

Two Human Natures:  
How Men and Women Evolved Different Psychologies

Alastair P. C. Davies and Todd K. Shackelford

Florida Atlantic University

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## Introduction

The bodies of men and women differ from each other, both internally and externally. These anatomical differences across gender, however, are dwarfed by the similarities. The external and internal structures of men's and women's bodies are more similar than dissimilar because evolving men and women overwhelmingly faced similar adaptive problems and so the evolutionary selection pressures on the physical make up of men and women were overwhelmingly the same. Evolving men and women, however, also faced many different adaptive problems and, therefore, many selection pressures on the human anatomy differed across the sexes. These sex-specific selection pressures have produced numerous external and internal differences in the bodies of men and women. Indeed, these differences are so profound that they allow one to easily identify whether a particular individual is a man or a woman.

Despite the foregoing, there remains significant resistance to the notion that evolution has resulted in profound psychological differences between men and women. In both popular and academic writings, a number of contemporary authors have argued either that men and women are essentially the same psychologically, or that any significant psychological differences between the sexes are not evolved, but, rather, are socially constructed (e.g., Butler, 1990; Harris 2003; Hyde, 2005; Thurer, 2005). We believe, however, that, except for those who might be creationists, not one of these authors would contest any of the evolutionary reasoning regarding human bodies laid out in the opening paragraph. Yet precisely the same reasoning necessarily also applies to human brains: because evolving men and women overwhelmingly faced similar adaptive problems, their psychologies are overwhelmingly the same. Nevertheless, because they also faced many different adaptive problems, numerous differences between the psychologies of men and women are expected to have evolved. Indeed, these psychological sex differences are likely to be so profound that they should give rise to behaviors that allow one to easily identify whether a particular individual is a man or a woman.

In this chapter, we aim to demonstrate that there are profound evolved psychological sex differences in humans. First, we outline how sex or reproductive roles lead to the evolution of anatomical and psychological sex differences. We then outline why these sex roles evolve. Next, we discuss how the

psychology of mating is influenced by whether an individual is pursuing a short-term or long-term mate. After this, in the main part of the chapter, we use evolutionary psychological reasoning to identify a number of psychological sex differences among humans that are hypothesized to have evolved within several domains related to mating and present some of the empirical evidence in support of their existence. Next, we outline why many anatomical and psychological traits are shaped by both natural and sexual selection. Finally, we consider a prominent social constructivist account for behavioral sex differences, as formulated by Wood and Eagly (2002), that rejects the notion that humans evolved psychological sex differences and we attempt to show that an evolutionary psychological account of behavioral sex differences is more valid.

### **Natural Selection and Sexual Selection**

Evolution produces adaptations through natural selection and sexual selection. Although these processes are considered to be distinct, they typically operate on traits simultaneously. Accordingly, although, for simplicity, in the first part of this chapter we consider traits to be the product of either natural selection or sexual selection, we later outline why the evolution of many traits has been shaped by both processes

Natural selection leads to the evolution of traits that facilitate survival and that directly facilitate reproduction. Since adaptive problems related to survival are similar across men and women, evolutionary reasoning expects traits that facilitate survival to be similar across the sexes. Of such traits, anatomical examples include the heart, liver, and eyes, and psychological examples include fear of predators, fear of heights, and preferences in foods.

The different sex or reproductive roles of men and women, however, mean that they face different adaptive problems in the context of reproduction and mating. Consequently, both natural and sexual selection are expected to produce sex differences in traits within these domains. Sex-differentiated traits related to sex roles that make their ontogenic appearance before the onset of puberty are termed *primary sexual characteristics*. Since they appear before individuals fully enter the mating game, they

evolve through natural selection and include such anatomical traits as the genitalia and reproductive organs.

At puberty, however, in order for individuals to successfully fulfill their respective sex roles, there occurs the further development of existing traits, as well as the emergence of additional traits. These sex-specific developments are known as *secondary sexual characteristics*. An anatomical example that has evolved through natural selection is the pubertal widening of the pelvic bone that occurs in girls but not in boys (Geary, 1998). In addition, since individuals fully enter the mating game at puberty, natural selection has resulted in the evolution of psychological traits that become further developed at this stage in the life cycle. These traits are sex-specific mating preferences. They are sex-differentiated because they necessarily reflect the fact that sex roles involve intra-sexual competition for mates being more intense within one sex and scrupulousness of inter-sexual selection of mates being greater in the other sex.

Mating preferences drive the process of sexual selection, and have, thereby, led to the evolution of additional sex-differentiated traits that make their ontogenic appearance at puberty. This is because sexual selection involves individuals within one sex evolving traits that facilitate the winning of *intra-sexual competition* to meet the mate preferences of the opposite sex and so, through *inter-sexual selection*, be chosen as mates over same-sex rivals. Anatomical examples of such traits include men's greater body size and muscle mass (Geary, 1998), and women's continually swollen breasts and greater fat deposits around the buttocks, thighs and hips (Buss, 2004). The psychological traits that have been sexually selected in this way are the sex-specific mating strategies that facilitate the sexes in meeting the mate preferences of the opposite-sex.

Moreover, since the reproductive goals of the sexes are often in conflict, sexual selection has led to the evolution of additional sex-specific traits that facilitate the winning of *inter-sexual competition*, in which individuals within one sex attempt to impede the mating strategies of the opposite sex. A physiological example of such traits is the tendency for the size of the ejaculate deposited by a man into his partner to be directly related to his perception of the likelihood that his partner has recently been sexually unfaithful to him, so as to reduce the probability that his partner will be successful in her attempt

to be impregnated by another man (for review, see Shackelford, Pound, & Goetz, 2005). Sexually-selected psychological traits that have evolved in the context of inter-sexual competition consist of additional sex-specific mating strategies through which one sex attempts to impede the mating strategies of the other.

The foregoing indicates that it is the different sex roles related to mating that led to the evolution of sex-differentiated psychological traits. In the next section, therefore, we outline why there evolved different sex roles in the context of mating.

### **The Evolution of Sex Roles**

Sex roles in the context of mating evolve due to a sex difference in potential reproductive rates (Clutton-Brock & Vincent, 1991), that is, the number of offspring that each sex can possibly produce per unit of time. This is because a sex difference in potential reproductive rates means that there is not a one-to-one operational sex ratio (OSR) (Emlen and Oring, 1977), that is, the number of sexually receptive males does not equal the number of sexually receptive females at any one time. As a result, there is a relatively large number of individuals among one sex in competition to mate with a relatively small number of individuals among the other sex. This leads to sex roles in which members of the former sex compete more intensely for mates, and members of the latter sex are more scrupulous in their choice of mates.

