

# Human Sex Differences in Sexual Psychology and Behavior

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Because age and sex constitute the only distinct anatomical and physiological *morphs* (types) of the human species, universal sex differences ought to be expected. According to Darwinian theory, the most numerous sex differences are likely to be found in the domains of sexuality and reproduction. We first briefly review the basic model of the *adaptationist program* of modern Darwinian psychology. We then present evidence suggesting substantial sex differences in the following domains of sexual behavior: Mate preferences, interest in casual sex, interest in partner variety, jealousy, fantasy, sexual "plasticity," and magnitude of intrinsic sexual motivation. We then propose a program for research and explanation of sex differences that invokes both proximate and ultimate variables where appropriate. This program is based in modern Darwinian theory, neuroendocrinology, human genetics, and social and behavioral sciences. We conclude by considering sociopolitical implications of research on sex differences.

**Key words:** adaptationism, Darwinian theory, evolutionary psychology, gender differences, sex differences, sexual politics.

*One should expect male and female humans to differ in some of their psychological adaptations for the same reason that one should expect species to differ from one another: they are adapted to solve somewhat different problems. In fact, if one considers a group of closely related species, such as the various species of the macaque monkey . . . one could reasonably argue that the females of these species are in many ways more similar to one another than they are to the males of their own species.*

Catherine Salmon & Donald Symons (2001, pp. 37-38)

*[The] fundamental thing is that women are more like men than anything else in the world.*

Dorothy Sayers (1971, p. 37)

Several universal sex differences in behavior and aptitude have been established to the satisfaction of most scientists—for example, boys and men are more physically aggressive than girls and women, and men and women differ in abilities to perform certain verbal and visual/

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spatial tasks, with women excelling on many verbal tasks, and men excelling on most visual/spatial tasks (Collaer & Hines, 1995; Halpern, 2000; Hyde, 1996; Kimura, 1999; Silverman & Eals, 1992).

When it comes to sexual psychology and behavior, however, authoritative facts about sex differences are more difficult to come by, although opinions abound, sometimes supported more by emotion than by scientific evidence. We first discuss several reasons why one ought to *expect* human sex differences in sexual psychology and behavior, and we briefly review the theoretical approach that frames this review. We then present evidence for the existence of sex differences in those domains of sexual life for which such differences have been convincingly documented. We conclude by proposing an integrated strategy, based in modern Darwinian theory, neuroendocrinology, human genetics, and social and behavioral science, for *explaining* sex differences in sexual psychology and behavior.

### **Sex Differences Ought to Be Expected**

Because age and sex constitute the only distinct anatomical and physiological *morphs* (types) of the human species (Tooby & Cosmides, 1990), universal sex differences ought to be expected, as well as universal differences between children and adults. That there might be no innate sex or age differences in behavior and psychology is implausible, particularly given that such differences exist in all other mammals (Mealey, 2000; Salmon & Symons, 2001; Symons, 1979).

The most numerous sex differences are likely to be found in the domains of sexuality and reproduction (Bjorklund & Shackelford, 1999; Buss & Schmitt, 1993; Daly & Wilson, 1983; Symons, 1979; Trivers, 1972). First, men and women differ in sexual and reproductive anatomy, and in the neuroendocrinological characteristics that directly affect sexual and reproductive functioning. Second, both men and women appear to perceive differences in the sexuality of their own sex and that of the other sex (e.g., Buss et al. 1999; Shackelford, Buss, & Bennett, in press). Third, some sex differences in sexual psychology and behavior are logical predictions of most major theories of human behavior, including psychoanalysis, evolutionary psychology, social learning theory, social role theory, and social script theory. In spite of their differences, each of these theories predicts that environmental conditions and experiences, interacting with biological and psychological mechanisms, generate human behavior. If certain experiences critically related to sexual behavior are universally different for men and women, differences in sexual psychology and behavior ought to be expected.

Several aspects of human life, which bear upon sexuality, have resulted in recurrently different experiences for men and women, apparently since the dawn of human society:

1. The minimum parental investment of women in reproduction is much greater than that of men (Symons, 1979, Trivers, 1972). This greater minimum female investment includes the depletion of one of a very limited number of egg cells available for fertilization; 9 months of difficult pregnancy; time and nutrients shared in lactation and early childhood care; and the risks and social consequences of all of these efforts. Risks include injury and death resulting from partner violence or disease transmission, and childbirth complications. Social consequences include a species-typical division of labor by sex (Eagly, 1987; Ehrenberg, 1989).

Differences in men's and women's minimum levels of parental investment have resulted in different psychological adaptations that reflect the sexual strategies each sex has used over evolutionary history (Buss, 1994; Symons, 1979; Trivers, 1972). In a metaphorical sense, because of differences in minimum parental investment, men and women have always lived in two different sexual worlds, and each sex has evolved sexual psychologies that are adapted to their respective worlds.

These different characteristic adaptations have far-reaching consequences, but they are most obviously reflected in areas of sexual life, such as mate preferences, willingness to mate casually, strength of sexual drive, and interest in partner variety (Buss, 1994; Symons, 1979; Trivers, 1972).

2. The majority of societies allow polygyny. Polygyny (one man takes multiple wives) is socially disallowed in just 15% of societies around the world (Murdock, 1981). A few societies—less than 1%—allow polyandry (one woman takes multiple husbands), often when the income and social status of two full brothers is required to attract and acquire one of a few women available for marriage (see Daly & Wilson, 1983, for a review and discussion).

3. Because of differences in minimum parental investment resulting in women being the more valuable reproductive resource, and because of the ubiquitous existence of polygyny, competition for access to mates, with few exceptions, has been more intense among men than among women over human evolutionary history. Therefore, as a result of sexual selection, human males are, on average, physically stronger, larger, and more physically aggressive than women.

This average size and strength sex difference, typical of primates and other mammals, has affected the social and sexual experiences of both sexes in a number of ways. First, it has affected the sexual division of

labor. Historically, men's greater size, strength, and physical aggressiveness made them better suited for hunting and warfare. Women—on average smaller, physically weaker, less aggressive, and the sex which bears children—historically have occupied roles of planting, gathering, and infant care (Barry & Schlegel, 1980; Trivers, 1972). The activities assigned to women according to this division of labor are unlikely to lead to social power, status, or wealth (Eagly & Wood, 1999). Throughout the world, then, although women may wield considerable dyadic power in heterosexual relationships or within the realm of family relationships, they approach sexual interactions with men from a position of lesser social status and power. Consequently, men's greater physical size and strength, combined with their greater physical aggression and social power, frequently has resulted in heterosexual interactions that include male aggression and female vulnerability (Smuts, 1992).

4. Because of universal sex differences in minimum parental investment, women, on average, are more cautious than men in their decisions to engage in sexual behavior. Hence, women represent a limiting reproductive resource to men, or as Baumeister (2000) has said, most acts of sex occur when a female changes a "no" to a "yes." On the other hand, because sperm are plentiful, and men are, on average, eager to engage in sexual behavior, men do not represent a limiting reproductive resource to women (Symons, 1979).

5. Patriarchy—a type of social arrangement in which men occupy the majority of upper positions in political and social hierarchies outside of the family—is universal, and there is no evidence that things have ever been different (Goldberg, 1993). It is likely that patriarchy is also an indirect result of sexual selection due to differences in minimum parental investment. This is because men are more motivated than women to achieve social power and status for the purpose of attracting mates, or (as during war) claiming mates (Goldberg, 1993). Patriarchal social arrangements affect many aspects of sexual relations between men and women (Eagly & Wood, 1999; Smuts, 1995).

6. Because polygyny has always been ubiquitous at the societal level, the possibility of female infidelity also has always been ubiquitous. Thus, men can never be certain that their putative children are their genetic children. Women, in contrast, are always certain that they are the genetic parent of their offspring. If we accept the proposition that people prefer to rear their genetic children and do not wish to be faced with evidence of a spouse's infidelity, this universal experience of men's *paternity uncertainty* also should be expected to have affected men's and women's mating psychology, particularly sexual jealousy (Buss, Larsen, Westen, & Semmelroth, 1992; Daly, Wilson, & Weghorst, 1982; Symons, 1979).

In the listing above, although we have referred briefly to certain ultimate explanations of sex differences based in evolutionary theory, we have intentionally refrained from elaborating on these explanations in detail, or discussing proximate explanations, such as the influence of genes and sex-typical hormonal factors on sexual psychology and behavior. We have done this so that the reader might appreciate that, even if hypotheses that invoke hormones, genes, and “evolution-minded” explanations are falsified, one still ought to expect sex differences in sexual psychology and behavior on the basis of the universal differences between men’s and women’s sexuality-related social experiences (see, for example, Geary, 2000, for a review and discussion of these issues, with special reference to human paternal investment.)

It would be possible simply to proceed in this fashion and catalogue the facts of human sex differences in sexual psychology and behavior primarily from a data-driven perspective (e.g., Oliver & Hyde, 1993). Were we to take this approach, however, sex differences would simply remain curiosities of human life. It is possible, moreover, to hypothesize hundreds or thousands of average sex differences in sexual behavior (D. Symons, August 2002, personal communication). Without a theoretical framework, the choice of sex differences to investigate is entirely arbitrary and potentially pointless.

Our review is guided by modern Darwinian theory, both in our choice of sex differences to investigate and in our choice of an explanatory model. We will now very briefly review this model, known as the “adaptationist program” or modern Darwinism.

### **The “Adaptationist Program”: A Modern Darwinian Approach**

One may arbitrarily identify an infinite number of human traits by partitioning behavior in any way one chooses, naming constructs and creating measures (Salmon & Symons, 2001). Only a small number of these partitions, however, will represent *adaptations*: Mechanisms designed by natural selection to solve a specific problem encountered recurrently by our ancestors over evolutionary time and related to survival or reproduction. Each of these mechanisms evolved in the context of particular parameters of the social and physical environment, referred to for convenience as the environment of evolutionary adaptedness (EEA; Symons, 1995; Tooby & Cosmides, 1990). Thus, the EEA does *not* refer to a particular historical time, such as the Pleistocene, or a particular place, such as the African savannah, although these probably do represent the time and place coordinates of the EEA for many adaptations (Salmon & Symons, 2001).

Adaptations may be distinguished from other demarcated traits in their evidence of special design and “special problem-solving machin-

ery" (Williams, 1966, p. 1). This machinery can be recognized by the economy, efficiency, precision, constancy, and specificity with which its effects are achieved (Symons, 1995; Tooby & Cosmides, 1990; Williams, 1966). Adaptations are simply too good at doing what they do to have emerged by chance. It is also true, however, that because adaptations are logically wedded to the environment in which they emerged, if parameters of this environment should change, the adaptation may not perform as it should. A frequently cited example is the existence of human taste preferences for sweet and fatty foods, undoubtedly an adaptation to the calorie-scarce environments of our ancestors. In the modern Western world, however, calories are not scarce, and this once adaptive mechanism, although still an adaptation, is no longer adaptive—witness current epidemics of obesity in nations where fast food is easily and cheaply available.

Because adaptations are not arbitrary demarcations of traits, they are not infinite in number and, indeed, adaptation is an "onerous concept," only to be employed when evidence of design is clearly apparent (Williams, 1966). The majority of demarcated human traits are not adaptations. They represent either "random noise" resulting from reproductively neutral genetic mutation or by-products of adaptations—incidental traits that exist as a direct result of a particular adaptation and are necessarily present if the adaptation is present. By-products, however, did not evolve to solve a specific problem, and they may serve no function at all, or if they do serve a function, this also will have occurred by chance.

Consider ubiquitous male arousal to photographic images of nude young women (pornography). Being aroused by two-dimensional images could not constitute an adaptation because it shows no evidence of design (and, of course, because no graphic two-dimensional images of nude women existed in the environments of our ancestors). Being aroused by the sight of *live* three-dimensional nude young women shows clear evidence of design, however. Because the minimum male parental investment is relatively small, any ancestral man who routinely failed to become aroused at the sight of live, young nude women, and who needed numerous other criteria to be met prior to arousal (e.g., knowledge of the social status of the woman's family, her ancestral pedigree, her sense of humor, gathering and cooking skills) would have missed many profitable, low-cost opportunities to reproduce. Arousal to pornography, therefore, is no doubt a by-product of the male adaptation to become aroused at the sight of live, young nude women.

The *adaptationist program* is a name originally used by evolutionary biologists, such as Ernst Mayr, and revived with some irony by Donald

Symons (1995), partially in response to its use as an epithet in misguided criticism of evolutionary psychology. The goal of the adaptationist program in the behavioral sciences is to identify and to describe human psychological adaptations and their consequences. The examination of sex differences is an interesting way to begin to isolate possible sexually dimorphic adaptations. Sex differences, however, are not adaptations themselves. They are behavioral reflections of adaptations and by-products of adaptations and identifying them is only a preliminary step toward the goal of the adaptationist program—it is not the goal itself.

