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Women's sexual strategies: the hidden dimension of extra-pair mating

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Abstract

Most evolutionary theories of human mating have focused on the adaptive benefits of short-term mating for men. Men cannot pursue a strategy of short-term mating, however, without willing women. Existing empirical evidence suggests that some women engage in short-term mating some of the time and probably have done so recurrently over human evolutionary history. The current studies tested hypotheses about the potential benefits women might derive from engaging in one type of short-term mating — extra-pair liaisons — and the contexts in which they do so. These include resource hypotheses (e.g. immediate resource accrual), genetic hypotheses (e.g. having genetically diverse offspring), mate switching hypotheses (e.g. acquiring a better mate), mate skill acquisition hypotheses (e.g. mate preference clarification) and mate manipulation hypotheses (e.g. deterring a partner's future infidelity). These hypotheses were tested by examining the perceived likelihood that women would receive particular benefits through a short-term extra-pair mating (Study 1); the perceived magnitude of benefits if received (Study 2); the contexts in which women engage in short-term extra-pair mating (Study 3); and individual differences among women in proclivity to pursue short-term matings in their perceptions of benefits (Study 4). Most strongly supported across all four studies were the mate switching and resource acquisition hypotheses. Discussion focuses on the distinction between functions and beneficial effects of short-term mating, limitations of the current studies and the consequences of women's short-term mating strategies for the broader matrix of human mating.

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1. Introduction

> The biological irony of the double standard is that males could not have been selected for promiscuity if historically females had always denied them opportunity for expression of the trait. —Smith (1984)

Women bear the burdens (and pleasures) of a far greater minimum obligatory parental investment than men to produce a child — nine months of internal gestation compared with one act of sexual intercourse. Evolutionary theories of human mating, as a consequence, have emphasized the tremendous reproductive benefits to men of short-term mating (see, e.g. Buss & Schmitt, 1993; Kenrick, Sadalla, Groth, & Trost, 1990; Symons, 1979; Trivers, 1972). Over human evolutionary history, the reproductive benefits of short-term sexual strategies for men presumably would have been large and direct in the form of additional offspring. A married man with two children, for example, could increase his reproductive success by a full 50% by producing one child through a casual sexual encounter (Symons, 1979). A married woman, in contrast, could not increase her ***direct*** reproductive output by sexual liaisons with dozens of men unless her husband proved to be infertile, impotent, or uninterested in sex.

Over evolutionary time, the differential reproductive payoffs of pursuing short-term mating have been hypothesized to affect the underlying nature of men's and women's evolved sexual psychology. Although both sexes have short-term and long-term mating strategies (Buss & Schmitt, 1993), men have been predicted to have evolved a greater desire for sexual variety, pursuing short-term mating in contexts where the costs and risks are low and, more generally, in contexts where the benefits outweigh the costs (Buss & Schmitt, 1993; Kenrick et al., 1990; Symons, 1979).

Much empirical data supports the hypothesized sex difference in desire for short-term mating. Compared with women, men express a desire for more than four times as many sex partners in the course of their lifetimes (Buss & Schmitt, 1993), have more than twice as many sexual fantasies (Ellis & Symons, 1990), more often engage in partner-switching during a single fantasy episode (Ellis & Symons, 1990), lower their standards for acceptable short-term mates (Kenrick et al., 1990), let less time elapse before seeking sexual intercourse (Buss & Schmitt, 1993), spend more time and energy trying to initiate sex (Greer & Buss, 1994) and are far more willing to consent to sex with an attractive stranger (Clark & Hatfield, 1989). The empirical data, in short, strongly support the predicted sex difference in desire for sexual variety, both within American culture and across cultures (Buss, 1994; Frayser, 1985; Symons, 1979).

Perhaps because of the elegance of parental investment theory and the large empirical data base supporting it, many theorists have overlooked a fundamental fact about short-term mating — mathematically, the average number of sexual partners for men and women who engage in short-term mating must be identical (assuming an equal sex ratio). Every time a man has sex with a woman for the first time, the woman is also having sex with a new partner.

Furthermore, if ancestral women had never engaged in short-term mating, men could not have evolved the powerful desire for sexual variety (Smith, 1984). That desire, if mating were consensual rather than forced, *required* the existence of some willing women some of the time. An important fact has been missing or downplayed in theoretical accounts of human sexual strategies. Women's non-monogamous mating is the hidden side of women's sexuality.

2. Clues to a history of non-monogamous mating

There are both physiological and behavioral clues that point to the possibility that over human evolutionary history women departed from a singular strategy of long-term mating. The first is physiological evidence of a history of sperm competition (Smith, 1984). Sperm competition can occur whenever the sperm from two males simultaneously occupy the reproductive tract of one female. Since human sperm can remain viable within a woman's reproductive tract for up to seven days, a woman who had sex with two men in the course of one week could set the stage for sperm competition (Baker & Bellis, 1994; Smith, 1984).

Across primate species, testes size is strongly correlated with the nature of the mating system. The greater the sperm competition via promiscuous or polyandrous mating, the larger the testes size relative to body size (Smith, 1984). Male gorillas, for example, have relatively small testes (0.031% of their body weight) and female gorillas are highly monogamous. Chimpanzees, in contrast, have relatively large testes (0.30% of their body weight) and are highly promiscuous. Human testes size are roughly 0.079% of body weight, suggesting that ancestral humans were unlike the promiscuous chimpanzees, but not invariably monogamous (Smith, 1984).