A sex difference in potential reproductive rates exists when there is a sex difference in parental investment (Trivers, 1972). Although, across species, maternal investment is typically greater than paternal investment, it can be misleading to use anisogamy as an indicator of the relative amounts of parental investment made by the sexes. This is because despite the fact that males produce the smaller sex cell, they produce them in vastly greater numbers than do females. As a result, parental investment in terms of energy expended in producing sex cells may be greater among males than among females. A more reliable indicator of relative reproductive rates, therefore, are the minimum amounts of parental investment that each sex must contribute toward gestation and nurturing. Specifically, the sex whose

minimum contribution toward gestation and nurturing is greater will have the lower potential reproductive rate.

Among humans, as among most species, it is females who necessarily invest more in gestation and nurturing. Once impregnated, women must gestate the child for nine months and during the period in which modern humans were evolving were obliged to lactate for several years after giving birth (Howell, 1979). During this period of gestation and lactation, evolving women would have remained infertile. In contrast, a man's minimum investment in gestation and nurturing can range from being as little as nothing to being more than that of the woman. Consequently, once a man has successfully mated with one woman, he has the possibility of quickly moving on to successfully mate with another. As a result, in comparison to women, the number of children that men produce is more highly correlated with the number of matings that they secure. Thus, the potential reproductive rate of men is higher than that of women, and, typically, the OSR is biased toward men.

Notwithstanding the foregoing, it is important to note that male-biased potential reproductive rates and OSRs, indicate only that intra-sexual competition is likely to be more intense among men and scrupulousness in mate choice is likely to be greater among women. The possibility of paternal investment leads to the possibility of competition for mates among women and selection of mates by men. First, women will compete among themselves for men who are willing and able to make the most parental investment. Second, in comparison to men who do not parentally invest, those men who do invest will be especially careful to mate with women who are of relatively high quality with respect to such traits as health, fertility and sexual fidelity (e.g., Johnstone, Reynolds, & Deutsch, 1996).

In sum, sex roles involving a greater intensity of intra-sexual competition among men, and a greater scrupulousness of mate choice among women have led to the evolution of psychological sex differences related to mating. The psychology of mating, however, is influenced by whether an individual is pursuing a short-term or long-term mate. Before we delineate a number of psychological sex differences, therefore, we first consider the temporal contexts in which mating takes place.

### **Long-Term and Short-Term Matings**

As noted above, in comparison to that among women, the variance in the amount of investment that men contribute to the raising of children is relatively great. This means that men can choose to pursue either *long-term* matings, in which they invest substantially in the raising of their children, or *short-term* matings, in which any economic investment made by men should be viewed as mating effort or a strategy to gain sexual access, rather than as direct paternal investment.<sup>1</sup> Men can gain reproductive benefits and suffer reproductive costs from both types of matings. It is expected, therefore, that men will have an evolved psychology that enables them to perform a cost-benefit analysis regarding which mating strategy will maximize their reproductive success. As we outline in the following section, such analyses may motivate a *mixed reproductive strategy* in which men pursue both short- and long-term matings.

Even though women are obliged to make a substantial investment toward gestating (if not toward nurturing) their children, it follows that if men are engaging in both short- and long-term matings, then women must also be doing so. Women, therefore, are also expected to have an evolved psychology that allows them to perform cost-benefit analyses regarding which type of mating to pursue. As we outline in the next section, women may also be motivated to attempt to maximize their reproductive success by pursuing a mixed reproductive strategy. We now proceed to delineate the psychological sex differences that evolutionary psychological reasoning suggests have evolved among humans.

### **Psychological Sex Differences**

Based on the general principles by which natural selection and sexual selection produce adaptations and the potential reproductive rates of men and women, evolutionary psychologists have derived hypotheses regarding the psychological sex differences that are likely to have evolved in humans. In this section, we outline the psychological sex differences that this evolutionary reasoning suggests have evolved within the following domains: readiness to mate and number of sexual partners desired; risk-

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<sup>1</sup> Although, as we later outline, women may direct resources gained through short-term matings towards the raising of their children.

taking and aggression; economic parental investment; age and physical attractiveness; sexual versus emotional commitment; and sexual versus emotional jealousy.

For all but two of the hypothesized sex differences that we outline, we present empirical evidence in support of their existence. For the two for which we know of no supportive empirical evidence, we offer accounts for why research might have failed to provide such evidence and highlight the value of evolutionary reasoning in informing possible future research.

### **Readiness to Mate and Number of Sexual Partners Desired**

Women's relatively low potential reproductive rate means that, in comparison to men, they gain little reproductive advantage by having multiple short-term mates. In addition, women risk both dying during childbirth and wasting their relatively large minimum parental investment if their child does not survive. Accordingly, women are expected to have evolved a psychology which causes them to be relatively hesitant to mate and choosy in their mate selection. In contrast, men's relatively high potential reproductive rate and low minimum parental investment means that men can increase their reproductive success by having multiple mates. Accordingly, men are expected to have evolved a psychology which causes them to desire numerous, short-term sexual partners. In addition, they are hypothesized to be relatively eager to mate and indiscriminate in their mate selection, as both these traits facilitate the securing of multiple mates.

Numerous studies have provided empirical evidence in support of the evolutionary psychological arguments that there are sex differences in eagerness to mate and number of mates desired. Clark and Hatfield (1989) conducted an experiment in which they found that, when approached by an opposite-sex stranger asking if they would have sex with him or her, no female students consented, whereas 75% of men did. Buss and Schmitt (1993) found that when asked to rate the likelihood that they would have sex with someone that they found attractive after knowing them for various periods of time, men gave a higher rating for every time period less than five years (the greatest length of time considered in the study). This study also found that when asked how many sexual partners they would like to have per

various time intervals ranging from one month to life, men gave a higher number than did women for every one.

The foregoing psychological sex differences in eagerness to mate and number of partners desired are also reflected in reported sexual fantasies. Ellis and Symons (1990) and Wilson (1987) found that men have about twice as many sexual fantasies as women. They also found that men's sexual fantasies are more likely to include multiple partners, strangers and the changing of partners and that 32 per cent of men but only 8 per cent of women reported having fantasized about more than one thousand sexual partners in their life.

Paralleling the findings regarding sexual fantasy are those regarding the consumption of erotic media. Pornography typically isolates sex from any emotional context and frequently displays individuals choosing sexual partners indiscriminately. In contrast, romance novels typically portray sex as being embedded in a drawn out, non-sexual, romantic relationship between a particular man and a particular woman. In support of the foregoing hypotheses, the consumers of pornography are overwhelmingly men, whereas the readers of romance novels are overwhelmingly women. (Ellis & Symons, 1990, Pound, 1998).