### *Ultimate and Proximate Variables*

Adaptations affecting human sexual behavior have both proximate causes and ultimate causes. Sex researchers are usually trained to consider primarily one or the other, but not both. For example, evolutionary theorists tend to focus on ultimate levels of causation, such as selection pressures over a long evolutionary history. Social role theorists and feminists also are concerned with ultimate explanations, but they employ different kinds of variables. Sex with multiple partners, for example, might be seen as a male privilege under patriarchy, a privilege that women would enjoy if they were free to do so.

Neither evolutionary theorists nor social-role/feminist theorists usually comment on the proximate social and biological processes that carry out the mandates of evolution or of patriarchy. Are hormonal events responsible? If so, which ones? Is neuroanatomy relevant? What is the role of socialization? These are questions of proximate causality.

On the other hand, those working in fields specializing in proximate causes, such as neuroendocrinology, neuroanatomy, or learning theory, rarely attempt to specify the ultimate origins of sex differences in hormonal effects, brain structures, or reinforcement contingencies beyond speculating in a general way that evolutionary forces or social forces are at work. This lack of grounding in ultimate theory constrains hypothesis generation and application of results.

It is difficult to be equally precise about both ultimate causes and proximate causes. Darwin (1859), for example, understood the consequences of heredity when he formulated his theory of natural selection, without understanding the proximate cause and unit of heredity—the gene. The theory of natural selection “works” without the gene, but it is more powerful with the inclusion of knowledge about the gene. Although we believe that ultimate explanations of sex differences can only emerge from the application of principles of Darwinian theory, it is important to examine the proximate factors that directly cause sex differences and those that mediate the strengths of those differences.

After reviewing evidence for sex differences, we will offer an explanation for one of these sex differences—sexually dimorphic mate preferences. We will use this exposition as a way of presenting a general program of research that includes considerations of the ultimate, evolutionary history of adaptations and the proximate, social and physiological processes involved in the development of sex differences.

*Two caveats.* In a meta-analytic review of the literature on sex differences in sexuality, Oliver and Hyde (1993) affirmed what most informed commentators suspected: When reliable sex differences are found, they often are only small-to-moderate in magnitude. Oliver and Hyde were somewhat arbitrary in their choice of sex differences to investigate and were concerned primarily with establishing the existence and magnitude of differences, rather than situating these differences within a theoretical perspective. As pointed out by Bailey, Gaulin, Agyei, and Gladue (1994), however, a number of sex differences not investigated by Oliver and Hyde are quite large (see also Buss, 1994; Eagly, 1995; Symons, 1979; Townsend, 1998).

Before discussing some of these sex differences in sexual psychology and behavior, we offer two caveats. The first concerns measurement. Sex differences are typically measured as mean differences in scores. For many of these differences, there is considerable overlap between the sexes and considerable variation within sex. Based on current knowledge, there is no sex difference in sexual behavior—apart from sex differences that accompany sex-differentiated anatomy—that is described by a bimodal distribution in which there is no overlap between the distribution for men and the distribution for women. For example, although there is no historical record of a woman who has taken a number of lovers approaching that of the more extreme examples of male promiscuity (Buss, 1994, 2000), some women are as promiscuous and serially polyandrous as many men (Gangestad & Simpson, 1990, 2000; Greiling & Buss, 2000; Mikach & Bailey, 1999; Shackelford, LeBlanc, Michalski, & Weekes, 2000).

Even if it were the case that a particular aspect of sexual behavior or psychology is entirely sexually dimorphic—for example, frequency of desire for sexual intercourse with complete strangers based entirely upon their physical appearance glimpsed for one and one-half seconds—it is also the case that empirical observations or measurements bearing on this question are likely to be influenced by many variables—some of which may be sexually *monomorphic*, not dimorphic (e.g., social desirability, demand characteristics, responses to artificial or evolutionarily novel situations). Such measurements—for example, college students' answers on questionnaires—are almost certain to yield overlapping, rather than bimodal, distributions.

It may be that men's and women's sexual psychology—usually less reliably measurable than behavior—differs within certain domains to a magnitude approaching nonoverlapping bimodality. For example, Clark and Hatfield (1989) had male confederates of average attractiveness approach college-aged women and ask the women if they would go back to the man's apartment to have sex with him. None of the women accepted the invitation. When female confederates of average attractiveness approached male targets with the same question, 75% answered affirmatively (see also Clark, 1990). A substantial number of the men who turned down the invitation were apologetic, explaining that they *would* have accepted had they not currently been in a monogamous relationship. Some of Clark and Hatfield's (1989) male participants might have been gay. If the target population had been unattached heterosexuals, perhaps closer to 100% of the men would have accepted the invitation.

Unlike the men, *none* of the women responded apologetically, suggesting that their relationship status was unrelated to their refusal. They simply were not interested. These results suggest that most women find the idea of sex with a stranger unappealing (see Buss, 1994, for a review of related research). These results suggest that most men, in contrast, find such a prospect appealing and a substantial number may well find the prospect particularly appealing. If so, this would represent a bimodally distributed, sex-differentiated psychological characteristic as well as behavioral propensity.

The second caveat involves limitations of qualitative reviews. A qualitative review is limited in several ways relative to quantitative reviews, such as meta-analyses. Because a qualitative review is subjective, it may suffer from bias in study sample selection and interpretation of findings. Moreover, important information on the magnitude of effects is typically absent. Qualitative reviews have the advantage, however, of allowing greater freedom to expand discussion and consider interpretative and speculative issues. This continues to make such projects worthwhile (Baumeister & Leary, 1997). The current review, however, is a preliminary step in a process that will be followed by meta-analyses, to be presented in a separate article.

Because we are dealing with many sex differences in a limited space, we made decisions that will bias this review. We review only those sex differences for which substantial empirical evidence exists. The research question we address here is not whether these sex differences are real, but what is the evidence in favor of these differences? With few exceptions, we do not consider the few studies that may have failed to support a particular sex difference, unless they appear to present a sub-

stantive challenge to the existence of the sex difference. In these cases, the discussion will center on why this apparent challenge is not a substantive challenge. In other words, had the challenge been truly substantive, the putative sex difference would not have been included in the review in the first place.

What is a “substantive challenge” or an “apparent substantive challenge”? If a sex difference were found only with a single methodology or only with limited types of samples, that would present an apparent substantive challenge. If the researchers proposing the sex difference cannot account for the negative results found with other samples or with other methodologies, that would constitute a substantive challenge and preclude inclusion of the sex difference among those considered here.

On the other hand, new interpretations arise regarding data previously thought to have established a sex difference. In the case of a sex difference in jealousy, for example, some researchers have hypothesized that this difference is artifactual (DeSteno & Salovey, 1996; Harris, 2000). Because they presented a reasonable argument in favor of this hypothesis, but this argument was subsequently demonstrated to be flawed by the collection of new data (Buss et al., 1999; Wiederman & Kendall, 1999), this counts as an “apparent substantive challenge.” We included this sex difference, discussing the flaws in the apparent challenge.

We next review evidence pertaining to human sex differences in sexual psychology and behavior in the following domains: mate preferences, interest in casual sex, interest in partner variety, jealousy, fantasy, sexual “plasticity,” and magnitude and consistency of intrinsic sexual motivation. We selected these sex differences to investigate because they are likely to illuminate psychological adaptations—either because they are direct results of adaptations or because they are likely to be by-products instead (An additional, robust sex difference—frequency of masturbation—will be discussed in the context of the difference in magnitude of intrinsic sexual motivation.)

### **Mate Preferences**

There are many attributes of a potential long-term partner or short-term partner upon which both men and women report placing value, including kindness, attractiveness, dependability, intelligence, sense of humor, and generosity (Botwin, Buss, & Shackelford, 1997; Buss, 1989, 1994). There also are several sex differences in the value that men and women place on certain qualities. In long-term mating and short-term mating contexts, men, more than women, value a mate’s youth and physical attractiveness; women, more than men, in contrast, value a mate’s social status, ability to acquire resources, and willingness to

share them. This sex difference has been documented in every society for which data have been collected, and there is no known society in the world where the direction of this difference is reversed (e.g., Buss, 1989; and see Buss, 1994, for a review). It has been found, regardless of economic or political system, status of women, or mating system (monogamy or polygamy). It has been documented in self-report questionnaire studies, analyses of "lonely hearts" advertisements, archival studies of marriage data, correlations of popularity with physical attractiveness, comparisons of the content of popular erotica favored by men and by women, and experiments in which the attractiveness of opposite-sex strangers has been manipulated. This sex difference has been particularly widely documented as the following citations attest: Bailey et al., 1994; Betzig, 1986; Borgerhoff Mulder, 1990; Botwin et al., 1997; Buunk, Dijkstra, Kenrick, and Warntjes, 2001; Buckle, Gallup, and Rodd, 1996; Buss, 1989, 1994; Buss and Barnes, 1986; Buss and Schmitt, 1993; Buss, Shackelford, Kirkpatrick, and Larsen, in press; Feingold, 1990, 1992; Greenlees and McGrew, 1994; Hatfield and Sprecher, 1995; Hill, 1945; Hudson and Henze, 1969; Jackson, 1992; Jones, 1996; Kenrick and Keefe, 1992; Kenrick and Gutierrez, 1980; Kenrick, Neuberg, Zierk, and Krones, 1994; Kenrick, Sadalla, Groth, and Trost, 1990; Langhorne and Secord, 1955; Malamuth, 1996; McGinnis, 1958; Powers, 1971; Sprecher, Sullivan, and Hatfield, 1994; Symons, 1979, 1995; Townsend, 1987, 1989, 1993, 1998; Townsend and Jankowiak, 1986; Townsend and Levy, 1990a, 1990b; Townsend and Wasserman, 1998; Waynforth and Dunbar, 1995; Wiederman and Allgeier, 1992, 1993; Whyte and Parish, 1984. The effect size for this particular sex difference is often quite large (e.g.,  $d > .80$  in Bailey et al., 1994). Bailey et al. commented about this sex difference and several others covered in the present article: "It is ironic that sex differences so large have been scientifically ignored until recently, when so much energy has been expended examining relatively small sex differences" (p. 1087). (See also Buss, 1994, & Feingold, 1990, for reviews).

Sex differences in mate preferences have been documented in "real world" behavior, and not just in self-report surveys. Throughout the world, for example, wives tend to be younger than their husbands (Buss, 1989, 1994; Buss, Shackelford, & LeBlanc, 2000; Kenrick & Keefe, 1992; Otta, Queiroz, Sousa, da Silva, & Silveria, 1999). Tellingly, the more successful a man is, the younger and more attractive his wife tends to be (Udry & Eckland, 1984), and the less likely he is to end up with no sexual partners (Laumann, Gagnon, Michael, & Michaels, 1994; Mealey, 1985). This is "telling" because successful people are more likely than others to be able to actualize their sexual preferences. If these prefer-

ences are markedly similar within sex, it is likely that these successful people are actualizing not only their personal preferences, but also the general preferences of their sex (Symons, 1979; Townsend, 1998).

Betzig (1986) and Mealey (1985) reported that men with status and wealth have more wives than other men in polygynous societies, and Pérusse (1994) presented evidence that the more successful a man is, the more sexual partners he has had (see also Townsend, 1998). Buss (1996) reported that, in the United States, the men that women choose as husbands earn an average of 50% more than men of the same age that women do not choose. The importance to women of status and the ability to acquire resources is indirectly reflected in a cross-cultural study by Betzig (1989), who found that inadequate financial support by husbands was cited as a cause of divorce in many societies around the world, but in no society was inadequate financial support by wives cited as a cause of divorce.

Women's preferences for somewhat older, higher-status, financially successful men shows evidence of reproductive and interpersonal wisdom. In a study of 1,800 Hungarian women over the age of 35 (and thus not likely to have more children), Bereczkei and Csanaky (1996) reported that women who married older, higher status, better educated men had more children, reported greater marital satisfaction, and were less likely to divorce than women who married younger men of lesser status and education (see also Botwin et al., 1997; Shackelford & Buss, 2000).

Townsend and Levy (1990b) presented men and women with photographs of people of the other sex who varied in physical attractiveness and in the social status indicated by their clothing. In one set of photographs, the models wore low-status clothing such as fast-food chain restaurant uniforms. In a second set of photographs, they wore conventional "middle-status" clothing. In a third set of photographs, the models wore designer clothes and accessories. Townsend and Levy (1990b) asked participants how willing they would be to enter into various types of relationships with the people in the photographs—from having coffee to having sex. The women found the *least physically attractive man* more acceptable than the *most physically attractive man* to have coffee with, to date, to have sex with, and to marry . . . , as long as he was depicted wearing a Rolex watch and a designer blazer. Men's responses, in contrast, were influenced primarily by the physical attractiveness of the model. They were indifferent to the woman's apparent social status. The men were unwilling to date the less attractive model, for example, regardless of what she was wearing (see also La Cerra, 1995).