Recent studies on human sperm competition provide additional physiological clues. Baker and Bellis (1994) found that the more time spent apart, the more sperm the husbands inseminated in their wives when they finally had sex — presumably because the separation would have given the woman an opportunity for an extramarital sexual liaison. When couples spend 100% of their time together, men inseminate only 389 million sperm per ejaculate. But when couples spend only 5% of their time together, men inseminate 712 million sperm per ejaculate. This increase in sperm insemination increases the odds of crowding out and displacing a competing man's sperm, which is precisely what would be expected if humans had an ancestral history of some casual sex and marital infidelity.

The number of sperm a woman retains is also linked with whether she is having an affair. In one study of 3679 women in Great Britain, women who were having affairs apparently timed their extramarital liaisons to coincide with ovulation (Baker & Bellis, 1994). Furthermore, such women had orgasms more often with their affair partner than with their regular husband. Women appear to retain more sperm within their reproductive tract when they have an orgasm than when they do not. These findings provide additional circumstantial evidence that points to an ancestral past in which women may have mated with more than one man within the space of a week.

At the psychological and behavioral levels, there are also clues to an ancestral history of female infidelity. Perhaps the most powerful evidence comes from research on male sexual jealousy (Daly, Wilson, & Weghorst, 1982; Symons, 1979; Buss, Larsen, Westen, & Semmelroth, 1992). Male sexual jealousy is a powerful emotion that gets triggered when men suspect or observe a sexual infidelity. It is a destructive emotion in the sense of being a leading cause of wife battering and homicide (Daly & Wilson, 1988).

One key to understanding men's sexual jealousy is to consider parental certainty. Because fertilization occurs internally within women, women are 100% certain that they are the parent of their children. Men, however, can never be entirely sure. For this reason, evolutionary psychologists have predicted that men's jealousy should be triggered maximally by cues to

sexual infidelity (since in ancestral times, that would have been the most reproductively damaging act), whereas women's jealousy should be more triggered by cues signaling the loss of investment or commitment from their regular mate (Daly et al., 1982; Symons, 1979). These sex differences have been confirmed using both physiological and psychological dependent measures (Buss et al., 1992; Wiederman & Allgeier, 1993) and they occur even in cultures with sexually liberal and egalitarian attitudes, such as The Netherlands (Buunk, Angleitner, Oubaid, & Buss, 1996), as well as non-western cultures such as Korea and Japan (Buss et al., 1999).

If ancestral women had always remained monogamous, why would males have evolved such a powerful psychology of jealousy? And why would men's jealousy be so intensely focused on the sexual infidelity of their regular partners? Since evolved mechanisms carry costs, they are unlikely to evolve unless there are adaptive benefits that they confer on the organisms bearing them. Men's sexual jealousy, according to this line of reasoning, must have evolved in response to something — some adaptive problem imposed by women.

The behavioral evidence also suggests that women in all but the most restrictive societies sometimes engage in extramarital sexual unions. In America, studies yield an affair rate ranging from 20 to 50% for married women (Athanasiou, Shaver, & Tavris, 1970; Buss, 1994; Hunt, 1974; Glass & Wright, 1992). Affairs by mated women have also been well-documented, despite the cloak of secrecy that surrounds them, in dozens of tribal societies including the Ache of Paraguay (Hill & Hurtado, 1996), the Yanomamo of Venezuela (Chagnon, 1983), the Tiwi of Australia (Hart & Pilling, 1960), the !Kung of Botswana (Shostak, 1981) and the Mehinaku of Amazonia (Gregor, 1985). Modern cultural and tribal behavioral evidence, in short, does not suggest that women invariably pursue a monogamous long-term mating strategy.

In summary, a number of clues point to an ancestral past in which some women sometimes departed from monogamous mating. Physiological clues come from testes size in primates and from recent evidence on sperm insemination and sperm retention. Behavioral evidence comes from the existence of affairs in every known tribal society for which relevant data exist. And psychological clues come from the existence of a powerful male desire for sexual variety and a powerful psychology of sexual jealousy. These male psychological mechanisms could not have evolved in a vacuum. According to this line of reasoning, they must have evolved in response to adaptive problems and adaptive opportunities, imposed and provided by women's sexual strategies.

3. Hypothesized benefits to women of extra-pair mating

The *costs* of short-term extra-pair mating for women seem obvious. Short-term mating, for example, may increase a woman's risk of contracting a sexually transmitted disease, lower her perceived desirability as a long-term mate, damage her reputation, put her at risk of battering at the hands of a jealous mate, or put her at risk of losing the resources of her primary mate (Buss, 1994; Daly & Wilson, 1988; Smith, 1984). Perhaps because of these salient costs, the potential adaptive benefits to women of short-term mating have been obscured.

One of the first to spot this gap was the primatologist Sarah Hrdy, who noted that "the [evolutionary] literature stresses the travails of males — their quest for different females, the burdens of intrasexual competition…No doubt this perspective has led to insights concerning

male sexuality. But it has also effectively blocked progress toward understanding female sexuality — defined here as the readiness of a female to engage in sexual activity" (Hrdy, 1981). Hrdy proposed what has become known as the *Paternity Confusion Hypothesis*, the hypothesis that a female who engaged in sex with several males would obscure the actual paternity; hence, a female might be able to elicit aid from a variety of males, each of whom might offer resources or protection to the offspring given that there would be some chance of their paternity. The sum of the resources from a variety of males, Hrdy proposes, might be larger than the sum that any single male might provide. This hypothesis may encounter conceptual difficulties however, such as the likelihood that men would be expected to evolve mechanisms to reduce their provisioning and protection in proportion to their reduction in paternity probability (Symons, 1982).

