

Sexual Strategies Theory: An Evolutionary Perspective on Human Mating

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This article proposes a contextual-evolutionary theory of human mating strategies. Both men and women are hypothesized to have evolved distinct psychological mechanisms that underlie short-term and long-term strategies. Men and women confront different adaptive problems in short-term as opposed to long-term mating contexts. Consequently, different mate preferences become activated from their strategic repertoires. Nine key hypotheses and 22 predictions from Sexual Strategies Theory are outlined and tested empirically. Adaptive problems sensitive to context include sexual accessibility, fertility assessment, commitment seeking and avoidance, immediate and enduring resource procurement, paternity certainty, assessment of mate value, and parental investment. Discussion summarizes 6 additional sources of behavioral data, outlines adaptive problems common to both sexes, and suggests additional contexts likely to cause shifts in mating strategy.

Mating is a human universal. All known societies have formal marriage alliances between men and women. More than 90% of all people in all societies marry at some point in their lives (Buss, 1985; Epstein & Guttman, 1984; Vandenberg, 1972). In a cross-cultural perspective, marriages are usually regarded as formal reproductive alliances that contain the features of (a) mutual obligation between husband and wife, (b) rights of sexual access, (c) an expectation that the marriage will persist through pregnancy, lactation, and child rearing, and (d) recognition of the legitimate status of the couple's children (Daly & Wilson, 1988, p. 187).

Long temporal durations, however, do not characterize all mating relationships. Mating relationships can last for a few months, a few days, a few hours, or even a few minutes. Matings of short duration have been given many names—brief affairs, one-night stands, or temporary liaisons. In this article, we anchor the ends of this temporal dimension using the descriptively neutral terms *short-term mating* and *long-term mating*. Matings of intermediate duration (e.g., dating, going steady, brief marriages, or intermediate-length affairs) occur between these end points.

Nearly all theories of human mating deal exclusively with long-term mating or marriage (cf. Murstein, 1970; Vandenberg, 1972). This may be due in part to the sheer difficulty of studying short-term mating, which by definition is a more transient phenomenon and one that is sometimes cloaked in greater se-

crecy. In the classic Kinsey, Pomeroy, and Martin (1953) study on sexual behavior, for example, the question about extramarital sex was the single, largest cause of refusal to be interviewed. Among those who did consent to be interviewed, this question received the highest refusal-to-answer rate, suggesting simultaneously the importance and prevalence of short-term mating outside the marital context.

No comprehensive theory of human mating, however, can ignore short-term mating. Stated simply, lifetime marital monogamy is not characteristic of most people in most societies. Approximately 80% of all human societies practice polygyny, permitting men to take multiple wives or mistresses (Ford & Beach, 1951; Murdock, 1967). In these societies, only a small percentage of men actually acquire multiple mates, but those that do render other men mateless. Even in presumptively monogamous societies such as in the United States, divorce rates hover near 50% (H. Fisher, 1987). Serial marriages are common in most cultures (H. Fisher, 1987; Lockard & Adams, 1991). In addition, estimates of adultery among American married couples range from 26% to 70% for women and from 33% to 75% for men (Daly & Wilson, 1983; H. Fisher, 1987; Hite, 1987; Kinsey, Pomeroy, & Martin, 1948, 1953; Symons, 1979). These data do not include the numerous short-term sexual liaisons that occur among single men and women, either before marriage or as an alternative to marriage. In summary, lifelong mating with a single person does not appear to be the norm for humans. Both sexes engage in both short-term and long-term mating. The theory of human sexual strategies proposed here views the temporal context to be pivotal to the adaptive problems men and women have confronted and the adaptive strategies they have subsequently adopted.

Role of Strategy in Human Mating

Previous theories of human mating differ in whether mating decisions are seen as goal directed and strategic or whether they are merely the product of forces beyond the individual's choice. Freud and Jung, for example, proposed that people seek in mates characteristics that resemble images or archetypes of their opposite-sex parent (Eckland, 1968). Winch (1958) pro-

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posed that people seek in mates characteristics they themselves lack: a search for complementarity. Cattell and Nesselroade (1967), Thiessen and Gregg (1980), Rushton (1989), and many others have proposed that people seek similarity in mates: that likes attract likes. Exchange and equity theories posit that people search for those with whom exchange of valuable resources will be in approximate equilibrium (e.g., Berscheid & Walster, 1974; M. S. Clark & Reis, 1988).

All these theories share the notion that human mating is strategic and choices are made, consciously or unconsciously, to maximize some entity, match, or balance. Each of these theories, however, lacks a specification of the particular content domains toward which strategic effort will be directed. Thus, the strategic components of these theories are broad—to seek equity, to seek similarity, and to seek complementarity—and do not identify equity in which domains or similarity in which domains. These theories, therefore, offer no differential predictions about the content domains in which they will be most and least applicable nor do they offer sex-linked predictions about which strategic goals will be more salient to women or men. In summary, few specific predictions can be derived from any of these theories.

Theories of mating that do not posit a goal-directed or strategic component include various sociological and propinquity theories. These theories propose that people mate with others with whom they come into contact. Support comes from the finding that distance is a powerful predictor of who marries whom. As Eckland (1968) pointed out, “cherished notions about romantic love notwithstanding, the chances are about 50–50 that the ‘one and only’ lives within walking distance” (p. 16). Some theories combine propinquity explanations with class-endogamy explanations, arguing that one’s social class determines the pool of potential mates to which one will be exposed by selectively placing similar individuals into close proximity. For example, educational institutions sometimes selectively admit individuals possessing similar characteristics such as socioeconomic status, achievement scores, intelligence test scores, and even social skills in those private colleges that require personal interviews. Assortment, therefore, might in part be attributable to institutional mechanisms placing similar individuals into close proximity.

There is empirical support for some of these theories. Similarity overwhelmingly is the rule in human mating, and this applies to characteristics as diverse as height, weight, personality attributes, intelligence, values, nose breadth, and earlobe length (Buss, 1985). Freud’s and Winch’s theories of mating, however, have been least supported (Eckland, 1968). The only characteristic on which complementarity is the norm, for example, is on biological sex: men tend to marry women and vice versa (Buss, 1985). For all other characteristics, people tend to mate with those who are similar. There is some evidence that people marry those who resemble their parents, but it has never been demonstrated that this occurs above and beyond the resemblance that would be expected solely on the basis of mating with someone who is similar to oneself (Eckland, 1968).

Each of these theories contains key conceptual limitations. The most important limitation is that all fail to provide an account of why humans would be motivated in the directions posited. Why should humans prefer similarity, equity, or prox-

imity? What are the origins of these goals? What functions could they serve? The second limitation is that each of the theories of mating is extraordinarily simplistic, positing typically a single process that determines who mates with whom (although see Murstein, 1970, for a more complex, sequential model). The third limitation is that the generality of the theories precludes the generation of specific predictions in particular domains. The fourth limitation is that each theory assumes that the processes that govern male and female mating are identical, and thus no sex-differentiated predictions can be derived from these theories. The fifth limitation is that previous theories of human mating are context blind, positing the same mating tendencies regardless of circumstances.

The current theory attempts to rectify these omissions by articulating a selective rationale for the origins of the particular strategies that human men and women exhibit. A core premise of the theory is that human mating is inherently strategic: Humans seek particular mates to solve specific adaptive problems that their ancestors confronted during the course of human evolution; humans’ mate preferences and mating decisions are hypothesized to be strategic products of selection pressures operating during ancestral conditions. The use of the term *strategies* is meant to connote the goal-directed and problem-solving nature of human mating behavior and carries no implication that the strategies are consciously planned or articulated. The theory is complex in the sense that the number of problem domains that require strategic solutions is proposed to be large. This complexity and numerosity yields a large number of precise predictions about what will be found in each domain. A key ingredient of Sexual Strategies Theory is that mating strategies are context dependent and, in particular, highly sensitive to the temporal context of short-term versus long-term mateships. Finally, a key ingredient of the theory is that men and women have faced different mating problems over human evolutionary history, at least in some delimited domains, and therefore the principles that govern the mating of women and men are predicted to be different in these domains.

This article articulates the key premises of Sexual Strategies Theory. We present the core strategic elements of the theory, hypotheses derived from the theory, and data from a series of empirical studies, many published and some new, to test 22 specific predictions derived from these hypotheses. The core of the theory is summarized in the next section.

Précis of Sexual Strategies Theory

1. In human evolutionary history, both men and women have pursued short-term and long-term matings under certain conditions where the reproductive benefits have outweighed the costs.
2. Different adaptive problems must be solved when pursuing a short-term sexual strategy as opposed to pursuing a long-term sexual strategy.
3. Because of a fundamental asymmetry between the sexes in minimum levels of parental investment, men devote a larger proportion of their total mating effort to short-term mating than do women.
4. Because the reproductive opportunities and reproductive constraints differ for men and women in these two contexts,

the adaptive problems that women must solve when pursuing each strategy are different from those that men must solve, although some problems are common to both sexes.

5. Men historically have been constrained in their reproductive success primarily by the number of fertile women they can inseminate. This reproductive constraint on men can be separated into four relatively distinct problems that men historically had to solve to effectively pursue a short-term mating strategy: (a) the problem of partner number, (b) the problem of identifying which women are sexually accessible, (c) the problem of identifying which women are fertile, and (d) the problem of minimizing commitment and investment.

6. Reproductive constraints on men can be separated into four relatively distinct problems that men historically had to solve to effectively pursue a long-term mating strategy: (a) the problem of identifying reproductively valuable women, (b) the problem of ensuring certainty in paternity, (c) the problem of identifying women with good parenting skills, and (d) the problem of identifying women who are willing and able to commit to a long-term mating relationship.

7. Women historically have been constrained in their reproductive success not by the number of men they can gain sexual access to but rather primarily by the quantity and quality of the external resources that they can secure for themselves and their children and perhaps secondarily by the quality of the man's genes.

8. These reproductive constraints can be separated into two distinct problems that women historically had to solve to effectively pursue a short-term mating strategy: (a) the problem of immediate resource extraction and (b) the problem of assessing prospective long-term mates.

9. These reproductive constraints can be separated into distinct adaptive problems women historically had to solve to effectively pursue a long-term mating strategy: (a) the problem of identifying men who have the ability to invest resources in her and her children on a long-term basis, (b) the problem of identifying men who show a willingness to invest resources in her and her children on a long-term basis, (c) the problem of identifying men with good parenting skills, (d) the problem of identifying men who are willing and able to commit to a long-term relationship, and (e) the problem of identifying men who are able and willing to protect them from aggressive conspecifics (see Table 1).

10. Men and women have evolved distinct psychological mechanisms that function to solve the adaptive problems confronted to effectively pursue short-term and long-term matings.

11. These psychological mechanisms and their behavioral manifestations, combined with the temporal contexts in which each set is activated, constitute the evolved sexual strategies of men and women. *Strategies* are defined as evolved solutions to adaptive problems, with no consciousness or awareness on the part of the strategist implied.

Parental Investment and Sexual Selection

Our theory takes as a starting point Trivers's (1972) seminal theory of parental investment and sexual selection. Sexual selection, as originally proposed by Darwin (1871), refers to the evolution of characteristics that give organisms reproductive

advantage, as contrasted with survival advantage. Survival is important only insofar as it affects reproduction. Two paths to reproductive advantage are (a) success at intrasexual competition (e.g., one male stag defeating another, with the winner obtaining access to the doe) and (b) success at intersexual attraction (e.g., the male peacock displaying brilliant plumage that is attractive to peahens). Characteristics that lead either to successful competition or to success at being preferentially chosen by the opposite sex will evolve simply because they give organisms reproductive advantage.

Trivers (1972) proposed that a central driving force behind sexual selection is the degree of parental investment each sex devotes to their offspring. *Parental investment* is defined as "any investment by the parent in an individual offspring that increases the offspring's chances of surviving (and hence reproducing) at the cost of the parent's ability to invest in other offspring" (Trivers, 1972, p. 139). Current conceptions of parental investment involve investment that increases an offspring's chances of survival and reproduction at the expense of alternative forms of reproductive investment (e.g., competition for mates), whether or not they involve one's own offspring (Clutton-Brock, 1991). Trivers proposed two related links between parental investment and sexual selection: (a) The sex that invests more in offspring should be more choosy or discriminating about who they mate with (intersexual attraction), and (b) the sex that invests less in offspring should compete more vigorously for access to the valuable high-investing members of the opposite sex (intrasexual competition).

There has been widespread empirical support for Trivers's (1972) theory of parental investment and sexual selection across dozens of species. Among mammals, for example, females typically invest more heavily than do males in offspring, and in hundreds of mammalian species, it has been documented that females are more selective, whereas males compete more vigorously in intrasexual competition (Trivers, 1985).

An even more compelling empirical test came with the discovery of several sex-role-reversed species (e.g., Mormon cricket, Panamanian poison-arrow frog, and several species in the pipefish seahorse family) in which males were observed to invest more in offspring than did the females. In these species, females are often larger than males, and they compete more aggressively with each other for access to the more choosy, heavily investing males (Trivers, 1985). In addition to providing powerful support for Trivers's theory, these results highlight the fact that relative parental investment, not biological sex per se, drives the process of sexual selection.

Humans are like most mammals in that women tend to be the more heavily investing sex. This occurs in part because fertilization, gestation, and placentation are internal within women. Women carry the additional parental investment associated with lactation for as many as several years after the birth of a child: often for up to 4 years in tribal societies (e.g., Shostak, 1981). These forms of investment constrain the number of children a woman can successfully produce; typically the upper bound is about a dozen under optimal conditions, and that upper bound is rarely reached. Men, in contrast, do not bear these forms of heavy parental investment, although they can and do invest heavily in other ways. The minimum investment by the man is the contribution of his sperm, and men, as a

Table 1
Mate Selection Problems Men and Women Confront in Short-Term and Long-Term Mating Contexts

Type of mating	Men	Women
Short term	<ol style="list-style-type: none"> 1. Problem of partner number 2. Problem of identifying which women are sexually accessible 3. Problem of minimizing cost, risk, and commitment 4. Problem of fertility 	<ol style="list-style-type: none"> 1. Problem of immediate resource extraction 2. Problem of evaluating short-term mates as possible long-term mates 3. Problem of gene quality 4. Problem of mate switching, mate expulsion, or mate backup
Long term	<ol style="list-style-type: none"> 1. Problem of paternity confidence 2. Problem of female reproductive value 3. Problem of commitment 4. Problem of good parenting skills 5. Problem of gene quality 	<ol style="list-style-type: none"> 1. Problem of identifying men who are able to invest 2. Problem of identifying men who are willing to invest 3. Problem of physical protection 4. Problem of commitment 5. Problem of good parenting skills 6. Problem of gene quality

consequence, have a higher ceiling on their potential production of offspring. These sex differences in minimum parental investment, according to Trivers's (1972) theory, suggest that women should be the more selective or discriminating sex with respect to mating partners, whereas men should be less discriminating and be more vigorous in intrasexual competition for mates.

It is important to note that these are generalizations for which there are many exceptions. Human males have many opportunities to invest in their offspring following birth (e.g., through provisioning, protecting, and promoting), and indeed humans arguably show greater parental investment than do any other mammals (Alexander & Noonan, 1979). Where men do invest heavily in their offspring, Trivers's (1972) theory predicts that they will exert greater selectivity in their choice of mates relative to when they invest less in offspring. Thus, although humans are like most mammals in that women tend to be the more heavily investing sex, human males stand out among mammals as often investing substantially in their children, and there exists considerable individual variation within each sex in the amount of investment: a point to be taken up later.

Adaptive Logic of Men Pursuing a Short-Term Sexual Strategy

The reproductive benefits that historically would have accrued to men who successfully pursued a short-term sexual strategy were direct: an increase in the number of offspring produced. A married man with two children, for example, could increase his reproductive success by a full 50% by one short-term copulation that resulted in insemination and birth. This benefit assumes, of course, that the child produced by such a brief union would have survived, which would have depended in ancestral times on a woman's ability to secure relevant resources through other means (e.g., by herself, through kin, or through other men). Historically, men appear to have

achieved increases in reproductive success primarily through increases in the number of sexual partners, not through increases in the number of offspring per partner (Betzig, 1986; Dawkins, 1986).