Men's greater interest in the physical attractiveness of a mate is reflected in men's visual orientation in sexual arousal. Men, more than

women, become sexually aroused at the sight of a nude member of the other sex (Bailey et al. 1994; Kinsey, Pomeroy, Martin, & Gebhard, 1953; Symons, 1979). In *Male and Female*, anthropologist Margaret Mead observed that everywhere girls are clothed before boys, and that females are taught to sit so that their genitals are not observable to boys and men so that inappropriate male attraction and arousal will not occur (cited in Symons, 1995).

Men's interest in youth and physical attractiveness is *sex-specific*, and not sexual-orientation specific—it is found among homosexuals as strongly as among heterosexuals (Bailey et al., 1994). Interest in status and resource acquisition does, however, appear to be *sexual orientation specific* as well as sex-specific: Homosexual women report placing little importance on this suite of mate preferences (Bailey et al., 1994).

Three sets of data regarding this topic warrant detailed description. These data were collected in radically different societies: China, the Ache of Paraguay, and the United States.

### *China*

The Chinese Marriage Law of 1950 (revised in 1987) stipulates the criteria by which both men and women are to choose mates: personal compatibility, political attitudes, and judgment of character. Criteria deemed inappropriate, in contrast, are wealth, good looks, sexual attractiveness, and family connections (Townsend, 1995). This law emerged in a noncapitalist society where governmental structure and regulations support equality for women, suppress the glorification of female beauty in the mass media, and devalue the notion of wealth. When Chinese emigrants were interviewed by Whyte and Parish (1984) and asked the criteria by which men and women during the 1970s *actually* chose mates, the criteria were as follows, rank ordered (adapted from Townsend, 1995, p. 219):

#### **Woman value:**

1. Job, income
2. Class label, political record
3. Family income and housing, social connections
4. Urban registration
5. Overseas connections
6. Pleasing personality, good character
7. Good looks

#### **Men value:**

1. Class label, political record
2. Good looks
3. Family income and housing, social connections
4. Pleasing personality, good character
5. Job and income
6. Urban registration
7. Overseas connections

The sex-differentiated rank-ordering of “good looks” and indicators of social status in this sample of Chinese emigrants parallels the sex-differentiated rank-ordering of these characteristics reported for college students in the United States and, indeed, for samples of participants from around the world (see Buss, 1989).

*The Ache of Paraguay*

Anthropologist Kim Hill (cited in Geary, 1998, p. 129) interviewed a woman named Achipura of the Ache, a preindustrial Paraguayan hunter-gatherer tribe. The purpose of the interview was to determine the type of man that Ache women found attractive.

KH: Achipura, what kind of man could get many women, what kind did women love, the kind who could easily find a wife?

A: He had to be a good hunter.

KH: So if a man was a good hunter he could easily find a wife?

A: No, not just a good hunter. A good hunter could find a wife, but a man needed to be strong.

KH: When you say strong, do you mean a man who could beat up others in a club fight?

A: No, women don't like those men. Women don't like men who love to hit others. I mean a strong man. One who would walk far to hunt, one who would carry heavy loads. I mean a man who would work hard when everyone was tired, or build a hut when it was cold and rainy. I mean a man who was strong. A man who could endure and not get tired.

KH: Did women love big men then [i.e., men of large body size]?

A: No, they would love a small man or a large man, but he had to be strong.

KH: What other men would be able to acquire a wife easily?

A: A man who was a “good man.”

KH: What does it mean, a “good man”?

A: A good man is one who is handsome [attractive face]. One who is nice and smiles and tells jokes. A “good man” is a man whom women love.

Achipura has described status (good hunter), with its attendant increase in ability to acquire resources, strength (more resource acquisition and physical protection), and willingness to share them (“good man”).

*The United States*

In the context of his work with law students, doctors, and medical students in the United States, Townsend (1995) suggested that high-income, high-status people are in better positions than others to actualize their mate preferences. If there is within-sex commonality among men's and women's responses, it is a reasonable hypothesis that these preferences might represent the ideal male and female criteria for the society. Townsend (1995) conducted in-depth interviews with high-status students and professionals regarding their mate preferences. What emerged among this sample is an exaggeration of the expected sex differences. Women were *more* concerned than usual with income, status, and occupation, whereas men were *more* concerned than usual with attractiveness.

Eighty-five percent of the men in Townsend's (1995) high mate-value sample reported that physical attractiveness was the characteristic that was *most* important to them when considering a serious dating relationship, whereas only 10% of women answered in this way. In contrast, 80% of the high-status women mentioned "respect for partners' abilities and achievements," whereas only 30% of the men responded similarly. This is in contrast to the results of survey data collected from middle-class and lower-class persons, in which men and women—although they differ in the importance they place on these attributes—do not place them *first* in importance. The patterns found in Townsend's (1995) sample are particularly interesting, given that many commentators have predicted that the more sex-egalitarian our society becomes, and the more resources are held by women, the less interested women will be in status and resources in men and the less men will care about youth and attractiveness (e.g., Ira Reiss, personal communication, June, 2000; and see Buss, 1989; Buss & Barnes, 1986).

**Short-Term Mating and Long-Term Mating**

Although the sex differences in preferences for status, resources, youth, and physical attractiveness obtain both for long-term mating contexts and short-term mating contexts, there are a number of nuances introduced if the short-term mating context and the long-term mating contexts are examined separately. A mate's physical attractiveness, for example, acquires greater importance to women in short-term mating contexts as compared with long-term mating contexts. This shift is not accompanied by a decrease of interest in status and resources, however. Requirements for status and resources either remain the same or *increase*. In sum, women's overall standards for a short-term mate either remain the same or *increase*, relative to their standards for a

long-term mate. For men, in contrast, their standards for a short-term mate are *relaxed*, relative to their standards for a long-term mate (Buss, 1994; Kenrick et al., 1990; Kenrick, Groth, Trost, & Sadalla, 1993; Landolt, Lalumiere, & Quinsey, 1995; Nevid, 1984; Regan, 1998). As Symons (1979) observed, the average man can acquire a higher mate quality wife than short-term sex partner, whereas the average woman can acquire a higher mate quality short-term sex partner than husband. We will discuss reasons for the evolution of sex differences in mating preferences at the conclusion of this review.

### **Willingness to Mate Casually**

*Women need a reason to have sex. Men just need a place.*

Billy Crystal

In the naturalistic studies of Clark (1990) and Clark and Hatfield (1989), a large sex difference was found in willingness to have sex with a stranger. Although some commentators have suggested that this sex difference originates in women's fears for their safety in encounters with male strangers, four types of data argue against this interpretation. First, debriefing interviews conducted by Clark (1990) suggested that fears about safety were unrelated to female participants' refusals to have sex with a stranger. As Buss (2000) pointed out, not a single woman expressed fears for her safety in explaining why she refused. Second, about 50% of the women expressed willingness to *date* the man, potentially placing them in a physically vulnerable position. Third, in a separate study, Clark (1990) arranged for close friends of participants to contact the participants regarding a person who wanted to have sex with them, and to personally verify the safety of this person—and yet the results were identical. Women were uninterested in sex with the man, although they were willing to date him. Finally, lesbians, who do not run risks of male-perpetrated violence in sexual situations, display as little proclivity for casual sex as do heterosexual women (e.g., Bailey et al., 1994; Symons, 1979).

Clark (1990) and Clark and Hatfield (1989) directly measured what people *actually do* rather than what they *report* that they would do. The findings should be considered reliable because they replicate self-report findings, although suggesting increased magnitude of effect. It may be that this sex difference is stronger in reality than the already strong difference reported in various questionnaire and interview studies (e.g., Buss & Schmitt, 1993; Ehrlichman & Eichenstein, 1992; Ellis & Symons, 1990; Schmitt, Shackelford, Duntley, Tooke, & Buss, in press; Townsend, 1995, 1998). In choosing a mate, paying too much attention

to how a person looks, or to what he or she does for a living and how much money is earned—as opposed to “who the person is inside”—may not be socially desirable, particularly among college students who often constitute samples in research (Townsend, 1995). Social desirability concerns, therefore, would bias questionnaire and interview data in the direction of smaller effect sizes.

There is other empirical evidence to support the claim that men and women differ in their interest in casual sex. This evidence comes not only from questionnaire and interview studies of attitudes, fantasy, and behavior, but also from analyses of art and literature, social custom (e.g., most customers of male or female prostitutes are men, and most prostitutes are women; Burley & Symanski, 1981), and from comparisons of erotic media such as “skin” magazines (male-oriented) and romance novels (female-oriented) (e.g., Ellis & Symons, 1990; Malamuth, 1996; Salmon & Symons, 2001). Kinsey and his colleagues (1948, p. 589) concluded that, “There seems to be no question but that the human male would be promiscuous in his choice of sexual partners throughout the whole of his life if there were no social restrictions,” but that “the human female is much less interested in a variety of partners.”

Several additional representative self-report studies are as follows: Buss and Schmitt (1993; and see Schmitt et al., in press) asked men and women how likely they would be to agree to have sex with someone they had known for an hour, a day, a week, a month, 6 months, a year, 2 years, or 5 years. At all intervals except 5 years, men reported that they would be more likely to agree to have sex (by 5 years the sexes were equivalent in their responses).

Ellis and Symons (1990) asked men and women who were currently married or in a relationship the following question: “If the opportunity presented itself of having sexual intercourse with an anonymous member of the opposite sex who was as competent a lover as your partner but no more so, and who was as physically attractive as your partner but no more so, and there was *no* risk of pregnancy, discovery, or disease, and *no* chance of forming a more durable relationship, do you think you would do so?” Four times as many men as women answered that they “certainly would,” and women were two and one half times as likely as men to answer “certainly not” to the question. When the same question was presented to people without steady partners, men were six times as likely as women to answer that they “certainly would” engage in anonymous sex, and women were, again, two and one half times as likely as men to answer “certainly not.”

Ehrlichman and Eichenstein (1992) asked a sample of young men and women to select their 20 most preferred “wishes.” Although the

sexes were similar in most respects, men were far more likely to include a wish to have sex with anyone they chose, and to be able to have sex without commitment.

Many women engage in casual sex, and the very existence of male sexual jealousy suggests that women always have (Buss, 2000). It appears that even when women do engage in casual sex, however, their motives and responses may be different from those of men. In Townsend's (1995) in-depth interviews, he found that women engaging in casual sex frequently felt emotionally vulnerable and anxious about whether the relationship would lead to a long-term relationship. Often, these female respondents—even those who possessed positive attitudes toward, and beliefs about, casual sex—reported that they felt “used” in casual sexual encounters, although they could not “defend” this feeling rationally (i.e., that is, they could not say that they had been treated badly or lied to). The more partners women reported having, the greater was the incidence of these anxious thoughts and unpleasant feelings. The more partners the men had, in contrast, the *less* anxiety of *any* sort they expressed.

In sum, the conditions under which men will consider mating casually or in the short-term are more numerous than those under which women will consider mating in this manner. This sex difference also is reflected in attitudes toward casual sex. Relative to women, men are more approving of recreational or casual sex (Kinsey et al., 1948, 1953; Laumann et al., 1994; Oliver & Hyde, 1993; Symons, 1979). As reported in the meta-analysis of Oliver and Hyde (1993), this sex difference is large in magnitude ( $d = .81$ ).

### **Interest in Partner Variety**

The sexes differ in their reported interest in having sex with a variety of partners and in the number of sexual partners they report having had (Buss & Schmitt, 1993; Ellis & Symons, 1990; Kinsey et al. 1948, 1953; Laumann et al. 1994; Oliver & Hyde, 1993; Schmitt et al., in press; Symons, 1979; Terman, 1938; Townsend, 1998). Because they were interested in attitudes and behavior, and not in motivation, Oliver and Hyde (1993) did not address the question of desire for a variety of partners in their meta-analysis. They did, however, report “moderately large gender differences” (p. 42) in number of sexual partners reported by men and women (in the direction of greater number of partners reported by men) relative to women—a logical conundrum upon which numerous researchers have commented (i.e., are a few women having sex with tens of thousands of men? Are men bald-faced liars? Are men and women prone to sex-specific types of recall errors?).