A possible additional source of evidence in favor of the predicted sex differences in eagerness to mate and number of partners desired was suggested by Symons (1979). He argued that if, in comparison to women, men are more eager to have sex and desire more sexual partners, then heterosexual men must be prevented from fully living out their sexual desires by the relative sexual conservatism of women. The sexual behavior of homosexual men, however, should more closely reflect men's mating preferences. In line with this, although heterosexual and homosexual men report no difference in their desire for uncommitted sex, homosexual men report much more success in realizing this desire. In contrast, the number of actual sexual partners that women report having, does not differ across sexual orientation (Bailey, Gaulin, Agyei, & Gladue, 1994).

Men's greater eagerness to engage in sexual relations and greater desire for multiple sexual partners, are expected to have produced selection pressure on women to have an evolved psychology that

especially motivates them to use short-term mating tactics that meet these preferences. Indeed, several studies have found that, when attempting to attract short-term mates, women are significantly more likely than men to use and to have success with tactics which involve indicating their sexual accessibility and the sexually unavailability of rivals (e.g. Buss, 1988a; Buss & Schmitt, 1996; Schmitt & Buss, 2001).

### ***Economic Parental Investment***

The relatively great minimum parental investment of women, in comparison to men, means that a woman's primary reproductive concern is expected to be ensuring that her child reaches reproductive age, so that she avoids wasting this investment. Accordingly, women are expected to be especially desirous to secure a long-term mate who is able to invest economically in the raising of her children. This will include not only men who have substantial resources, but also those who display high social standing or dominance, as these are typically correlated with resource acquisition.

In reality, however, over evolutionary history, the amount of economic investment that a particular woman's long-term partner would, typically, have been able to provide would have been highly limited. Accordingly, it is likely that women with long-term mates would have been able to further their reproductive success by also pursuing short-term matings through which they could secure additional resources. Ancestral women without a long-term partner may also have secured resources through short-term matings. Such women may have been unattached because they were able to secure a greater amount of resources from multiple short-term matings than they could extract from any available long-term partner. In addition, they would have avoided the huge risks that, as we outline later, are undertaken by women who are sexually unfaithful to a long-term mate. In ancestral times, as well as today, prostitution may be the least ambiguous means by which women secure resources from men who wish to engage in sex without direct paternal investment.

Ancestral women who pursued short-term matings may have been able to secure meat for their children by exploiting male hunters' desire for sex in which they could avoid direct paternal investment. In modern societies, single and attached women pursuing short-term matings may facilitate the raising of their children by securing gifts such as jewelry and cash. Other modern gifts secured by such women,

including flowers and expensive dinners, that cannot be readily invested toward raising children, may be evolutionarily novel means by which men exploit women's evolved desire to secure resources from short-term matings.

Nevertheless, although both men and women may pursue long-term and short-term matings, women's relatively great physiological parental investment means that they are likely to place a greater importance than are men on a person's ability to provide economic resources in the context of both short-term and long-term matings. Greiling and Buss (2000) provided empirical evidence in line with this hypothesized sex difference in the context of short-term sexual affairs. Men and women were presented with a number of potential benefits that individuals in long-term relationships might secure from engaging in a short-term sexual infidelity and were asked to rate the likelihood that the individuals would actually receive them. Results indicated that sexually unfaithful women were perceived as being significantly more likely than men to receive resources such as money, jewelry, free dinners, and clothing.

In addition, Greiling and Buss (2000) asked men and women to rate the likelihood that several circumstances would motivate individuals in long-term relationships to commit a short-term sexual infidelity. Results indicated that among the circumstances judged likely to motivate a woman to be sexually unfaithful were the inability of her long-term partner to keep a job and meeting a man who had a better economic outlook than her long-term partner. In contrast, circumstances judged likely to motivate a man to be sexually unfaithful included discovering that his partner is having an affair, and his partner is no longer willing to have sexual relations with him.

There is much empirical evidence in support of the hypothesized sex difference regarding the importance placed on a long-term mate's ability to invest in offspring. In studies in the years 1939, 1956, 1967 and 1988 (Buss, 1989a; Hill, 1945; Hudson & Henz, 1969; McGinnis, 1958), when American women and men were asked to rate the relative desirability in a marriage partner of eighteen traits, women rated "good financial prospect" about twice as highly as did men. Similarly, Kenrick, Sadalla, Groth, & Trost (1990) found that when American college students were asked to indicate for each of

several qualities, the “minimum percentiles” that they would find acceptable in a marriage partner, women and men respectively indicated the seventieth and fortieth percentiles for earning capacity. Parallel results were found for earning capacity with respect to partners in a dating, sexual, and steady dating relationship. Convergent evidence outside of college campuses for this mate preference was provided by Wiederman (1993) who found that women taking out personal ads were about eleven times more likely than men to request a mate with financial resources. Evidence suggesting that these sex differences in desired mate qualities may be universal across humans was provided by Buss (1989a). He found that among individuals from each of the 37 cultures and various political systems spanning 6 continents that he investigated, women invariably placed a greater importance on the good financial prospects of a marriage partner than did men and, across all cultures, women rated it about twice as important as did men.

If women place a greater importance than do men on the amount of resources held by both short-term and long-term mates, then they should also have a greater preference for both short-term and long-term mates with high social status or dominance, as such individuals are better able to secure resources. This hypothesis finds much empirical support. Betzig (1986) found that across a diverse range of 186 societies, high-status men invariably had greater resources, more wives and better provided for their children. Numerous studies of Americans have found that women invariably rate such attributes as high social status, high-status profession, prestige, rank, position, power, standing, station, high-place, and high level of education as significantly more desirable in both a short- or long-term mate than do men (e.g. Buss & Barnes, 1986; Buss & Schmitt, 1993; Hill, 1945; Langhorne & Secord, 1955). This sex difference was paralleled in the vast majority of the 37 cultures considered by Buss (1989a). Further, Kenrick and his colleagues (1993) asked men and women what would be the minimum percentile at which a person would have to be along different mate qualities, before they would consider the person as partner for a single date, steady dating, a one-night stand and marriage. Across all relationship types, women required a potential mate to be at a higher percentile for social status than did men.

Langhorne and Secord (1995) found that among 5,000 American undergraduates, women far more than men desired mates who showed ambition and industriousness; qualities shown to facilitate the securing of higher salaries and occupational status (Kyl-Heku & Buss, 1996; Jencks, 1979; Willerman, 1979). Further, across the overwhelming majority of the 37 cultures investigated by Buss (1989a), women but not men, rated these two qualities between important and indispensable in both a short-term and long-term mate.

Further evidence in support of the argument that a mate's social status is of greater importance to women than to men, was provided by Kenrick, Neuberg, Zierk, and Krones (1994) using contrast effects. Among men and women in long-term relationships who were shown pictures of opposite sex individuals who were described as being socially dominant, women subsequently reported a greater reduction in their commitment to their current partner than did men.