All sexual strategies carry costs, and short-term mating is no exception. Men can incur major reproductive costs: (a) They risk contracting a sexually transmitted disease, and this increases with the number of women with whom sexual contact is achieved; (b) they risk acquiring a social reputation as a womanizer that could impair their mate value when seeking a long-term mate: Women of high mate value may be reluctant to mate with a man who shows promiscuous proclivities that signal poor prospects for enduring parental investment; and (c) they risk violence at the hands of jealous husbands if the women with whom they are pursuing this strategy are married or mated (Daly & Wilson, 1988).

Problems Men Confront When Pursuing a Short-Term Sexual Strategy

Men face a complex and multifaceted problem when they pursue a short-term sexual strategy: Men are constrained in their reproductive success by the number of fertile women they can inseminate. This problem can be separated into four highly specialized adaptive problems or facets: (a) the problem of partner number, or variety (Symons, 1979); (b) the problem of identifying which women are sexually accessible; (c) the problem of identifying which women are fecund; and (d) the problem of minimizing commitment and investment to effectively pursue short-term matings.

Problem of Partner Number

What specific adaptations should be expected in the evolved sexual psychology of men to solve the problem of gaining sexual access to a number of women? One first-line solution to the

problem of number can be expected in desire: Men may have evolved over human evolutionary history a powerful desire for sexual access to a large number of women (cf. Symons, 1979). A second specialized adaptation expected on theoretical grounds would be a relaxation of standards imposed for acceptable short-term partners. Elevated standards, by definition, preclude a large number of women from exceeding them. The relaxation of standards should apply to a wide range of mate characteristics, including standards for age, intelligence, personality traits, and personal circumstances such as whether a woman is already involved with someone else. A third specialized feature of men's evolved sexual strategy should be to impose minimum time constraints in knowing a prospective mate before seeking sexual intercourse. The less time that is permitted to elapse before obtaining sexual intercourse, the larger the number of women a man can gain access to. Prolonged time delays, by absorbing more of a man's mating effort, interfere with solving the problem of number.

Problem of Sexual Accessibility

Men, being the less investing sex, are predicted to be less discriminating than are women when seeking short-term mates. Nonetheless, reproductive advantages would accrue to those men who directed their mating effort most intensely toward those women who are sexually accessible. Time, energy, and resources devoted to women for whom sexual accessibility is unlikely would interfere with the successful enactment of a short-term sexual strategy.

Specialized adaptations for solving the problem of sexual access should be embodied in the psychological preferences that men express for short-term mates. Women who are prudish, sexually inexperienced, conservative, or who appear to have a low sex drive, for example, should be disfavored. Signs of sexual accessibility, such as looseness or promiscuity, which would be undesirable in long-term mates, might be desired by men in short-term mates because they signal accessibility.

Problem of Identifying Which Women Are Fertile

Biologists distinguish two facets of the ability to bear offspring: fertility and reproductive value. *Fertility* refers to the probability of present reproduction. Among humans, female fertility typically peaks in the early to mid 20s. A copulation with a woman of this age would be most likely to result in reproduction. *Reproductive value*, in contrast, is defined actuarially in units of expected future reproduction: the extent to which people of a given age and sex will contribute, on average, to the ancestry of future generations (R. A. Fisher, 1930). In human females, reproductive value peaks earlier than fertility: in the mid teens.

The difference between fertility and reproductive value can be illustrated by contrasting two women, one age 14 years and one age 24 years. The younger woman would have higher reproductive value than the older one because, actuarially, her future reproduction is expected to be higher. On average, 14-year-old women can expect more future children than can 24-year-old women. In contrast, the 24-year-old woman is more fertile than the 14-year-old woman because the current proba-

bility of reproduction is higher for the 24-year-old woman. After menarche (onset of menstruation), women generally experience a period of approximately 2 years in which they cannot conceive (Frayser, 1985). Women in their early teens typically have low fertility, even though their reproductive value is high.

Given these considerations, it may be predicted that men who seek long-term mates would prefer women of high reproductive value rather than women of high fertility. A man who mates with a woman of high reproductive value will have access to a greater reproductive asset than will a man who mates with a woman of lower reproductive value. The same logic dictates that men seeking short-term mating partners would prefer to mate with women of high fertility. The future reproductive potential of a woman is largely irrelevant to men seeking opportunistic copulations.

Although this adaptive problem for men seeking short-term matings is clear, namely to find a woman of high fertility, the solution to this problem is more difficult than it first appears. How can men "figure out" (again, no conscious interest is implied) which women possess the highest fertility or reproductive value? The capacity of a woman to bear children is not stamped on her forehead. It is not part of her social reputation, so no one is in a position to know. Even the woman herself lacks direct knowledge of her fertility and reproductive value. So how could a preference evolve for something that cannot be directly discerned?

The answer lies with those features of women that provide cues that are correlated with fertility or reproductive value. Two obvious cues to these values are age and health. Old and unhealthy women have a lower reproductive capacity than do young and healthy women. Thus, men could solve the problem of desiring reproductively capable women simply by preferring those who are young and healthy. However, age and health, like reproductive capacity, are not qualities that can be observed directly. Counting systems are relatively recent human inventions. In humans' evolutionary past before counting systems, age could not be evaluated directly. Indeed, even in modern times with close monitoring of age, deception about age is not unknown. The same applies to health. Short of securing access to a doctor's report, men have no direct way of evaluating the health of a woman.

Nevertheless, our ancestral humans did have access to three classes of cues that provide probabilistic evidence of a woman's age and health status: (a) features of physical appearance (e.g., full lips, clear skin, smooth skin, clear eyes, lustrous hair, symmetry, good muscle tone, and absence of lesions), (b) observable behavior (e.g., sprightly, youthful gait, and high activity level), and (c) social reputation (e.g., knowledge gleaned from others about a person's age and prior health history).

Because physical and behavioral cues provide the most powerful observable evidence of a woman's reproductive capacity, the evolutionary logic of mating suggests that men may have evolved a preference for, and attraction to, women who display these cues. Men who fail to prefer qualities that signal high reproductive capacity would, on average, leave fewer offspring than would men who prefer to mate with women possessing these qualities.

The reproductive success of women, in contrast to that of men, is not as closely linked with obtaining reproductively valu-

able mates. A man's reproductive capacity, to the degree that it is valued by women, is less steeply age graded from puberty on than is a woman's. Therefore, it cannot be assessed as accurately from physical appearance. Physical appearance should be less central to a woman's mate preferences than to a man's mate preferences. This evolutionary logic leads to a clear prediction: Men, more than women, should value relative youth and physical attractiveness in potential mates because of their powerful links with fertility and reproductive value.¹

If men in humans' evolutionary past have adopted short-term matings as part of their repertoire of strategies, then one would expect specialized adaptations to solve the problem of fertility. Men's mate preferences should be context dependent: They should seek a reproductively valuable woman for the long term but a fertile one for the short term. This prediction must be qualified, however, by the solution to the problem of number, namely, the relaxation of standards. Although men seeking short-term mates, other things being equal, might prefer fertile women in their early to mid 20s, a wide range of ages should be acceptable in short-term mates because of the relaxation of standards.

Problem of Avoiding Commitment and Investment

Men seeking short-term mates are predicted to avoid those women who will extract commitment or large investment before consenting to sex. The larger the investment in a particular mating, the fewer the number of sexual partners a given man can access. Women who require heavy investment effectively force men into a long-term strategy, which conflicts with the pursuit of opportunistic copulations. The most direct way to instantiate these mate preferences is to shun women who appear to desire long-term commitments or heavy investment of resources as requirements for mating.

To summarize, men are predicted by Sexual Strategies Theory to pursue, at least in part, short-term sexual strategies. Thousands of generations of human evolution should have produced specialized adaptations for solving the highly specialized problems that constrained men's reproductive success. Evolved solutions are predicted in the form of preferences for mates who possess or exhibit certain short-term characteristics such as fertility, sexual accessibility, and low investment requirements.

Preferences as Psychological Mechanisms

Preferences are evolved psychological mechanisms that solve survival and reproductive problems. Consider a survival problem: What foods should one eat? One is faced with a bewildering array of potential objects to ingest—berries, fruits, nuts, and meat but also dirt, leaves, gravel, poisonous plants, rotting carrion, twigs, and feces. What would happen if one had no taste preferences and instead ingested objects from the environment randomly? Some organisms, by chance variation alone, would ingest objects that provided caloric and nutritive sustenance; others, also by chance alone, would ingest toxins or other objects detrimental to survival. Given a random distribution of preferences, if such variation had even a slight basis in genetic variation, then over time, preferences for nutritive objects would evolve. These preferences in humans turned out to

be for objects rich in fat and sugar; aversions evolved for bitterness and sourness (Rozin & Vollmecke, 1986). All existing humans have ancestors who possessed these food preferences. These food preferences solved a basic problem of survival.

Mate preferences are in some ways analogous to food preferences. However, rather than solving survival problems, mate preferences solve reproductive problems. Consider one reproductive problem that men in human evolutionary history had to face: selecting a fertile woman. Those men in humans' evolutionary past who chose to mate with infertile women failed to reproduce; those who preferred to mate with fertile women were more successful at reproducing. It is reasonable to suppose that, over thousands of generations, there would evolve in men a preference for those women who were most fertile, or more accurately, a preference for and attraction to female cues that reliably correlated with fertility. This preference solves a reproductive problem much like food preferences solve survival problems.

When we speak of preferences as solutions to reproductive problems, there is no implication that these preferences, or the reproductive problems they solve, are consciously articulated, although the preferences themselves may be accessible to awareness. Instead, they operate as desires, attractions, and gut-level emotions that characteristically impel a person toward some mates and repel a person from others. Humans like certain foods and are repulsed by others without necessary awareness of the adaptive logic of nutritive content. Similarly, humans are attracted by some potential mates and repulsed by others without any awareness of the adaptive logic behind the preference.

However, the psychological solutions to adaptive problems proposed here are not blind instincts, carried out regardless of circumstances or context. Rather, Sexual Strategies Theory specifies that evolved psychological mechanisms are exquisitely sensitive to context and, in particular, to the temporal dimension of context: whether a short-term or long-term mating relationship is sought or anticipated. The context dependency of the strategic activation of these psychological mechanisms makes this theory unique among all theories of human mating.

In summary, evolved psychological mechanisms are proposed to be the solutions to the specific adaptive problems that

¹ The evolutionary psychology of physical attractiveness is even more complex than this discussion implies. Whereas it is clear that youth is given greater weight in judgments of women's than of men's attractiveness, cues to health might be important for both sexes. Needed are psychophysical studies that systematically vary cues to youth and health and that identify the weightings given to these components by both sexes. An additional complexity comes from theories that predict that physical attractiveness may be used by women in short-term mating contexts as a cue to health, low parasite load, symmetry, and perhaps benefits of producing children who are attractive to the opposite sex (Gangestad & Simpson, 1990; Gangestad & Thornhill, in press; Hamilton & Zuk, 1982; Trivers, 1985). These theories predict that where women do not secure continuous access to a man's resources, as might be the case in long-term mating, they may secure better genes that are passed on to their children by mating short-term with physically attractive men. Although thorough tests of these controversial theories remain for the future, circumstantial evidence may come from examining whether women value physical attractiveness more in short-term mates than in long-term mates.

each sex has faced when confronted with different types of mating problems. Because this first set of predictions, involving various aspects of men's solutions to the problems of short-term mating, is so central to Sexual Strategies Theory, it is perhaps expedient to examine the empirical results of the studies testing these predictions before shifting to the other three quadrants of the theory. Empirical failure of this first set of predictions would jeopardize the entire theory, and thus it would not be worth proceeding without substantial evidence of their support. The predictions, and the hypotheses on which they are based, are presented in the next section, followed by summaries of the empirical studies conducted to test them.

A Note on the Empirical Tests

This section summarizes the specific hypotheses and predictions that follow from Sexual Strategies Theory and summarizes the relevant empirical tests of each. For those empirical tests that have been published already, readers are referred to the original articles for further methodological and statistical details. For those tests specifically designed for this article, sufficient methodological and statistical details are presented to allow readers to evaluate the findings and their bearing on the hypotheses and predictions. In all cases, we report sample composition, sample size, the methods used, statistical tests such as *t* tests and associated *p* values, and magnitudes of effect. Although some studies are based on self-report methodology, we note that self-report is a reasonable method of choice for gauging mate preferences (Buss, 1989b), albeit a method with some obvious limitations, and that numerous other studies using alternative methods such as psychophysiological techniques, observational recording, and behavioral decision making are reported to provide convergent evidence for the key hypotheses and predictions. Discussions of the limitations of these studies may be found in the General Discussion section and in the originally published articles.

Hypothesis 1: Because of the Lower Levels of Minimum Parental Investment Incurred by Men, Short-Term Mating Will Represent a Larger Component of Men's Sexual Strategy Than of Women's Sexual Strategy

Prediction 1: Men will express greater desire for, or interest in, short-term mates than will women. To test this prediction, a sample of 148 college students, 75 men and 73 women, rated on 7-point scales (1 = not at all currently seeking and 7 = strongly currently seeking) the degree to which they were currently seeking a short-term mate (defined as a 1-night stand, brief affair, etc.), and, independently, the degree to which they were currently seeking a long-term mate (defined as a marriage partner). The results are shown in Figure 1. Although men and women did not differ in their stated proclivities for seeking a long-term mate ($t = 0.48, ns$), men more than women in this study reported that they were currently seeking short-term sexual partners ($t = 5.37, p < .001, \gamma = 0.87$).² These findings, although obviously limited by sample and age restrictions, support the hypothesis that short-term mating strategies represent a larger component of men's mating effort.³

Prediction 2: For any given period of time (e.g., a month, a year,

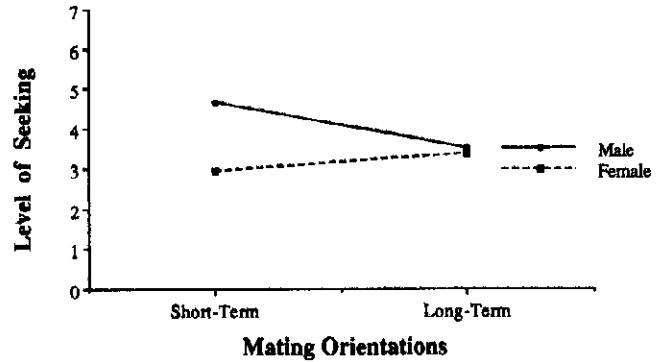


Figure 1. Mating orientations. (Short-term and long-term mates are rated on a scale from 1 [not at all currently seeking] to 7 [strongly currently seeking].)

a decade, or a lifetime), men will desire a larger number of mates than will women (solution to the problem of number). To test this prediction, 75 men and 73 women estimated how many sexual partners they would ideally like to have over a series of time intervals: during the next month, 6 months, 1 year, 2 years, 3 years, 4 years, 5 years, 10 years, 20 years, 30 years, and a lifetime. The results of this study are shown in Figure 2. At each time interval, men reported that they desire a larger number of sex partners than women reported. During the next 2 years, for example, men reported desiring approximately eight sex partners, whereas women reported desiring approximately one. Over the course of a lifetime, men reported, on average, desiring more than 18 sex partners, whereas women reported desiring 4 or 5. At each time interval men expressed a desire for a greater number of partners ($p < .001$ for *t* tests conducted for each interval, γ range = 0.49 to 0.87, mean $\gamma = 0.63$). Whether these preferred partners involve premarital-sex partners, extra-marital affairs, or serial marriages cannot be evaluated from these data. Nonetheless, these results, although limited in scope, support the hypothesis that short-term mating represents a larger component of men's mating strategies than of women's mating strategies. They also support the prediction that men possess solutions to the problem of partner number, in this case in the form of consciously articulated desires.