Symons (1979) proposed several other potential benefits. He suggested that women might benefit in the following ways by sexual intercourse with men other than their husbands: by exchanging sex for meat, goods, or services (Resource Accrual Hypothesis); by becoming impregnated by a man with better genes than her regular husband (Better Genes Hypothesis); or by using the sexual intercourse to get rid of a husband (Mate Expulsion Hypothesis) or by acquiring a better one (Mate Switching Hypothesis)(see also Fisher, 1992). Additionally, Symons (1979) noted the possibility of a short-term affair by a woman as a revenge for her husband's affair, presumably functioning as a deterrent to his future affairs (Revenge Hypothesis).

Smith (1984) articulated three additional potential benefits. First, the Sexy Son Hypothesis — the hypothesis that a woman, by mating with an especially attractive man, might bear sons who were themselves especially attractive to women in the next generation and hence increase her production of grandchildren (see also Fisher, 1958, who pioneered the more general form of the sexy son hypothesis). The Genetic Diversity Hypothesis states that a woman who mated with multiple men would bear children who were more genetically diverse, which could act as a hedge against environmental change. The Fertility Backup Hypothesis states that a woman could benefit from an extra-pair mating if her husband were infertile, had reduced fertility, or where the couple had gametic incompatibility (Smith, 1984).

Another potential benefit noted by Smith (1984) is the Protection Hypothesis (see also Smuts, 1985). Men typically provide protection to their mates and children, including defense against predation by non-humans and defense against exploitation by other humans. Because a primary mate cannot always be around to defend and protect, a woman might gain added protection by consorting with another man. Finally, Smith (1984) offered the Status Enhancement Hypothesis, whereby a woman might, in principle, elevate her social status among her peers or gain access to a higher social stratum by a temporary liaison with a high-status man.

Several additional benefits have been proposed for women's short-term mating. Geoffrey Miller (personal communication, 1991) suggested that women might increase their skills of attraction and seduction through short-term mating (Honing Mating Skills Hypothesis). Miller (personal communication, 1991) and Thornhill (1992) also proposed that women might use short-term mating to elevate their self-esteem, thus enabling them to make better mating decisions (Self-Esteem Hypothesis).

Buss and Schmitt (1993) proposed that women might use short-term mating as an assessment device to evaluate potential long-term mating partners (Mate Assessment Hypothesis). Greiling (1993) proposed several other potential benefits. Women may use short-

term mating to clarify their long-term mate preferences (Preference Clarification Hypothesis), on the assumption that experience with short-term mates enables a woman to better identify desirable long-term mates. And women might use a short-term mating to increase the commitment of her regular mate or a mate with whom she is trying to secure a long-term relationship (Commitment Hypothesis).

These hypotheses are summarized in Table 1, grouped into five conceptual categories: Resource hypotheses (e.g. immediate exchange of sex for resources, securing protection, elevating status, securing resources through paternity confusion); Genetic hypotheses (e.g. better genes, diverse genes, sexy son genes, fertility backup); Mate switching hypotheses (e.g. mate assessment, mate expulsion, securing a better mate); Mate-skill acquisition hypotheses (e.g. honing skills of mate attraction, improving decision-making via self-esteem enhancement, clarifying mate preferences); and Mate manipulation hypotheses (e.g. increasing commitment of regular mate, using revenge to deter a mate's future infidelity).

4. Empirical evidence

Despite the recent plethora of hypothesis generation, there have been few empirical tests of these various hypotheses. Gangestad and Simpson (1990) found that women who pursue short-term sexual strategies (unrestricted sociosexual orientation, in their terms) tended to bear more

Table 1
Potential benefits to women of short-term mating

	Author
Resource hypotheses	
Resource accrual	Symons (1979)
Protection	Smith (1984); Smuts (1985)
Status elevation	Smith (1984)
Eliciting investment through paternity confusion	Hrdy (1981)
Genetic hypotheses	
Better genes	Symons (1979)
Genetic diversity	Smith (1984)
Sexy son genes	Fisher (1958); Smith (1984)
Fertility backup	Smith (1984)
Mate switching hypotheses	
Mate assessment	Buss & Schmitt (1993)
Mate expulsion	Greiling (1993)
Mate switching	Symons (1979)
Mate skill-acquisition hypotheses	
Honing skills of mate attraction	Miller (1991, pers. comm.)
Elevating self-esteem to improve mating decisions	Miller (1991, pers. comm.); Thornhill (1992)
Preference clarification	Greiling (1993)
Mate manipulation hypotheses	
Increasing commitment of long-term mate	Greiling (1993)
Revenge to deter mate's infidelity	Symons (1979)

sons than women who pursued long-term sexual strategies (restricted sociosexual orientation) —a finding that supports the better genes hypothesis. Furthermore, a variety of researchers have found that women who engaged in short-term mating elevate the importance they place on a man's physical attractiveness, a finding consistent with the Good Genes Hypothesis or the Sexy Son Hypothesis (Buss & Schmitt, 1993; Gangestad & Simpson, 1990; Greiling, 1995; Kenrick et al., 1990).

Buss and Schmitt (1993) assessed women's desires in the context of seeking both a short-term and long-term mate. In support of the Resource Accrual Hypothesis, they found that women elevate the importance they attached to immediate resources in the short-term context. For example, women view men with extravagant lifestyles, who spent a lot of money on them early on and who give them gifts early on as more desirable in short-term compared with long-term mating contexts.

Several studies have found that women who engage in extramarital affairs are significantly less happy with their marriages, emotionally and sexually, than women who do not have affairs (Glass & Wright, 1985; Hunt, 1974; Kinsey, Pomeroy, & Martin, 1953), providing circumstantial support for the Mate Switching Hypothesis.

