

- Haselton, M., Buss, D. M., Oubaid, V., & Angleitner, A. (2005). Sex, lies, and strategic interference: The psychology of deception between the sexes. *Personality and Social Psychology Bulletin*, *31*, 3–23.
- Jankowiak, W. (Ed.). (1995). *Romantic passion: A universal experience?* New York: Columbia University Press.
- Schmitt, D. P. (2005). Fundamentals of human mating strategies. In D. M. Buss (Ed.), *The handbook of evolutionary psychology*. New York: Wiley.
- Schmitt, D. P. (2004). Patterns and universals of mate poaching across 53 nations: The effects of sex, culture, and personality on romantically attracting another person's partner. *Journal of Personality and Social Psychology*, *86*, 560–584.
- Schmitt, D. P., & Buss, D. M. (2001). Human mate poaching: Tactics and temptations for infiltrating existing mateships. *Journal of Personality and Social Psychology*, *80*, 894–917.
- Sprecher, S., Aron, A., Hatfield, E., Cortese, A., Potapova, E., & Levitskaya, A. (1994). Love: American style, Russian style, and Japanese style. *Personal Relationships*, *1*, 349–369.

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Social Structural Origins of Sex Differences in Human Mating

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The key to understanding hominid mating systems lies in an analysis of why some components of mating relationships are highly variable across societies and others are more universal. As we explain in this chapter, sex-typed physical attributes and related behaviors, especially women's childbearing and nursing, provide an organizing framework for human mating that is universal across societies. Within this framework, many sex-typed mating preferences vary across cultures, because men's and women's attributes and behaviors interact with local conditions to yield specific patterns of preferences.

BIOSOCIAL MODEL OF HOMINID MATING

Variability in human mating across cultures and ecologies reflects the species' sensitivity to local circumstances. Humans are endowed with this flexibility because they evolved in diverse environments with changeable conditions that impinged in differing ways on their reproductive outcomes. For example, especially in the late Pleistocene Epoch, climate appears to have been

highly variable. Accommodating successfully to such ecological challenges required behavioral flexibility, enabled by an evolved capacity for social learning and the cumulation of culture (Richerson & Boyd, 2005). Comparative studies of primates have located humans' unique adaptation for cumulative culture in socially shared intentionality (Tomasello, Carpenter, Call, Behne, & Moll, 2005). These evolved capacities allow humans to produce novel solutions to the problems of reproduction and survival. Human innovation is evident in both tolerance for a wide range of different foods and diversity in mating arrangements.

Human flexibility does not imply that the mind is a blank slate. With respect to mating, evolutionary pressures shaped humans to favor healthy, fertile members of their own species who are of the sex complementary to their own. More specific mating preferences for partners with particular skills or personality traits emerge interactively from the evolved characteristics of the human species, individuals' developmental experiences, and their situated activity in society. These skills and traits gain meaning within the particular circumstances that people encounter in their culture and in their individual situations. This meaning takes the form of costs and benefits that are perceived to follow from choosing particular types of mates.

Beliefs about these costs and benefits are socially transmitted and shared within and between cultures. This learning is channeled largely through men's and women's social roles, because their lives are organized by these roles, which in turn create advantages for different types of mating relationships and partners (Eagly & Wood, 1999; Wood & Eagly, 2002). One way that social roles influence mating is through the formation of gender roles, by which people are expected to possess the characteristics that equip them for the activities that are typical of their sex. For example, to facilitate childrearing, women may be expected to be nurturing and kind. Gender roles, along with specific roles (e.g., occupation, marital status), then guide preferences for types of mates and relationships.

The influence of roles on behavior is mediated by various developmental and socialization processes as well as processes involved in social interaction and self-regulation. In addition, biological processes, such as hormonal changes, influence perceived costs and benefits by orienting men and women toward certain roles and facilitating certain behaviors. For example, hormonal influences on the perceived costs and benefits of mating could account for women's increased sexual interest during the portion of their monthly cycles when they are likely to be fertile.

Men's and women's social roles are themselves influenced by evolved physical attributes of the sexes and related behaviors, especially women's childbearing and nursing of infants and men's greater size, speed, and upper-

body strength (Wood & Eagly, 2002). For a given society, the roles held by men and women are defined by the interaction between these evolved sex differences and the prevailing social, economic, technological, and ecological forces. The social roles that emerge from this interaction are characterized by a division of labor, because the physical endowments allow members of each sex to perform certain tasks efficiently, depending on a society's circumstances and culture. Specifically, childbearing and nursing of infants enable women to care efficiently for very young children and cause conflict with roles requiring extended absence from home and uninterrupted activity. Men's greater speed and upper-body strength facilitate their efficient performance of tasks that require intensive bursts of energy and strength. In short, sex-typed physical attributes and related behaviors are not a direct cause of mate preferences but instead exert their influence through biological, social, and psychological mechanisms. The attributes and related behaviors provide a universal framework that, in interaction with local conditions, yields sex-typed mate preferences that differ across cultures.