Prediction 3: Men will be willing to engage in intercourse after less time has elapsed in knowing a potential partner than will women (solution to the problem of number). To test this prediction, a sample of 75 men and 73 women were posed with the following question: "If the conditions were right, would you consider having sexual intercourse with someone you viewed as desirable . . . if you had known that person for 5 years . . . if you had known that person for 2 years . . . if you had known

² The effect sizes (γ) reported throughout the article are gammas (Howell, 1987). They signify the difference between means in standard deviation units. Cohen (1977) defines effect sizes as *small* if they are 0.20, *medium* if they are 0.50, and *large* if they are 0.80 or greater.

³ This and subsequent sections present only those tests that directly bear on the specific predictions derived from the theory. Readers interested in the complete set of analyses may write to us.

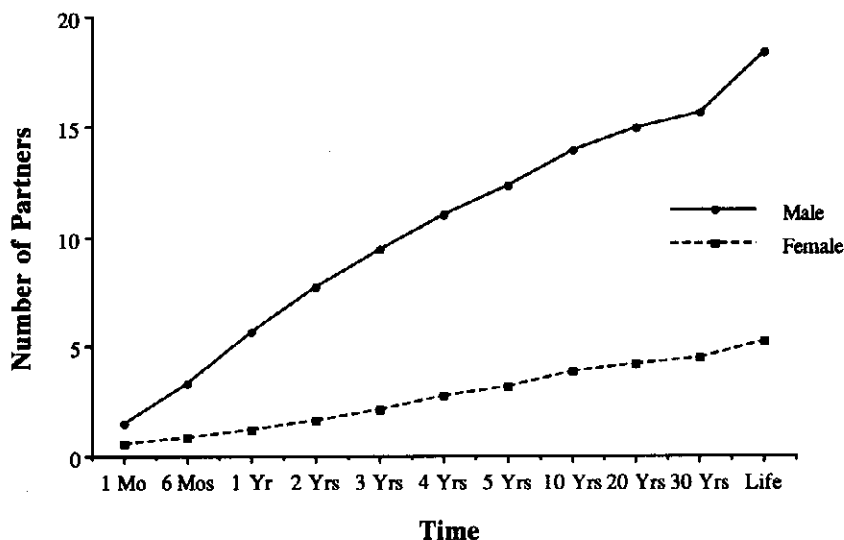


Figure 2. Number of sexual partners desired. (Subjects recorded in blank spaces provided how many sexual partners they would ideally like to have for each specified time interval.)

that person for 1 year . . . if you had known that person for 6 months . . . if you had known that person for 3 months . . . 1 month . . . 1 week . . . 1 day . . . 1 evening . . . 1 hour?" Each time interval was rated on a scale ranging from -3 (*definitely not*) to 3 (*definitely yes*).

The results are summarized in Figure 3. When they have known a desirable potential mate for 5 years, both men and women stated that they would probably have sexual intercourse with that person. At every time interval briefer than 5 years, however, men stated that they would be more likely to have

sexual intercourse with the potential partner. If he has known a woman for 6 months, for example, a man is just as likely to consent to sex as if he had known her for 5 years. In contrast, women dropped from 2 (*probably yes*) to close to 0 (*neutral*) when the interval shifted from 5 years to 6 months. Having known a potential mate for only 1 week, men were still on average positive about the possibility of consenting to sex. Women, in sharp contrast, stated that they are highly unlikely to have sex after knowing someone for just 1 week. After knowing a potential mate for just 1 hour, men are slightly disinclined

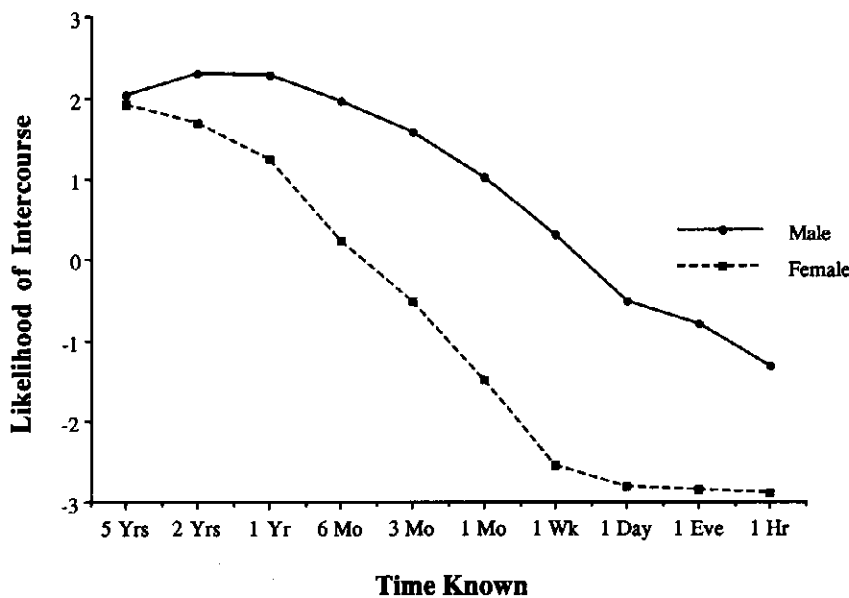


Figure 3. Probability of consenting to sexual intercourse. (Subjects rated the probability that they would consent to sexual intercourse after having known an attractive member of the opposite sex for each of a specified set of time intervals.)

to consider having sex, but the disinclination is not strong. For most women, sex after just 1 hour is a virtual impossibility. The sex differences are highly significant ($p < .001$) at each time period less than 5 years ($\gamma = 0.46$ to 1.21, mean $\gamma = 1.00$).

In an innovative study by different investigators (R. D. Clark & Hatfield, 1989), an attractive man or woman confederate approached strangers of the opposite sex on a college campus and posed one of three randomly selected questions: "I have been noticing you around campus. I find you very attractive. (a) Would you go out with me tonight? (b) Would you come over to my apartment tonight? (c) Would you go to bed with me tonight?" Of the women approached for a date, roughly 50% consented; of the women approached with an invitation to go back to the man's apartment, only 6% consented; and of the women approached with a request for sex, none consented. Of the men approached, roughly 50% agreed to go out on a date (same percentage as women), 69% agreed to go back to the woman's apartment, and fully 75% agreed to go to bed with her that evening. These findings have been replicated (R. D. Clark & Hatfield, 1989) and appear to be robust.

These behavioral data indicate that men are even more willing to engage in casual sex with a virtual stranger than the self-reported estimates in the aforementioned study. The discrepancy may be due to two key differences in the studies. First, a living physically attractive woman presented herself in the R. D. Clark and Hatfield (1989) study, whereas it was merely an imagined partner in the self-report study. Second, the female confederates indicated that they found the subjects to be very attractive, which also might have made men even more inclined to casual sex. Taken together, however, both studies support the hypothesis that men are more oriented toward short-term mating opportunities and solve the problem of number in part by allowing little time to elapse before seeking or consenting to sex.

Prediction 4: Across all desired attributes in potential short-term mates, men will impose less stringent standards than women impose (solution to the problem of number). To test this prediction, we assembled 67 characteristics that had previously been nominated as potentially desirable in a mate (see Buss & Barnes, 1986). These spanned a gamut of attributes ranging from adventurous, artistic, and athletic to stylish in appearance, understanding, and well liked by others. A sample of 57 men and 51 women rated each characteristic on a 7-point scale ranging from 3 (*extremely desirable*) through 0 (*inconsequential or uncertain*) to -3 (*extremely undesirable*) in a short-term mate, defined as previously described.

On 41 of the 67 characteristics, approximately two thirds, men's standards for a short-term mate were significantly lower than those of women ($p < .05$, two-tailed, for each t test). For example, men required in a short-term mate lower levels of charm, athleticism, education, devotion, social skills, generosity, honesty, independence, kindness, intellectuality, loyalty, sense of humor, sociability, wealth, responsibility, open-mindedness, spontaneity, courteousness, cooperativeness, and emotional stability. For no characteristics were men more exacting than women in the short-term mating context. A summary score, representing a composite across all 67 characteristics, showed men to be substantially less exacting than women in their standards for a short-term mate ($p < .001$, $\gamma = 0.79$) and

less exacting in short-term than in long-term contexts ($p < .001$, $\gamma = 1.90$). These findings support the prediction that men relax their standards in short-term mating contexts, providing a partial solution to the problem of number.

The hypothesis of relaxed male standards in short-term contexts also has received independent empirical support from Kenrick, Sadalla, Groth, and Trost (1990). Using a unique methodology, they asked subjects to report on what their minimum levels of acceptability would be for characteristics such as intelligence and kindness in different types of relationships. They found that, although both sexes expressed high minimum standards in a marriage partner for these traits (at least 60th percentile), the standards men imposed for someone with whom they would have only sexual relations dropped dramatically (e.g., 40th percentile on intelligence), whereas women's standards remained uniformly high for such relationships (e.g., at least 55th percentile on intelligence). In summary, evidence from independent investigations supports the hypothesis of relaxed male standards in short-term mating contexts.

Prediction 5: In short-term mating contexts, men will impose less stringent exclusionary criteria than do women (i.e., they will have fewer characteristics that they find undesirable or abhorrent). To test this prediction, we assembled a list of characteristics that were previously nominated as undesirable in a potential mate. Examples are unaffectionate, bigoted, boring, cheap, dishonest, dumb, lacks ambitions, has bad breath, and so on. A sample of 44 men and 42 women judged each characteristic on a 7-point scale, ranging from 3 (*extremely desirable*) to -3 (*extremely undesirable*) in a short-term mate.

Out of the 61 characteristics, roughly one third were judged to be more undesirable by women than by men. These included mentally abusive, physically abusive, bisexual, disliked by others, drinks a lot of alcohol, dumb, uneducated, a gambler, old, possessive, promiscuous, self-centered, selfish, lacking a sense of humor, not sensual, short, sleeps around a lot, submissive, violent, and wimpy. In contrast, only 5 of the 61 negative characteristics were judged by men to be more undesirable than judged by women. A summary score, based on a composite of all 61 characteristics, showed that women expressed significantly stronger exclusionary standards than did men when evaluating a short-term mate ($p < .001$, $\gamma = 0.57$), and men expressed significantly less stringent exclusionary standards in the short-term context compared with the long-term context ($p < .001$, $\gamma = 1.52$). These results provide further support for the hypothesis that men's standards when seeking a short-term mate become relaxed, thus solving in part the problem of number.

Hypothesis 2: Men Have Evolved a Distinct Sexual Psychology of Short-Term Mating Such That Preferences for Short-Term Mates Will Solve the Problem of Identifying Which Women Are Sexually Accessible

Prediction 6: Cues to immediately available sex (e.g., promiscuity or apparent sexual experience) will be valued by men in short-term mates more than in long-term mates because they provide cues to sexual accessibility. To test this prediction, we examined the men's preferences for short-term mates as opposed to long-term mates for the characteristics of promiscuity, sex ap-

peal, and sexual experience (see the sample and the procedure description for Prediction 5). The results are shown in Table 2. All three are significantly more valued by men in a short-term mate, as predicted. It is noteworthy that men find promiscuity mildly desirable in a short-term mate but clearly undesirable in a long-term mate. Also of note is the finding that women find promiscuity extremely undesirable in either context ($M = -1.28$ in short-term mates and $M = -2.15$ in long-term mates). These findings support the hypothesis that men have specific preferences that attend short-term mating, preferences that in part solve the problem of sexual accessibility.

Prediction 7: Cues that signal a disinclination on the part of a woman to engage in short-term sexual intercourse, such as prudishness, sexual inexperience, or apparent low sex drive, will be disliked by men seeking short-term mates. To test this prediction, we selected three key attributes from among the list of 61 undesirable mate characteristics. The results from this study, involving 44 men, are shown in the bottom half of Table 2. In short-term mating contexts more than long-term mating contexts, men expressed a particular dislike for women who have a low sex drive, are prudish, and who lack sexual experience, although low sex drive and prudishness are also disliked by men in long-term mates. In contrast, lack of sexual experience is mildly valued by men in a long-term mate. These findings support the hypothesis that men's short-term mate preferences function to solve, at least in part, the problem of identifying women who are sexually accessible.

Hypothesis 3: Men Have Evolved a Distinct Sexual Psychology of Short-Term Mating Such That Preferences for Short-Term Mates Will Solve, in Part, the Problem of Minimizing Commitment and Investment When Pursuing This Strategy

Prediction 8: Because the successful enactment of a short-term sexual strategy for men requires minimizing commitment and

investment, men will find undesirable in potential short-term mates any cues that signal that the woman wants to extract a commitment. To test this prediction, we conducted a t test for the variable *wants a commitment* for short-term versus long-term mate preference (see Prediction 5 for the description of the sample and the procedure). Of all the variables, this one showed the most striking context difference for men (see Table 2). Specifically, the attribute of wanting a commitment was seen by men as strongly desirable in a long-term mate but strongly undesirable in a short-term mate. For women, this context difference was also found but was not nearly as strong: *Wants a commitment* was seen as highly desirable in a marriage partner but only as mildly undesirable in a short-term sex partner. These findings support the hypothesis that men especially seek to avoid commitment when seeking a short-term mate, a partial solution to the problem of maximizing copulatory opportunities.

Hypothesis 4: Men Have Evolved a Distinct Sexual Psychology of Short-Term Mating Such That Preferences for Short-Term Mates Will Solve, in Part, the Problems of Identifying Which Women Are Fertile

Prediction 9: Because the most important class of cues that are linked with fertility and reproductive value are physical (Buss, 1987, 1989b; Symons, 1979; Williams, 1975), men will place great importance on physical attractiveness in both short-term and long-term mating contexts. To test this prediction, we examined how desirable men found the characteristics *good looking* and *physically attractive*. The results are shown in Table 2 (see the sample and the method description from Prediction 5). Men's preference for physical attractiveness in short-term mates approached the ceiling of the rating scale. Indeed, this preference was stronger for men seeking short-term mates than for men seeking long-term mates and was stronger for men than for women in both contexts.

Table 2
What Men Value and Dislike More in Short-Term Mating Than in Long-Term Mating

Characteristic	Short-term mean	Long-term mean	t	p	γ^a
Value					
Good looking	2.67	2.21	5.30	.000	0.61
Physically attractive	2.71	2.31	4.30	.000	0.50
Promiscuous	0.36	-0.99	6.71	.000	0.80
Sex appeal	2.67	2.33	4.10	.000	0.47
Sexually experienced	1.09	0.19	6.55	.000	0.76
Dislike					
Wants a commitment	-1.40	2.17	-10.08	.000	1.56
Low sex drive	-2.38	-2.02	-3.19	.003	0.49
Prudish	-1.64	-1.14	-2.13	.039	0.33
Not sexually experienced	-0.43	0.52	-4.66	.000	0.72
Physically unattractive	-2.24	-1.88	-2.93	.006	0.45

^a The effect sizes (γ) are gammas (Howell, 1987). They signify the difference between means in standard deviation units. Cohen (1977) defines effect sizes as *small* if they are 0.20, *medium* if they are 0.50, and *large* if they are 0.80 or greater.

For the women, $M = 2.41$ and $M = 1.92$ for good looking and $M = 2.43$ and $M = 2.10$ for physically attractive, in short-term and long-term contexts, respectively. Women thus place greater value on physical appearance in short-term than in long-term mating contexts. Although circumstantial, these findings are consistent with the theories advanced by Gangestad and Simpson (1990), Hamilton and Zuk (1982), and Trivers (1985) about the potential role of better genes in short-term mating contexts.

The finding that men express a stronger desire for physical attractiveness in short-term than in long-term contexts was not predicted in advance and deserves further theoretical and empirical scrutiny. One speculation is that there are a larger number of adaptive problems that men must solve to successfully pursue a long-term strategy, problems involving assessing the degree of commitment, loyalty, signs of good parenting skills, signs of being a good long-term cooperator, signs of fidelity, and so on. In contrast, the adaptive problems that must be solved to pursue a short-term strategy are smaller in number, and the complexity of the relationship is commensurately reduced. Perhaps preferences for cues to the many attributes sought in a long-term mate render physical attractiveness relatively less important in that context, a speculation that must be examined with future empirical work.