A number of researchers have addressed the issue of desire, and they have uniformly found that men are more interested in a variety of sexual partners than are women. For example, Buss and Schmitt (1993; and see Schmitt et al., in press) asked young men and women how many sex partners they would like to have over various time periods ranging from 1 month to a lifetime. At each time period, men expressed a desire for many more sex partners. At one year, for example, men wanted six times as many partners as women (men = 6 partners, women = 1 partner); at 3 years, men wanted five times as many partners (men = 10 partners, women = 2 partners). This ratio remains large throughout the time periods, with men expressing the desire for 18 partners in a lifetime and women expressing the desire for only four or five partners in a lifetime (Buss & Schmitt, 1993; Schmitt et al., in press).

At first glance, these figures seem straightforward, but Symons (personal communication, June, 2001) pointed out that, if taken seriously, the numbers suggest either that the men in Buss' and Schmitt's studies were planning to settle down with one woman soon, or were planning to die within three years! Social desirability concerns might therefore have diminished the true sex difference. Although it is also possible that social desirability concerns caused women in this study to underreport the number of partners they would prefer to have, the weight of all other evidence argues against this possibility.

The sex difference in attitudes toward partner variety has not changed appreciably over the past half-century, despite the sexual revolution and the fact that sex differences in attitudes toward premarital sex (in the context of committed relationships) have changed considerably (Geary, 1998). As sexual freedom has increased, sex differences have become more, not less apparent (Townsend, 1998). Greater sexual freedom allows men and women to experiment with different sexual lifestyles and partners and to determine their own comfort levels. As Townsend (1998) observed, "The greater availability of sex outside marriage now allows more men to attempt to have sex with many partners with little or no emotional involvement, and allows more women to feel disappointed when these men succeed" (p. 16).

Why should men be more interested in casual sex and partner variety than women? In order to understand this, it is useful to construct a model comparing the fate of the genetic line of ancestral men and women who either preferred, or eschewed, casual sex and partner variety. An ancestral woman had a very limited number of secondary oocytes (egg cells) available for fertilization, and she could not produce more than one child per year. Her reproductive career spanned only about 20-25 years, and to reproduce was dangerous, time consuming,

painful, and depleting of nutritional resources. None of these factors came into play among our male ancestors, for whom reproduction was potentially swift, low cost, and pleasurable.

Although an ancestral woman would, under specific circumstances, have gained reproductively from infidelity or casual sex (Greiling & Buss, 2000; Symons, 1979), a woman who was indiscriminate in her mating would not have gained reproductively, given that her reproductive opportunities were constrained relative to men's. Indeed, she would have risked disease transmission, violence from jealous mates or poor choices of partners, and so forth.

A man who enjoyed casual sex and sex with a variety of women—as long as such liaisons did not seriously threaten efforts to invest in the best of these mating opportunities—would have gained reproductively. On average, the genetic line of men who found pleasure in casual sex with a number of partners would have prospered, and the genetic line of women who found pleasure in casual sex with a number of partners would have died out.

The strong evidence we have reported that men, more than women, do enjoy casual sex and multiple partners (and associated fantasies, as we describe subsequently) is evidence in favor of this historical scenario. It is not sufficiently appreciated that numerous facts of current human sexual life are evidence of the structure of past environments and the behavior of ancestral humans. Scenarios such as those described earlier are not “just-so stories,” as some have charged, any more than is the claim that the environments of our ancestors included oxygen, sunlight, gravity, and objects with edges (Salmon & Symons, 2001; Tooby & Cosmides, 1990). Analyses of organs, such as the lungs, eyes, heart, and limbs, focusing on their “engineering” qualities, reveal the physical properties of ancestral environments or, as Jones (1996) observed, paraphrasing George Williams (1966), “organisms . . . are historical documents.” We can construct certain properties of past environments with no evidence other than engineering analyses of human biology and comparative studies of the biology of other mammals. The same is true for constructions of numerous aspects of social environments based on the study of psychological adaptations (Salmon & Symons, 2001; Symons, 1995; Tooby & Cosmides, 1990).

It is important to stress that constructing past environments is not a goal of adaptationist analysis, it is a means. Constructing scenarios of past environments is primarily useful for the generation of testable hypotheses.

### **Sexual Fantasy**

Cues to human sexual psychology can be found in sexual fantasy—the most common form of human sexual experience (Ellis & Symons,

1990). Fantasy is an important topic in understanding sex differences because not only are men's and women's sexual fantasies different in many respects, but these differences shed light on other sex differences in sexuality, such as men's greater interest in partner variety and casual sex.

Sex differences in sexual fantasy emerge prior to puberty, along with the onset of sexual fantasizing (Gold & Gold, 1991; Knoth, Boyd, & Singer, 1988). Young boys (and young men recalling their boyhoods) report that their first sexual fantasies were in response to a visual stimulus. Girls and women, in contrast, report that their first sexual fantasies occurred in the context of a real or imagined romantic relationship. Boys' fantasies begin several years earlier than girls' and are more frequent, intense, distracting, sexually explicit, and positive in associated feelings (Gold & Gold, 1991). When Knoth et al. asked adolescent boys and girls about the frequency of their sexual fantasies, 45% of boys, but only 6% of girls, reported that they had sexual fantasies "many times a day," whereas 35% of girls, but only 8% of boys, reported that they had sexual fantasies only "once a week" (see Ellis & Symons, 1990, for similar results).

These early emerging sex differences continue into adulthood. When Cameron (1967) asked men and women to estimate what percentage of the time they thought about sex, 55% of men, but only 42% of women, answered "more than 10% of the time." When Cameron and Biber (1973) asked men and women if they had had a sexual thought "in the last 5 minutes," 52% of men aged 14-25 years said "yes" as compared with only 39% of women in this age range. In the 26-55 year age range, the figures were 26% for men and 14% for women. Men also report an average of twice as many *different types* of fantasies (Leitenberg & Henning, 1995). Finally, in a national probability sample of Americans, 54% of men, but only 19% of women, reported that they thought about sex every day or several times a day (Laumann et al., 1994). Men think and fantasize about sex more than do women.

Men's sexual fantasies are more sexually explicit and focus on body parts, whereas women's sexual fantasies focus on commitment and romance (Ellis & Symons, 1990; Follingstad & Kimbrell, 1986; Gil, 1990; Hardin & Gold, 1988). Men also are more likely to report fantasizing about sex with numerous partners. This is one of the most robust findings in the sexual fantasy literature (see Leitenberg & Henning, 1995, for a review). In the study conducted by Ellis and Symons (1990), men reported fantasizing about twice as many different partners per day as did women. When these investigators asked their participants if they thought that, over their lifetimes, they had

imagined having sex with over 1,000 partners, four times as many men (32%) as women (8%) responded that they had. Men also reported switching partners during the course of a single fantasy more often than did women.

### Jealousy

Men and women differ in their experience of jealousy. The sexes do *not* differ, however, in the frequency or intensity of their jealousy, or in the importance of the emotion of jealousy in their lives or relationships (Buss, 2000; Buunk, 1995; Buunk & Hupka, 1987; Shackelford, LeBlanc, & Drass, 2000). Rather, the sexes differ in the kinds of situations that trigger the *most intense* emotions of jealousy.

Men are more upset by overt cues to *sexual* infidelity, whereas *emotional* or *love* infidelity—that is, threats to the love and commitment aspects of the relationship—triggers women's most intense experiences of jealousy (Bailey et al., 1994; Buss et al., 1992, 1999; Buunk, Angleitner, Oubaid, & Buss, 1996; Daly et al., 1982; Geary, Rumsey, Bow-Thomas, & Hoard, 1995; Shackelford, Buss, & Bennett, in press; Shackelford & Weekes-Shackelford, in press; Teismann & Mosher, 1978; Wiederman & Allgeier, 1993; Wiederman & Kendall, 1999; White, 1981; Yarab, Allgeier, & Sensibaugh, 1999).

In the first scientific study designed to address these sex differences in jealousy, Buss et al. (1992) presented a sample of men and women with the following dilemma:

Please think of a serious committed romantic relationship that you have had in the past, that you currently have, or that you would like to have. Imagine that you discover that the person with whom you've been seriously involved became interested in someone else. What would distress or upset you more (please circle only one):

- (a) Imagining your partner forming a deep emotional attachment to that other person.
- (b) Imagining your partner enjoying passionate sexual intercourse with that other person.

The participants also were presented with the same situation, but offered the following choices:

- (a) Imagining your partner trying different sexual positions with that other person.
- (b) Imagining your partner falling in love with that other person.

Displayed in Figure 1 are the differences between men's and women's answers to this question. There were large sex differences in responses to the questions posed by Buss et al. (1992). Buss et al. (1992) followed the questionnaire study with a study of their participants' physiological responses to thoughts of a partner's sexual infidelity or emotional infidelity. When men imagined a partner's sexual infidelity, they displayed greater autonomic arousal measured by electrodermal activity (EDA) and pulse rate, and greater muscular tension measured by EMG activity of the corrugator supercilii muscle. This muscle is associated with "frowning" of the brow during facial responses to unpleasant emotion. The pattern was opposite in women, who displayed greater physiological arousal to thoughts of a partner's emotional infidelity (but see Harris, 2000, for a different interpretation of these physiological measurements).

These sex differences in jealousy have been found using different types of measures in samples in China (Geary et al., 1995), Sweden (Wiederman & Kendall, 1999), Korea, Japan, and The Netherlands (Buss et al., 1999). The same sex differences were found in the sex-egalitarian nations of Sweden and The Netherlands as in the somewhat less sex-egalitarian United States, although they were substantially less strong in China. Geary et al. (1995) speculated that the lesser sexual

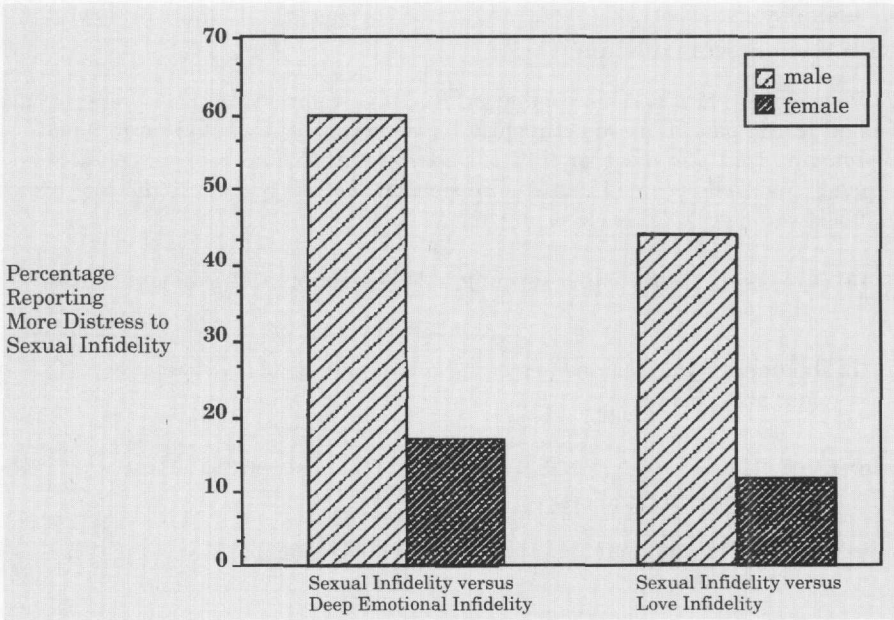


Figure 1. Sex differences in jealousy as reported by Buss, Larsen, Westen, & Semmelroth (1992). (Reproduced with permission of the authors).

jealousy found among Chinese men is related to the lower risk of female infidelity in China as compared to most Western nations, particularly the United States. As we discuss in detail later, consideration of proximate variables—in this case, sociocultural differences—is important for a complete understanding of sex differences.

Both sexes find both types of infidelity extremely upsetting (e.g., Hupka & Bank, 1996; Shackelford & Buss, 1996; Shackelford, LeBlanc, & Drass, 2000). The sex difference emerges only in the degree to which each type of infidelity evokes a jealous response. Moreover, the size of the difference fluctuates depending on the sample and the way in which the study was conducted (see Buss, 2000, for a review).

Although there is enough evidence in support of the notion of sex differences in jealousy to include this difference in our review, findings of these sex differences are still controversial, and on rare occasions the predicted difference is not found. Moreover, the data on sex differences in jealousy are more complicated than they seem at first. In the study by Yarab et al. (1999), for example, although women found “emotional infidelity” far more upsetting than did men, women found sexual infidelity just as upsetting as did men, and more upsetting than emotional infidelity. In *no* study, however, has the direction of the sex difference reversed, with women being more upset than men about a partner’s sexual infidelity, and men being more upset than women about a partner’s emotional infidelity.

