics of a potential long-term mate: physical attractiveness, two resource cues (willingness to work hard and educational attainment), being the preferred age, and being a good companion. Second, they were asked to assume that all of the potential pool of partners were both hardworking and well educated, so they did not have to worry about these things, and to assign a budget of 25 points among physical attractiveness, creativity, being easygoing, being the preferred age, and being a good companion. These latter traits were chosen because prior work indicated that there is no sex difference in their importance, and that they are important in mate choice in the U.S. The expectations were that in the first scenario men would place more of their points on physical attractiveness than women. In the second scenario it was expected that women would tend to place the points that they had assigned in the first task to working hard and educational attainment on physical attractiveness, and there would no longer be a sex difference in the number of points assigned to physical attractiveness.

If women do not change their emphasis on physical attractiveness when resources are removed from the decision, the alternative hypothesis that to some extent women avoid long-term relationships with physically attractive men because attractiveness has to be discounted by the probability of mate desertion will seem plausible. It can, however, be tested more directly. For this hypothesis to be correct, women should rate physically attractive men as more likely to desert and seek extra-pair copulations, and should show some positive sign that they would avoid attractive men for long-term relationships. To test this, the subjects were shown five facial photographs of members of the opposite sex. These photographs were drawn from samples of 100 women's and 70 men's photographs that had been rated for facial attractiveness for use in previous studies by Thornhill and Gangestad (1999b) and Waynforth (unpublished data). The chosen photographs represented individuals of each sex at the 1st, 25th, 50th, 75th, and 100th percentiles for facial attractiveness. To control for any potential bias introduced by variation in skin color, two photographs of darker-skinned subjects were replaced with the most closely rated photograph. Subjects ranked the five opposite-sex photographs according to how likely they felt each of the photographed individuals would be to desert or cheat on them in a long-term relationship. They were then told that they could meet the five individuals at a party and were instructed to rank the photos according to the order in which they would approach

them to initiate a conversation with the goal of a long-term sexual relationship in mind.

RESULTS

As predicted, with the trade-off between resources and attractiveness in place, men assigned more of their budget to physical attractiveness in a mate than women did ($t = -2.98, p < 0.01$). Women placed greater importance on finding a hardworking mate ($t = 4.40, p < 0.001$), but not on educational attainment ($t = 1.78, p < 0.1$). The effects of the removal of the trade-off between resources and physical attractiveness can be seen in Figure 1.

The removal of the trade-off was examined statistically by analyzing the sex by trade-off interaction using analysis of variance for repeated measures. The interaction effect was statistically significant for attractiveness (interaction effect: $F = 4.23, p < 0.05$; main trade-off effect: $F = 4.61, p < 0.04$; main sex effect: $F = 3.32, p < 0.07$). Additional analysis of the attractiveness data was performed using a within-subjects test of the difference in number of points assigned to attractiveness with the trade-off in place minus the number without the trade-off. The result was consistent with the analysis above: women added points to attractiveness without resources in their budgeting decision ($t = 2.10, p < 0.05$).

Interaction effects were not significant for age preferences or companionship (for age, interaction effect: $F = 0.92, p < 0.34$; main trade-off effect: $F = 1.98, p < 0.16$; main sex effect: $F = 2.75, p < 0.10$; for companionship, interaction effect: $F = 0.92, p < 0.34$; main trade-off effect: $F = 0.43, p < 0.52$; main sex effect: $F = 15.63, p < 0.0001$). The significant main sex effect for companionship was not predicted, nor was its importance relative to those of physical attractiveness and age. Men sought companionship more than women did, whereas women placed more of their budget on preference for easy-going mates ($t = 2.10, p < 0.05$).

The above results are not consistent with the alternative hypothesis, that women avoid long-term unions with very attractive men to try to avoid mate desertion. This is because such an adaptation would be likely to suppress women's desire for attractiveness regardless of any trade-off in mate choice between attractiveness and resources. However, women were more likely to rank the most attractive men as also being the most likely to desert the relationship or cheat on them (Figure 2). This did not lead to reduced willingness of women to say that they would approach the most attractive men at a party; indeed, women were more likely than men to choose the individual with the highest attractiveness rating ($\chi^2 = 24.05, df = 1, p = 0.001$).