Prediction 10: Men will find physically unattractive women to be undesirable in both short- and long-term mating contexts. The great value men place on physical attractiveness in a short-term mate is mirrored in their dislike of physical unattractiveness in a short-term mate (Table 2; see the sample and the method description under Prediction 5). Although unattractive women are not desired by men in either context, men's dislike for absence of beauty is especially strong in the short-term context. Furthermore, physical unattractiveness is seen as more undesirable by men than by women in both mating contexts (for women, $M = -1.77$ and $M = -1.39$ in short-term and long-term contexts, respectively). These results mirror those found for the desire for physical attractiveness. Men express stronger preferences on this attribute in the short-term than in the long-term context, suggesting that this finding is robust across desirable and undesirable modes of preference presentation.

Interim Summary

Four hypotheses and 10 corresponding predictions about the psychology of men's short-term sexual strategies were tested in a series of empirical studies and by independent investigators. The findings support the hypothesis that short-term sexual strategies loom larger in men's strategic repertoire than in women's, at least for these samples. Men reported desiring a larger number of short-term mates, allowing less time to elapse before expressing willingness to have intercourse, expressing less stringent standards for short-term mates, and imposing fewer exclusionary criteria with the exception of physical attractiveness.

Furthermore, the studies support the hypotheses that men's mate preferences solve the distinct adaptive problems that must be solved when pursuing a short-term sexual strategy. Specifically, men value cues to immediately available sex, dislike signs of sexual disinclination, seek to minimize commitment, and

value cues that are reliably linked with fertility when evaluating a short-term mate. Many of these preferences are sharply differentiated from what men seek in a long-term mate, supporting the theoretical importance of temporal context in men's mating strategies. Further research, particularly on more diverse samples, is needed to verify these findings. Taken together, however, these findings provide encouraging support for a major set of premises of Sexual Strategies Theory. We now turn to the next quadrant, the psychology of men's long-term mating strategy.

Adaptive Logic of Men Pursuing a Long-Term Mating Strategy

Given the powerful reproductive advantages that accrue to men who pursue short-term sexual strategies, why should men pursue a long-term mate? The primary reproductive advantage to men of long-term mating is that it offers the possibility of monopolizing a woman's lifetime reproductive resources. Additionally, it may offer benefits of prolonged economic cooperation with the woman and the development of long-term alliances with her kin (Barb Smuts, 1991, personal communication).

There are several potentially powerful reproductive reasons why men would seek long-term rather than short-term matings. These include (a) when long-term mating becomes necessary to obtain women of high mate value,⁴ (b) to avoid the cost of not pursuing a long-term mate, (c) to increase the genetic quality of children, (d) to solve the problem of concealed ovulation in women, and (e) to reap the benefits of mutual cooperation and division of labor.

Fulfilling Standards Imposed by Women

There is an asymmetrical relationship between the two components of sexual selection. The mate preferences of one sex should influence the competitive tactics used by the opposite sex, either over evolutionary time or over the course of individual development (Buss, 1988a). If women require reliable signs that a man is committed to them for a long-term relationship as a prerequisite for consenting to sexual intercourse, then men will have to display signals of long-term commitment if they are to succeed in acquiring a mate (barring attempts to circumvent female choice).

These signals, of course, can be, and sometimes are, deceptive. Men may feign long-term interest as a tactic for obtaining a short-term mate. However, women should evolve over time to combat deception in three ways: (a) evolving psychological mechanisms that detect when deception is occurring, (b) focusing on cues that reliably predict actual long-term commitment, and (c) requiring increased levels of commitment that are costly

⁴ The concept of mate value was first introduced by Symons (1987b), although similar concepts such as market value (Buss & Barnes, 1986; Frank, 1988) have been used throughout certain literatures. It refers to an overall summary, given a set of weights (Frank, 1985, p. 186), to various component attributes. The obvious implication of Sexual Strategies Theory is that the weights given to the components differ for men and women.

to feign before intercourse. Thus, men may be forced de facto into long-term matings to fulfill standards imposed by women.

Costs of Not Pursuing a Long-Term Mate

The costs and benefits of one strategy must be evaluated by contrasting them with the costs and benefits of alternative strategies. The primary alternative to long-term mating is short-term mating. Repeatedly seeking short-term mates, however, can be costly in time, energy, and resources. These costs become especially pronounced in contexts where women show reluctance to mate quickly, requiring instead prolonged courtship, investment, and signs of commitment. Female delay and discrimination in permitting sexual access increase the costs to men pursuing an exclusive strategy of short-term mating. If a man does not form a long-term mateship, he may also lose the opportunity to develop a well-tuned cooperative relationship and efficient task specialization or division of labor. Cooperation occurs because of "strategic confluence" (Buss, 1989c), whereby children provide gene vehicles for both parents. For all these reasons, in the economics of reproductive effort, the costs of not pursuing a long-term mate may be prohibitively high.

Potential Increase in Mate Quality

In addition to the costs of short-term mating, the economics of the mating marketplace typically produce an asymmetry between the sexes in the attractiveness or desirability of a mate they can obtain in long-term as opposed to short-term relationships (Symons, 1979, p. 271). Most men can obtain a much more desirable mate if they are willing to invest and commit to a long-term relationship. Most women, in contrast, can obtain a much more desirable short-term mate with whom nothing but sex is exchanged. Thus, men may gain reproductively by obtaining a high quality long-term mate (as opposed to lower quality short-term mates) in the currency of either (a) better phenotypic mate attributes or (b) better genes that are passed on to his sons and daughters (cf. Gangestad, 1989; Gangestad & Simpson, 1990). The potential genetic benefit remains theoretically controversial in evolutionary biology, appears difficult to test at the present (e.g., Trivers, 1985; Williams, 1975), but represents a viable theoretical possibility.

Combating the Problem of Concealed Female Ovulation

Most sexually reproducing species do not form long-term pair-bonds (some bird species provide exceptions). Among most mammals, females enter estrus only at intervals, and mating occurs primarily during those periods. Human females, however, have lost estrus. Women do not have large, red, genital swellings when they ovulate nor is there evidence that they emit noticeable pheromonal cues, as some other primate species do. Indeed, women are at least somewhat unique among primates in that ovulation is cryptic, or concealed (although a few other primate species have somewhat cryptic ovulation; Hrdy, 1981). There is no evidence that men can detect when women are ovulating (Symons, 1992).

With the concealment of ovulation came changes in the ground rules of human mating. Concealment of ovulation cre-

ated a special reproductive problem for men: the problem of decreased probability of their paternity. A nonhuman primate male who is the only one to copulate with a female for the brief period that she is in estrus can be fairly "confident" in his paternity (again, no conscious articulation is implied). The period for which he must guard or sequester a mate to achieve paternity is sharply time constrained. After estrus, he can go about his other business without running the risk that another male will inseminate his mate.

Human males confront a qualitatively different adaptive problem. A man in human ancestral conditions never knew when a woman was ovulating. Because mating is not the only activity that humans must engage in to survive and reproduce, women cannot be guarded around the clock. Even if they could be continuously guarded, the costs in time and energy would seriously impair solving other adaptive problems. Men, therefore, are faced with a unique paternity problem that is not faced by other primate males: How can paternity be ensured under conditions of ovulatory uncertainty?

Concealed ovulation is likely to have been one force in human evolutionary history that selected for men to form long-term mating relationships with women (Alexander & Noonan, 1979). Men who monopolized a woman over long periods of time would carry a selective advantage over men who did not, if by so doing they substantially increased the probability of paternity, and this increase sufficiently outweighed the costs, such as opportunity costs (e.g., the alternative copulations they could achieve if they spent less time mate guarding). This line of reasoning leads to a specific prediction: In the context of long-term mating, men should prefer women who provide evidence that paternity will be likely and after mate selection occurs should have mechanisms that continue to ensure paternity (e.g., sexual jealousy).

Mutual Cooperation and Division of Labor

A final benefit that ancestral men would have received from long-term mating concerned establishing a coordinated mutual relationship such that the couple could function more efficiently in various ways together than either could alone. Division of labor may have been one facet of mutual cooperation, enabling each person to specialize in functions, yielding greater efficiency. Furthermore, mutual cooperation may have allowed more efficient care and provisioning, with less likelihood that a man's investment would be misdirected. The mutual interest in the same children makes it easier for such cooperative relationships to develop (Alexander, 1987). Finally, long-term relationships offer the possibility of fine-tuned efficiency and intermeshing of efforts that may yield greater economy and ultimate payoff compared with a strategy that does not entail forming long-term bonds.

Costs of Long-Term Mating

Long-term mating, like all sexual strategies, carries costs when contrasted with alternative strategies. The primary cost to men is the opportunity cost: the copulations that the man could have obtained if he were not committed to a long-term mating. Over human evolutionary history, we expect that selec-

tion would operate on men to reduce these costs where possible. Some men seek extramarital affairs that are concealed from their long-term mate, for example, and in evolutionary history this would have helped to reduce the opportunity cost of long-term mating (Symons, 1979). Nonetheless, the reproductive cost of foreclosed copulations is real.

In summary, there are compelling reproductive reasons for men to seek long-term mating. It is a method of tying up a woman's reproductive effort for years, it is a method of obtaining more attractive and desirable mates, it may take less effort per viable offspring than an exclusive pursuit of short-term mating, it may increase the certainty of paternity, and it may be required to fulfill standards imposed by women. The major cost to men of mating long term is the foreclosed opportunity to inseminate other women. Natural selection would be unlikely to produce long-term mating strategies in men blindly. Men should have evolved powerful preferences about whom they are willing to mate with long term. These preferences should serve to ensure that the reproductive benefits that men can accrue from long-term matings are delivered. To the extent that men do invest in long-term mating, their preferences should become increasingly exacting for those characteristics that facilitate solving the adaptive problems they face.

Problems Men Must Solve When Pursuing a Long-Term Mating Strategy

Problem of Certainty in Paternity

Humans stand out among the primates as a species in which men provide substantial parental investment to their children (Alexander & Noonan, 1979), including tangible resources such as food, opportunities for learning, and protection against traditionally hostile forces of nature such as predators and conspecific aggressors. Given the tremendous effort that men sometimes expend for their children, we expect that natural selection would not produce men who dispensed it casually or indiscriminately.

Wherever men invest parentally, selection should favor men who act to ensure that their investment is directed toward their own children and not to the children of another man. Sexual jealousy is one adaptation to the problem of paternity uncertainty (Buss, 1988b; Daly, Wilson, & Weghorst, 1982). Male sexual jealousy apparently functions to guard a mate and to dissuade intrasexual competitors, thus lowering the likelihood of alien insemination. Initial mate preferences provide another possible solution to the paternity certainty problem.

The sexes are asymmetrical in probability of parenthood. Because women, like all other mammals, conceive internally, there is never any doubt about their parenthood. Maternity is 100% certain. Men can never be entirely sure. Because ovulation is concealed, or cryptic, in women, a man would have to sequester his mate for a period of months to be entirely sure. Even then, he has to sleep sometimes, and this opens the window of possibility for alien insemination. Two sets of studies will test the paternity certainty hypothesis: studies of sexual jealousy and studies of mate preferences for cues to paternity.

Evidence for three mate preferences will be examined to test the hypothesis of men's evolved solutions to the problem of paternity uncertainty: desire for chastity, desire for sexual fidelity, and abhorrence of promiscuity in a long-term mate.

Problem of Female Reproductive Value

The primary reproductive advantage to men of adopting a long-term mating strategy is the possibility of monopolizing a woman's entire reproductive capacity for her lifetime. Given this potential benefit, men have evolved preferences to mate long term with those women who have high reproductive capacity.

Predicting that men will value physical attractiveness in women because of its association with reproductive value does not negate or deny the existence of cultural and other determinants of standards of attractiveness. Ford and Beach (1951) have documented cultural variation in standards for female attractiveness along the dimensions of plump versus slim body build, light versus dark skin, and emphasis for particular physical features such as eyes, ears, or genitals. Symons (1979) has suggested that regularity of features, proximity to the population average, and association with status might also influence attractiveness standards.

The predicted sex differences in mate preferences for youth and physical attractiveness, however, are expected to transcend cultural variations and other determinants of beauty standards. The physical and behavioral cues that signal youth and health, and are regarded as attractive, should be linked with female reproductive value in all cultures. These sex differences are predicted to be species typical among *Homo sapiens*, despite cross-cultural variations in absolute age preferences, the presence or absence of counting systems, or culture-specific criteria for female attractiveness that are not linked with reproductive value.

Hypothesis 5: When Men Pursue a Long-Term Mate, They Will Activate Psychological Mechanisms That Solve the Problem of Paternity Confidence (e.g., Sexual Jealousy and Specific Mate Preferences)

Prediction 11: Men's jealousy will be activated strongly by cues to sexual infidelity because that is the act that would have been reproductively damaging to ancestral men; women's jealousy, in contrast, will focus more on emotional infidelity as a cue to loss of investment and commitment of a man over time (Daly et al., 1982; Symons, 1979). Buss, Larsen, Westen, and Semmelroth (1992) tested this prediction using both self-report methods and physiological methods. They asked subjects the following question: "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 one only): (A) Imagining your partner forming a deep emotional attachment to that person. (B) Imagining your partner enjoying passionate sexual intercourse with that other person" (p. 252).

The majority of the men (60%) picked sexual infidelity as more distressing, whereas 85% of the women said they would be more upset by their partner's emotional infidelity. In a sec-

ond study, Buss et al. (1992) recorded heart rate, electrodermal activity, and corrugator contraction (frown muscle) of men and women while they imagined (separately) their partner having sexual intercourse and their partner becoming deeply emotionally involved. Men showed greater heart-rate acceleration, greater skin conductance, and more facial frowning to imagining their mate having sex with someone else. Women showed the opposite pattern. This evidence supports the hypothesis that, psychologically and physiologically, the weighting given to cues that trigger jealousy differs for the sexes in accordance with the paternity uncertainty hypothesis.

Prediction 12: Compared with the short-term context, in the long-term mating context men should place greater value on characteristics such as faithfulness, sexual loyalty, and chastity that historically solved, in part, the problem of paternity certainty. To test this prediction, two studies were carried out. A sample of 75 men rated the desirability of 67 characteristics in a long-term mate and in a short-term mate. The results for the relevant variables are shown in Table 3.

The characteristics of faithfulness and sexual loyalty, although seen as neither particularly desirable nor undesirable in a short-term mate, are near the ceiling of the scale in desirability in a long-term mate. Indeed, *faithful* was the single most valued characteristic by men in the context of a long-term mate. Chastity was also valued by men more in long-term than in short-term mates, although it was not highly evaluated by this sample in either context.

A cross-cultural examination of preference for chastity was carried out by Buss (1989b), who examined this characteristic in a study of preferences for marital partners in a sample of 37 societies with a sample size of 10,047. Although the temporal context was restricted to long-term mating, and thus we cannot contrast men's short-term preferences with their long-term ones, we can examine sex differences in the value placed on chastity, on the basis of the hypothesis that certainty in parent-

hood is an adaptive problem that ancestral men, but not ancestral women, had to solve. A sample of the results are shown in Figure 4.

Over all 37 samples, 23 samples showed a significant sex difference in the predicted direction. The remaining 14 samples showed no significant sex difference. In no sample did women value chastity more than did men. In addition, there is tremendous variability across cultures in the absolute value placed on chastity: indeed, greater variability than any of the other 30 mate preferences examined across cultures (Buss, 1989b). Most of the Chinese sample, for example, said that chastity was indispensable in a long-term mate, whereas most of the Swedish and Dutch samples judged it to be largely irrelevant or unimportant. These results provide only modest support for the hypothesis that chastity will be valued by men as a cue to increased paternity certainty and suggest that the presence or absence of sex differences in the value placed on chastity are highly variable across cultures. These data do not suggest, however, that men's and women's values are unconstrained and arbitrary: a conclusion that would be supported if there were as many (or even some) cultures in which women valued chastity more than did men.

Combined with the study on the importance men place on faithfulness, we may conclude tentatively that certainty of paternity is more ensured by (a) seeking cues to future sexual conduct—signs of fidelity—rather than signs of prior total abstinence before mate selection and (b) enacting sexual jealousy and various forms of mate guarding after mate selection (Buss, 1988b; Buss et al., 1992; Wilson & Daly, 1992).