### *Objections*

Some researchers are unconvinced by findings of sex differences in jealousy. DeSteno and Salovey (1996; see also Harris, 2000) proposed that men and women differ in their beliefs about the other sex’s sexual and emotional involvements. According to these researchers, men believe that if women are sexually involved with someone, they also will become emotionally involved with that person. Women, in contrast, believe that if men are emotionally involved, they also will be sexually involved. If a man is presented with a scenario involving his partner’s sexual infidelity, he experiences it as a sexual infidelity *and* an emotional infidelity. If a woman is presented with a scenario involving her partner’s emotional infidelity, she experiences it as an emotional infidelity *and* a sexual infidelity. According to DeSteno and Salovey, this “double-shot” of infidelity explains why the sexes experience greater jealousy in response to different types of cues.

In four follow-up studies, Buss and his colleagues tested their evolutionary hypothesis against the “double-shot” hypothesis (Buss et al., 1999). In the first of these investigations, Buss et al. (1999) asked par-

ticipants to imagine their partner (a) forming a deep emotional (*but not sexual*) relationship with another person, or (b) enjoying a sexual (*but not emotional*) relationship with another person. Results confirmed women's greater fears of emotional infidelity and men's greater fears of sexual infidelity.

In the second study, Buss et al. (1999) asked subjects to imagine that their partner had become sexually involved *and* emotionally involved with another person. They then asked which aspect of their partner's imagined infidelity was most upsetting. Sixty-three percent of men, but only 13% of women, reported that the sexual aspect was more upsetting. In contrast, 87% of women, but only 37% of men, reported that the emotional aspect was more upsetting. These results were replicated in well-designed, more thorough tests of the double-shot hypothesis in additional U.S. samples, as well as in Korean, Japanese, and Dutch samples (Buss et al., 1999). Additionally, in Wiederman and Kendall's (1999) test of the double-shot hypothesis in Sweden, the predicted sex differences in jealousy were found irrespective of participants' beliefs about the conditional probabilities of men's and women's sexual and emotional involvements. The double-shot hypothesis is incorrect.

#### *Other Evidence: Polygyny and Murder*

The experimental evidence of sex differences in jealousy is persuasive, but many kinds of correlational and anecdotal data corroborate these sex differences in jealousy. First, there is the historical fact of widespread human polygyny, in contrast to the rarity of polyandry. When polyandry does occur, it is frequently accompanied by serious conflict among cohusbands (including brothers in adelphic polyandrous societies), sometimes escalating to lethal violence (e.g., Balikci, 1970; Rasmussen, 1931, cited in Symons, 1979). Polygyny, in contrast, often occurs with relatively little conflict among cowives (e.g., Jankowiak & Diderich, 2000; Shoumatoff, 1985; Sprecher, Hatfield, Cortese, & Potapova, 1994). Even where jealousy does exist within polygynous relationships, there is no indication that this jealousy is specifically sexual in nature. Jealous cowives may be more concerned about the diversion of resources and attention to another wife than about sexual behavior.

In a cross-cultural study of divorce, Betzig (1989) found that in over 50 of the societies studied, female infidelity predicted subsequent divorce. This was the case for male infidelity in only two societies. Male sexual jealousy is apparently cross-culturally universal, whereas female sexual jealousy, although it is undoubtedly widespread, may not be universal.

Finally, there are analyses of world-wide statistics for homicide: Male sexual jealousy is the most frequently cited cause of spousal homicide

throughout the world and may be indirectly responsible for a large share of all homicides throughout the world (Buss & Shackelford, 1997a, 1997b; Daly & Wilson, 1988; Daly et al., 1982; Shackelford, 2000, in press-a, in press-b; Shackelford, Buss, & Weekes-Shackelford, in press; Shackelford, Buss, & Peters, 2000; Wilson & Daly, 1992, 1996).

Why do the sexes differ in the kinds of events that trigger the most intense experiences of jealousy? Symons (1979) presented the first ultimate explanation of this sex difference, and it was elaborated upon by Buss (2000). According to Symons, because of the ubiquity of polygyny, the fact that women are a valuable, limiting resource for men's reproduction, and the fact of paternity uncertainty, it would always have been adaptive in ancestral environments for men to be sexually jealous of their mates. On the other hand, precisely because of the ubiquity of polygyny, the fact that men are not a limiting resource for women's reproduction, and women are always 100% certain of maternity, it would not necessarily have been adaptive for women to be sexually jealous of their mates. Sexual jealousy has evolved as an obligate trait in men, but a facultative trait in women (Symons, 1979). There is no reason, however, why jealousy as a general trait should be less intense in women than men (Buss, 2000).

### **"Erotic Plasticity"**

Baumeister (2000) hypothesized that women possess greater "erotic plasticity" than do men—or that men are more "sexually rigid" than women (Hyde & Durik, 2000). By "plasticity," Baumeister was referring to the malleability, or changeability, of one's erotic responses or sexual behavior—changes that may occur as a consequence of cultural forces or personal circumstances.

Baumeister (2000) presented evidence in support of several predictions based on the hypothesis that women have greater erotic plasticity than do men. Among these predictions were the following:

1. Relative to individual men, individual women will show more variation over time in their sexual behavior.

In this prediction, Baumeister (2000) was referring to the fact that men tend to have a relatively consistent occurrence of sexual "outlets," or orgasms, but women vary considerably in the frequency of orgasm over their lifetimes. If a man is involved in a sexual relationship that ends, he tends to maintain the same frequency of orgasm by masturbating or by participating in commercial sex. Women, in contrast, often go for long stretches of time with no sexual outlets, and then enter periods where they are very sexually active (e.g., Adams & Turner, 1985; Ard, 1977; Kinsey et al., 1953).

Relevant data also have been collected in studies of male and female homosexuality and bisexuality. Substantially more lesbians than gay men have had heterosexual experience. Eighty percent of lesbians have had sexual experience with men, but only 50-60% of gay men have had sexual experience with women (Bell & Weinberg, 1978; Kinsey et al., 1948, 1953; Laumann et al., 1994; Rosario, Meyer-Bahlburg, Hunter, Exner, Gwadz, & Keller, 1996; Savin-Williams, 1990; Whisman, 1996). These findings are interesting because, given men's greater interest in multiple partners and casual sex, one might expect greater heterosexual contact among male homosexuals, not less (Baumeister, 2000). Additionally, when women are presented with sexually explicit film clips, they show equal levels of physiological arousal to gay male, heterosexual, and lesbian sexual activity (Chivers & Bailey, 2001). Women are less dependent upon a specific target sex in their patterns of arousal than are men, who show little or no arousal to erotic film clips of targets other than their preferred sex.

Relative to men, women are more likely to identify themselves as bisexual (Laumann et al., 1994; Whisman, 1996) and report having an easier transition to bisexual behavior in the context of "group marriage" or "swinging." In a study of "swingers," O'Neill and O'Neill (1970) found that 60% of the women, but only 12% of the men, engaged in same-sex sexual behavior. In another study of swingers, Bartell (1970) found that, during parties, women had oral sex with each other 75% of the time, whereas men had oral sex with each other less than 1% of the time. It might be argued that men are "afraid to show their bisexual nature." According to Baumeister (2000), however, this is another sex difference revealing greater male sexual rigidity and female sexual plasticity.

Particularly interesting data relevant to plasticity of women's sexual orientation have been collected by Diamond (1998, 2000a, 2000b, 2000c, in press) in the first ongoing, prospective study of the development of sexual orientation in adolescents and young women. One hundred sixty-seven adolescent and young adult women have been interviewed in three waves over a 7-year period. Diamond pointed out that the typical male pattern of development of homosexual identity is not at all typical of women. This male-typical pattern includes cross-gender behavior or feelings of "differentness" in childhood, late-childhood or early adolescent same-sex attractions, lack of sexual interest in the other sex, resultant same-sex experimentation in adolescence and, finally, self-labeling as gay.

In contrast, numerous lesbian and bisexual women have no childhood or adolescent same-sex attractions but claim that these attractions occurred for the first time in adulthood in response to adult exposure to gay, lesbian, or bisexual ideas or individuals, or the formation of

intense, passionate friendships with a particular woman (Diamond, 2000a; see also Golden, 1996).

Diamond's (2000a) studies also include substantial numbers of "unlabeled" women. These are women who are "still questioning" and unwilling to categorize themselves. Diamond observed that these women have been underrepresented in prior research, and that researchers and journal editors often intentionally exclude them from samples because they are difficult to categorize. As one journal reviewer told Diamond, "How can you be sure of their true sexual orientation: It would make for a cleaner study if you took them out" (Diamond, 2000a, p. 300). Diamond suggested that behind this reasoning is an implicit assumption that self-identified lesbians are the most "prototypical" group of sexual minority women, and therefore they should be used to form generalizations about women involved in same-sex attractions and behavior.

It appears that the vast majority of women who have experienced same-sex desire or behavior, however, self-identify as heterosexual (e.g., Laumann et al., 1994). Diamond's work suggests that our current understanding of the development of same-sexuality in women is improperly based, first, on gay male models of development, second, on models that exclude a large segment of bisexual women, and third, on data from women who comprise "the smallest, least representative subset of this population" (i.e., committed lesbians, Diamond, 2000a, p. 300).

2. Social and cultural forces will have less of an impact on male sexuality than on female sexuality.

Baumeister (2000) predicted that, because men's sexuality is less flexible, they would be less affected by social influences. With respect to sexual orientation, for example, a number of researchers have asked gay men and lesbians about the degree to which they perceived their sexual orientation to have been a matter of choice. A higher percentage of lesbians than gay men report that their sexual orientation is a matter of choice (Rosenbluth, 1997; Savin-Williams, 1990; Whisman, 1996). During the period of intense feminist activity in the United States, many formerly heterosexual women intentionally chose a lesbian sexual lifestyle as a political statement (Blumstein & Schwartz, 1983; Charbonneau & Lander, 1991; Echols, 1989; Kitzinger, 1987; Pearlman, 1987). There is no evidence that any gay man has intentionally and successfully chosen his sexual orientation. Indeed, it is possible that, if "lesbian" is defined as a woman who says she is a lesbian, then there may exist two or more subtypes of female homosexuality. According to this view, buttressed by the work of Diamond (e.g., 2000a), one of these subtypes represents the approximate female equivalent of the male homosexual, whereas other subtypes may represent personal choices

and be specific to women (Singh, Vidaurri, Zambarano, & Dabbs, 1999). In contrast, there is only one category of male homosexual.

Men also seem more resistant to the influence of religion on their sexuality. Church participation and religiosity appear to reduce women's but not men's sexual permissiveness and rates of masturbation (Adams & Turner, 1985; Laumann et al., 1994; Reiss, 1967). Similar results have been found for education, peer influence, and parental influence, all of which have greater effects on women's sexual behavior than on men's sexual behavior (Laumann et al., 1994).

Finally, men are vastly overrepresented among those diagnosed with a sexual paraphilia (Money, 1990). Some commentators doubt the existence of true female paraphiles, although this view appears to be inaccurate (for a fascinating interview with a female necrophile, see Parfrey, 1990). Although many paraphiles are able to engage in more typical sexual behaviors, the paraphile finds nonparaphilic sex less appealing or satisfying, and he typically is rigidly wedded to specific sexual routines and symbols. It is unusual for a woman to be so restricted in her sexual repertoire that she is unable to find pleasure in only a small range of possible sexual activities. Paraphilias are resistant to treatment (Money, 1990). In sum, once male sexual habits and desires are formed, they are less likely to change than those of women.

Why should this be so? There are two logical ways this problem can be framed. One might ask why women's sexuality is so plastic; or one could instead frame the question in terms of men: Why are they so rigid? Symons (1979) took the evolutionary logic of men's lack of sexual plasticity for granted, because the typical expression of this lack of plasticity is an obstinate sexual interest in young women—a highly productive stubbornness from the perspective of male reproductive success (and when the male-typical profile of sexual attraction to young women is altered in development, resulting in homosexuality or paraphilia, that too remains intractable).

Symons (1979) focused instead on women's plasticity. According to his view, the plasticity of women's sexuality is a result of the fact that the capacity for orgasm in women—rather than representing an adaptation as is the case for men—is an incidental by-product of those properties of sexual anatomy and physiology that women and men share in common. Orgasm is integrated into the male (but not female) reproductive system as an essential design feature because of its connection to ejaculation. The facultative capacity for orgasm in women is a by-product of this male adaptation of orgasm. Female orgasm occurs because of the numerous characteristics of genital tissue and neurophysiology that the sexes share due to common prenatal origins.

Female orgasm is then related to female plasticity, according to Symons' (1979) view, because it is likely that, over evolutionary time, women's potential for orgasm was inconsistently, perhaps rarely, realized. Therefore, "these potentials would have been largely 'invisible' to natural selection" (pp. 312-313), and selection did not have the opportunity (i.e., raw material) to shape women's sexual desire and response to the extent and specificity that it has men's.