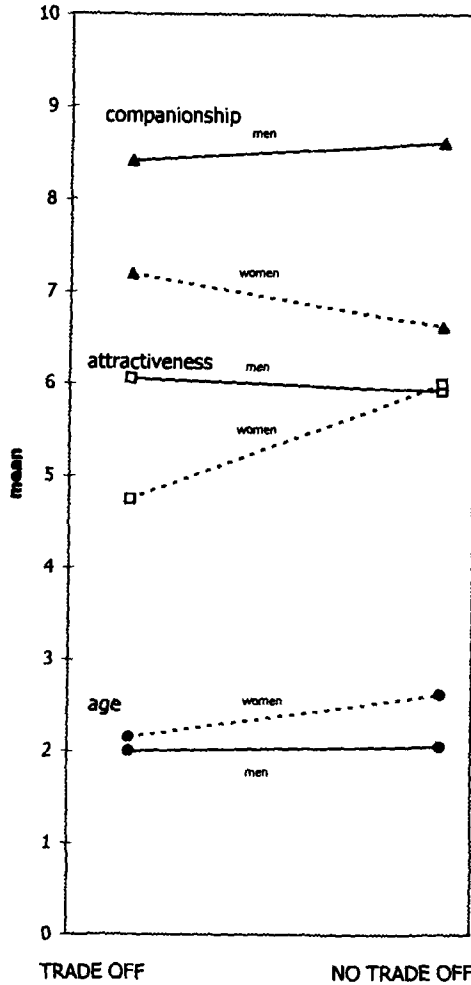


Figure 1. Interaction plot showing change in mean number of mating budget points assigned to physical attractiveness (squares), companionship (triangles), and age (circles) when cues to financial resources are removed from the decision. As predicted, when not having to trade off physical attractiveness with resources, women increased their emphasis on physical attractiveness.

DISCUSSION AND CONCLUSIONS

Most of the published literature on human mate choice suggests that men place more importance on physical attractiveness in a mate than women do. This has been interpreted to mean that physical attractiveness

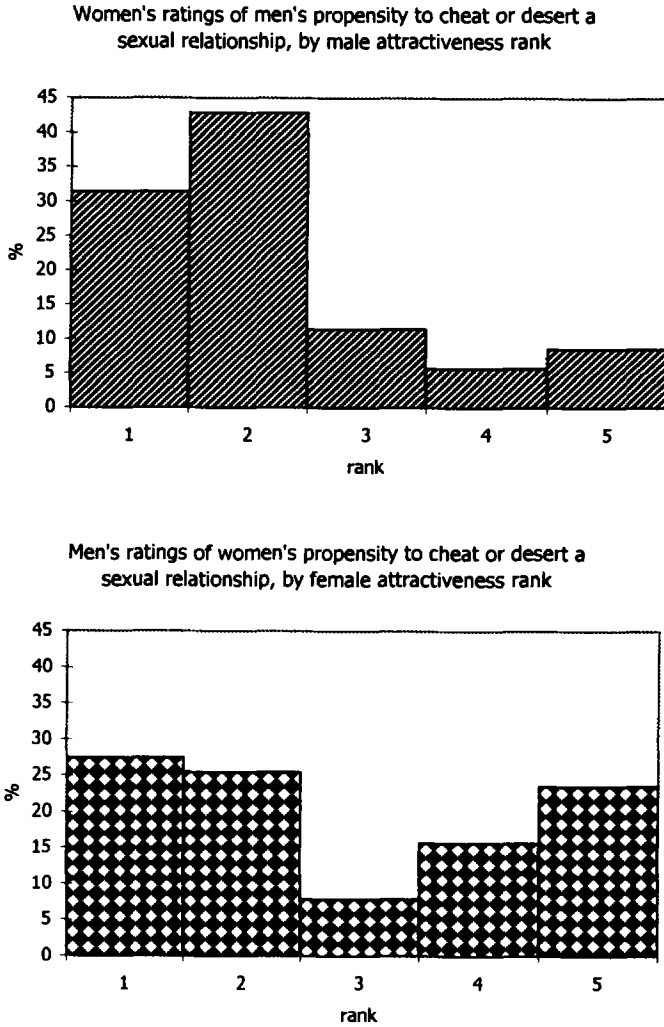


Figure 2. Bar charts showing the percentage of subjects who rated each of the five opposite-sex stimulus photographs as the most likely to desert a sexual relationship or have extra-pair sex. Women were more likely to rate attractive men as most likely to desert ($\chi^2 = 10.44$, $df = 4$, $p = 0.034$, $n = 121$).

contributes less to male mate value than it does to female mate value. The results presented here support the idea that women trade off physical attractiveness for resources, which could explain why women focus on attractiveness less than men, and why attractiveness comprises a smaller part of mate value in men. The results indicate that women may be able to adjust the importance of individual traits to maximize fitness. It could appear to be a moot argument, since at first glance women necessarily require significant resources from their mate and therefore will always emphasize resources at the cost of physical attractiveness. However, this situation is by no means universal in human societies; for example, in societies practicing the avunculate, husbands' resources go toward raising sisters' children, thus eliminating the need for female mate choice based on resources. In addition, if the relationship between resource-based parental investment and offspring fitness diminishes at higher levels of investment, past a certain resource acquisition ability or accrual point male resources will have less impact on female fitness, and women should begin to discriminate among potential mates primarily using physical attractiveness. Diminishing returns characterize many predicted relationships between activities and fitness (e.g., Smith 1991), and thus there may be reasons for women to remain capable of high levels of discrimination in male physical attractiveness.