Prediction 13: Characteristics such as promiscuity and sexual experience will be shunned by men in long-term mates because they signal lowered confidence in paternity, failure to monopolize a woman's reproductive value, and an increased risk of investing in children that are not genetically related (see Buss, 1988b; Daly et al., 1982). The tests of this prediction are shown in Table 2, which was described earlier under short-term mate preferences. Although men have a slight preference for promiscuity in a short-term mate, it is seen as undesirable in a long-term mate (women, in contrast, rate it as undesirable in both contexts). Sexual experience, also viewed as desirable in a short-term mate, is seen as neutral in a long-term mate (women, in contrast, judge it to be mildly desirable in both contexts).

Another study asked men to rate 61 characteristics, previously nominated as undesirable in a potential mate, on the degree to which they were undesirable in a short-term and long-term mate. Among the characteristics were the variables *promiscuous*, *sleeps around a lot*, and *unfaithful*. As shown in Table 3, all three characteristics were judged by men to be especially undesirable in a long-term mate, as contrasted with a short-term mate. Indeed, the variable *unfaithful* was seen by men as the single most undesirable characteristic in a long-term mate, providing strong support for the hypothesis that men's mate preferences solve, at least in part, the adaptive problem of paternity uncertainty. Women judge these characteristics also to be highly undesirable in long-term mates but rate them as significantly more undesirable than men do in short-term contexts, suggesting the possibility that women use short-term mating as an assessment device for long-term mating.

Table 3
Preferences Hypothesized to Solve the Problem of Paternity Certainty for Men

Characteristic	Long term		Short term		<i>t</i> tests	γ^a
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
Study 1 (<i>N</i> = 75)						
Faithful	2.88	0.37	0.32	0.93	-21.81*	2.52
Sexually loyal	2.85	0.49	0.72	1.05	-17.07*	1.97
Chastity	0.91	1.20	0.19	1.65	-3.73*	0.43
Study 2 (<i>N</i> = 42)						
Unfaithful	-2.93	0.26	-1.21	1.46	7.32*	1.13
Promiscuous	-2.07	1.30	-0.40	1.88	5.82*	0.90
Sleeps around a lot	-2.79	0.65	-1.95	1.23	4.14*	0.64

^a The effect sizes (γ) are gammas (Howell, 1987). They signify the difference between means in standard deviation units. Cohen (1977) defines effect sizes as *small* if they are 0.20, *medium* if they are 0.50, and *large* if they are 0.80 or greater.

* $p < .001$.

Chastity:

No Previous Sexual Intercourse

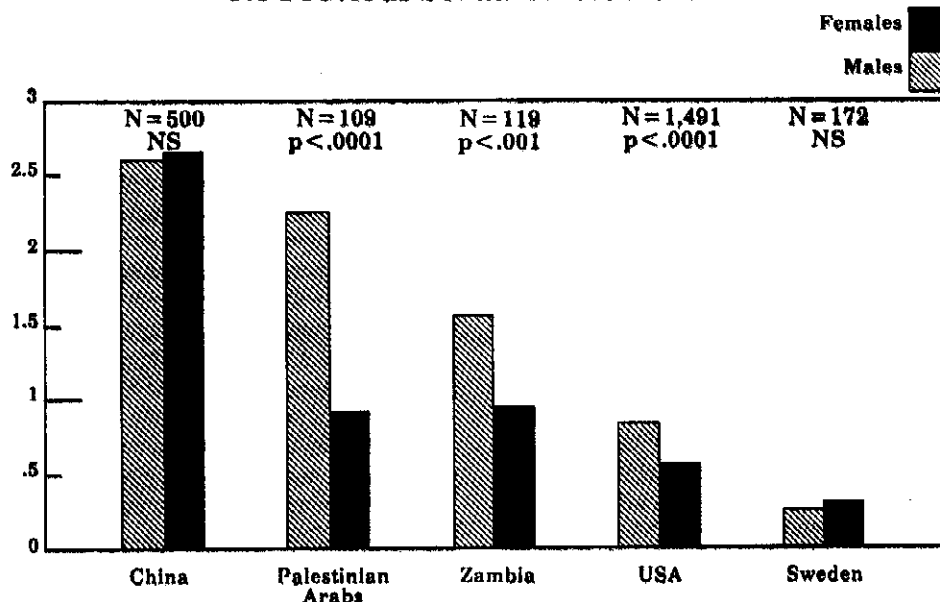


Figure 4. Chastity: No previous sexual intercourse. (Subjects rated this variable, in the context of 18 other variables, on how desirable it would be in a potential long-term mate or marriage partner using a 4-point scale, ranging from 0 [irrelevant or unimportant] to 3 [indispensable].)

Hypothesis 6: When Men Pursue a Long-Term Mate, Men Will Express Preferences That Solve the Problem of Identifying Reproductively Valuable Women

Prediction 14: Men should value physical attractiveness in long-term mates because it provides a powerful cue to age and health, which historically have been powerful cues to reproductive value (Buss, 1989b). Many studies have documented the value that men place on physical appearance and attractiveness in potential mates (Buss, 1987; Buss & Barnes, 1986; Hill, 1945; Hudson & Henze, 1969; McGinnis, 1958). This finding has been documented across 37 societies as well (Buss, 1989b). Figure 5 shows a sample of these findings from five diverse cultures. Although the absolute value placed on physical attractiveness varies, men consistently grant it greater importance than do women in the context of seeking a long-term mate.

Prediction 15: Men will value relative youth in long-term mates because it provides a powerful cue to reproductive value. Two recent large-scale studies have tested this prediction. The first by Buss (1989b) found that in each of 37 cultures, men consistently preferred marriage partners who were younger than they were. A sample of these findings for five cultures is shown in Figure 6.

The precise degree of relative youth differs from country to country. In Zambia, for example, men express a preference for wives who are more than 7 years younger, whereas in Italy, men express a preference for wives who are just under 3 years younger: findings that may be due to the polygynous nature of the Zambian mating system contrasted with the legally legislated monogamous mating system in Italy (Buss, 1989b). The sex difference, however, is consistent across all 37 societies, and

in no society do men prefer older women on average nor do they mate with older women on average.

These findings have been replicated and extended by a series of studies by Kenrick and Keefe (1992). They tested a more refined version of this hypothesis: As men get older, they will prefer mates who are progressively younger than they are. This prediction was confirmed in samples drawn from persons columns across generations within the United States and also across cultures such as India currently. Taken together, these studies support the hypothesis that men seek reproductively valuable women as long-term mates.

Adaptive Logic of Women Pursuing Short-Term Sexual Strategies

The costs incurred by women are likely to be more severe than those incurred by men when pursuing a short-term sexual strategy. Like men, women risk contracting sexually transmitted diseases with increased sexual contact. Also like men, they risk impairing their long-term mate value by acquiring a social reputation as promiscuous. The reputational damage to long-term mate value, however, is likely to be more severe for women than for men. This is ultimately because of the asymmetry between men and women in confidence in parenthood. Because of paternity uncertainty, cues that a woman has had multiple mates should be disfavored by men seeking long-term mates; hence, such women are predicted to experience a decrease in social status.

There is yet another reason why the damage to mate value is expected to be more severe for women than for men. Histori-

Physical Attractiveness

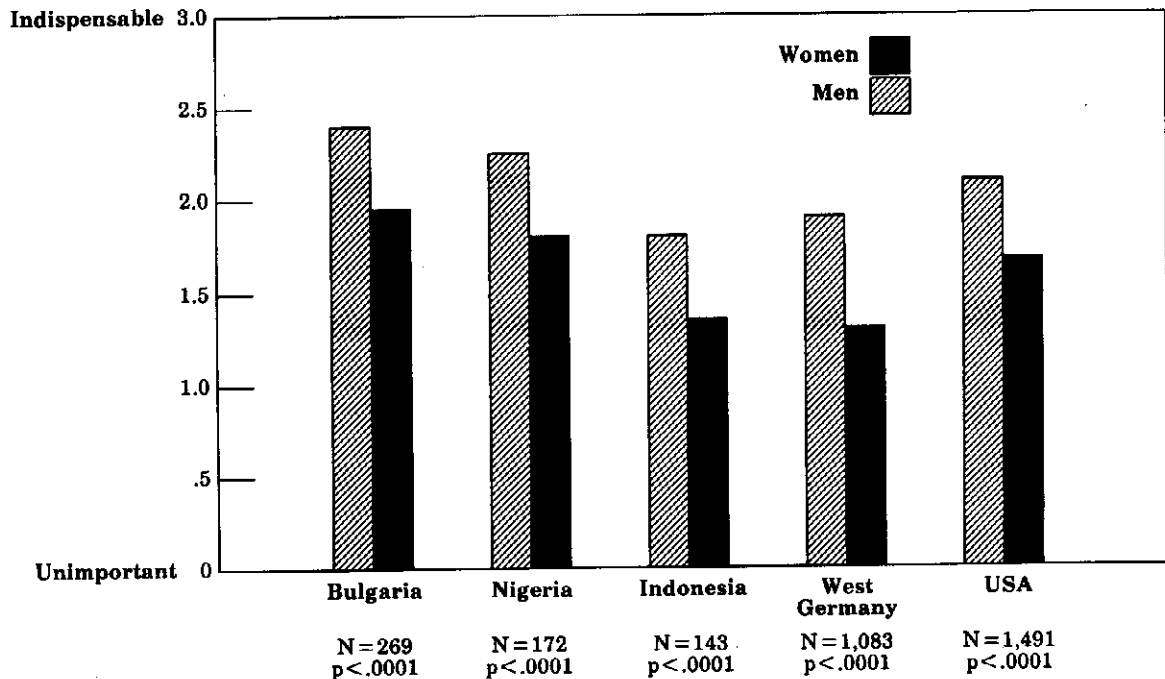


Figure 5. Physical attractiveness. (Subjects rated this variable, in the context of 18 other variables, on how desirable it would be in a potential long-term mate or marriage partner using a 4-point scale, ranging from 0 [irrelevant or unimportant] to 3 [indispensable])

cally, most human societies have been polygynous, with men being permitted to acquire multiple mates. It is only powerful men who are high in status and resource control, however, who can obtain multiple mates (Betzig, 1986). Because of this association, men who are able to gain sexual access to many women may be credited with being high in status or resource control (cf. Bar-Tal & Saxe, 1976).

Precisely the opposite social inference may operate when people interpret a woman's sexual contact with many men. Because women of high mate value are generally more discriminating than women of low mate value (Buss, 1988a), sexual promiscuity may be interpreted as a sign that a woman cannot obtain a long-term mate of high quality who is willing to commit resources and parental investment. Because lower mate value in women is linked with greater sexual accessibility, a woman may suffer reputational damage that is due to a short-term sexual strategy because people interpret that strategy as a sign of low mate value: a trend that may occur even in relatively promiscuous cultures such as the Ache (Kim Hill, 1991, personal communication).

In addition to sexually transmitted diseases and impairment of long-term mate value, women risk something else that is linked with contact with multiple men: physical abuse and sexual abuse. Because men are physically larger and stronger, they can and sometimes do abuse women physically and sexually, often in an attempt to control them reproductively (Daly & Wilson, 1988). Lacking a long-term mate who could offer physi-

cal protection, women who adopt a short-term sexual strategy may be at greater risk (Smuts, 1991). The risk is not only one of physical injury but also one of circumventing a woman's sexual choice through sexual harassment (Studd & Gattiker, 1991) and forced copulation (R. Thornhill & Thornhill, 1983, 1987). Smuts (in press) has made a compelling case for the importance of male protection of females from conspecific aggressors among nonhuman primate species as well.

In spite of the potential costs to women of short-term mating, there are potential reproductive benefits that can accrue to women who pursue a short-term sexual strategy. One hypothesized benefit that has been proposed is the possibility of obtaining better genes that can be passed on to offspring. This possible benefit remains currently controversial and does not appear to be testable given current methodologies. Other key benefits include (a) immediate extraction of resources, (b) using short-term mating to evaluate long-term prospects, and (c) gaining increased protection. These are considered in detail in the next section.

Problems Women Confront When Pursuing a Short-Term Sexual Strategy

According to our temporal theory of sexual strategies, women should typically pursue short-term sexual strategies less often and less intensely than do men. However, this generalization masks a fundamental fact: Women sometimes do seek

Age Difference Preferred Between Self and Spouse

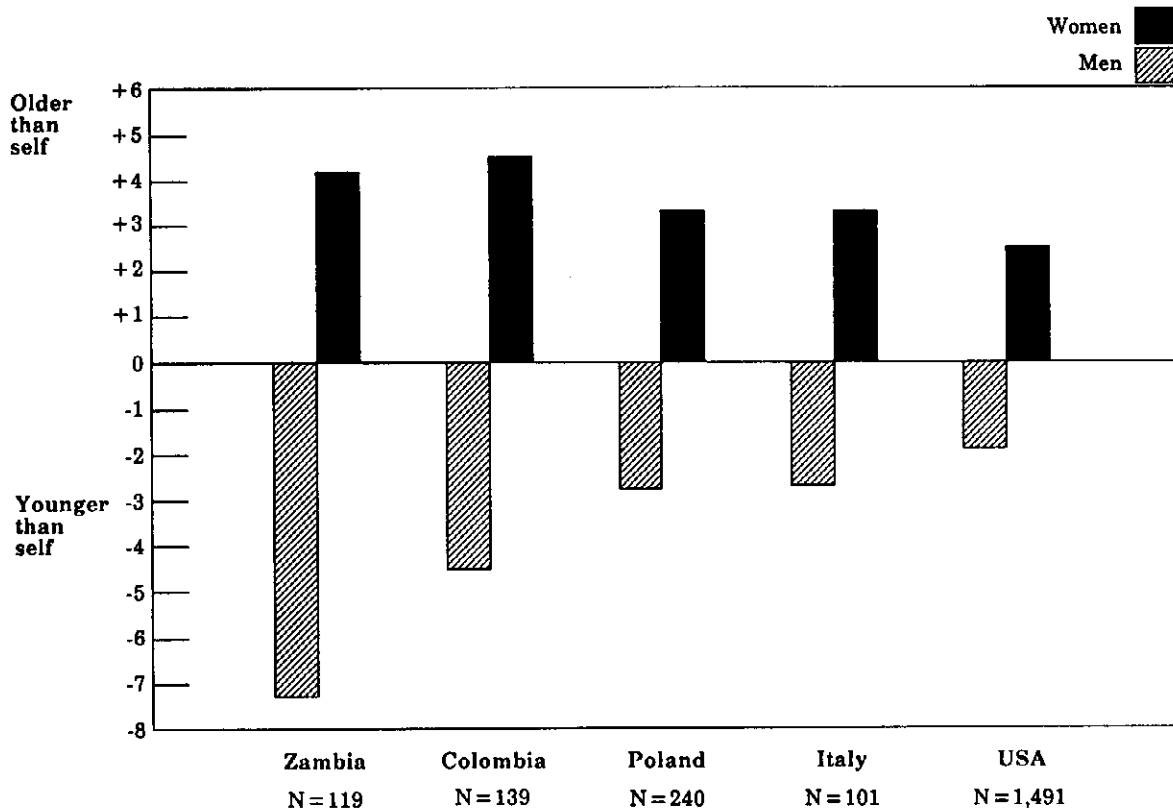


Figure 6. Age difference preferred between self and spouse. (Subjects recorded their preferred age difference, if any, between self and spouse. The scale shown is in years, with positive values signifying preference for older spouses and negative values signifying preference for younger spouses.)

short-term matings, and there are reproductively beneficial conditions for doing so (see Gangestad, 1989; Gangestad & Simpson, 1990). Short-term strategies differ from long-term strategies in that women generally cannot sequester a man's resources or his willingness to provide such resources reliably. Unlike men, obtaining copulatory opportunities per se is unlikely to be a powerful goal of short-term mating for women, who do not face the reproductive constraint of sexual access to mates that men do. Minimal access is all that is needed; there is rarely a shortage of men willing to provide the minimum sperm contribution; additional sperm beyond that are superfluous.