Other findings suggest that these preferences are evolved, and not due to women being excluded from the economic arena and positions of power. Thus, Buss (1989b) found a positive correlation between women's income and the importance they placed on a partner's income, and Townsend (1989) found that a sample of women who expected their future employment to provide them with a relatively high salary and social status placed a high importance on earning potential in their mate choice.

The greater importance placed by women than by men on a partner's ability to provide economic parental investment means that women are also expected to have an evolved psychology that causes them to place a greater importance on a partner's willingness to do so. La Cerra (1994) provided empirical support for this hypothesized sex difference through a study in which women and men were asked to rate the relative attractiveness of an individual of the opposite sex posing in a variety of contexts in slide images. La Cerra found that women rated the man in the slides as increasingly attractive the greater the degree to which the slide depicted the man as interacting positively with a young child. In contrast, men rated the woman in the slides as equally attractive across all contexts. As we outline later, convergent evidence for this hypothesized sex difference in the importance placed on a mate's willingness to provide

resources is also provided by studies investigating sex differences in the importance placed on a mate's emotional commitment.

Women's relatively great preference for short- and long-term mates who are able to economically invest in their offspring, is additionally expected to have produced sexual selection pressure for men to have an evolved psychology that especially motivates them to use mating tactics that meet these preferences. In accordance with this, several studies have found that, when attempting to attract either short-term or long-term mates and to retain long-term mates (by definition, one doesn't retain short-term mates), men are more likely than women to use and to have success with tactics which involve displaying their own resources, ambitiousness, and physical and social dominance, or derogating rivals along these attributes (e.g. Buss & Dedden, 1990; Buss & Schmitt, 1993; Buss & Schmitt, 1996).

### **Risk-Taking and Aggression in Intra-Sexual Competition**

Men's greater potential reproductive rate means that the variance in reproductive success among men is greater than that among women. Thus, in comparison to women, intra-sexual competition offers men greater reproductive gains from winning, and a greater likelihood of total reproductive failure from losing. These circumstances are likely to have produced sexual selection pressures for men to evolve a psychology that makes them more willing than women to undertake risks (Daly & Wilson, 2001).

There is a wealth of empirical evidence in support of this hypothesized sex difference regarding risk-taking. Numerous studies indicate that rates of death in accidents are much higher among men than among women (e.g., Holinger, 1987; Wilson & Daly, 1997) and that men are more likely than women to expose themselves to dangers in recreational activities (e.g., Lyng, 1990), and substance abuse (e.g. Irwin, Igra, Eyre, & Millstein, 1997). Similarly, Wilson, Daly, and Gordon (1998) found that the level of pollution in a job location did not affect men's job choice but was an important negative influence on women's job choice, suggesting that men are less sensitive to health dangers posed by the environment. Paralleling these findings, studies indicate that men are less conscientious than women in monitoring their health and undertake less preventative health-care (e.g., Woodwell, 1997).

It is worth noting that although the form or context of risk-taking engaged in by men today may sometimes be evolutionarily novel, it is often related to the securing of resources, as in the above example of selecting a job location. Other examples of modern-day risk-taking that appear to be unrelated to intra-sexual competition may involve activities, such as roller-coaster rides, that were designed to exploit or parasitize the predisposition for risk-taking that evolved in the context of intra-sexual competition. Even the engagement in these activities, however, may allow men to display their disregard for danger to male rivals or potential mates.

If, indeed, it is a sex difference in the intensity of sexual selection pressures in the context of intra-sexual competition for mates that has led to the sex difference in risk-taking, then the difference should be most pronounced at the stage in the life-cycle when the sex difference in the intensity of sexual selection pressures is greatest. This stage is young adulthood because it is then that individuals enter the mating game. Failure to get ahead early on in the game in accruing the attributes preferred in a mate by women, is likely to have left a man in the EEA unable to catch up with his rivals (especially as life expectancy then was relatively low), greatly limiting his sexual access to women.

In line with this hypothesis, numerous studies have found that, across a wide range of activities, young men, in particular, are motivated by competition and willing to incur hazards (e.g., Bell & Bell, 1993; Gove, 1985). Further, demographics indicate that the magnitude of the sex difference regarding men's greater likelihood of dying as a result of factors correlated with attitudes towards risk, such as accident, suicide and homicide (Daly & Wilson, 1988; Holinger, 1987), reaches its zenith during young adulthood. Indeed, it is at this stage in the life-cycle that the sex difference regarding men's greater tendency for "sensation-seeking", as measured by preferences for exciting, hazardous activities in general, is greatest (Zuckerman, 1994).

If women prefer as mates those men who have relatively high status, it follows that another indication that men's greater risk-taking evolved in the context of intra-sexual competition for mates would be provided if it is motivated by a greater desire to gain or avoid losing social-status. This would be indicated by men undertaking greater risks in the presence of an audience. In accordance with this

argument, several studies indicate that young male drivers take greater risks in the presence of peers than when alone (e.g., Chen, Baker, Braver, & Li, 2000). The strategy for winning intra-sexual competition that, perhaps, entails the greatest risk is the use of physical aggression. Accordingly, if it is the sex difference in the intensity of intra-sexual competition for mates that has resulted in men evolving a psychology that causes them to be greater risk-takers than women, then men should be more inclined than women to engage in physical aggression against same-sex rivals so as to gain status and resources. Several lines of evidence provide support for this. For instance, studies of same-sex bullying among school-children in the United States and Finland both found bullying among boys to be more likely to involve the expropriation of possessions (Ahmad and Smith, 1994; Bjorkqvist, Lagerspetz, and Kaukiainen, 1992). In addition, a man's employment status (along with his marital status) is the major modulator of the likelihood of him becoming involved in a male-male, non-relative homicide (Daly & Wilson, 2001; Wilson & Daly, 1985).

Further, although male-male, non-relative homicides are most commonly classified in police reports as arising from "trivial altercations" (Daly & Wilson, 1988), evidence, such as the fact that these reports frequently implicate the presence of an audience in their escalation, suggests that underlying the inconsequential issue being disputed, lies an evolutionarily non-trivial contest over social dominance or status (Daly & Wilson, 1988; Polk, 1994; Wilson & Daly, 1985). Moreover, studies of tribal cultures have found there to be a high correlation between a man's social status and his warriorship or the number of men from other tribes that he has killed (Chagnon, 1983, 1988; Patton, 1997).