EVOLUTIONARY PSYCHOLOGY ACCOUNTS OF HOMINID MATING

According to many evolutionary psychologists, human mating is organized by sexual selection pressures (see Buss, Chapter 41, and Thornhill, Chapter 43, this volume). In this view, male reproductive success depends on competition with other males, thus promoting evolved psychological attributes of aggressiveness and dominance and the physical attributes of larger size and greater strength. These characteristics emerge more strongly in species with polygynous mating systems, in which males engage in more intensive competition for mates and females favor mates who can provision and protect them and their offspring.

This sexual selection account of human mating patterns may seem consistent with the readily observed sex difference in human size. However, comparisons with other primate species show that the size difference in humans is relatively small, a finding inconsistent with the prominent role that evolutionary psychologists ascribe to male-male competition. Also, unlike highly dimorphic primate species, men and women have similarly sized canine teeth. Among primate species with low levels of dimorphism comparable to that of humans, considerable variability exists in mating systems and intensity of male-male competition (Plavcan & van Schaik, 1997). In addition, compared with other primate species, humans have a low operational sex ratio (i.e., the ratio of adult males to sexually available females; see

Wrangham, Jones, Laden, Pilbeam, & Conklin-Brittain, 1999), which is also compatible with low male-male competition instead of the higher levels inherent in polygynous mating systems. Finally, the modest sex difference in human size may well reflect selection pressures on females more than males, consistent with the increase in size of females relative to males as hominid evolution proceeded from *Australopithecus* to *Homo* species.

UNDERSTANDING HUMAN MATING SYSTEMS

Cross-Cultural, Cross-Temporal, and Individual Variation in Mate Preferences

Comparisons of mate preferences across cultures, time periods, and individuals within cultures provide support for our biosocial model of human mating preferences. These comparisons show that mating practices are flexibly emergent from the evolved physical attributes and related behaviors of men and women within social and ecological contexts (Eagly & Wood, 1999; Wood & Eagly, 2002). Furthermore, these effects are mediated by biological, social, and psychological processes. Our perspective rejects false dichotomies between the evolution of nature and culture but strives to understand the relation between them.

Cross-cultural variation in mate preferences of women and men reflects the divergent responsibilities and obligations inherent in their social roles. In societies with a strong division between male providers and female homemakers, women should seek a mate who is a good provider, and men should seek a mate who is a skilled homemaker and child caretaker. This good provider-domestic worker marital system should also generate sex-typed age preferences, given that older men are likely to have acquired resources, and younger women without resources are likely to value marriage and older partners with resources. In a test of these patterns, Eagly and Wood (1999) reanalyzed the data from Buss's (1989) study of the mate preferences of young adults from 37 diverse, primarily urbanized, cash-economy cultures. The characteristics that men and women desired in a mate were related to the extent to which the good provider-domestic worker division of labor was in place in each society. This division of labor in each culture was estimated with the Gender Empowerment Measure of the United Nations Development Programme, which represents the extent to which women participated equally with men in economic, political, and decision-making roles (see Eagly & Wood, 1999).

Consistent with the prediction that mate preferences reflect each sex's attempts to maximize outcomes within the societal structure, women's prefer-

ences for older mates and mates with resources and men's preferences for younger mates and mates with housekeeping and cooking skills were more pronounced in societies with a more traditional division of labor. Providing additional evidence that the preferences of men and women were a common response to a sex-typed division of labor, the sex differences in mate preferences tended to coexist within societies: In societies in which women expressed especially strong preferences for older mates with resources, men also expressed especially strong preferences for younger mates with domestic skills. Nonetheless, because a gender-equal division of labor had not been attained in any of the societies in the data set, the sex differences in mate preferences were present to some degree in all of the sampled societies.¹

Also showing that mate preferences emerge flexibly from the division of labor, Sweeney (2002) documented cross-temporal changes within the U.S. population in the relation between economic prospects and marriage formation. The traditional tendency for higher earnings to increase the likelihood of marriage for men but not women has changed over time as earnings have become more important for women's marital prospects. As a result, the relations between earnings and marriage are now similar for men and women.