This study yielded some unpredicted results: men valued companionship in a mate significantly more than women did. This cannot be explained as part of the trade-off between resources and other characteristics because, when resources were excluded from the decision, women placed no more emphasis on companionship than they did with the trade-off in place. Indeed, it appears that companionship is a trait that women will not trade off for resources, whereas physical attractiveness is. Second, women placed greater emphasis on finding an easygoing partner. This may reflect a desire to avoid men who might behave aggressively in a relationship.

It is remarkable that women showed no sign that they would trade off resources for a companionable mate, or one of the ideal age. This may mean that women expect to find a mate with these qualities, regardless of their relative importance, but they do not expect to find a physically attractive mate without having to compromise finding a male with resources.

The result showing that women were significantly more likely to opt to approach the most attractive individual at a hypothetical party was also unexpected, especially since the same female subjects placed less importance on physical attractiveness when asked to assign a fixed budget of mating points among traits. This could suggest that certain research designs are more likely to uncover sex differences than others. The result does not seem to be a function of personal appearance, since all of the individuals photographed wore similar clothing styles and had similar

facial expressions. Nor did it appear to be due to absolute attractiveness ratings of the individuals, as the men's and women's ratings matched closely at each of the five percentiles.

Although women were found to be flexible enough to be able to trade off physical attractiveness for resources, it is important to note that humans are highly unusual among animals for not being more oriented towards male physical attractiveness. In nonhuman animals, the sex bearing the lesser cost of reproduction generally competes more heavily for mates (Bateman 1948). Since it is almost always males who invest less in each offspring, it is typical for males to compete for access to females, and as a consequence, it is males who are usually larger and have brighter coloration (Andersson 1994). If humans followed this pattern, one would expect the reverse of what is generally found, i.e., that women would be more interested in the physical attractiveness of men. It is possible that in humans, the relative cost of reproduction or the costs of parental care borne by each sex are less important in shaping mating preferences than the potential cost of lack of male resources, owing to either lack of ability to garner resources or mate desertion. Consistent with this, Ihara and Aoki (in press) mathematically modeled the possibility of a viability-reducing female physical trait and male mating preference for the trait. They concluded that female sexual signals and male preference for females with these (attractive) traits can evolve through sexual selection by male choice as long as female fitness is strongly dependent on male resources. Hence, while in most mammals females choose males for their attractive physical traits, humans may present a case in which Fisherian sexual selection occurred more equally for both sexes, and thus both sexes focus extensively on physical traits in mate choice.

If the importance of paternal provisioning is genuinely responsible for our unusual lack of emphasis on male physical attractiveness, we might expect to find differences between human groups in the emphasis placed on male physical attractiveness to be associated with provisioning patterns. Specifically, the less paternal provisioning in a society, the greater the emphasis on male attractiveness there should be.

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REFERENCES

- Andersson, M.
1994 *Sexual Selection*. New Jersey: Princeton University Press.
- Bateman, A.
1948 Intra-sexual Selection in *Drosophila*. *Heredity* 2:349–368.
- Berscheid, E., and E. Walster
1974 Physical Attractiveness. In *Advances in Experimental Social Psychology*, L. Berkowitz, ed. Pp. 157–215. New York: Academic Press.
- Borgerhoff Mulder, M.
1987 On Cultural and Reproductive Success: Kipsigis Evidence. *American Anthropologist* 89:617–634.
- Buss, D. M.
1989 Sex Differences in Human Mate Preferences: Evolutionary Hypotheses Tested in 37 Cultures. *Behavioral and Brain Sciences* 12:1–49.
1999 *Evolutionary Psychology: The New Science of the Mind*. Needham Heights, Massachusetts: Allyn and Bacon.
- Buss, D. M., and D. P. Schmitt
1993 Sexual Strategies Theory: An Evolutionary Perspective on Human Mating. *Psychological Review* 100:204–232.
- Buss, D. M., and T. K. Shackelford
1997 From Vigilance to Violence: Mate Retention Tactics in Married Couples. *Journal of Personality and Social Psychology* 72:346–361.
- Cunningham, M. R., A. P. Barbee, and C. L. Pike
1990 What Do Women Want? Facialmetric Assessment of Multiple Motives in the Perception of Male Facial Physical Attractiveness. *Journal of Personality and Social Psychology* 59:61–72.
- Gangestad, S., and D. Buss
1993 Pathogen Prevalence and Human Mate Preferences. *Ethology and Sociobiology* 14:89–96.
- Gangestad, S., R. Thornhill, and R. Yeo
1993 Facial Attractiveness, Developmental Stability, and Fluctuating Asymmetry. *Ethology and Sociobiology* 15:73–85.
- Hill, K. R., and A. M. Hurtado
1996 *Ache Life History: The Ecology and Demography of a Foraging People*. New York: Aldine de Gruyter.
- Husain, A., and Firdous
1990 Physical Factors of Mate Selection: Testing Assortative Mating Theory. *Psychologia* 33:118–122.
- Ihara, Y., and K. Aoki
in press Sexual Selection by Male Choice in Monogamous and Polygynous Human Populations. *Theoretical Population Biology*.