Glass and Wright (1992) examined 17 potential 'justifications' for extramarital affairs, ranging from "for fun" to "in order to advance in my career". Factor analyses yielded four justification factors: Sex (e.g. for sexual excitement), Emotional Intimacy (e.g. for someone to understand problems and feelings), Love (e.g. falling in love with another person) and Extrinsic (e.g. to advance in my career). Women viewed the Love and Emotional Intimacy as the most compelling justifications for an affair, providing circumstantial evidence for the Mate Switching Hypothesis. Furthermore, 77% of the women viewed Love as a compelling justification, compared with only 43% of the men. Men, in contrast, viewed sexual excitement as a more compelling justification for an affair (75% of the men versus 53% of the women).

Finally, Scheib (1994) examined whether mate preferences shift across the contexts of a long-term mate, a sperm donor and the extra-pair sex partner. Scheib found few differences between the affair and long-term mate contexts and concluded that her results did not show that women had a separate psychology for extra-pair mating that differed significantly from the psychology for selecting a long-term partner.

One potential problem with this conclusion, however, is that Scheib defined EPC to the women subjects as a brief affair with someone "you are not likely ever to see again". The context of never seeing an affair partner again would have been extraordinarily unlikely in human ancestral conditions. Second, the definition restricts affairs to only one type, so subjects could not express mate preferences for other types of extra-pair copulations. Third, the definition effectively precluded tests of a wide range of hypothesized benefits of EPC's, such as those subsumed by the Mate Switching Hypothesis, the Mate Insurance Hypothesis, the Protection Hypothesis and the Status Enhancement Hypothesis. Fourth, Scheib's mate preference items were restricted to those involving character, health, physical attributes, abilities and resources and thus did not contain a range of characteristics relevant to testing many of the hypothesized benefits of extra-pair matings. For these reasons, we believe that it is premature to conclude that women do not possess an evolved EPC psychology that is distinct from their long-term mating psychology.

Aside from this very preliminary evidence, the potential benefits women may reap from

extra-pair mating remain largely unexplored. Thus, the primary goal of our research was to examine the potential benefits to women of extra-pair mating. Specifically, we were interested in testing hypotheses about the potential benefits to women of extra-pair mating by examining: (1) perceptions of the likelihood that particular benefits would be received through a short-term extra-pair mating; (2) perceptions of the magnitude of benefits, given that they have been received through short-term extra-pair mating; and (3) perceptions of the contexts in which short-term extra-pair mating is most likely to occur. In addition, we sought to test the hypothesis that women actively pursuing short-term extra-pair mating would differ from women not pursuing short-term extra-pair mating in their perceptions of possible benefits. Toward these ends, we conducted four empirical studies.

5. Study 1: the perceived likelihood of gaining benefits from short-term extra-pair mating

This study was designed to test hypotheses about the functions of short-term mating by examining the perceived likelihood that a particular benefit would be received from short-term extra-pair mating.

5.1. Method

5.1.1. Participants

Participants ($N = 90$; 58 women and 32 men) were recruited through advertisements in two different states. Thirty-one participants were volunteers and 59 were paid $10 to complete a one hour questionnaire. Participants ranged in age from 19 to 70 yr, with a mean age of 29.

5.1.2. Measure

We constructed a 28 item instrument to assess the perceived potential benefits, described to correspond to the hypotheses outlined in the introduction. For example, the item ''She would improve her skills of attraction and seduction'' was written to correspond to the Honing Mate Skills Hypothesis. The item ''She would receive, money, free dinners, or clothing'' corresponded to the Resource Accrual Hypothesis. This list of benefits was supplemented with several potential benefits drawn from previous research (Wright & Glass, 1992), such as ''She would receive sexual gratification'' about which we had no explicit hypotheses. Because this methodology does not permit direct tests of the various genetic hypotheses, these were excluded from further consideration.

5.1.3. Procedure

Participants were tested in groups ranging from 10 to 15. Male and female participants were seated at separate tables. A male and female experimenter were present to answer any questions that arose. Male and female participants were given the following instructions:

> Think of a woman [man] *who is in a committed relationship* but who chose to have a short-term sexual relationship with another person. Below is a list of potential benefits this woman [man] could derive by being sexually active with someone other than her [his] current

partner. Please read each potential benefit carefully and assess, in your own judgment, whether or not this woman [man] derived, or would derive, each particular benefit from the short-term sexual relationship.

Participants were given a list of 28 possible benefits to short term extra-pair mating and were asked to evaluate the likelihood that these benefits would be received by the imagined man or woman. Both male and female participants were asked to rate male and female actors. Thus, we had a 2×2 design with sex of rater and sex of actor. Participants rated the likelihood for men and for women separately on a 9 point scale with -4 being highly unlikely to receive a benefit, 0 being neutral and $+4$ being highly likely to receive the benefit. Following completion of the instrument, participants placed responses in a sealed envelop to ensure anonymity.

5.2. Statistical concerns

Because we have separate hypotheses for specific dependent variables, we chose not to perform omnibus analyses. However, in order to minimize Type I errors, we raised our alpha level to $p < 0.01$ and employed two-tailed analyses wherever appropriate. This is the suggested technique when the dependent variables are not viewed as a set. We employed this strategy in each study.

5.3. Results

Although we did not have an explicit hypothesis about sex of rater, we viewed it as possible that women and men might differ in their perceptions of the benefits of short-term extra-pair mating. Thus, we conducted a series of repeated measure two-way ANOVAs with sex of rater as one factor and sex of actor as the second factor.