Our biosocial theory also has implications for individual differences in mate preferences within cultures. In general, persons who have a more traditional gender ideology prefer qualities in a mate that reflect a conventional homemaker-provider division of labor. That is, more traditional men have stronger preferences for younger mates with homemaker skills, and more traditional women have stronger preferences for older mates with breadwinning potential. This greater sex typing of mate preferences among individuals with traditional ideology has proven to be quite stable across a nine-nation sample (Eastwick, Eagly, Glick, Johannesen-Schmidt, Fiske, et al., in press).

The Importance of Patriarchy

Cross-cultural investigations have challenged aspects of evolutionary psychology accounts of human mating, especially the claim that men evolved a disposition to ensure paternity certainty by controlling women's sexuality. The sexual double standard, represented by greater control of female than

¹The gender empowerment measure is calculated in part from the relative numerical representation of men and women in politics and management (see Eagly & Wood, 1999). Because women tend to be concentrated in roles with less power and status than men, gender equality on this index (i.e., a score of 1) cannot be interpreted as true equality of opportunity within a society. Thus, women's occupancy of 50% of managerial roles in contemporary societies would not mean that their power as managers would be comparable to that of men.

of male sexuality, is not a universal attribute of human mating systems. Whyte (1978) reported that in 75 nonindustrial societies selected to be geographically representative of world societies, only 43% had an extramarital double standard favoring greater promiscuity by men.

Instead of a universal phenomenon, sexual control of women is a historical development that emerged with societal complexity, much like other forms of patriarchy (e.g., male political power, property ownership by men). As societies developed in socioeconomic complexity, the tasks that became essential to economies required extensive training and skills development, high energy expenditure, and extended absences from home (Wood & Eagly, 2002). Women's reproductive activities limited their ability to engage in such tasks and to reap the social and economic capital inherent in them. The resulting male control of resources in more complex societies produced patriarchal social structures. In support of this analysis, anthropologists' assessments across ethnographic samples of world societies show that patriarchy is not a universal feature of human societies, and that approximately one-third of all pastoral and simple nomadic groups had egalitarian relations between the sexes (see Wood & Eagly, 2002).

Directly challenging the idea that sexual selection pressures produced a disposition for men to control women's sexuality, cross-cultural investigations have revealed that this control emerged with societal complexity; that is, the sexual double standard and the associated phenomenon of greater male than female sexual jealousy appear to have emerged with the development of socioeconomic structures within which sexual control of women acquired special utility. In Gaulin and Schlegel's (1980) review of nonindustrial societies, sexual control emerged with societal practices that imbued childbearing with economic implications in the form of property inheritance through male lines. Under these conditions, control over women's sexuality enabled men to ensure certainty of paternity and consequent economic advantage. Consistent with this argument, the sexual double standard was least prevalent in societies with simpler economies.

The patriarchal social structures that became prevalent as societies increased in socioeconomic complexity were associated with higher levels of male sexual jealousy, which also provided a mechanism for controlling women's sexuality. This interpretation is consistent with Reiss's (1986) finding in 80 nonindustrial societies that several indexes of patriarchy (e.g., patrilineal inheritance, patrilocal residence, importance of private property) predicted the tendency of husbands to manifest intensified sexual jealousy (see also Hupka & Ryan, 1990). The presence of this relationship does not, of course, mean that sexual jealousy is absent in men or women of any soci-

ety given that sex is a valuable resource even in societies that legitimize extramarital relationships (see Wood & Eagly, 2002).

Additional challenge to the idea that men have evolved a disposition to experience sexual jealousy comes from Harris's (2005) failure to find supporting sex differences in five lines of evidence. For example, according to a meta-analytic investigation of jealousy-inspired homicides across 20 cultures that adjusted for base rates for murder, men were no more likely than women to commit murder out of jealousy. Also, European and U.S. college students' reports of their experiences of sexual jealousy revealed no consistent tendency for men to respond with greater jealousy than women to imagined or real sexual infidelity.

The lack of consistent evidence for patriarchy and sexual control of women, especially in simpler societies, raises questions about the plausibility of the evolutionary psychology assumptions about male sexual control. Simpler societies are presumably more similar than complex societies to the social contexts in which humans evolved as a species, thus favoring the display of evolved dispositions. Given the cross-cultural evidence that we have reviewed in this chapter, it seems that evolutionary psychologists have observed sex differences in modern, patriarchal societies and inappropriately concluded that humans evolved sex-typed psychological dispositions in ancestral times that correspond to these differences.

CONCLUSION

In summary, in our biosocial theory, human mating practices are characterized by behavioral flexibility that is an emergent product of local conditions and prevailing culture, developmental experiences, and evolved attributes. Our approach is in stark contrast to evolutionary psychology theories that treat culture largely as error variance or as a moderating variable that selects for certain pre-existing evolved dispositions (see Buss, Chapter 41, and Thornhill, Chapter 43, this volume).