Problem of Immediate Resource Extraction

Are there clear reproductively relevant environmental benefits that a woman could derive from short-term matings? There are several. First, women can (and frequently do) obtain resources in exchange for short-term copulations. In many societies, men are expected to bring gifts such as food or jewelry to their mistresses, and women may decline to engage in sex if these gifts are not presented (Malinowski, 1929; Shostak, 1981). An obvious form of short-term mating is prostitution. Prostitution involves the direct exchange of money or other resources for temporary sexual access: a phenomenon found

cross-culturally in a great many societies from the Aleut to the Zuni in North America, from the Araucanians to the Yaruro in South America and the Caribbean, from Czechoslovakia to Yugoslavia in Europe, from the Amhara to the Yemen in the Middle East, from the Ainu to the Vietnamese Tonkin in Asia, and from the Alor to the Yap in Oceania (Burley & Symanski, 1981). In the most extensive cross-cultural analysis of prostitution yet conducted, Burley and Symanski (1981) concluded that "the motives expressed by many sorts of women in numerous societies are, at their core, clearly economic: men create a demand and women find an economic advantage meeting it" (p. 260).

If immediate extraction of resources is one potential benefit of short-term mating for women, then women who pursue a short-term mating strategy should prefer in mates characteristics that signal immediate resource provisioning. They should dislike characteristics such as frugality that imply that such resources will not be forthcoming.

Problem of Assessing Prospective Long-Term Mates

There is another possible benefit: the use of short-term mating as an assessment device to evaluate potential long-term mating partners. Given the tremendous reproductive impor-

tance of the choice of a long-term mate, great effort should be devoted to the assessment of long-term prospects. Short-term mating is often necessary to gauge these long-term prospects. Engaging in several short-term matings allows one to (a) evaluate one's own mate value (How many members of the opposite sex and of what quality are interested in mating with you and for what duration?), (b) assess the intentions of the prospective mate (Is he seeking a brief encounter or a marriage partner?), (c) evaluate the enduring characteristics of the potential mate (e.g., How does he hold up under stress? How reliable is he over time?), (d) discern any deception that might have occurred (e.g., Is he truly "free," or is he already involved in a serious relationship?), and (e) evaluate his mate value (How attractive is he to women?). These forms of assessment typically cannot be made with precision without becoming involved in a short-term mating relationship.

The same logic should apply to men who seek long-term mates. Men, no less than women, need to gauge a prospect's mate value, assess enduring characteristics, and penetrate any deception that has occurred (e.g., lies about age). However, as noted in the previous section, men have been selected to seek short-term matings as ends in themselves: The reproductive benefits historically have been large and direct in the currency of number of offspring. For women, however, the reproductive benefits of short-term mating as an end in itself are less direct and the potential costs more steep. The costs to a woman of making a poor choice of a long-term mate are potentially more severe than they are for a man. These considerations suggest that women will place greater emphasis on the assessment process and that short-term mates will be tested and evaluated as long-term prospects rather than being end goals in and of themselves.

If this reasoning is correct, then important empirical predictions follow. The most important prediction is that compared with men, what women seek in a short-term mate should be far more similar to what they seek in a long-term mate. Because men often seek opportunistic sex in short-term mating, they need not impose stringent standards for such low-cost ventures. However, if women seek short-term matings as a means to assess long-term prospects, then they should impose standards that closely approximate those of a long-term mate.

How might this assessment function be revealed in women's short-term mate preferences? Consider two attributes of a prospective mate: (a) The person is already in a relationship and (b) the person is promiscuous. If women were seeking short-term mates for opportunistic sex, as men do, then these qualities should not be particularly bothersome to women. If women are using short-term mates to evaluate long-term prospects, however, the fact that a prospective mate is already in a relationship or is promiscuous would be seen as highly undesirable because it decreases her odds of acquiring a long-term relationship with that person.

Problem of Protection

Among humans and other primates that show substantial sex differences in size and strength, females sometimes face the problem of being physically dominated by larger, stronger males. Females can be susceptible to injury and sexual domina-

tion: having males forcing themselves on females, thus circumventing female choice. Under these conditions, females should seek potential mates who have the ability to protect them. These considerations suggest that physical strength should be part of a woman's mate selection preferences. Although gaining protection should be important to women in both short-term and long-term mates, Barkow (1989) advanced compelling arguments that suggest it may be even more important in the short-term context.

A number of complex forces may be operating here. A key distinction is between the abuse women face by mates versus nonmates. Because men in long-term mateships are heavily invested, they should go to greater effort than short-term mates in ensuring protection from abuse by other men. Therefore, women who are in short-term mateships may be more at risk for abuse from nonmated men than are women who are in long-term mateships. Physically strong men in a short-term mateship may effectively deter abuse from other men, and the cost to the defender is smaller if he is stronger. Because a woman in a long-term mateship can generally count on the commitment of her mate to protect her, his physical strength may be a bit less important to women compared with that of a less investing short-term mate. Thus, all these forces lead to the prediction that, although women will value physical strength in both mating contexts, it will be more valued in short-term than in long-term mating contexts.

Hypothesis 7: In Short-Term Matings, Women Will Seek Men Who Are Willing to Impart Immediate Resources

Prediction 16: In short-term contexts, women will especially value signs that a man will immediately expend resources on her. To test this prediction, we conducted a study that requested 20 female subjects to evaluate the desirability of the following characteristics in a short-term and long-term mate: *spends a lot of money early on, gives gifts early on, and has an extravagant lifestyle.* The results are shown in Table 4. For all of the targeted characteristics indicating immediate resource extraction, women placed greater value on them in a short-term mate rather than in a long-term mate, in spite of the fact that women are generally less exacting in short-term than in long-term mating contexts.

Prediction 17: In short-term contexts, women will see as undesirable cues that a man is reluctant to expend resources on her immediately. The test of this prediction is also shown in Table 4. Women seeking short-term mates especially dislike men who are stingy early on, thus showing reluctance to impart immediate resources. This attribute is seen by women as undesirable in a long-term mate as well, but significantly more so in a short-term mate. This finding occurs in spite of the fact that women generally see more characteristics as strongly undesirable in long-term, rather than in short-term, contexts.

Hypothesis 8: Because Women More Than Men Use Short-Term Matings to Evaluate Long-Term Prospective Mates, They Will Dislike Characteristics in a Potential Mate That Would Be Detrimental to Long-Term Prospects

Prediction 18: Women more than men will dislike in a short-term mate the attribute of that person already being in a

Table 4
Immediate Extraction of Resources: Women's Preferences

Characteristic	Short term		Long term		<i>t</i> tests	γ^a
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
Spends a lot of money on me early on	1.80	1.28	1.20	1.20	2.85*	0.64
Gives me gifts early on	1.80	1.28	1.20	1.11	3.94**	0.88
Has an extravagant lifestyle	1.10	1.33	0.30	1.46	3.56**	0.64
Stingy early on	-1.90	0.72	-1.60	0.68	-2.85*	0.80

^a The effect sizes (γ) are gammas (Howell, 1987). They signify the difference between means in standard deviation units. Cohen (1977) defines effect sizes as *small* if they are 0.20, *medium* if they are 0.50, and *large* if they are 0.80 or greater.

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

relationship. To test this prediction, we examined the relative undesirability to men ($N = 42$) and women ($N = 44$) of a prospective mate who was already in a relationship for short-term mating, using a scale from -3 (*extremely undesirable*) to 3 (*extremely desirable*). Whereas men were bothered slightly in a short-term mating by the women already being in another relationship ($M = -1.04$), women saw that characteristic as moderately undesirable ($M = -1.70$) in this mating context ($t = 2.10$, $p < .039$, $\gamma = 0.45$).

Prediction 19: Women more than men will dislike in a short-term mate the attribute of promiscuity because it signals to a woman that the man is pursuing short-term mating relationships and is less likely to commit to a long-term mateship. The same sample of 42 men and 44 women evaluated promiscuity in short-term mates using a rating scale from -3 (*extremely undesirable*) to 3 (*extremely desirable*). Whereas men found this attribute to be close to neutral (neither desirable nor undesirable), with $M = -0.41$, women rated promiscuity to be moderately undesirable ($M = -2.00$) in a short-term mate ($t = 4.55$, $p < .0001$, $\gamma = 0.89$).

Prediction 20: Because one hypothesized function for women of short-term mating is protection from aggressive men, women will value attributes such as physical size and strength in short-term mates more than in long-term mates. To test this prediction, the characteristic of *physically strong* was evaluated on its desirability in long-term and short-term mates by women ($N = 73$) and men ($N = 75$). Women placed greater value on physical strength in a short-term mate ($t = 6.49$, $p < .001$, $\gamma = 0.94$) and in a long-term mate ($t = 4.25$, $p < .001$, $\gamma = 0.66$) than did men. Furthermore, women placed greater value on physical strength in a short-term mate than in a long-term mate ($t = 2.19$, $p < .05$, $\gamma = 0.20$), despite women's generally higher standards overall for a long-term mate.

Adaptive Logic of Women Pursuing a Long-Term Sexual Strategy

Benefits of Long-Term Mating for Women

From a reproductive standpoint, why would a woman want a long-term mate, especially if she can obtain a more desirable

man for a brief encounter? The key lies in the male parental investment that women garner through long-term mating. Men may provide women with food, find or defend territories, and feed and protect the children. They may also provide opportunities for learning; they may transfer status, power, or resources; and they may aid offspring in forming reciprocal alliances later in life (Buss, 1989b).

In addition to these direct benefits to the children, women are especially vulnerable when pregnant and lactating. A lone woman in ancestral environments may have been susceptible to food deprivation (Shostak, 1981). She also may become a target for aggressive men (Smuts, 1991). Thus, a long-term mate can provide protection for and sustenance to the woman, in addition to the parental investment he devotes to her offspring.

These reproductive resources all garnered by women through long-term matings can be summarized by three categories: (a) immediate material advantage to the woman and her children, (b) enhanced reproductive advantage for her children through acquired social and economic benefits, and (c) genetic reproductive advantage for her children if variations in the qualities that lead to resource acquisition are partly heritable. Women should seek long-term mates who can provide these reproductive benefits, and their mate preferences should embody solutions to these adaptive problems. Exclusive pursuit of short-term mating, while carrying some benefits, does not provide the benefits of long-term mating.

Figure 7 graphically depicts the hypothesized links between observable cues, judgments of a man's attractiveness as a long-term mate, and his ability to devote resources to a particular woman. Women are proposed to judge a man's attractiveness or mate value in part on the basis of her observations of his ambition, industriousness, status, lack of existing commitments, intelligence, material possessions, and apparent income (A). These observable cues, in turn, are known to be closely linked with a man's overall ability to devote resources to her (B), at least in North America (Willerman, 1979) and probably among contemporary tribal societies (Chagnon, 1983; Hart & Pilling, 1960; Shostak, 1981). Finally, judgments of a man's attractiveness as a long-term mate should be linked with his overall ability to provide resources.

Reproductive Costs of Long-Term Mating for Women

The opportunity costs to women of long-term mating are generally less severe than those incurred by men. Foreclosed mating opportunities typically do not restrict the number of children that a woman can bear as in the case of men. Nonetheless, there are benefits of short-term mating for women, benefits in immediate extraction of resources, for example, and these may be lost when pursuing a long-term mating strategy.

Problems Women Confront When Pursuing a Long-Term Mating Strategy

Problem of Male Parental Investment

Sexual Strategies Theory predicts that women will select men on the basis of the parental investment they are willing and able to provide mainly under particular conditions: (a) where resources can be accrued, defended, and monopolized;

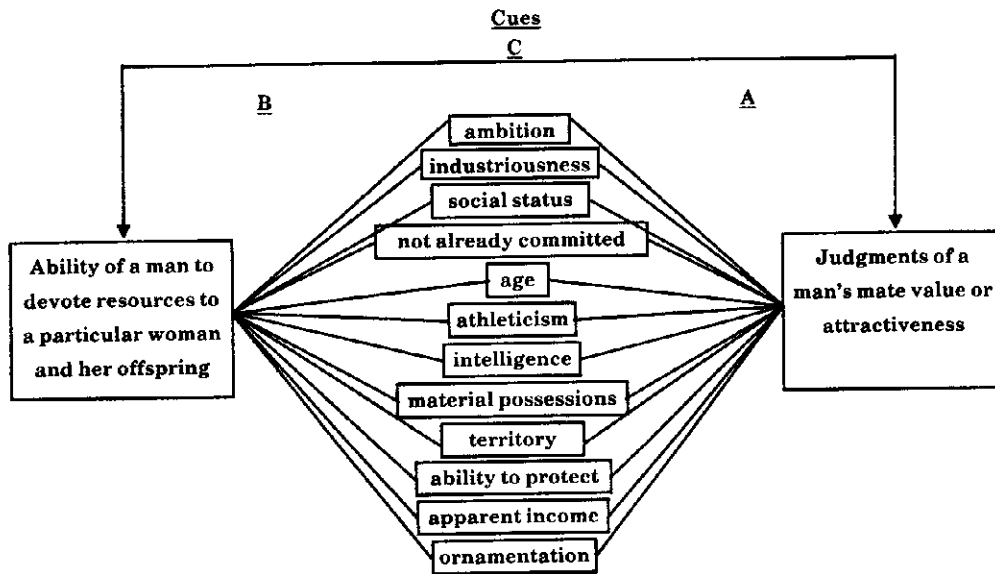


Figure 7. Lens diagram of hypothesized links between cues, judgment of a man's mate value, and ability to devote resources. (Cues down the center are the potentially observable characteristics. These are hypothesized to be correlated with judgments of a man's attractiveness as a mate because of their links with resource accrual potential. A = Hypothesized links between observable cues and a man's mate value, or attractiveness as a potential mate; B = hypothesized links between observable cues and a man's ability to devote resources to a particular woman and her offspring; C = hypothesized link between a man's mate value, or attractiveness as a potential mate, and his ability to devote resources to a particular woman and her offspring.)

(b) where men tend to control these resources; (c) where male variance in resource holdings and willingness to invest those resources is sufficiently high; (d) where some men are in fact willing to invest these resources in a woman and her children; and (e) where women have sufficient mate value to attract an investing mate.

Among humans, these conditions are often met. Territory, money, and goods, to name just three resources, are certainly accrued, defended, monopolized, and controlled by men worldwide. Men vary tremendously in the quantity of these resources they command: from poverty and destitution to the billionaires of the jet set. In addition and perhaps most important, men differ from each other in how willing they are to invest their time and resources in long-term mateships. The range is from copulation followed by desertion (minimum parental investment) to lifelong devotion and commitment. Women should have evolved preferences for mates who show an ability and willingness to invest resources in offspring.

Hypothesis 9: Women Seeking a Long-Term Mate Will Value the Ability of a Man to Provide Economic and Other Resources That Can Be Used to Invest in Her Offspring

Prediction 21: Women in long-term mating contexts, more than men, will desire cues to a potential mate's ability to acquire resources, including ambition, good earning capacity, professional degrees, and wealth. This prediction has been confirmed extensively across cultures (Buss, 1989b). A representative sample of findings from five countries located on five separate conti-

nents is shown in Figure 8. Women vary in how much they value good financial prospects in a long-term mate: more in the Zambian sample, for example, than in the Australian sample. Nonetheless, women more than men consistently value the economic resources of men in prospective long-term mates, regardless of how the question is worded. Similar results occur for *social status* and *ambition-industriousness*, two characteristics known to be linked with resource accrual (Buss, 1989b).

To further test this prediction, we conducted another study in which men ($N = 28$) and women ($N = 20$) rated how desirable the "average male" or "average female" would find each attribute in short-term and long-term mating contexts (see the method description under Prediction 16). We focused on future resource acquisition potential with characteristics such as *has a promising career, has good financial prospects, is likely to succeed in profession, is likely to earn a lot of money, and has a reliable future career*. The results are shown in Table 5. For each attribute indicating future resource potential, women found it more desirable in a long-term mate than in a short-term mate. Furthermore, t tests for sex differences showed that women valued each of these characteristics in a long-term mate more than men did. Combined, these studies support the hypothesis that women place a special premium on resource accrual capacities in a long-term mate.