### **Intensity and Constancy of Sex Drive**

Baumeister, Catanese, and Vohs (in press) proposed that there is a sex difference in the average strength of intrinsic sexual motivation or sex drive. This is a controversial assertion. The belief of most sex researchers and educators is that there is no sex difference in intrinsic sexual motivation. Although "stereotypes" of more intense male sex drive are acknowledged, they are usually characterized as having been "discredited." On the rare occasions when any actual difference is contemplated, it is the possibility that women's sex drive might be intrinsically more intense (e.g., Hyde & DeLamater, 1997). In our view, however, and in the view of Baumeister et al. (in press), the evidence does suggest that the sexes differ in intrinsic sexual motivation, and that the difference is in the direction of men possessing a stronger sex drive. We also believe, however, that to some degree this evidence is misleading. We will first summarize the evidence, and then suggest some inherent problems with the data.

Because the concept of "sex drive" is theoretically ambiguous, Baumeister et al. (in press) took pains to define this term. *Sex drive* refers to intrinsic sexual motivation, "usually focused on craving for sexual activity and sexual pleasure" (p. 2). According to these authors, a person with a higher sex drive has "more intense and/or more frequent desires for sex" (p. 2). This desire is to have sex for its own sake, rather than to have sex in the service of more distal goals, such as procreation, power, or relief from stress. According to Baumeister et al. (in press), a higher sex drive should produce "more frequent and more intense efforts to reach satisfaction" (p. 3). Such motivation tends to override other, possibly conflicting desires. These authors argued that a weak sexual motivation, in contrast, ought to "yield precedence" to other motivations and, as a result, not produce behavior designed to facilitate sexual experience (p. 3).

Baumeister et al. (in press) reviewed abstracts for the entire 35-year publication history of *The Journal of Sex Research* and all issues of *Archives of Sexual Behavior* dating back to 1990. They reviewed the articles that measured sexual motivation in any form and located relevant

sources cited in those articles. They then conducted literature searches of the PsycINFO and MEDLINE databases, yielding a total of 5,400 articles. They reviewed these articles, omitting unpublished dissertations and research on nonhuman animals, and focused on research conducted with nonclinical populations. Baumeister et al. found substantial evidence for average sex differences in a number of areas that index strength of sexual motivation, including frequency of sexual thoughts, fantasies, and spontaneous arousal; desired frequency of sex; frequency of masturbation; desired number of sex partners; willingness to forego sex; seeking versus avoiding sexual behavior; initiating versus refusing sexual behavior; enjoyment of many types of sexual practices; sacrificing resources to obtain sex; favorable attitudes toward sexual behavior; prevalence of hypoactive sexual desire disorder (HSDD); and self-ratings of strength of sex drive. Although no single piece of this evidence is conclusive, the data uniformly suggest a stronger male sex drive.

There are two possible exceptions to the expectation of greater male sex drive. Baumeister et al. (in press) suggested that one of these regards the onset of a new sexual relationship, in which there may occur a brief period when intimacy is rising rapidly and passion is high, and when women's sex drive (directed toward a particular individual only, however) may equal men's.

Far more important—indeed, critical—is the other possible exception. This regards those days during the preovulatory phase closest to ovulation, and the ovulatory phase itself (e.g., Wallen, 1995, 2000). Data suggest the possibility that the seemingly greater intensity of male sex drive is, at least to some degree, an artifact of the averaging of measures across the reproductive cycle. Because behavioral science has not been adequately informed by neuroendocrinology, there has been a pervasive assumption that women's intrinsic sexual motivation does not reliably fluctuate with the menstrual cycle. Empirical evidence suggests that it does, however (Clayton, Clavet, McGarvey, Warnock, & Weiss, 1999; Dennerstein, Gotts, Brown, & Morse, 1994; Gangestad & Thornhill, 1998; Krug, Plihal, Fehm, & Born, 2000; Regan, 1996; Riley & Riley, 2000; Stanislaw & Rice, 1988; Wallen, 1995; Zillmann, Schweitzer, & Mundorf, 1994).

For example, Stanislaw and Rice (1988) analyzed diary reports of sexual desire among 1,066 women who were participating in a program of family planning. They found that desire gradually increased throughout the cycle, but sharply peaked at the time of ovulation, measured by a peak in levels of estradiol (See Figure 2).

When Wallen (2000) compared the charts of the women in Stanislaw and Rice's study to charts of rhesus monkey females' demonstrations of

willingness to mate according to their estrus cycles, the patterns were the same. The sex drive of women may not be less intense than men's—it may simply be less constant. Mean scores for women on various measures of strength of sex drive (e.g., frequency of sexual thoughts, masturbation, desire for sex), averaged across the menstrual cycle, will fail to take into account sharp increases occurring during maximally fertile periods. Although it may turn out that women's sex drive is less constant and less intense, at the present time the question of intensity cannot be answered adequately because studies have not compared men with women in their follicular phase.

### **An Integrated Approach to Understanding Sex Differences in Mate Preferences**

Many variables go into motivating any man or woman to be attracted to a specific other person. The patterns of mate preferences and the other sex differences we have described do not necessarily emerge to a measurable degree in any one particular case but, rather, are clearly seen when large groups of people are studied—although, as we proposed earlier, some of this overlap may be due to measurement issues. In any

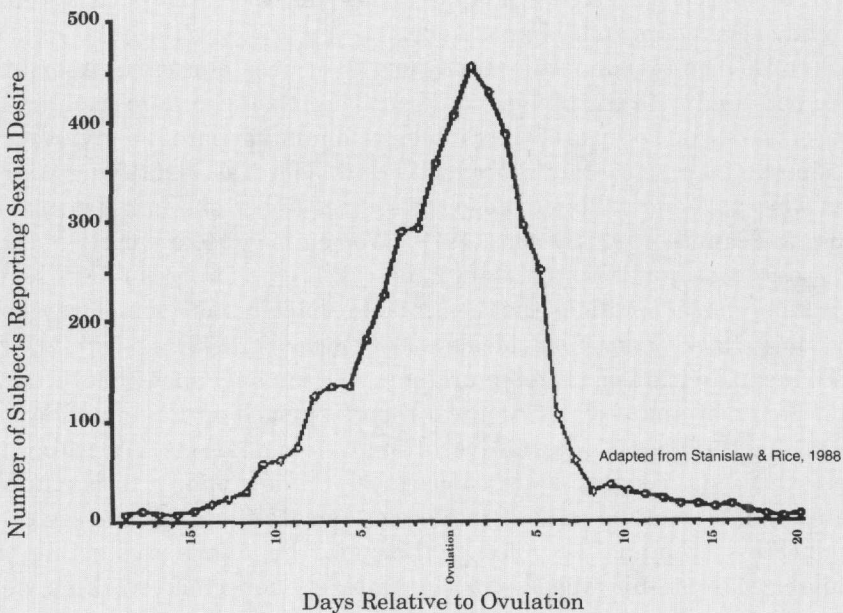


Figure 2. The number of women reporting sexual desire for the first time in their ovarian cycle in relation to the presumed time of ovulation as determined by a basal body temperature shift. (Reproduced from Wallen, 1995 with permission of the author, and adapted by Wallen from Stanislaw & Rice, 1988).

particular case, however, idiosyncratic variables can overwhelm sex-typical tendencies, just as one adaptation may “overrule” another (Tooby & Cosmides, 1990). Even in large groups, where the sex differences can be seen, these differences differ in magnitude and character as a consequence of sociocultural factors.

### Ultimate Level of Explanation

According to a modern evolutionary psychological perspective (see Buss, 1994, 1999, for a review), because human females do not “advertise” fertility to the extent that other primates do during estrus, a key reproductive problem faced by our male ancestors was identifying which females were more likely to be fertile (and, in the case of long-term mating choice, have long careers of fertility ahead of them). In order to accomplish this task, men used primarily visual cues of youth and health, because these are the most reliable indicators of fertility (Buss & Schmitt, 1993; Symons, 1979; and see Shackelford & Larsen, 1997, 1999). Although recent evidence suggests that the male olfactory sense may play a role in assessing women’s fertility (Singh & Bronstad, 2001), there is no evidence as yet that olfaction does so reliably. Moreover, the limited range of distance in olfaction still requires that men are motivated to approach a given woman to a close distance. Visual cues would still have been of primary importance.

Because men remain fertile throughout their lives, our female ancestors were not faced with the problem of identifying men who were likely to be fertile. Moreover, because of their intensive minimum parental investment in reproduction, their key reproductive problem was identifying which men were able and willing to devote resources to her and to her offspring (Buss & Schmitt, 1993; Symons, 1979). Women may use a variety of cues to assess these qualities in a man. Human mate preferences reflect sexually dimorphic adaptations that continue to shape human sexual psychology (Buss, 1994; Geary, 1998; Mealey, 2000; Symons, 1979).

This explanation of ultimate origin is not the only such theory, however. Feminist and social structural theorists, such as Eagly and Wood (1999) have proposed alternative ultimate explanations. According to these theorists, peoples’ mate choices reflect their efforts to maximize their available mating options in a society where these options are constrained by acceptable sex roles. In this view, the man is exchanging his available assets—his wages—for the woman’s household work as well as for her education and beauty. Thus, “a woman’s preference for a wealthy man can be explained by the simple reality that . . . males monopolize ownership of productive resources” (Hrdy, quoted in Eagly & Wood, 1999, p. 415).

From this perspective, the age differences desired by each partner reflect a "best fit" to the social roles expected of men and women. Because men have more power, they prefer younger women who, presumably, have lesser wages, social status, education, and knowledge than same age peers. Women, on the other hand, prefer older men because older men tend to be more economically and socially successful than younger men.

Although this explanation makes sense of younger women's interest in somewhat older, wealthier men, it does not explain two important facts. First, women of all ages, including older women, prefer to mate with men older than themselves (see Buss, 1994, for a review). Men's earnings and social power often decrease in the modern world with retirement. If women are concerned with mating with men who control resources, much older women ought to prefer younger men.

Second, feminist and social structural explanations do not adequately explain the importance to men of youth and physical attractiveness. If men prefer younger partners because they wish to maintain their greater degree of power, then in individual matings, men should prefer older, less educated, lower social status, poorer, and less attractive women to younger, more attractive women, particularly if more attractive women are of higher social status and are well educated (i.e., more powerful). If social power is defined as the ability to effect one's will in society, then more attractive women have more power than less attractive women because people of all ages, including infants, prefer attractive people to unattractive people (Langlois et al., 2000). Attractive people earn more money, are granted more favors, and receive fewer punishments and more rewards. They also tend to be healthier and higher in status (see Buss, 1994, for a review). Men therefore should prefer unattractive women, if the social role theory is correct.

In addition, it does not appear to be the case that men prefer younger partners so much as that they prefer young partners (e.g., Buunk et al., 2001). Boys in early-to-mid adolescence prefer women several years older, and young adult males prefer partners that are about their own age (Kenrick & Keefe, 1992; Kenrick, Gabrielidis, Keefe, & Cornelius, 1996). It is only when men pass their mid-20s that a strong preference for younger partners appears. In this sense, the proposed male preference for "younger" partners is misleading. To paraphrase Symons (1979), *Penthouse* magazine does not publish special issues geared toward 50-year-old men with nude photographs of 45-year-old women. The age of models remains the same—between 18 and 24 years—regardless of the age range of prospective male buyers

of the magazine. Similarly, when Buunk et al. (2001) asked men ages 20 to 60 to report the age they considered optimal for sex and sexual fantasies, these men chose women at ages of optimal fertility, regardless of their own age. A modern evolutionary psychological perspective predicts a preference for young partners, as opposed to younger partners, because young adulthood is the period of optimal fertility for women. This finding would not be predicted by social role theory and feminist theory, which stress that desired partners should be younger, but not necessarily young.

If the social role explanation were correct, one would expect that high-status, financially successful women should be less interested in status and financial resources in a mate, because these women control their own resources and do not need to depend on someone else. High-status women, in fact, are more interested in status and financial resources in a mate, not less interested (Ardener, Ardener, & Warmington, 1960; Buss, 1989; Townsend, 1989, 1998; Wiederman & Allgeier, 1992).

Moreover, if the social role explanation were correct, one should not see the same pattern of men preferring young, physically attractive women, and women preferring older, successful men in societies that are relatively sex-egalitarian, such as those in northern Europe. The same patterns do appear in Sweden and Norway, however (see Buss, 1989, 1994). Men's greater interest in young, physically attractive partners, and women's greater interest in social status and financial stability do not vary according to the status of women, although the strength of the sex differences do vary—but often in the direction opposite to that predicted by social role theory.