The principle that sex differences in social roles are emergent from female reproductive activity and male size and strength explains why profound changes occurred in the status of women in the 20th century in most industrialized countries. Weakening both the traditional division of labor and patriarchy are women's increased control over reproduction, the marked decline in birthrates, and the decrease in the proportion of productive activities that favor male size and strength. Accordingly, women have increased their participation in the paid labor force, and young women's rates of edu-

cation now equal or exceed men's in many nations. It is also not surprising that research tracking sex differences across recent time periods in the United States suggests that many psychological attributes and related behaviors of women have changed with women's entry into formerly male-dominated roles (see Wood & Eagly, 2002). The demise of many sex differences with increasing gender equality is a prediction of our theory that will be more adequately tested to the extent that societies equalize opportunities for women and men.

REFERENCES

- Buss, D. M. (1989). Sex differences in human mate preferences: Evolutionary hypotheses tested in 37 cultures. *Behavioral and Brain Sciences*, 12, 1–49.
- Eagly, A. H., & Wood, W. (1999). The origins of sex differences in human behavior: Evolved dispositions versus social roles. *American Psychologist*, 54, 408–423.
- Eastwick, P. W., Eagly, A. H., Glick, P., Johannesen-Schmidt, M., Fiske, S. T., et al. (in press). Is traditional gender ideology associated with sex-typed mate preferences?: A test in nine nations. *Sex Roles*.
- Gaulin, S. J. C., & Schlegel, A. (1980). Paternal confidence and paternal investment: A cross-cultural test of a sociobiological hypothesis. *Ethology and Sociobiology*, 1, 301–309.
- Harris, C. R. (2005). Male and female jealousy: still more similar than different: Reply to Sagarin (2005). *Personality and Social Psychology Review*, 9, 76–86.
- Hupka, T. B., & Ryan, J. M. (1990). The cultural contribution to jealousy: Cross-cultural aggression in sexual jealousy situations. *Behavior Science Research*, 24, 51–71.
- Plavcan, J. M., & van Schaik, C. P. (1997). Interpreting hominid behavior on the basis of sexual dimorphism. *Journal of Human Evolution*, 32, 345–374.
- Reiss, I. L. (1986). *Journey into sexuality: An exploratory voyage*. Englewood Cliffs, NJ: Prentice-Hall.
- Richerson, P. J., & Boyd, R. (2005). *Not by genes alone: How culture transformed human evolution*. Chicago: University of Chicago Press.
- Sweeney, M. (2002). Two decades of family change: The shifting economic foundations of marriage. *American Sociological Review*, 67, 132–147.
- Tomasello, M., Carpenter, M., Call, J., Behne, Y., & Moll, H. (2005). Understanding and sharing intentions: The origins of cultural cognition. *Behavioral and Brain Sciences*, 28, 675–735.
- Whyte, M. K. (1978). *The status of women in preindustrial societies*. Princeton, NJ: Princeton University Press.
- Wood, W., & Eagly, A. H. (2002). A cross-cultural analysis of the behavior of women and men: Implications for the origins of sex differences. *Psychological Bulletin*, 128, 699–727.
- Wrangham, R. W., Jones, J. H., Laden, G., Pilbeam, D., & Conklin-Brittain, N. (1999). The raw and the stolen: Cooking and the ecology of human origins. *Current Anthropology*, 40, 567–577.

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The Evolution of Women's Estrus, Extended Sexuality, and Concealed Ovulation, and Their Implications for Human Sexuality Research

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By 1930, research showed that women's ovulation occurs near the midpoint of the menstrual cycle (not during or just after menses, as previously thought), that it is facilitated by the same hormones as ovulation in other mammals, and that estrogen plays a central role (etymologically, the "gen" or creator of estrus). These discoveries led to the hypothesis that women have estrus or "heat" that functions to motivate female eroticism at ovulation because sperm are needed for conception. Multiple reviews of the large body of literature produced in the 1970s, 1980s, and 1990s to test this hypothesis concluded that no overall, clear-cut patterns indicate estrus in women. Women's sexual motivation and mating does not show a definite periovulatory peak that corresponds with the high proceptivity (initiation of mating) and receptivity (allowing mating) that characterizes estrus in other mammals; nor was the attractivity component of mammalian estrus evident at midcycle, which would be observed in pair-bonded humans as a distinct periovulatory sexual attraction of males to their partners. Scholars' conclusion, therefore, that women had lost estrus led to numerous hypotheses to try to explain the loss.