Homicides involving same-sex, unrelated adults constitute one of most clear indicators of the use of aggression in intra-sexual competition. Daly and Wilson (1988) compiled statistics of same-sex, non-relative homicides from all 35 of the studies that provided such data at the time. The studies investigated a broad range of cultures, ranging from Pittsburg in the United States to the !Kung San of Botswana. Within every single study, the number of non-relative homicides that were male-male far exceeded those that were female-female. Furthermore, other studies have shown this sex difference to peak dramatically during young adulthood (Daly and Wilson, 1990; Wilson and Daly, 1993). The hypothesis that these

male-male, non-relative homicides are motivated by a greater intensity among men than among women of intra-sexual competition for mates is supported by the fact that (along with employment status) the major modulator of a man's likelihood of becoming involved in such a homicide is his marital status (Daly & Wilson, 2001; Wilson & Daly, 1985).

Sex differences in both the type and rate of same-sex bullying also indicate a sex difference in the tendency to use aggression that has evolved due to a sex difference in the intensity of intra-sexual competition. Ahmad and Smith (1994) found that among American high-school students, 36% of boys but only 9% of girls reported being physically hurt by a same-sex bully. Paralleling these findings, Bjorkqvist, Lagerspetz, and Kaukiainen (1992) found that among Finnish fifteen-year-olds, boys were three times more likely than girls to have engaged in direct physical aggression against individuals of the same-sex.

It is warfare, however, that constitutes perhaps the most destructive example of the sex difference in aggression in the context of intra-sexual competition. Ethnographies reveal coalitional warfare to be almost universal across human cultures, pursued almost exclusively by men, and directed overwhelmingly against other men (e.g., Alexander, 1979; Chagnon, 1988; Keeley, 1996; Tooby & Cosmides, 1988; Wrangham & Peterson, 1996). Moreover, in support of the evolutionary psychological hypothesis that men's greater tendency to engage in high-risk, aggressive behavior is due to men having been subject to more intense sexual selection pressures in the context of intra-sexual competition for mates, there is both anecdotal and empirical evidence indicating that men are motivated to form aggressive coalitions, whether they are war parties or gangs, in order to gain social status, material resources, and territory, as well as direct sexual access to women (Chagnon, 1988; Keeley, 1996; Palmer & Tilley, 1995).

### ***Age and Physical Attractiveness***

Pursuing a mixed reproductive strategy is also expected to offer reproductive advantages for men. Since the viability of a child is best ensured through bi-parental investment, it follows that while continuing to pursue multiple short-term mates, a man should also be motivated to have at least one long-term mate and to invest in the raising of any children that they produce together. In this way, men can

increase their reproductive success by best ensuring the viability of some of their offspring, while possibly producing other viable offspring in which they do not invest.

Ancestral men are likely to have increased their inclusive fitness by investing in the children of a long-term partner even if the woman and her relatives had sufficient resources of their own with which to ensure the viability of a child. This is because the process of evolution is essentially competitive, in the sense that it operates by selecting or filtering individuals according to their fitness *relative* to that of others, not according to some absolute level of fitness. Thus, children who received a greater amount of economic parental investment than other children, are also likely to have had relatively greater fitness and reproductive success.

In the context of both long- and short-term mating, because men's fertility exhibits far less variability over the lifespan than does women's, men are expected to place a greater emphasis on fertility than are women. Since it is women between the onset of puberty and their mid-late twenties who are most fertile, men are expected to prefer mates who are relatively young. In addition, as relative youth is indicated by such physical features as skin that is unwrinkled and not sagging, and hair that is not gray, men are expected to find women who possess such features as especially attractive and to be especially desirous of them as mates. This preference not only best ensures that men's long-term mate is fertile, it also enables them to best exploit the relatively great reproductive advantage that they gain from having multiple, short-term mates. Accordingly, men are expected to place great importance on youth and physical attractiveness in both types of mates.

Evolutionary reasoning also suggests the expected preferences of women regarding the physical attractiveness of a mate. Thus, although a woman's primary goal is to secure the economic investment from a long-term mate that will ensure the survival of her children, another reproductive benefit that women require from a mate is "good" genes. Having "superior" genes may mean that her children have relatively greater survival chances because they are better able to repel parasitic infections and withstand environmental perturbations (e.g., Gangestad, Thornhill, & Yeo, 1994; Grammer & Thornhill, 1994). Moreover, as "good" genes are indicated by a person's physical appearance, such as symmetrical body

and facial features, high cheekbones and a prominent chin (e.g., Barber, 1995; Hume and Montgomerie, 1999), children with superior genes may also have relatively greater reproductive chances because they are more attractive than other individuals (Fisher, 1958; Gangestad & Buss, 1993). It follows that, if her long-term mate is able and willing to provide substantial resources but is genetically inferior to other men, a woman may attempt to secure good genes through a short-term mating, in which the attribute on which she is likely to place the greatest importance will be physical attractiveness.

The foregoing suggests that when choosing a long-term mate, women may be willing to relax their standards regarding genetic quality in return for greater economic investment. However, when choosing a short-term mate from whom they do not expect to secure resources, women may put a premium on genetic quality.

Although men are expected to emphasize physical attractiveness when attempting to secure a short-term mate, setting their standards too high will limit the number of short-term mates that they are likely to attain. In contrast, women gain little reproductive benefit from having multiple mates. It follows that when their primary requirement in a short-term mate is “good” genes, women are expected to place a greater importance on the physical attractiveness of a short-term mate than are men. In a long-term mate, however, as fertility is most important for men, and resources are most important for women, men are expected to value physical attractiveness more than are women.

Despite the greater importance that women are hypothesized to place on physical attractiveness in a short-term mate, men are expected to place a greater importance on youth in both long- and short-term mates than are women. In other words, men are expected to prefer mates who are relatively younger than those preferred by women. This is because men’s fertility is relatively stable across the lifespan, and so a man’s physical attractiveness in the eyes of women will not be so highly correlated with youth. It is also due to the fact that in both short- and long-term mates, women, more than men, value the ability to provide economic parental investment and it typically takes an individual a large number of years after puberty to accumulate resources, or to attain the high social status or dominance that facilitates doing so.

Numerous studies have provided empirical support for the foregoing hypothesized sex differences regarding the importance placed on a mate's physical attractiveness and the preferred age of a mate, across short-term and long-term mating. First, there is much empirical evidence in support of the notion that men place a greater importance than do women on the physical appearance of a long-term mate. All the aforementioned studies between 1939 and 1988 which found that women place a far greater importance on the financial prospects of a potential spouse than do men, also found that men reliably place a far greater importance on the physical attractiveness of a potential spouse than do women (Buss, 1989a; Hill, 1945; Hudson & Henz, 1969; McGinnis, 1958). Further, the aforementioned study by Kenrick et al. (1994) using contrast effects, also found that among men and women in long-term relationships who were shown pictures of nude, highly attractive, opposite sex individuals, men subsequently reported a significantly greater reduction than did women in the amount of love that they expressed for their current partner. In addition, Weiderman (1993) found that in personal ads in North America, an explicit request for physical attractiveness in a long-term mate was made about 3 times as often by men as by women. This sex difference is paralleled across cultures. Thus, in all of the 37 cultures considered by Buss (1989a), men placed a greater importance on a marriage partner's physical attractiveness than did women, and in all but 3 of the cultures this difference was significant.