Structural Powerlessness: An Alternative Hypothesis for Female Valuation of Male Resources

Buss (1989b) tested predictions on the basis of an alternative hypothesis, the structural powerlessness hypothesis. This hy-

Good Financial Prospect

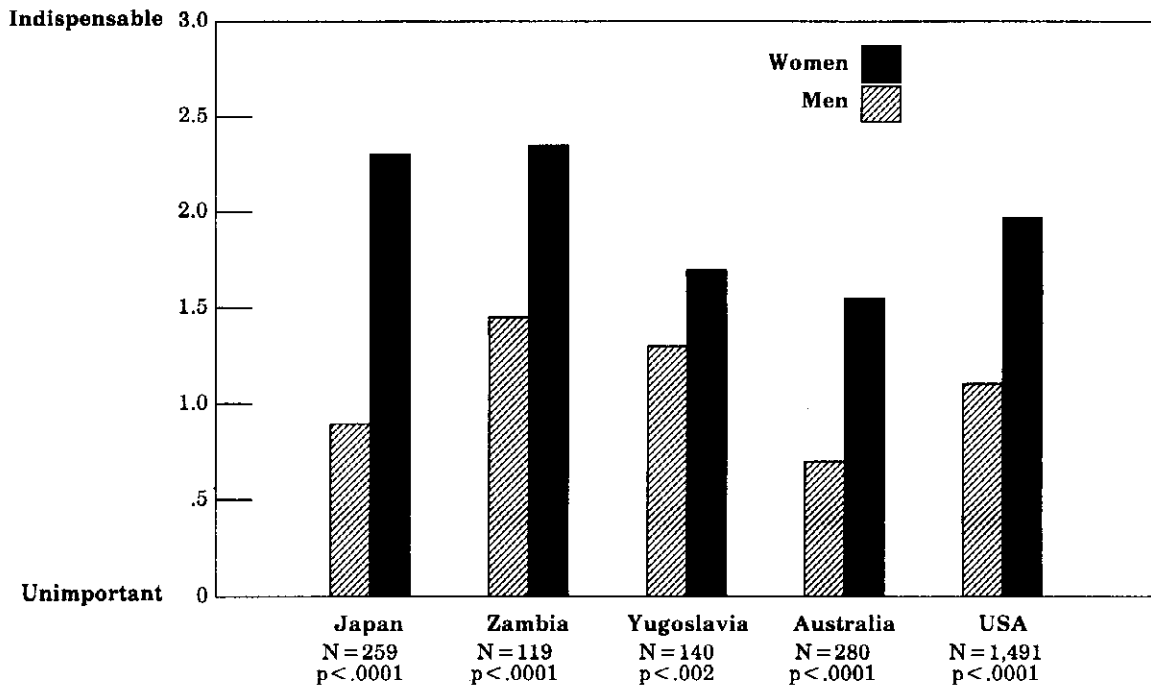


Figure 8. Good financial prospect. (Subjects rated this variable, in the context of 18 other variables, on how desirable it would be in a potential long-term mate or marriage partner using a 4-point scale, ranging from 0 [irrelevant or unimportant] to 3 [indispensable].)

pothesis, in brief, is that because men across all cultures have greater economic power than women, women value such resources in a mate because it is the only or major route through which they can gain access to such resources (Buss & Barnes, 1986). The structural powerlessness hypothesis assumes that men and women have exactly the same information-processing mechanisms governing mate choice but that their preferences differ because the same mechanisms are getting different informational input. It assumes that a person's mate preference mechanisms assess the level of economic resources available to that person and cause one to prefer mates with a lot of resources when one has few resources oneself. In contrast, Sexual Strategies Theory predicts that the evolved preference mechanisms are, in some cases, sexually dimorphic, and that as women and men get more resources they are in a better bargaining position and hence may expect even more from a prospective mate.

The structural powerlessness hypothesis, stripped of its evolutionary anchor, predicts that (a) in countries where the sexes are more equal in economic power, the preference differences between men and women on the key characteristics should be attenuated; (b) within cultures, those women who are financially successful should value such resources less than women who are less financially successful (i.e., successful women should show preferences more similar to those of men); (c) within cultures, men who are financially less successful should value such resources more than do men who are more finan-

cially successful (i.e., they should show preferences more similar to those of women).

All three predictions have been examined. Across cultures, there is no relationship between the economic parity of men and women and the magnitude of the sex differences on the resource variables (Buss, 1989b). In an independent investigation, Townsend (1989) found that occupationally successful women medical students showed the same preferences as other women for mates with financial resources. He concluded that "increasing socioeconomic status (SES) of women does not eliminate and may not even reduce traditional sex differences in mate selection criteria and marital goals" (p. 241). Buss (1989b) found that women with resources value them in mates more than women with less resources, contradicting the structural powerlessness hypothesis and that men who had fewer resources showed preferences indistinguishable from men with a lot of resources. Similar results have been found in two independent investigations by Weideman and Allgeier (1992). Although additional research is needed, available evidence provides no support for the structural powerlessness hypothesis as an alternative to the evolution-based hypothesis that is based on parental investment theory. Women's sexual psychology, and more specifically their mate preference mechanisms, apparently persevered even across the different contexts of personal access to resources, suggesting the existence of sexually dimorphic, rather than monomorphic, mate preferences.

Table 5
Long-Term Resource Potential: Women's Mate Preferences

Characteristic	Short term		Long term		<i>t</i> tests	γ^a
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
Has a promising career	1.20	1.20	2.30	0.80	-3.49*	0.78
Has good financial prospects	1.20	1.11	2.60	0.50	-5.09**	1.14
Likely to succeed in profession	1.10	0.97	2.60	0.50	-6.38**	1.42
Likely to earn a lot of money	0.90	0.97	2.10	0.85	-4.86**	1.09
Has a reliable future career	0.40	0.50	2.70	0.47	-15.66**	3.50
Unable to support you financially	-0.70	0.92	-1.30	1.38	3.27*	0.78
Financially poor	-0.64	0.87	-1.36	1.14	4.63**	0.70
Lacks ambition	-0.86	1.05	-2.36	0.81	9.14**	1.38
Uneducated	-1.25	1.06	-2.39	0.81	7.05**	1.06

^a The effect sizes (γ) are gammas (Howell, 1987). They signify the difference between means in standard deviation units. Cohen (1977) defines effect sizes as *small* if they are 0.20, *medium* if they are 0.50, and *large* if they are 0.80 or greater.

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

Prediction 22: In long-term contexts, women will find a man's inability to accrue resources particularly undesirable, including signs that a man is poor, lacks ambition, or is uneducated. To test this prediction, 42 women judged the relative desirability-undesirability of the characteristics of *financially poor*, *lacking in ambition*, and *uneducated* (see Table 5; see the description of the procedure under Prediction 5). Women judged all three characteristics to be especially undesirable in long-term mates but only mildly undesirable in short-term mates. Furthermore, women saw these attributes as significantly more undesirable than did men in both contexts. A second study in which women evaluated their perceptions of what the average woman would seek in a mate, the characteristic *unable to support you financially* was seen as especially undesirable in a long-term mate (see Table 5; see the description of the procedure under Prediction 16).

General Discussion

Men and women have faced different adaptive problems and different constraints on their reproductive success throughout human evolutionary history. For men, one major reproductive constraint has been the number of reproductively valuable or fertile women they can successfully inseminate. For women, one major reproductive constraint has been obtaining as mates men who showed an ability and willingness to invest resources in themselves and their offspring. These constraints follow from the adaptive logic of Sexual Strategies Theory. They can be separated conceptually into distinct mating problems that ancestral men and women had to solve. A central thesis of this article is that men and women have evolved to pursue both long-term and short-term mating strategies and that the problems they face differ when they pursue these temporally distinct strategies. Sexual Strategies Theory predicts that psychological mechanisms such as mate preferences have evolved in response to selection pressures generated by the adaptive prob-

lems confronted in these contexts. Empirical tests of the 22 predictions from nine hypotheses derived from Sexual Strategies Theory suggest that it has heuristic value in guiding research to important domains of inquiry in the study of mating strategies. Furthermore, the theory has the virtue of organizing under one temporally contextual framework a host of findings that would otherwise remain scattered, isolated, and inexplicable. This discussion summarizes the status of the theory and then draws out implications for viewing humans from a psychological strategic perspective.

Evolutionary Psychology of Men's Mating Strategies

The potential reproductive benefit of long-term mating for men is that it offers the possibility of monopolizing a woman's entire lifetime reproductive capacity. At least four mate selection problems must be solved to succeed in this long-term strategy: the problem of identifying which women are reproductively valuable, the problem of ensuring certainty in their paternity in children (a problem exacerbated in humans by concealed ovulation in women), the problem of identifying women likely to strongly commit to a long-term mateship, and the problem of identifying women with good parenting skills.

The reproductive logic of short-term mating strategies of men differs substantially from that of long-term mating strategies. Rather than monopolizing a woman's lifelong reproductive capacity, a short-term strategy entails inseminating a number of fertile women. To succeed in a short-term strategy, men must solve different mating problems: the problem of number, the problem of fertility, the problem of identifying which women are sexually accessible, and the problem of minimizing commitment.

A central thesis of this article is that mate preferences, representing one class of psychological mechanisms, have evolved in men to solve the distinct reproductive problems associated with these strategies. Because for men the problems differ substan-

tially according to the strategy pursued, their mate preferences were hypothesized to be highly contingent on the temporal context of matings of short-term versus long-term duration.

The preferences men express for long-term mates appear to solve the problems of reproductive value and paternity certainty. Men prefer as long-term mates women who are young and physically attractive as indicators of reproductive value (see Buss, 1989b) and who are sexually loyal and likely to be faithful as indicators of paternity certainty. Men in some cultures value chastity in a long-term mate, but this preference is highly variable across cultures, suggesting that if it is an evolved preference, it is one that is highly open to cultural input. One tentative conclusion from these data sets is that the paternity certainty problem is more typically solved by valuing cues to future behavior such as sexual loyalty, rather than cues to prior virginity per se. Furthermore, the psychological and physiological sex differences in the weighting given to events that activate jealousy (Buss et al., 1992) support the hypothesis that there are evolved mechanisms for solving the problem of paternity uncertainty after mate selection has occurred.

The mate preferences that men express for short-term mates differ sharply from those expressed for long-term mates. The problem of number of partners looms large for men when pursuing a short-term mating strategy: a strategy that we hypothesized to be a larger component of men's repertoire than of women's repertoire. In human evolutionary history, large and direct increments in a man's reproductive success through the number of offspring presumably accrued from obtaining sexual access to a larger number of partners. Women, in contrast, because they are sharply constrained in the number of offspring they can produce and because sperm are usually readily available, cannot increase the number of offspring (hence, their reproductive success) by increasing the sheer number of sexual partners. The evidence supports the hypothesis that men have evolved specific psychological mechanisms for solving the problem of number. These include being more oriented toward short-term mating, greatly relaxing the standards that a short-term mate must meet, requiring less time to elapse before seeking sexual intercourse, and desiring a large number of sexual partners.

A second problem that faces men who pursue short-term sexual strategies is identifying women who are sexually accessible without a prolonged courtship. This problem appears to be solved by the preferences that men express for short-term partners who are sexually experienced: an attribute that men do not find particularly desirable in a long-term mate. Disliked in short-term mates by men are those who have a low sex drive, are sexually inexperienced, and who are prudish: qualities that likely signal lack of sexual accessibility in the short term. Promiscuity, sexual experience, high sex drive, and lack of prudishness probably provide strong cues to a woman's relative level of sexual accessibility for short-term mating.

Sexual Strategies Theory suggests that the more resources and commitment a man must devote to a given mate, the fewer mates he can have. Men pursuing a short-term strategy are predicted to avoid women who seek a commitment or who consume large shares of their resources. The preferences that men express for short-term mates appear to reflect these concerns. Men express a strong dislike for potential short-term partners

who want a commitment. Also disliked are short-term mates who are prone to spend a lot of their money.

In summary, the psychological preferences of men for mates differ sharply according to temporal context. Three general conclusions can be reached from these data: (a) short-term mating represents a larger proportion of men's mating effort than of most women's mating effort, (b) men have evolved distinct preferences that solve in part the reproductive problems associated with gaining sexual access to a number of short-term partners, and (c) men have evolved distinct preferences that solve the long-term reproductive problems associated with monopolizing a particular woman's lifetime reproductive capacity. The temporal context of mating heavily affects the mate preferences expressed by men and hence the sexual strategies they adopt.

Evolutionary Psychology of Women's Mating Strategies

Temporal context was also hypothesized to affect the mate preferences expressed by women. In principle, there are adaptive benefits that could accrue to women who pursue long-term as well as short-term mating strategies. Therefore, although short-term mating is expected to represent a smaller proportion of women's than of men's mating effort, women were hypothesized to have both strategies in their mating repertoire.

The primary benefit that can accrue to women who pursue long-term matings is gaining continuous access to a man's resources and parental investment. This benefit can be separated into two distinct mating problems: identifying men who are able to invest resources and identifying men who are willing to invest resources in her and her children. Women should value observable cues, such as ambition, industry, income, status, and generosity that are correlated with a man's ability and willingness to invest as shown in Figure 7. The data strongly support predictions from the first two hypotheses. Women in long-term contexts do place great value on a man's ambition, earning capacity, and professional degrees. Furthermore, women dislike prospective long-term mates who are poor, who lack ambition, and who are uneducated.

Women seeking short-term mates cannot generally gain continuous access to a mate's resources. In principle, however, there are several distinct benefits that could have accrued to ancestral women who pursued a short-term mating strategy: immediate extraction of resources, using short-term matings as an assessment device to evaluate long-term prospects, securing protection from abuse by nonmated males, and possibly better genes. Do women's short-term mate preferences reflect solutions to these problems? The data support several of these hypotheses about benefits of women's short-term mating. Women seeking short-term mates rather than long-term mates were judged by other women to desire men who spend a lot of money on them early on and give them gifts early on. Especially disliked in a short-term mate by women is the attribute of being stingy early on. These results support the hypothesis that women use short-term mating in part as a strategy for an immediate extraction of resources. Furthermore, although women value physical strength in both temporal contexts, they value it significantly more in short-term than in long-term contexts.

Is there any evidence that women, more than men, use short-term matings to evaluate long-term prospects? The evidence is

indirect on this hypothesis. First, there is a significantly stronger correlation between women's short-term and long-term preferences ($r = .81$) than is the case for men ($r = .63$). Second, women see *promiscuity* and *already in a relationship* as highly undesirable qualities in a short-term mate. Men, in contrast, are not particularly bothered by these qualities in a short-term mate. Men, in contrast, are not particularly bothered by these qualities in short-term mates. If women did not see short-term mates as long-term prospects, why would they be so bothered by the fact that a man is already in a relationship? These somewhat circumstantial data must be regarded as tentative, pending more direct research on the assessment functions of short-term mating for both sexes.

These potential short-term benefits to women clearly do not exhaust the possibilities. Recent evidence on sperm competition in humans suggests that women may have physiological mechanisms that preferentially favor sperm from extra-pair men over sperm from the regular long-term mates (Baker & Bellis, in press). Recent explorations of female sexuality by female researchers (e.g., Small, 1992; N. Thornhill, 1992) suggest additional potential benefits to women of short-term mating. Future research could explore the hypotheses that women can gain the following potential benefits from short-term mating: (a) getting rid of an unwanted mate, (b) mate switching, (c) clarifying one's mate preferences, (d) deterring a long-term mate from further sexual infidelities, (e) increasing the commitment of a long-term mate, and (f) gaining access to social circles that are otherwise inaccessible.

The evidence also shows clearly that women are far less oriented toward short-term mating than are men. They maintain more exacting standards for potential mates, impose more stringent age criteria, require a longer period of time to elapse before consenting to sexual intercourse, and desire a smaller number of future mating partners. In general, we can conclude that women in these studies are less inclined to short-term mating than are men, but their short-term mate preferences nonetheless correspond to the hypothesized adaptive benefits that could accrue from short-term mating.