Finally, social-role and feminist explanations typically beg the question of the origins of the institutions which they claim are ultimate causes of various conditions. Why are men larger and stronger than women? Why is there patriarchy? Why are there "social scripts," and why are some of these scripts relatively invariant? If women exchange their beauty for men's resources, why do men value beauty in the first place? For that matter, what *is* beauty? In this sense, feminist and social-role theorist's ultimate explanations are evolutionary (given that no known process apart from evolution can create ultimate causes), but they do not adequately specify or describe the evolved mechanisms responsible for species-typical psychological processes and responses (e.g., men's preference for young women, women's preference for older men); nor do they situate these responses and processes within a model of organic life that is consistent with other forms of scientific knowledge.

### Proximate Level and Mediating Variables

#### *Chemical Mediators*

*The menstrual cycle.* When Penton-Voak et al. (1999) controlled for menstrual cycle phase in research on women's preference for male faces, they found that women in the follicular phase of their menstrual cycle were more likely than women in other phases of the cycle to prefer male faces that were highly "masculinized"—faces that displayed exaggerated, testosterone-related characteristics such as prominent jaw, brow, and cheekbones.

Similar results were found by Gangestad and Thornhill (1998) and by Thornhill and Gangestad (1999), regarding women's preferences for male faces low in fluctuating asymmetry. These investigators had women rate the attractiveness of the scent of t-shirts worn for 2 nights by different men. As a group, women in the follicular phase of their menstrual cycles preferred the scent of the t-shirts worn by more symmetrical men. When the data for each individual woman were examined, it was found that each participant's preference for the scent of symmetrical men was strongly correlated with the possibility that she could conceive on the day that she smelled the shirts. On the other hand, women taking birth control pills, or who were in a low-fertility phase of their cycles, did not prefer symmetrical men.

Women's preferences for generous, high-status men may be "overruled" during the follicular phase by a strong preference for symmetrical, high-testosterone men. This may present a clue to the conflict some women feel between the appeal of "dads" (reliable men pursuing a long-term mating strategy) versus "cads" (highly physically attractive men pursuing a short-term mating strategy).

The menstrual phase may affect men's preferences as well. For example, Singh and Bronstad (2001) found that men preferred the scent of women in the follicular phase, finding this scent more pleasing and sexier. Men may "lower their standards" for youth and beauty when in the presence of a potential partner in her follicular phase, although this possibility has not been tested.

*Testosterone and estrogen.* The hormones testosterone and estrogen are important mediators of the mate preferences of men and women. Many of the facial and body characteristics that men find attractive in young women are indicative of a low testosterone to estrogen ratio, such as exists in healthy female adolescents and young adults (Jones, 1996; Perrett et al., 1998; Symons, 1995; Thornhill & Grammer, 1999). These characteristics include clear skin, full lips, lustrous hair, a relatively shortened lower portion of the face (giving the illusion of large eyes,

high cheekbones, a gracile jaw), and a relatively low waist-to-hip ratio (WHR) as compared to older adults (reviewed in Symons, 1995).

Waist-to-hip ratio (WHR) is a measure of body attractiveness in women that is generally reliable although not perfectly so; it may vary somewhat according to ecological conditions. For example, idiosyncratic, strong preferences for thinness (e.g., Puhl & Boland, 2001) or a distaste for thinness (e.g., Marlowe & Wetsman, 2001) can "overrule" the importance of WHR. A large number of studies, however, conducted among a variety of demographic groups, and including photographic stimuli as well as line drawings, have confirmed the importance of WHR as a measure of attractiveness in women (Henss, 2000). WHR also is related to the level of free estrogen and testosterone in women (Singh, 1993; Singh & Suwardi, 1995). As estrogen decreases and testosterone increases, so too does the WHR increase. The distribution of WHR thus is sexually bi-modal, independent of body weight (Symons, 1995), and the WHR of adolescent and young adult nulliparous women is lower than that of older women or parous women. Lower WHR women get pregnant more easily (Zaadstra et al., 1993), and high WHR may be associated with health and fertility problems (see Symons, 1995, for a summary). A high free testosterone-to-estrogen ratio increases the risk of skin problems including acne (Pearl, Arroll, Lello, & Birchall, 1998) and hirsutism, both of which are universally considered unattractive. Estrogen and testosterone levels predict women's attractiveness to men.

Free testosterone also predicts men's attractiveness to women, although the outcome is different. Testosterone levels are positively associated with the number of sexual partners that men attract (Bogaert & Fisher, 1995), as well as with men's risk taking, dominance, facial attractiveness, masculine charm, and success in activities that require courage and fortitude (Dabbs, 2000). Many women find these traits attractive in a potential mate, particularly a short-term, casual sexual partner (see Buss, 1994, for a review).

Testosterone is *not*, however, associated with financial success or status in the modern world (Dabbs, 2000), and thus it is not a straightforward indicator of attractiveness in men. The reason that testosterone is not associated with success in the modern world is eloquently stated by Dabbs (2000):

High levels of testosterone brought the force and energy that helped to develop the modern world: bold traders, sailors and explorers traveled and exchanged ideas and materials; shipwrights designed vessels for trade and exploration; copper miners and traders brought resources that made the bronze age possible. Life and ideas grew at the frontiers of experience,

and restless individuals explored and mastered a material world that supports our intellectual world. High-testosterone individuals helped to build the modern world, and the modern world restricts them. High testosterone is close to the intersection of what is tragic and what is simply ironic. What evolved as an advantage so many generations ago is now often at cross-purposes with the demands of society. (pp. 151-152)

High testosterone men remain attractive to many women even as some of these men's qualities have become less conducive to success in the modern world and, not surprisingly, less appealing to women in general, particularly in their choice of long-term mates.

*MHC-Haplotype compatibility.* The major histocompatibility complex (MHC) is a group of genes related to immunological functioning in mammals, including humans (Wedekind & Furi, 1997). Evidence suggests that rodents prefer to mate with those whose MHC-haplotypes differ from their own (Janssen & Zavazava, 1999). Researchers have hypothesized that such pairings increase the effectiveness of the immune system in offspring, thus helping to successfully defend against pathogens (Hamilton & Zuk, 1982).

Several investigators have extended these investigations to humans. Results of recent studies among genetically isolated populations suggest that people prefer to mate with those whose MHC-haplotypes differ from their own. This might improve the individual's own reproductive success by strengthening the immune systems of his or her children (Génin, Ober, Weitkamp, & Thomson, 2000; Ober et al., 1997; Wedekind & Furi, 1997; Wedekind, Seebeck, Bettens & Paepke, 1995). These researchers have hypothesized that haplotypes are assessed through olfactory senses. MHC-haplotype compatibility of two individuals may modify sex-typical mate preferences.

### *The Operational Sex Ratio and the Sexual Balance of Power*

One important proximate factor that has not been given enough consideration in analyses of mating behavior in general, and mate preferences in particular, is the *operational sex ratio* (OSR) of men to women (Guttentag & Secord, 1983; Pedersen, 1991). OSR is the term given by zoologists and ethologists to the ratio of males to females available for mating. Even if it were true, as is widely (and mistakenly) believed, that the sex ratio in adulthood is always even, it still would not be the case that an equal number of males and females would be available for mating.

As explained by Guttentag and Secord (1983), it is necessary to take into account the influence of age and status in mate preferences. Women tend to marry men who are older and who have higher status. This limits the pool of unmarried men who are of the right age and "the

right stuff." Even if we started out with a sex ratio of 100 (that is, 100 available men for 100 available women), the OSR would still be less than 100 because relatively few men are in the older, higher status brackets.

There also is the problem known as the *marriage squeeze*. What happens when the cohort of women born at a time when the birthrate is increasing reaches adulthood? They are looking for men who are older than they are. But the men who are older than they are were born while the birth rate was lower. These women therefore must choose from an even smaller group of men than the original sex ratio would have provided. Under these circumstances, there are too many women. On the other hand, men experience a marriage squeeze if they are born when the birth rate is decreasing. When they reach adulthood there are too many men for the number of younger, available women.

What are the consequences of unequal OSRs, and how might they affect the expression of sex differences in mate preferences? In order to answer this question, we need to differentiate two types of power: *structural power* and *dyadic power* (Guttentag & Secord, 1983). Structural power involves social, political, and economic institutions. Because patriarchy is universal, men have always held institutional power in society—with fluctuations in structural power therefore being relatively minimal. The *dyadic* power of women—their ability to effect their desires in personal relationships with men—fluctuates considerably (e.g., Geary, 1998), and one of the factors impacting this fluctuation in women's dyadic power is the OSR.

Consider what would happen to women's dyadic power if the OSR were high. There would be more than one man available for every woman and women would have greater choice among spouses. Men would have more within-sex competition for each woman, and some men would be deprived of mating opportunities altogether. Men would be more grateful for the opportunity to mate under these circumstances.

When the OSR is high, therefore, women's power in relationships with men increases. As Guttentag and Secord (1983) noted (see also Pedersen, 1991), under such social conditions, women are relatively highly valued in society and express less dissatisfaction with their lives. Such periods in history are characterized by sexual mores and practices for both sexes that approximate the average sexual styles of women: relatively low promiscuity, lower divorce rates, a focus on family life, and a sexual ideology that stresses sexual morality and marital fidelity.

If the OSR is low, in contrast, males' dyadic power is increased. Men marry later and more of them remain single. Under these conditions, women experience a subjective sense of powerlessness, and feel deval-

ued—which, to some degree, they are. They often feel exploited because men will frequently break off relationships to move on to other relationships. Women find it more difficult to achieve economic mobility through marriage because there are fewer available higher status men and, therefore, men find it easier to have sexual relations with women without committing to them. Divorce, out-of-marriage births, and single-parent families headed by women increase in number. Nonmarital sex becomes more acceptable, sexual ideology becomes more liberal, and marital infidelity more commonplace. Women respond to this situation either by increasing their efforts to attract men or by initiating struggles for economic, political, and personal independence from men through career training or feminist activism (Guttentag & Secord, 1983; Petersen, 1991).

As a simple exercise, consider that for the entire history of America, until about 1950, the OSR has been relatively high (a relative abundance of men). After World War II, the OSR began to drop slowly as a consequence of the baby boom, falling sharply to its lowest level in the 1960s, during which time there were just 75 available men for every 100 women (Guttentag & Secord, 1983).

As expected from a perspective informed about the consequences of a low OSR, the sexual revolution occurred in the 1960s. The United States saw liberalization of sexual ideology, and increases in the rates of divorce, premarital sex, extramarital sex, and out-of-wedlock cohabitation. For the first time in American history, a relatively promiscuous lifestyle was not viewed with condemnation (Allyn, 2000). The 1960s also was the decade of the birth of the modern feminist movement. Beginning in the late 1970s, as the OSR began to shift back again toward a higher figure, American sexual practices and ideology began to shift in a more conservative direction (Okami, 1992). In short, the predictions offered by Guttentag and Secord (1983) about the social consequences of varying OSRs are supported by a review of modern American history.

As the dyadic power of each sex increases due to shifts in the OSR, so might the importance each sex places on sex-typical mate preferences. Under conditions of a low OSR, with fewer men per women and less female dyadic power, women ought to place less importance on status and resources than they would under conditions of a high OSR, when their available options and dyadic power are greater. Under conditions of a low OSR, men ought to place more importance on youth and attractiveness than they would under conditions of a high OSR, when their available options are fewer and their dyadic power is lower.

Several research findings are consistent with the hypothesis that the higher the dyadic power, the more important sex-typical mate preferences will be. First, high-status women—who have greater dyadic

power—place more not less importance on the financial prospects of a mate than do women of lesser means (and thus, lesser dyadic power). Similarly, high-status men place more importance on attractiveness in a mate than do lower-status men (Townsend, 1998; Wiederman & Allgeier, 1992). High-status men also are more likely than low-status men to be married to young, attractive women (Udry & Eckland, 1984).

Other evidence comes from comparisons of the mate preferences of college students over periods of shifting OSRs. During the period of the 1940s through the 1950s, when the OSR was still high, college students' mate preferences remained stable. Beginning in the late 1960s, however, and continuing through the 1970s, when women's interest in men's status and financial prospects remained stable, men became more interested in the physical attractiveness of their mates, with good looks rising four ranking points in importance to men between 1956 and 1967, and an additional two points between 1967 and 1977 (Hoyt & Hudson, 1981; see Buss et al., in press). Women's rankings of the importance of good looks remained at the bottom of the 18-point ranking scale, until 1977 when it rose two points. Thus, as the OSR plunged, the dyadic power of men rose, as did men's expectations of having their mating preferences met.

### *Sexual Orientation*

*Men who are obsessed with sex are convinced that lesbians are obsessed with sex. Actually, like other women, lesbians are obsessed with love and fidelity*

—Anonymous member of Gay Women's Liberation in Berkeley, CA (cited by Echols, 1989, p. 218)

Symons (1979) proposed that sexual orientation mediates certain mating behaviors and preferences in humans. He observed that men's preferences for physically attractive mates, and their interest in casual sex and partner variety, appear to be identical in the psychology of homosexuals and heterosexuals. Symons (1979) hypothesized, however, that these preferences and desires would be exaggerated in homosexuals relative to heterosexuals in actual behavior. Symons (1979) hypothesized that behavior patterns in lesbian relationships, in contrast, would exaggerate those of heterosexual relationships. Symons' rationale for this hypothesis was that, in heterosexual relationships, each sex has to "compromise" with the sexual style of the other sex; among homosexuals, in contrast, each sex is free to express sex-typical preferences.