These findings of sex differences regarding the importance placed on physical attractiveness in the context of long-term mating are in contrast to those in the context of short-term mating. Thus, as predicted by the foregoing evolutionary psychological reasoning, the aforementioned study by Kenrick et al. (1993) found that for, and only for, the relationship type "one night-stand", women required a potential mate to be at a higher percentile than did men along the mate attribute "attractiveness". Several other studies have found that women place a premium on a short-term mate's physical attractiveness (e.g., Buss & Schmitt, 1993; Gangestad & Simpson, 1990). Several sources have found evidence in accordance with the foregoing predicted sex difference in mate preferences regarding age. The aforementioned studies into mate preferences between 1939 and 1988 found that among American college students, men desire mates who are younger than themselves, whereas women desire mates who are older than themselves (Buss,

1989a; Hill, 1954; Hudson and Henze, 1969; McGinnis, 1958). Further, Buss (1989a) found that, on average, across the 37 cultures studied, women preferred men who were about 3 years older than themselves, whereas men preferred women who were about 3 years younger than themselves. Similarly, Kenrick and Keefe (1992) found that in personal ads, as men age, they request women who are increasingly younger than themselves, whereas, as women age, they request men whose ages more-or-less match their own. Several studies have also found that, in comparison to women, men are especially attracted to individuals who possess the aforementioned features indicating relative youth (e.g. Hens, 1992; Jackson, 1992). These mate preferences regarding age are reflected in actual mating behavior. Thus, across the world, grooms are, on average, 3 years older than brides (Buss & Schmitt, 1993).

Men's greater preference than women's for physical attractiveness in a long-term mate is hypothesized to have resulted in women evolving a psychology that especially motivates them to use long-term mating strategies that facilitate them in meeting this preference. In line with this, Buss (1988b) found that when attempting to retain a long-term mate, women were judged more likely than men to use and to have success with tactics involving appearance enhancement.

Women's greater preference than men's for physical attractiveness in a short-term mate is expected to have produced sexual selection pressures for men to be more likely than women to use and to have success with short-term mating strategies that involve displaying one's own physical attractiveness and derogating that of same-sex rivals. We, however, know of no studies that support this reasoning. In contrast, to the best of our knowledge, studies indicate that it is mostly women, not men, who use and have success with such short-term strategies (e.g., Buss, & Schmitt, 1996). We offer two inter-related accounts for these findings. One is that due to the relatively great variability of women's fertility across the life-cycle, physical attractiveness in a short-term mate is also highly important to men. Second, as outlined in a foregoing section, as well as "good genes" (indicated by physical attractiveness), women may also seek to secure economic resources from a short-term mate, thus requiring men to use a short-term mating strategy other than that outlined in the preceding paragraph. Consequently, if studies fail to investigate short-term matings in which women are seeking "good genes", then, due to the high

importance that men invariably place on physical attractiveness in a short-term mate, such studies are unlikely to find men being more likely to use and have success with short-term tactics involving displaying one's own physical attractiveness and derogating that of rivals. This suggests, therefore, that future research into short-term mating strategies should specify or identify the reproductive benefits that the pursued sex seeks to secure from a short-term mate and that the pursuing sex believes are sought by the pursued.

### ***Sexual versus Emotional Commitment***

The sex difference in the type of parental investment made indicates that there are likely to have evolved additional sex differences in the context of long-term relationships. As women are internally fertilized, men can never be entirely sure that the child to which their long-term mate gives birth is their own. It follows that, perhaps, the greatest threat to the reproductive success of a man is unknowingly directing his economic investment towards children to whom he is not genetically related because they are the result of his long-term mate being impregnated by another man. A man cuckolded thus, not only directly furthers the reproductive success of rivals, but also has fewer resources both to invest in children to whom he *is* genetically related and with which to attract short-term mates. This leads to the expectation that men will have evolved a psychology that causes them to prefer as long-term mates women who indicate that they are not sexually promiscuous and are likely to be sexually faithful to them. In contrast, perhaps the greatest threat to the reproductive success of a woman is her physiological investment in a child going to waste if the child dies as a result of her long-term mate's withdrawal of his economic investment and his re-directing of it towards another woman. This leads to the expectation that, as a high level of emotional commitment from a mate is a reliable indicator of a willingness to continually provide resources, women will have evolved a psychology that causes them to prefer as long-term mates, men who indicate that they are emotionally attached to them.

Empirical evidence in support of the hypothesized sex difference in preferences for long-term mates has been provided by several studies. For instance, Buss (1989a) found that within all 37 of the cultures he considered, men placed a greater importance on the chastity or virginity of a potential

marriage partner than did women, and within 23 of the cultures this difference was significant. In addition, Ellis & Symons (1990) found that, whereas men's sexual fantasies are typically based on pure lust and sexual gratification, such that they are highly visual, with a focus on bodily parts and sexual positions, women's sexual fantasies are, typically, based on romantic commitment. Thus, women are substantially more likely than are men to focus on the emotional and personality attributes of the partner in their fantasies, and to fantasize about a current romantic partner.

Additional sex differences regarding long-term mating tactics are expected to have evolved as a result of the selection pressures created by the sex difference regarding the preference for sexual versus romantic commitment. Thus, men's preference for long-term mates who are sexually faithful leads to the expectation that women will have evolved a psychology that when they are attempting to attract long-term mates, causes them to be more likely than men to use and have success with mating tactics that involve displaying their own sexual fidelity and impugning rivals as being sexually promiscuous.

Several studies have provided empirical support for this hypothesis (e.g. Buss, 1988a; Buss, 1994; Buss & Schmitt, 1996; Buss & Dedden, 1990). In addition, when attempting to retain a long-term mate, the findings of several studies have indicated that women are more likely than men to use and to have success with the tactic of threatening to be sexually unfaithful (e.g. Buss, 1988b; Buss & Schmitt, 1996; Buss & Dedden, 1990); presumably because a partner's sexual fidelity is especially important to men, and so the threat of losing it especially heightens a man's appreciation of his current mate.

These strategies of women in the context of intra-sexual rivalry are also evidenced in bullying. Thus, the aforementioned studies of same-sex bullying among school-children in the United States and Finland both found bullying among girls to be more likely to involve pejorative name-calling and the spreading of rumors labeling rivals as sexually promiscuous (Ahmad and Smith, 1994; Bjorkqvist, Lagerspetz, and Kaukiainen, 1992). Further, the finding that such bullying exists among girls in high-school but not those in middle-school, indicates that it emerges when girls enter the mating game and so is a form of intra-female competition for mates (Ahmad and Smith, 1994).