- Kenrick, D. T., and R. C. Keefe
1992 Age Preferences in Mates Reflect Sex Differences in Reproductive Strategies. *Behavioral and Brain Sciences* 15:75–133.
- Johnston, V. S., and M. Franklin
1993 Is Beauty in the Eye of the Beholder? *Ethology and Sociobiology* 14:183–199.
- Langlois, J. H., and L. A. Roggman
1990 Attractive Faces Are Only Average. *Psychological Science* 1:115–121.
- Li, N. P., J. Bailey, and D. T. Kenrick
in prep. The Necessities and Luxuries of Mate Preferences: Testing the Trade-offs.
- Low, B. S.
1988 Pathogen Stress and Polygyny in Humans. In *Human Reproductive Behaviour: A Darwinian Perspective*, L. Betzig, M. Borgerhoff Mulder, and P. Turke, eds. Pp. 115–128. Cambridge: Cambridge University Press.
- Mealey, L., R. Bridgestock, and G. C. Townsend
1999 Symmetry and Perceived Facial Attractiveness: A Monozygotic Co-twin Comparison. *Journal of Personality and Social Psychology* 76:151–158.
- Oda, R.
2001 Sexually Dimorphic Mate Preferences in Japan: An Analysis of Lonely Hearts Advertisements. *Human Nature* 12:191–206.
- Parsons, P. A.
1990 Fluctuating Asymmetry: An Epigenetic Measure of Stress. *Biological Review* 65:131–145.
- Pawlowski, B., R. I. M. Dunbar, and A. Lipowicz
2000 Evolutionary Fitness: Tall Men Have More Reproductive Success. *Nature* 403:156.
- Penton-Voak, I., D. Perrett, D. Castles, M. Burt, T. Koyabashi, and L. K. Murray
1999 Female Preference for Male Faces Changes Cyclically. *Nature* 399:741–742.
- Perrett, D., K. Lee, I. Penton-Voak, D. Rowland, S. Yoshikawa, D. Burt, S. Henzi, D. Castles, and S. Akamatsu
1998 Effects of Sexual Dimorphism on Facial Attractiveness. *Nature* 394:884–887.
- Singh, D.
1993 Adaptive Significance of Waist-to-hip Ratio and Female Physical Attractiveness. *Journal of Personality and Social Psychology* 65:293–307.
1995 Female Health, Attractiveness, and Desirability for Relationships: The Role of Breast Asymmetry and Waist-to-hip Ratio. *Ethology and Sociobiology* 16:465–481.
- Smith, E. A.
1991 *Inujjamiut Foraging Strategies: Evolutionary Ecology of an Arctic Hunting Economy*. New York: Aldine de Gruyter.
- Symons, D.
1979 *The Evolution of Human Sexuality*. New York: Oxford University Press.
- Thornhill, R., and S. Gangestad
1993 Human Fluctuating Asymmetry and Sexual Behavior. *Psychological Science* 5:297–302.

- 1999a Facial Attractiveness. *Trends in the Cognitive Sciences* 3:449–490.
1999b The Scent of Symmetry: A Human Sex Pheromone That Signals Fitness? *Evolution and Human Behavior* 20:175–201.

Waynforth, D.

- 1998 Fluctuating Asymmetry and Human Male Life History Traits in Rural Belize. *Proceedings of the Royal Society of London, Series B* 265:1497–1501.
1999 Differences in Time Use for Mating and Nepotistic Effort as a Function of Male Attractiveness in Rural Belize. *Evolution and Human Behavior* 20:19–28.

Waynforth, D., and R. I. M. Dunbar

- 1995 Conditional Mate Choice Strategies in Humans: Evidence from Lonely Hearts Advertisements. *Behaviour* 132:755–779.

Weiderman, M. W.

- 1994 Evolved Gender Differences in Mate Preferences: Evidence from Personal Advertisements. *Ethology and Sociobiology* 14:331–352.

Weiderman, M. W., and E. R. Allgeier

- 1992 Gender Differences in Mate Selection Criteria: Sociobiological or Socio-economic Explanation? *Ethology and Sociobiology* 13:115–124.