5.3.1. Sex of rater and interactions

Of the 28 ANOVAs conducted, there were no significant effects due to sex of rater. Three of the 28 analyses yielded significant interactions: Likelihood she [he] would find a sexual partner who seemed interested in commitment ($F = 17.86$, $p < 0.001$), Likelihood she [he]would have someone to spend her [his] free time with ($F = 10.88$, $p = 0.001$), Likelihood she [he] would no longer be bored ($F = 7.20$, $p = 0.009$). Because of the total lack of sex of rater effects and the small number of significant interactions, subsequent results present means and standard deviations that were calculated collapsing across sex of rater.

5.3.2. Overall scores

In order to evaluate how likely it was for men and women to receive benefits from short-term mating overall, a mean score was computed across all 28 potential benefits. These mean scores were then compared using a two-way ANOVA. Women were rated as more likely to receive benefits from short-term extra-pair mating than were men (male mean = 0.10, female mean = 0.41, $F = 8.19$, $p = 0.005$).

5.3.3. Benefits perceived to be most likely to be gained

The benefits rated as likely to be received by women and men are presented in Table 2 in order of the magnitude of perceived benefit for women. The top ten perceived benefits for women are: receiving sexual gratification, finding a sexual partner who did not want a commitment, having someone to spend her free time with, finding a partner she felt was more desirable than her current partner, no longer experiencing boredom, having an easier time breaking up with her current partner, improving her skills of attraction and seduction, being able to replace her current partner, finding a sexual partner who was willing to spend a lot of time with her and gaining revenge against her current partner for current partner's infidelity.

The top ten benefits for men are receiving sexual gratification, having his self-esteem increased, finding a sexual partner who did not want a commitment, no longer experiencing boredom, feeling good about himself because he had a sexual partner, having someone to spend his free time with, finding a more desirable partner than his current partner, finding a sexual partner who was willing to spend a lot of time with him, being able to replace his current partner and finding it easier to break up with his current partner.

5.3.4. Sex differences in perceived benefits

Women were rated as significantly more likely than men to receive seven benefits. These results are summarized in Table 3 and include receiving protection for her children, receiving jewelry, money, free dinners, or clothing, receiving protection from an abusive family, advancing one's career, becoming friends with high status people, clarifying long-term mate preferences and having someone to spend her free time with.

Men were rated as significantly more likely than women to receive three specific benefits. These include having his reputation increased among friends, having his status increased by being seen with another sexual partner and feeling good about himself.

5.4. Discussion

The benefit perceived to be most likely for women to receive was sexual gratification. Ironically, none of the hypotheses correspond specifically to this particular benefit. If sexual gratification is sustained as a key benefit to women in short-term extra-pair mating, two theoretical approaches can be examined. First, sexual gratification may serve a function yet unidentified, such as facilitating sperm transfer and fertilization (Baker & Bellis, 1994). Alternatively, sexual gratification might not serve any function at all in short-term mating and be more appropriately conceptualized as an incidental byproduct of pleasure-producing mechanisms that are already in place for other reasons (see Symons, 1979).

Among the hypotheses most strongly supported are the Mate Switching Hypotheses (finding a more desirable partner, replacing a partner), the Mate Expulsion Hypothesis (easier to break up with current partner) and the Honing Skills of Mate Attraction Hypothesis (improving skills of attraction and seduction). Hypotheses receiving moderate support include the Vengeance Hypothesis (retaliating against a partner for infidelity), the Resource Accrual Hypothesis (dinners, money, jewelry), the Self-esteem Hypothesis (her self-esteem was increased), the Preference Clarification Hypothesis (clarified characteristics thought important in a potential long-term marriage partner), the Status Enhancement Hypothesis (she became

Table 2
The benefits women and men are perceived to be likely to receive from short-term extra-pair mating ($N = 90$)[a]

Benefit	Women		Men	
	mean	S.D.	mean	S.D.
Likelihood of receiving sexual gratification	2.36	1.87	2.86	1.82
Likelihood of finding a sexual partner who did not want a commitment	1.88	2.11	1.60	2.13
Likelihood of having someone to spend free time with	1.61	2.12	1.13	2.34
Likelihood of finding a partner more desirable than current partner	1.44	2.01	0.98	2.42
Likelihood of no longer be bored	1.42	2.23	1.36	2.46
Likelihood that it would be easier to break up with current partner	1.39	2.44	0.82	2.79
Likelihood it would improve skills of attraction and seduction	1.31	2.16	0.78	2.35
Likelihood of being able to replace current partner	1.14	2.48	0.91	2.64
Likelihood of finding a sexual partner who was willing to spend a lot of time with her/him	1.05	2.30	0.94	2.29
Likelihood of gaining revenge against current partner for partner's infidelity	0.88	2.74	0.41	2.78
Likelihood of receiving jewelry, money, free dinners, or clothing	0.82	2.84	−1.47	2.46
Likelihood of discovering other potential partners who were interested in her/him	0.82	2.32	0.30	2.65
Likelihood of self esteem being increased	0.64	2.49	1.67	2.50
Likelihood of clarifying the characteristics believed to be important in a potential long term marriage partner	0.42	2.34	−0.55	2.49
Likelihood of becoming better able to evaluate accurately what other potential partners thought about her/him	0.28	2.37	0.23	2.47
Likelihood it would increase her chances of getting pregnant	0.12	2.80	na	na

[a] +4 = highly likely, 0 = neutral, −4 = highly unlikely; na = not applicable.