In contrast, due to women's preference for long-term mates who are emotionally faithful to them, it is expected that men will have an evolved psychology that, when they are attempting to attract long-term mates, causes them to be especially likely to engage in mating tactics that involve displaying their own emotional fidelity or commitment, and impugning rivals as being unlikely to offer such a commitment. Although, at the present time, we know of no empirical evidence that speaks to this hypothesis, the aforementioned findings of La Cerra (1994) regarding women's preferences for men interacting with a child, suggest that men might be successful in attracting long-term mates by displaying a potential for being good fathers.<sup>2</sup>

In line with this, one of the current authors (APCD) recalls that a photograph of a hunky male model holding a baby became a sales phenomenon among women in England in the 1980s. Several years later, having hit upon hard times, the male model sold his story to a tabloid newspaper, and told how being in that photograph had enabled him to sleep with over 3000 women. Several further years later, a TV channel interviewed some of the women who had bought the photograph and dated and slept with the model. These women related how, at the time, they had believed that the model would make the ideal husband and father. However, when they later read the tabloid story of what a philanderer he had been, they felt that they had been terribly deceived and, in anger, had immediately destroyed the photograph that they had bought! This anecdote also suggests that men may be successful in securing short-term matings by successfully deceiving women into believing that they have strong paternal inclinations.

### ***Sexual versus Emotional Jealousy***

When a partner in a long-term relationship commits either a sexual or emotional infidelity, he or she is pursuing a mating strategy by which to increase his or her own reproductive success at the expense of the reproductive success of the other partner. This creates inter-sexual competition and, therefore, sexual selection pressures for the evolution of sex differentiated psychological traits that facilitate

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<sup>2</sup> We thank the editors for this suggestion.

individuals within one sex in impeding attempts by the other sex to commit a romantic or sexual infidelity.

Since men and women differ in whether romantic or sexual infidelity poses the greater threat to their respective reproductive successes, it is expected that there will be divergent sexual selection pressures across the sexes regarding the evolution of psychological traits to prevent romantic infidelity. As a mate's sexual infidelity poses the greater threat to the reproductive success of a man, men are expected to have evolved a psychology that makes them especially motivated to prevent their partners from being sexually unfaithful. Accordingly, men are hypothesized to be especially likely to experience sexual jealousy, such that they become especially distressed by signs, or actual instances, of their long-term mate being sexually unfaithful to them. In contrast, as a mate's emotional infidelity poses the greater threat to the reproductive success of a woman, women are expected to have evolved a psychology that makes them especially motivated to prevent their partners from being emotionally unfaithful. Thus, women are hypothesized to be especially likely to experience emotional jealousy, in which they feel especially distressed by signs, or actual instances, of their long-term partner forming an emotional attachment to another woman.

This hypothesized sex difference in romantic jealousy has received empirical support from numerous studies. Thus, Buss, Larsen, Westen, & Semmelroth (1992) found that among a sample of American college students, 83 percent of women but only 40 percent of men reported that they would find a long-term partner becoming emotionally involved with someone else more distressing than the individual having sexual intercourse with someone else. In contrast, 60 percent of men but only 17 percent of women reported that they would find a partner's sexual infidelity more upsetting. These self-report findings were paralleled in measures of both physiological arousal and brow muscle contraction. Thus, when asked to imagine the two types of infidelities, greater responses in terms of pulse rate, skin conductance and frowning were reliably displayed by men to the scenario involving a sexual infidelity, and by women to the scenario involving an emotional infidelity. These sex differences in the level of distress felt in response to a sexual and an emotional infidelity have found empirical support from

numerous other studies, across a broad range of cultures (e.g. Buss, Shackelford, Kirkpatrick, Chloe, Hasegawa et al., 1999; Sagarin, Becker, Guadagno, Nicastle, & Millevoi, 2003; Buunk, Angleitner, Obaid, & Buss, 1996).

A large and disturbing psychological sex difference that results from romantic jealousy is in the motivation to kill a spouse or partner. Police reports indicate that a large proportion of spousal homicides in the United States are motivated by jealousy, and of such homicides, an overwhelming number are committed by men (Daly & Wilson, 1988, 1996). These patterns regarding spousal-homicide are paralleled across cultures (Daly & Wilson, 1988).<sup>3</sup>

One way by which a man can reduce his risk of being cuckolded as a result of his partner's sexual infidelity is to reduce the likelihood of his partner's lover fertilizing her egg by placing his sperm in competition with that of his partner's lover (Birkhead, & Parker, 1997). This suggests an additional psychological sex difference, for it is expected that men (but clearly not women) will have evolved a psychology that motivates them to create sperm competition for this purpose. In accordance with this, Shackelford, LeBlanc, Weekes-Shackelford, Bleske-Rechek, Euler, et al. (2002) found that the greater the likelihood that a man's partner had been sexually unfaithful, as indicated by the amount of time that the couple had spent apart, then the more attractive he found her and the more eager he was to copulate with her. The fact that this finding was independent of the amount of time since the couple's last copulation, indicates that men have a psychology that motivates them to place their sperm in competition with that of a possible lover of their partner, as soon as possible after the partner's suspected sexual infidelity. A literary example of the psychological effect that the threat of cuckoldry may have on men can be found in the novel "Fear of Flying" by Erica Jong (1973). In it, the narrator, Isadora Wing, relates that when her

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<sup>3</sup> The finding that wives who leave their husbands are significantly more likely to be killed by their estranged husbands than are wives who do not, appears contradictory to the notion that men's violence against their wives is motivated by a desire to prevent cuckoldry. Wilson and Daly (1996), however, suggest that a man is only likely to be successful in scaring any partner that he might have into being sexually faithful, if he occasionally evidences that he will actually follow through with his threats of violence.

husband caught her *in flagrante delicto* with another man, the husband was induced to have mad, passionate sex with her.

Although, up to this point we have considered anatomical and psychological traits to be the product of either natural selection or sexual selection, the evolution of many traits has been shaped by both processes. In the next section, therefore, we outline why traits are subject to both forces and illustrate this through examples of anatomical and psychological traits.