Symons (1979) cited data consistent with his hypotheses. At the time he was writing, however, no data had been collected specifically to eval-

uate these hypotheses. Bailey et al. (1994) tested Symons' hypotheses by collecting psychological and behavioral data. Bailey et al. found that, in most respects, homosexuals were similar to heterosexuals of their own sex in mating psychology. Regardless of their sexual orientation, the sexes differed in areas such as interest in casual sex and partner variety, concern with the attractiveness or status of a mate, interest in visual sexual stimuli, and upset in response to a partner's sexual infidelity versus a partner's emotional infidelity.

There were, however, differences between heterosexuals and homosexuals in mating behavior that supported Symons' (1979) hypothesis that homosexuals' behavior exaggerates the sexual style of their own sex, particularly in the case of men. For example, gay men were more likely than were heterosexual men to have many partners and to engage in short-term casual sex, although heterosexual men did not display less psychological interest in these activities. Both homosexual men and heterosexual men were relatively uninterested in their partner's status, but very interested in physical attractiveness and visual sexual stimuli.

For men, two aspects of mating psychology did vary by sexual orientation: concern for partner youth, and sexual jealousy versus emotional jealousy. On these variables, the pattern for gay men was closer to the pattern for women. For example, whereas gay men were as concerned with partner attractiveness as straight men, they did not define attractiveness in terms of youth to the degree that straight men did. Gay men also were less likely than straight men to report greater upset in response to partner's sexual infidelity than in response to a partner's emotional infidelity.

Bailey et al. (1994) hypothesized that the lesser concern with youthful partners among the gay male sample stemmed from the detachment of gay sex from the potential for reproduction. Because male sexual jealousy evolved as a solution to the adaptive problem of paternity uncertainty, the lesser degrees of sexual jealousy among the gay male participants was attributed by Bailey et al. to the lack of potential for squandering resources on another man's children.

The lesbians and heterosexual women in Bailey et al.'s (1994) sample were similar in their preferences and behaviors. Like men, however, there were two aspects of mating psychology that differed with sexual orientation: Lesbians expressed less interest in a partner's status than did heterosexual women, and they also were more likely than were heterosexual women to be interested in visual sexual stimuli. In these respects, lesbians more closely resembled men than they did heterosexual women.

The explanation for these last findings is not immediately apparent. At first glance, heterosexual women's greater interest in a partner's status may be seen to support the social structural explanation that women who are interested in raising a family are also in an economically dependent position relative to men and are thus attracted to men's status. The problem with this explanation, as Bailey et al. (1994) suggested, is that in countries such as Sweden, women are able to raise families without men, and yet the preferences emerge just as they do elsewhere. In addition, high status women in the United States are more, rather than less, interested in their partner's status. Finally, there is no particular reason why lesbians should find visual sexual stimuli more appealing than do heterosexual women.

If, however, we consider the fact that whenever homosexuals of either sex differ from heterosexuals of their own sex, the difference is in a direction typical of the other sex, then an explanation rooted in neuro-hormonal factors seems likely. Taking lesbian's greater interest than heterosexual women in visual sexual stimuli as an example, Bailey et al. (1994) pointed to earlier work that found that women who had been exposed to high levels of prenatal androgens were more responsive to visual sexual imagery than women who had not been so exposed (Money & Ehrhardt, 1972). Women exposed to prenatal androgens also tend toward less traditionally "feminine" pursuits such as marriage and family, and they tend to focus on their own careers much more than do women not exposed to prenatal androgens (Money & Ehrhardt, 1972; Udry, 1995). Prenatal androgenization also may be associated with lesbians' relative lack of interest in the status of their mates.

*Assortative Mating, Similarity, Compatibility, and Influence of Kin*

Finally, we consider effects on expressed mate preferences of the qualities of similarity and compatibility between spouses, and the effects of kin. Positive assortment (also known as "matching" or "assortative mating") refers to the phenomenon that people mate according to various aspects of similarity (Blackwell & Lichter, 2000; Thiessen, 1999). The expression "birds of a feather flock together" suggests this idea. Although it is true that "opposites attract" occasionally, far more frequently people who are similar are more likely to meet, more likely to find one another physically attractive, and more likely to share interests. They communicate well and can empathize with each other (Sternberg 1986). In any particular instance, the desire to mate assortatively may "overrule" a sex-typical mate preference. In a pluralistic society, for example, a foreign-born citizen might prefer a compatriot of lesser mate value to a native-born person of higher mate value.

There are a formidable number of other characteristics that may make two people feel compatible with one another apart from positive assortment (reviewed in Buss, 1994). A man may pass over a younger, prettier mate for one who shares his passion for jazz. A woman may take up with a poor man because his poetry is wonderful, his muscles ripple, and he loves giving her oral sex. Such idiosyncratic decisions are less apparent when large groups of people are studied.

Finally, and particularly in traditional societies, kin may have a great deal to say about who marries whom. As a result, it is possible that people's emotional responses to potential partners are affected by the influence of their kin (Geary, 1998).

### **The Science and Politics of Research in Sex Differences**

*Never before in the history of psychology has such a formidable body of scientific information encountered such a powerful political agenda.*

Eagly (1995, p. 155)

Regardless of how much one would like to retain a dispassionate scientific attitude and treat sex differences as one would any other research topic, the political implications of such research are considerable, and no complete discussion of the science of sex differences can avoid confronting the politics of sex differences (Fausto-Sterling, 2000; and see Buss & Malamuth, 1996; Shackelford & LeBlanc, in press).

Social role theorist Alice Eagly (1995) considered the recent history of sex difference research and its connection to the emergence of modern feminism. A new wave of research in sex differences in personality and abilities began in the mid-1970s, when the modern women's movement was gathering steam. These researchers, most of them women (or men sympathetic to feminist ideas), were critical of past writings and research on sex differences. They claimed that past research and writing had portrayed women as inferior to men. Previous studies of sex differences were sometimes referred to as "battle weapons against women" (Bernard, cited in Eagly, 1995, p. 149). Methodological flaws in this previous research were highlighted and magnified until little was left of the research but flaws. New research projects were begun.

As Eagly (1995) suggested, much of this new research on sex and gender was fueled by two missions: (a) to reveal people's harmful stereotypes concerning women, and (b) to demonstrate an absence of sex differences in behavior, traits and abilities. Most of these researchers, including Eagly (1995) herself, had hopes and expectations of finding no differences between women or men. There was a tendency to equate equality with

equivalence. It was feared that, because of women's lower social status, any evidence of differences would be interpreted as evidence of inferiority. For these reasons, some feminist commentators insisted that research on sex differences should not be conducted (Eagly, 1995).

Some early studies of the 1970s (themselves flawed methodologically; Eagly, 1995) provided "null" findings of no differences or only small differences between the sexes. Such studies were picked up by the mass media and by sympathetic textbook authors and popular book authors caught up in the pro-feminist *zeitgeist* of the times, helping to form a consensus opinion (a) that any existing sex differences were small; (b) that findings of sex differences were inconsistent across studies; (c) that findings of sex differences resulted primarily from methodological flaws in the studies; and (d) that results of most of the studies disconfirmed sex stereotypes (Eagly, 1995).

According to Eagly (1995), because consensus opinion in behavioral and social science is difficult to change with "only" the disconfirming evidence of research findings, most textbooks and mass media presentations continue to "protect" this early consensus opinion. What has actually emerged from research over the subsequent 2 decades are findings contrary to the early consensus. Specifically, (a) the magnitude of many sex differences found in research are large, not small; (b) sex differences are relatively consistent across studies; (c) they do not result from methodological flaws; and (d) they frequently corroborate stereotypes, rather than disconfirm them (Ashmore, 1990; Eagly, 1995; Feingold, 1994; Oliver & Hyde, 1993).

This last point is important. As Eagly observed (see also Jussim, 1991; Symons, 1987), there is good reason to expect that some sex stereotypes are accurate. After all, men and women interact with one another on a daily basis in a host of settings.

Is research on sex differences dangerous to the struggle for women's equality? There are a number of separate questions embedded in the larger question above, an important but neglected one being whether it is possible to predict the consequences of publishing any piece of research. The key question, however, is whether the differences that have emerged from the literature portray women as inferior to men.

As Eagly, Mladinic, and Otto (1991; see also Eagly, 1995) have pointed out, it appears that women are evaluated more, not less, favorably than men by most people. They also suggest, however, that this favorable view of women may be a double-edged sword, because the positive characteristics ascribed to women are not those associated with high-status roles. For example, aggressiveness is associated with the achievement of high-status occupations, whereas nurturance is not. According to Eagly

(1995), the Catch-22 for women is that “less aggressiveness” and “more nurturance and kindness” are socially desirable traits, but they also are not associated with the very highest-status occupations.

It is our view that, if this Catch-22 for women exists, it does so primarily in the area of sex differences in personality. In the realm of sex differences in sexual behavior, there is less evidence that a “double-edged sword” exists for women. From the perspective of traditional value systems of Western societies, if either sex appears in a poor light when it comes to sexuality, it is men. It is men who tend toward promiscuity, infidelity, and the use of pornography. Men masturbate frequently, are concerned (and sometimes obsessed) with women’s body parts, fantasize about hundreds or thousands of different partners, visit prostitutes, and are interested in sex without love or commitment. Men sometimes commit rape-murder (see Shackelford, in press-a), child sexual abuse, and sexual harassment. They have sex with animals and inanimate objects. They have a relatively rigid sexual “style,” and swell the ranks of paraphiles (see Buss, 1994 for a review of this research).

Women, in contrast, are less frequently promiscuous, unfaithful, or drawn to sexually explicit pornography. They masturbate only moderately frequently, rarely visit prostitutes, are rarely obsessed with men’s body parts, and are satisfied with only a few or sometimes just one sexual partner. Women usually do not enjoy sex without commitment and, although they may fantasize about animals, rarely have sex with them. They virtually never commit rape-murder, and relatively rarely commit child sexual abuse. They have a more flexible sexual “style” and, although they do sometimes have sex with inanimate objects (e.g., vibrators), they are rarely paraphiles (see Buss, 1994, for a review of this research).

Nevertheless, as Linda Mealey (personal communication, May, 2001) pointed out, by sex-typing women as the sexually “better-behaved” sex, one still may be setting up for particular condemnation women who do not conform to this stereotype. For example, prostitutes—who are by definition promiscuous women—are usually stigmatized more than their male customers who, presumably, are simply behaving as expected.

### **Summary and Concluding Remarks**

We began this review by suggesting several reasons why sex differences in sexual behavior and psychology are expected. A key reason for expecting such differences is that certain experiences critically related to sexual behavior have differed for men and women over human evolutionary history. For example, ancestral men, but not ancestral women,

recurrently confronted the adaptive problem of identifying prospective mates who were fertile. Ancestral women, but not ancestral men, recurrently confronted the adaptive problem of identifying prospective mates who showed evidence of the ability to acquire resources and the willingness to share them. These sex-differentiated adaptive problems, in turn, produced a sex-differentiated sexual psychology in which men, more than women, are concerned with prospective sexual partners' youth and attractiveness, whereas women, more than men, are concerned with prospective partners' status, resources, and generosity. In short, sex differences in sexual psychology and behavior are expected in those domains in which the sexes have recurrently confronted different adaptive problems (Buss, 1994, 2000; Symons, 1979, 1995).

We reviewed empirical and theoretical work for seven domains in which there are well-established sex differences in sexual psychology or behavior. We revealed unambiguous sex differences in expressed and actualized mate preferences; willingness to have short-term casual sex; desire for multiple sexual partners, sexual fantasy, jealousy, erotic "plasticity;" and strength of intrinsic sexual motivation.

We offered an explanation for one of the reviewed sex differences as a way to outline a program of research in sex differences in sexual psychology and behavior. This program stresses the importance of utilizing both ultimate variables and proximate variables. The remaining six domains of sexual psychology and behavior reviewed in this article will benefit from this research approach.

We closed this review with a discussion of the politics of sex difference research. A consideration of existing research and theory reveals that work on sex differences is unlikely to be dangerous to the struggle for women's equality with men—although care needs to be applied in interpretation and generalization of findings to avoid stigmatizing those who do not conform to sex-types. Evidence for a difference should not be used to legitimate an inequality of treatment under law, or a devaluation of the personhood of an individual or of all the individuals of a particular sex.

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