Table 3
Sex differences in perceived likelihood of receiving benefits from short-term extra-pair mating[a] (***$p < 0.001$, **$p < 0.01$, +$p = 0.01$)

Benefit	Sex of Actor		F (d.f.)
	Male M	Female M	
Women more likely to receive			
Likelihood her sexual partner would protect her children from her current abusive partner	−2.08	−0.13	44.48 (1,72)***
Likelihood she would receive jewelry, money, free dinners, or clothing	−1.47	0.79	33.37 (1,79)***
Likelihood she would receive protection from abusive family through sexual partner	−2.09	−0.19	28.29 (1,73)***
Likelihood it would advance his or her career (promotion, pay raise, better grades)	−1.81	−0.69	15.44 (1,79)***
Likelihood she would become friends with people whom he or she viewed as high in status through sexual partner	−1.12	0.14	15.04 (1,78)***
Likelihood it would clarify the characteristics thought important in a potential long term marriage partner	−0.55	0.47	9.50 (1,78)**
Likelihood she would have someone to spend her free time with	1.07	1.61	7.46 (1,78)**
Men more likely to receive			
Likelihood that his reputation would be increased among friends	−0.09	−1.91	17.39 (1,79)***
Likelihood that his status would be increased by being seen with someone other than his current partner	0.19	−1.33	15.97 (1,79)***
Likelihood he would feel good about himself because he had a sexual partner	1.16	−0.25	12.89 (1,78)+

[a] +4 = highly likely, 0 = neutral, −4 = highly unlikely.

friends with high status people) and the Fertility Backup Hypothesis (she increased her chances of getting pregnant).

The analyses of sex differences offered further support for the Resource Accrual Hypothesis, since women were judged to be significantly more likely to receive dinners, money and jewelry than were men. The analyses of sex differences also supported the Protection Hypothesis (protection against abusive mates as well as abusive family members), the Status Enhancement Hypothesis (advancing career, becoming friends with high status people) and the Preference Clarification Hypothesis.

Study 1 provides a preliminary assessment of the perceived likelihood of receiving particular benefits from short-term mating. It does not assess how beneficial these are. In principle, a benefit could be of trivial importance, despite its being highly likely to be received. Alternatively, a benefit could be received from short-term mating only rarely, but if received, could prove to be extremely beneficial. Study 2 was designed to identify the perceived magnitude of each benefit, assuming it has been received by a person engaging in a short-term extra-pair liaison.

6. Study 2: the perceived magnitude of the benefits of extra-pair mating

The goal of Study 2 was to provide a second test of the hypotheses about perceived benefits of short-term extra-pair mating for women. In contrast to Study 1, which focused on the perceived likelihood with which each benefit would be received by a woman, Study 2 focused on how beneficial each benefit would be, if it were received by the person engaged in short-term extra-pair mating.

6.1. Method

6.1.1. Participants

Participants were 98 undergraduates (53 women and 45 men) who completed the study as part of the requirement for their introductory psychology course. Participants ranged in age from 17 to 22 with a mean age of 19. None of these subjects participated in Study 1.

6.1.2. Measure

Because of the absence of significant sex of rater effects found in study 2, this study requested participants to focus on members of their own sex who had a short-term extra-pair sexual relationship. These instruments were identical except for the proper changing of pronouns and the rewording of a few items to make them sex-appropriate (e.g. increasing chances of getting pregnant versus increasing chances of getting a woman pregnant).

The benefit list consisted of 81 potential benefits of engaging in a short-term extra-pair relationship. This benefit list was expanded after Study 1 yielded results that needed further clarification. Specifically, we felt that the original list was female biased. This was especially apparent for the resource items. Therefore, we added such items as 'He [she] bought me compact discs' and 'He [she] allowed me to use his [her] car' to further test the Resource Acquisition Hypothesis and add a more sex neutral dimension.

Self-esteem emerged from Study 1 as a potential benefit of short-term extra-pair mating. However, this still did not answer the question about why women perceived an increase in self-esteem after a short-term affair. Therefore, in Study 2 we expanded the self-esteem items and included such things as 'She felt good about herself because her sexual partner respected her', 'Because her sexual partner was emotionally sensitive towards her, her self-esteem was increased', 'Her sexual partner made her feel sexy', 'Because her sexual partner was very high in status, her self-esteem was increased' and 'She felt good about herself because she had more than one sexual partner'.

Sexual gratification, although not linked with any specific hypotheses about short-term extra-pair mating benefits to women, emerged from Study 1 as a benefit highly likely to be received by women engaging in short-term extra-pair mating. A possible rationale for this benefit has recently been provided by Baker and Bellis (1994). They argue that the female orgasm speeds the progression of sperm through the cervical opening to the uterus. If their argument is correct, a potential adaptive function of gaining sexual gratification would be increased fertilization — a notion that gains credence from the finding that women are apparently more orgasmic with their affair partners than with their regular partners (Baker & Bellis, 1994). In order to provide a preliminary test of this notion, Study 2 separated 'sexual gratification' into several elements to determine more precisely the nature of perceived sexual benefit. Thus, the item 'She [he] experienced orgasms with her [his] sexual partner, but not with her [his] steady partner' was added.

6.1.3. Procedure

Participants were tested in single-sex groups ranging from 10 to 15 people. An experimenter of the same sex was present at all times. Following completion of the instrument, subjects placed responses in a sealed envelop. Participants were given the following instructions:

> In this section we ask you to imagine a woman [man] *who is in a committed relationship* but who decided to have a short-term sexual relationship with someone *other than her [his] steady partner*. Below is a list of possible benefits she [he] could gain by having a short-term sexual relationship with someone *other than her [his] steady partner*. Please consider each item separately and *assume that she [he] has received each benefit* as you read the list. *Given that she [he] has received each benefit*, please rate how beneficial each item would be.