Links Between Preferences and Actual Mating Behavior

Psychological preferences could not have evolved unless they have consequences for actual behavior. Taste preferences for sugary and fatty foods, for example, could not have evolved unless they actually caused people to consume foods containing these substances, and those who did survived and reproduced in greater numbers than those lacking the preferences. Thus, an important source of empirical evidence for Sexual Strategies Theory comes from studies of actual mating behavior.

Before examining this source of evidence, it is important to outline the conceptual relations that are expected between preferences and mating behavior. Preferences are clearly only one cause of mating behavior, and, on conceptual grounds, a one-to-one correspondence between preferences and behavior is not expected. First, people cannot always get what they want. Preferences may not be able to be actualized because the relevant mates possessing all the desired qualities are not available or because one's own mate value may not be sufficiently high to

attract such mates. Second, parents and other kin often exert an influence over mating decisions, even in contemporary western societies, although this is likely to be more true where there are arranged marriages such as in India. Third, members of one's own sex often compete for the same mates, thus creating a bottleneck that precludes everyone's preferences from being realized. Finally, members of the opposite sex exert preferences, and these constrain actual mating behavior. If men desire to mate after only a brief time interval has elapsed, for example, and women require more time and investment before consenting, then this constrains the degree to which men and women can translate their preferences into mating behavior.

With these conceptual issues in mind, let us turn to six sources of empirical data bearing on actual mating behavior. First, it has been documented that men in fact marry women who are younger than they are, on average, in every country worldwide for which data exists (Buss, 1989b). Brides are 3 years younger than grooms on average worldwide, and this age disparity increases with divorce and remarriage. Men marry women 5 years younger on second marriage and 8 years younger on third marriage, at least within the United States (Secord, 1983). Men's preferences for younger women seem to be translated into actual marriages to younger women (see also Kenrick & Keefe, 1992).

A second source of behavioral data comes from large-scale sociological studies of marriage decisions. Three independent investigations have found evidence that a powerful predictor of the occupational status of the man that a woman marries is her physical attractiveness (Elder, 1969; Taylor & Glenn, 1976; Udry & Eckland, 1984). Indeed, a woman's attractiveness seems to be a stronger predictor of actual marriage decisions than the variables of the woman's education, her socioeconomic status, or her IQ. These data support the hypothesis that women possessing qualities that are valuable to men are in a position to actualize their mate preferences. Conversely, men possessing attributes that are valuable to women are better able to actualize their mate preferences.

A third source of behavioral data comes from studies that show men's far greater proclivity to seek short-term sexual encounters. R. D. Clark and Hatfield (1989), for example, demonstrated that 75% of the men did consent to having sex with an unknown woman who approached them on campus; in contrast, not a single woman consented to having sex with an unknown man who approached them in the same manner. This study was replicated 4 years later with nearly identical results (R. D. Clark & Hatfield, 1989). Men seem more prone to short-term sexual encounters in preferences, in fantasy, and in actual behavior (Ellis & Symons, 1990).

The fourth source of behavioral data comes from studies of conflict between the sexes. Buss (1989a), for example, predicted from Sexual Strategies Theory that the sources of conflict would be predictable from interference with the respective sexual strategies preferred by each sex. Thus, women were found to complain more about men's sexual aggressiveness and to become more upset when men were sexually aggressive (e.g., men trying to force sex acts on women). Men, in contrast, were found to complain more about women being sexually withholding and were more likely to become upset by sexual withholding than were women. Conflict between the sexes seems to

be caused in part by one sex enacting a sexual strategy that interferes with the preferred strategy of the other sex.

A fifth source of behavioral data comes from studies on the causes of conjugal dissolution. In the most extensive cross-cultural study yet conducted on divorce, Betzig (1989) found that the causes were predictable and highly sex linked. The most frequently cited cause of divorce worldwide was sexual infidelity, and infidelity by the wife was far more likely to lead to divorce than vice versa. Other sex-linked causes of divorce across cultures included the failure of a man to provide resources to the woman and their children, old age (and hence low reproductive value) on the part of the woman, infertility on the part of the woman, and sexual refusal by the woman (Betzig, 1989). Thus, the causes of divorce all appear to be caused by a failure to provide the sex-linked reproductive resources that are central to male and female mate preferences.

The sixth source of behavioral data comes from studies of the tactics that men and women use in intrasexual mate competition. This represents a more subtle set of predictions from Sexual Strategies Theory: The behavioral tactics used by one sex should be designed to embody or fulfill the mate preferences expressed by the other sex. In a series of six studies, Buss (1988a, 1988b) confirmed this link between the preferences of one sex and the tactics of intrasexual competition used by the other sex. Men were more likely to display resources as a tactic of intrasexual competition, whereas women were more likely to enhance their appearance. Analogous behavioral findings have been discovered in the domains of intersexual and intrasexual deception (Tooke & Camire, 1991).

In summary, all six sources of actual mating behavior confirm basic tenets of Sexual Strategies Theory. Marriage decisions, events leading to actual divorce, behavioral sources of conflict between the sexes, thresholds for seeking or consenting to sexual intercourse, and tactics of intrasexual competition are all predictable from the adaptive problems that each sex confronts in the contexts of short-term and long-term mating strategies. Although more research on mating behavior must be conducted to test additional predictions, the available behavioral evidence suggests that mate preferences are translated to some extent into actual mating behavior.

Unresolved Issues: Mating Problems Faced by Both Sexes and Individual Differences Within Sex

Sexual Strategies Theory provides a precise set of predictions about when men and women will differ in their mating psychology and when they will be the same. It predicts that the sexes will differ only in those circumscribed domains where they have faced recurrently different adaptive problems over the course of human evolutionary history. It predicts that the sexes will be the same in all domains where they have faced the same adaptive problems. In this article, we have focused heavily on the differences because it is in these areas where the predictions are often the clearest and most easily subjected to empirical tests. However, it is important to note that there are several domains where the sexes are predicted to be more or less the same in their sexual strategies: (a) the problem of identifying a good reciprocal ally, (b) the problem of commitment, and (c) the problem of identifying mates with good parenting skills. We

address these three crucial, and largely unexplored, domains in turn.

Problem of identifying a good reciprocal ally. Long-term mating relationships pose special problems from a reproductive vantage point in that they require the intense and repeated cooperation of two individuals who are genetically unrelated and who may have many competing demands that conflict with the interests of one or another of the parties. Indeed, the reproductive interests of a genetically unrelated man and woman coincide only under conditions where they have mutually produced offspring; where neither will mate with anyone else (i.e., lifetime monogamy); and where there are no genetic relatives, including children from former mates, to whom resources could be differentially diverted (Alexander, 1987; Buss, 1989a).

One crucial problem that both sexes face, therefore, is identifying a potential mate who will be a good cooperater and a good ally (and whose kin will be good cooperaters and allies) so that the confluence of interests can be maximized. At the current state of knowledge, we do not know precisely what these cues are. One speculation is that the tremendous value that both sexes place on *kind and understanding* in potential mates across cultures is a possible solution to the problem of identifying a good cooperater (Buss, 1989c). The tendency of both sexes to seek mates who are similar may represent another solution to the problem of strategic confluence (Buss, 1989c). More research is needed, however, to discover empirically what cues men and women use to solve this problem linked exclusively with long-term mating.

Problem of commitment. In selecting a long-term mate, men and women both face the problem of commitment: the problem of evaluating whether their mate will deliver consistently and over a long time period the relevant reproductive resources. Although the resources lost through commitment failures are different for men and women, they may be as reproductively severe. A woman who mates with a man who is likely to desert, defect, or redirect his mating effort risks the loss of his tangible resources as well as direct parental investment in her children. Although women do not experience lowered maternity probability if their mate is unfaithful, they do risk the diversion of his parental effort away from their children.

Men who choose women who are likely to defect risk the loss of their reproductive value and parental effort. Such women are more likely to conceive by another man and devote parental effort toward another man's children. For both sexes, the tremendous costs of prolonged courtship suggest that there is likely to have been commensurate reproductive benefit. This benefit cannot typically be reaped without commitment. Both men and women should value signs of commitment when they pursue a long-term mating strategy.

One important domain of future research, therefore, is the study of cues to commitment and the degree to which they are valued in long-term as contrasted with short-term mates. Using the current data sets, we found that both sexes judged the mate attribute *wants a commitment* to be considerably more desirable in a long-term mate than in a short-term mate. However, this finding is almost definitional and begs the question of what cues reliably forecast commitment. One possibility is provided by Johnson and Rusbult (1989), who found that people started to derogate alternative potential mates as they became

more deeply committed to one mate. Thus, signs that a person is derogating other potential mates might be one cue to commitment. There are undoubtedly many more such cues, however, and future research could profitably turn to them directly (see Rusult, 1983; Shaver, Hazan, & Bradshaw, 1988; Sternberg, 1988; Sternberg & Barnes, 1988).

Problem of good parenting skills. A third adaptive problem that both sexes face when pursuing a long-term mating strategy is selecting a partner who will exhibit good parenting skills. Presumably either sex would benefit by selecting a mate who parented mutually produced children in a skillful manner. Unfortunately, it is unclear conceptually how to identify the criteria by which good parenting skills could be evaluated. Some candidate criteria include intelligence, kindness, and nurturance. Barkow (1989), for example, hypothesizes that intelligence is key to good parenting skills: providing good judgment in protecting children in times of danger, good socialization practices to prepare the child for the adult world he or she will enter, and perhaps wisdom to forecast environmental changes and trends that might be impending. Furthermore, Simpson and Gangestad (1992) found through a factor analysis of mate preferences a factor they labeled *personal/parenting qualities*, which included the attributes of *responsibility, kind and understanding, and stability of personality*. These results may be used to guide future research that examines skillful parenting and cues that indicate it directly.

Individual Differences in Mating Strategies Within Each Sex

Sexual Strategies Theory, as developed in this article, has focused primarily on the sex-typical adaptive problems that men and women have confronted over evolutionary history when pursuing short-term and long-term strategies. It is clear, however, that individuals vary within each sex in their mating strategies (see Buss, 1991). Snyder, Simpson, and Gangestad (1986), for example, have shown that individuals vary within each sex in what they call *sociosexual orientation*, which refers to the degree to which individuals prefer long-lasting mateships versus brief sexual encounters: a dimension that bears a close resemblance to our temporal contextual dimension of short-term versus long-term mating. These individual differences show interesting links to personality variables such as extraversion and self-monitoring and have implications for a host of attitudinal and sexual variables (e.g., Gangestad & Simpson, 1990; Snyder et al., 1986).

Simpson and Gangestad (1992) offered evidence for a coherent constellation of characteristics that covary with sociosexual orientation. They find, for example, that those with a restricted sociosexual orientation (long term, in the language of Sexual Strategies Theory) tend to prefer mates who are kinder, more affectionate, more responsible, and more loyal. Those with an unrestricted sociosexual orientation (short term) tend to seek mates who are more physically and sexually attractive. Simpson and Gangestad offered compelling evolutionary arguments that these alternative strategies could either be maintained by frequency-dependent selection or could be the result of ecologically contingent shifts in mating strategies.

The intriguing theoretical issue, from the vantage point of

Sexual Strategies Theory, is why do some individuals favor one component of their sex-typical array of sexual strategies over another and under what conditions do they do so? One theoretical speculation centers on the mate value of the individual. Individuals of high mate value should be more able to carry out their sex-typical preferred strategy, whereas those whose mate value is low may be forced to settle for a less preferred strategy: "Those males most sought after for their adaptive attributes could have afforded to invest less in any one female's offspring. Hence, males should have been selected to invest less exclusively when they possessed adaptive attributes or resources" (Simpson & Gangestad, 1992, p. 45). In historical and cross-cultural perspective, there is some evidence for this proposition for men. Men of high status and wealth have often acquired numerous mates, whether in the form of multiple wives, concubines, mistresses, or brief sexual encounters (e.g., Betzig, 1986; Chagnon, 1983; Hart & Pilling, 1960). Thus, men whose attributes closely embody female mate preferences may more frequently carry out short-term sexual strategies, in addition to whatever long-term strategies they carry out. Alternatively, some men may simply have the power to impose their preferences on others.

Another predictor of individual differences in sexual strategy might be age, especially if short-term mating is used as a means for assessing one's mate value and for evaluating potential mates. Short-term sexual strategies might be more frequently adopted by young people to perform these assessment functions. With increasing age, the information value gleaned from short-term mating may reach diminishing returns. Thus, individuals may shift from a short-term to a long-term mating strategy with increasing age.

A third speculation about situational causes of within-sex variation centers on sudden changes in life circumstances. There is considerable evidence that serial marriage is a common mating pattern among humans across nearly all cultures (e.g., H. Fisher, 1987). Thus, a divorce may produce a period of time in which the assessment (or reassessment) functions of short-term mating again become necessary. Pursuing a short-term strategy, therefore, might be predicted to occur in between bouts of long-term mating. Another shift that could prompt the pursuit of a short-term sexual strategy would be a sudden increase in status or wealth. Any change that renders assessment functions more important would be expected to trigger the pursuit of short-term mating, at least for a period of time.

Other contextual predictors of temporal shifts in mating strategy include operational sex ratio (Petersen, 1991), cultural factors such as food sharing, anticipated future mate value, legal and social sanctions, and the strategies pursued by others (Buss, in press). These potential predictors of individual differences in sexual strategy remain important avenues for further development of Sexual Strategies Theory.

Conclusions and Implications

Evidence of adaptation is most clearly seen in complex design: Do the design features of a mechanism function to solve special reproductive problems in particular ways that are unlikely to have arisen by chance alone (Williams, 1966)? The evidence from these empirical studies supports the general hy-

pothesis that mate preferences, as one class of psychological mechanisms, differ in predictable ways according to temporal context and according to biological sex in ways that are unlikely to have arisen by chance alone. These preferences, manifesting themselves uniquely in each of the four context-by-sex quadrants, seem tailored to solving particular adaptive problems that are faced by men and women in short- and long-term contexts: problems predicted by Sexual Strategies Theory.

One misunderstanding of evolutionary predictions in psychology is that postulated adaptations are presumed to be highly intractable, impervious to environmental context. Early sociobiologists may have fostered this misunderstanding by writing as if adaptations were intractable. We have shown precisely the opposite, that it is the context that powerfully determines the nature of the mate preferences observed. However, rather than invoking general, and hence imprecise and typically ill-specified contexts such as culture or socialization, we have identified a specific and theoretically driven contextual variable: Mate preferences, far from being impervious to varying conditions, are highly sensitive to temporal contextual conditions.

The temporal contextual variable, important as it appears to be, is clearly just the start of an examination of important conditions on which mate preferences depend. One excellent candidate for future research involves assessment of one's own mate value. Previous research has shown that men with low self-esteem are reluctant to approach women who are physically attractive (Berscheid & Walster, 1974). Tooby and Cosmides (1990) speculate that "a man's self-esteem may be, in part, a function of his desirability in the marriage market" (p. 53). Another study of personals ads found that men with abundant resources more often advertised for physically attractive women, and women mentioning their physical attractiveness more often advertised for men with resources (see Kenrick & Keefe, 1992). If self-esteem, resources, and attractiveness are reflections of mate value, then expressed mate preferences may be calibrated up or down depending on one's mate value (Buss, 1988a). Other important contextual variables probably include age, one's network of family and alliances, the sex ratio in the available mating pool, the degree to which parents and other kin influence the mating decisions, and individual successes or failures in the pursuit of each strategy.

The empirical studies presented here represent just the start of the study of the effects of context on psychological mate preferences. At the current stage, this theory is limited in several important respects: It does not identify all of the conditions affecting when men and women will pursue short-term versus long-term sexual strategies, it does not currently account for individual differences within sex, and it has not accrued empirical support for predictions about the adaptive problems confronted by both sexes such as identifying cues to commitment and cues to good parenting skills. Even with these current limitations, however, Sexual Strategies Theory generates more detailed, more precise, and more numerous predictions than any previous theory of human mating about the adaptive problems that men and women have confronted in different mating contexts. Combined with the supporting empirical tests, we now have the outlines of the sexual strategies that men and women

have evolved as solutions to these mating problems and a theoretical understanding of why they have done so.

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