### **The Dual Action of Natural and Sexual Selection on Traits**

Although natural selection and sexual selection are considered to be distinct processes, they typically operate on traits simultaneously. Accordingly, both forces shape the evolution of many traits. An interesting illustration of the notion that traits may be subject to both natural and sexual selection is provided by the *handicap principle* (Zahavi, 1975). According to this principle, the evolution of some traits may involve natural selection for survival being opposed by sexual selection for attracting mates. Specifically, such traits evolve precisely because they reduce the survival chances of their possessors, for they signal to the opposite sex that in order to be able support the traits, their possessors must be of relatively high genetic quality. These traits are handicaps because they are energetically costly to grow and maintain and make their possessors more susceptible to predation. They are hypothesized to include large and elaborate anatomical features, such as the peacock's tail, as well as elaborate physical maneuvers. The size and elaborateness of handicapping traits will increase only up to the point at which reproductive benefits associated with attracting mates are outweighed by reproductive costs associated with reduced survival chances.

Although they may not be examples of the handicap principle, we shall use the traits of risk-taking and aggression to illustrate how numerous human psychological traits are likely to have been shaped by both natural and sexual selection. It is almost certain that sex differences in risk-taking and aggression are the product of sexual selection because they facilitate the winning of intra-male competition, and are likely to have been further supported by inter-sexual selection, for those women who found them attractive would have benefited from having aggressive, risk-takers as mates. They are also

likely to have been supported by natural selection, as aggressiveness and risk-taking are likely to have advantaged men in the context of hunting. At the point, however, at which increases in the sex differences in aggressiveness and risk-taking meant that the reproductive benefits that men accrued in the context of intra-male competition, inter-sexual selection and hunting began to be outweighed by the reproductive costs associated with an increased risk of death, natural selection would have opposed any further increases in sex differences along them.

The sex differences outlined in the foregoing are those that evolutionary psychological principles suggest have evolved. As we stated in the introduction to this chapter, however, social constructivist perspectives suggest that any observed psychological or behavioral sex differences are not evolved but are products of social norms. Prominent among such perspectives is Wood and Eagly's (2002) *biosocial theory*. In the next section, therefore, we outline this theory and suggest why an evolutionary psychological account of behavioral sex differences has greater explanatory power.

Wood and Eagly's (2002) *biosocial theory* is fundamentally an extended and more detailed version of the *social role theory* outlined by them in an article in 1999 (Eagly and Wood, 1999). Accordingly, as there are no inconsistencies across the two theories, they can be considered as one and the same theory. We, therefore, treat them as such in the critique that follows.

### **Wood and Eagly's (2002) Biosocial Theory**

Wood and Eagly's (2002) biosocial theory posits that behavioral sex differences emerge from an interaction between distal biological and contextual factors. The biological factors are evolved sex-specific anatomical attributes, especially the greater speed, upper-body strength and size of men, as well as behaviors related to them, especially women's reproductive activities of childbearing and nursing. Wood and Eagly consider these biological attributes to be *essentialist*, such that they are stable across societies. The contextual factors consist of the social, economic, technological and ecological forces to which people are subject. The interaction of these ultimate biological and social factors either facilitates or hinders each sex in performing specific tasks, resulting in one sex being more efficient than the other at performing them. Sex-differentiated behavior in a society, therefore, emerges as men and women each

assume the tasks or roles that they can most efficiently perform. Wood and Eagly stated, “[W]e develop a biosocial theory of sex differences and similarities that blends essentialist and social constructionist perspectives” (p. 701). As such, they reject both the essentialist assumption that humans have stable sex-differentiated psychological dispositions and the strict social constructivist assumption that biology plays no role in producing general patterns of sex differences.

According to the biosocial theory, from the division of labor into sex-specific social roles arise certain proximal processes that lead to sex-differentiated behavior. One of these processes consists of gender roles such that the psychological traits necessary for the performance of the sex-specific labor become stereotypic of each sex. These gender roles guide social behavior by way of mediating processes, among which are several socialization processes, such as reinforcement, observational learning, and role modeling. Biological proximal processes also guide and facilitate sex-differentiated behavior. Most notable among these are hormonal changes which occur in response to or anticipation of the demands associated with the performance of social roles, such as the rise in testosterone levels in males in anticipation of engaging in competition.

Friedman, Bleske, and Scheyd (2000) argued that by allowing the evolution of physical but not of psychological sex differences, Eagly and Wood (1999) made a dualistic distinction between mind and body. In response, Wood and Eagly (2000) stated, “On the contrary, ours is an interactionist perspective in which psychological and physical sex-linked attributes are repeatedly constructed or emergent in response to the evolved attributes of the species, the developmental experiences of each sex, and the situated activity of men and women in society” (pp. 1062-1063). Wood and Eagly’s response explains that their theory does not hold that there cannot be an interface or interplay between mind and body. The response, however, in no way addresses the dualistic issue put forward in Friedman et al.’s critique: how is it possible that divergent selection pressures across the sexes shaped the formation of the human body but that the formation of the human brain evaded these same divergent selection pressures?

Eagly and Wood (1999) stated, “[A]n implicit assumption of our approach is that social change emerges, not from individuals’ tendencies to maximize their inclusive fitness, but instead from their

efforts to maximize their personal benefits and minimize their personal costs in their social and ecological settings” (p. 421). The difficulty with this approach, however, is that if the psychology for the maximization of utilities does not maximize inclusive fitness, then it would be selected against in favor of one that does. Moreover, in contrast to terms such as personal costs and benefits in the biosocial account, the meaning of the terms “reproductive benefits”, “reproductive costs”, and “inclusive fitness” used in evolutionary psychological accounts and how they are to be measured have been precisely defined elsewhere (e.g., Williams, 1966). We contend, therefore, that the evolutionary psychological model for the origin of behavioral sex differences is superior to the biosocial model in terms of preciseness and explanatory power. In addition, in contradiction of the biosocial model but in accordance with the evolutionary psychological model, neuropsychological evidence strongly indicates the existence of sex differences in the design and functioning of the human brain (see Kimura & Watson, this volume).

### **Conclusion**

For scientists weighing the empirical evidence, the theory of evolution is the only theory in the game with respect to accounting for how we humans came to exist. Moreover, while by no means all human traits evolved through the process of either natural selection or sexual selection (Gould & Lewontin, 1979), the empirical evidence argues irrefutably that an overwhelming proportion of the anatomical and psychological traits that enable us to successfully function on this planet did evolve through one of these processes (Buss, Haselton, Shackelford, Bleske, & Wakefield, 1998). The acceptance of the foregoing means that since it is a biological fact that the sexes have differing reproductive roles, it follows that, in areas related to reproduction and mating, men and women will have faced divergent selection pressures.

Our goal in this chapter has been to demonstrate that from both a theoretical and an empirical standpoint, it is not reasonable to contend that our bodies were subject to these divergent selection pressures but that our brains escaped them. We hope, thereby, to have convincingly argued that the sexes are just as clearly differentiated by their thoughts and behaviors as they are by their anatomies and, thus,

that if one accepts that brains as well as bodies evolved, then one must also accept that sex differences evolved in both.

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