Participants were asked to rate how beneficial each benefit was on a scale from 0 (not at all beneficial) to 5 (highly beneficial).

6.2. Results

6.2.1. Overall scores

An overall mean was computed across benefit items for men and women. These means were then compared using a two-tailed t-test. Men and women perceived the benefits of short-term extra-pair mating as equally beneficial (male mean = 2.24, female mean = 2.31, $t = -0.41$, $p = 0.684$).

Table 4
The most beneficial aspects of short-term extra-pair mating for women ($N = 53$) and men ($N = 45$)[a]

Benefit	Women		Men	
	mean	S.D.	mean	S.D.
Received protection from abusive family through sexual partner	4.18	1.08	3.76	1.11
Sexual partner made her/him feel better about self than any partner had ever done	3.87	1.15	3.11	1.66
Sexual partner did not demand sex, whereas steady forced it upon her/her	3.81	1.35	2.40	1.26
Felt emotionally satisfied because sexual partner was willing to listen to her/his problems	3.70	1.16	3.05	1.20
Felt good about self because sexual partner respected her/him	3.68	1.02	2.64	1.26
Sexual partner protected her/his children from steady partner	3.68	1.54	3.56	1.45
Sexual partner treated her/him as something special, while steady partner thought she/he was average	3.64	1.19	3.27	1.21
Clarified the characteristics she/he thought important in a potential long-term marriage partner	3.55	1.28	3.40	1.32
Because sexual partner was interested in the details of her/his life, she/he felt good about self when with sexual partner	3.55	1.28	2.27	1.31
Because sexual partner was emotionally sensitive towards her/him, her/his self esteem was increased	3.43	1.35	2.61	1.45
Self-esteem was increased	3.38	1.31	2.80	1.32
Sexual partner was very interesting to talk to	3.38	1.33	2.71	1.15
Because sexual partner was very understanding, she/he felt more secure in relationship with sexual partner	3.34	1.26	2.98	1.37
Sexual partner made he/him feel important	3.28	1.31	2.43	1.37
Sexual partner made her/him feel intelligent	3.24	1.42	2.78	1.38
Was able to make better decisions about long-term partners because she/he felt good about self	3.23	1.29	2.87	1.42
Sexual partner cuddled with her/him	3.22	1.41	2.73	1.28
Sexual partner made her/him feel beautiful/handsome	3.20	1.41	2.61	1.37
Because sexual partner listened, she/he felt that sexual partner cared for her/him more than the steady partner	3.13	1.39	2.71	1.44
Because sexual partner was interested in her/his work or school, her/his self-esteem was increased	3.09	1.25	2.43	1.27
Because sexual partner was extremely sexually attracted to her/him, he/his self-esteem was increased	3.01	1.47	2.89	1.30
Found a sexual partner who seemed interested in commitment to her/him	2.98	1.47	2.73	1.21
Found a sexual partner who was willing to spend a lot of time with her/him	2.94	1.31	2.66	1.20
Experienced orgasms with sexual partner	2.91	1.53	2.43	1.69
Increased the commitment of her/his steady partner	2.90	1.43	2.69	1.58
Because sexual partner was extremely intelligent, she/he was sexually aroused by him/her	2.87	1.31	2.55	1.23
Steady partner began to treat her/him with more respect when he found out she/he was seeing another person	2.77	1.27	2.00	1.31
Although she/he had difficulty experiencing orgasms with steady partner, she/he was able to reach orgasm with sexual partner	2.77	1.72	2.73	1.50
Sexual partner made her/him feel sexy	2.75	1.62	2.59	1.48
Sexual partner decreased her/his feelings of loneliness	2.72	1.29	2.93	1.21
It advanced her/his career	2.64	1.33	2.60	1.47
Experienced sexual gratification because sexual partner was a skilled lover	2.63	1.52	2.77	1.48
Received sexual gratification	2.60	1.31	2.60	1.45
Because sexual partner was extremely physically attractive, her/his self-esteem was increased	2.51	1.41	2.44	1.37
Became friends with people viewed as high in status through sexual partner	2.50	1.31	2.73	1.37

[a] 5 = highly beneficial, 0 = not at all beneficial.

6.2.2. The most beneficial aspects of short-term extra-pair mating

Means and standard deviations were computed for men and women for each benefit. For women, 54 benefits were rated at least slightly beneficial (i.e. receiving a 2 or higher on the scale). For men, there were 55. For ease of presentation, only those benefits which received a score above the median are presented. The consequences of short-term extra-pair mating perceived to be most beneficial for women if received are receiving protection from her abusive family through her sexual partner, having a sexual partner who made her feel good about herself, having a sexual partner who did not demand sex, feeling emotionally satisfied because her sexual partner was willing to listen to her problems and feeling good about herself because her sexual partner respected her (see Table 4).

The most beneficial aspects of short-term extra-pair mating for men are also found in Table 4. These include receiving protection from his abusive family and for his children, clarifying long-term mate preferences, being treated as something special by his sexual partner and having a sexual partner who made him feel good about himself.

6.2.3. Sex differences in the magnitude of benefits

Two-tailed *t*-tests were conducted to test for significant sex differences in the magnitude of the benefits of short-term extra-pair mating. These results are found in Table 5. Women rated seven benefits as significantly more beneficial than did men. These benefits include having a sexual partner who did not demand sex, feeling good about herself because her sexual partner respected her, having a sexual partner who made her feel important, having a sexual partner who was interested in the details of her life and having her self esteem increased because her sexual partner was emotionally sensitive towards her. There were no items rated by men that were significantly more beneficial than rated by women

6.3. Discussion

Based upon the absolute magnitudes of the benefits, the most heavily supported hypothesis was the Self-Esteem Hypothesis (Miller, 1991, personal communication; Thornhill, 1992) Benefits such as (1) her sexual partner made her feel better about herself than any other man had ever done, (2) she felt good about herself because her sexual partner respected her and (3) her self-esteem was increased, all suggest that short-term extra-pair mating may be a strategy some women employ to increase their self-esteem. Further evidence for the Self-esteem Hypothesis comes from the analysis of sex differences; women viewed self-esteem enhancement through short-term extra-pair mating as significantly more beneficial than did men.

Other hypotheses receiving support are the Protection Hypothesis (receiving protection from an abusive family through sexual partner and her sexual partner protected her children from her steady partner), the Preference Clarification Hypothesis (she clarified the characteristics she thought important in a potential long-term partner), the Mate Switching Hypothesis (she found a sexual partner who seemed interested in commitment, she found a sexual partner who was willing to spend a lot of time with her and she was able to replace her steady partner), the Resource Acquisition Hypothesis (it advanced her career) and the Status Enhancement Hypothesis (She became friends with people she viewed as high in status through her sexual partner).

Table 5
Sex differences in beneficial aspects of short-term extra-pair mating[a] (***$p < 0.001$, **$p < 0.01$, *$p < 0.05$)

Benefit	Sex of actor		t
	male m	female m	
More beneficial for women			
Her sexual partner did not demand sex, whereas his steady partner often forced it upon her	2.40	3.81	−4.63***
She felt good about herself because her sexual partner respected her	2.64	3.68	−4.32***
Her sexual partner made her feel important	2.43	3.28	−3.00**
Because her sexual partner was interested in the details of her life, she felt good about herself when she was with him	2.77	3.55	−2.87**
Because her sexual partner was emotionally sensitive towards her, her self esteem was increased	2.61	3.43	−2.76**
Her steady partner began to treat her with more respect when he found out she was seeing another person	2.00	2.77	−2.68**
She felt emotionally satisfied because her sexual partner was willing to listen to her problems	3.05	3.70	-2.65**

[a] 5 = highly beneficial, 0 = not at all beneficial.

Interestingly, sexual gratification is another outcome seen as highly beneficial. Of the sexual benefits, the one perceived as most beneficial is having the woman's sexual partner cuddle with her. Others rated as beneficial include experiencing orgasms with her sexual partner, receiving sexual gratification and receiving pleasurable sexual stimulation, but not necessarily orgasms.

Both Study 1 and Study 2 explored the perceived benefits — likelihood and magnitude, respectively — of short-term extra-pair mating. A third study was designed to examine the contexts in which there is an increased likelihood of women engaging in short-term extra-pair mating.

7. Study 3: the contexts that promote short-term extra-pair sexual relationships

The goal of study 3 was to identify the contexts that are most conducive to promoting a short-term extra-pair encounter. Our rationale was that identifying the contexts that inclined individuals to engage in short-term mating would provide another lens through which to examine the potential benefits women could gain from short-term extra-pair mating and hence yield further clues to women's short-term sexual psychology. For example, if one context that is discovered to incline a woman to an extra-pair mating is if her current partner cannot hold down a job, this would provide circumstantial evidence for the Mate Switching Hypothesis or Resource Accrual Hypothesis. Even more support for these hypotheses would be found if this context occurred in conjunction with another context — meeting someone who has better financial prospects than her current partner, who seemed interested in her. Thus, identifying the contexts that incline women to extra-pair sex provides another window for discovering the potential adaptive benefits underlying women's pursuit of short-term extra-pair mating.

7.1. Methods

7.1.1. Participants

Participants (N = 165; 101 women and 64 men) were gathered through advertisements in two different states. Sixty-five participants were volunteers and 100 were paid $10 to complete a one hour questionnaire. Participants ranged in age from 20 to 73, with a mean age of 30. Ninety of these participants were also subjects in Study 1.

7.1.2. Measure

Participants were given an instrument to assess the perceived likelihood that certain contexts would affect the probability of a man or a woman becoming sexually involved with someone other than his or her current partner. Specific contexts were generated to correspond to the hypothesized benefits, although this did not prove to be possible for all of the hypothesized benefits. For example, the context "She finds out that her current partner is having an affair" was written to correspond to the Vengeance Hypothesis. The context "She feels that she could find someone with whom she was more compatible than her current partner" was written to correspond to the Mate Switching Hypothesis. In contrast, we could think of no contexts that might correspond to two of the genetic hypotheses — securing better genes or increasing genetic diversity. Nor did this format lend itself to testing the paternity confusion hypothesis.

In all, only 6 of the hypotheses could be tested by gauging the contexts that might prompt a short-term mating.

7.1.3. Procedure

This study had a 2×2 design where male and female participants imagined both male and female actors. Participants were tested in groups ranging from 10 to 15. Male and female participants were seated at separate tables. A male and female experimenter were present to answer any questions that arose. Following completion of the instrument, subjects placed responses in a sealed envelope. Participants were given the following instructions:

> Below is a list of possible situations affecting the likelihood that a man [woman] might become sexually involved with someone other than his [her] current partner. Please read each situation carefully and indicate how you think this situation would affect his [her] choice to become sexually involved with someone other than his current partner.

If a participant did not know anyone who had engaged in this act, he or she was instructed to separately imagine a man and a woman who would.

Participants were asked to rate how likely it was that each context would affect the man's or the woman's decision to become sexually active with someone other than his or her current partner. Participants evaluated 47 different contexts on a scale from -4 (highly unlikely to become sexually involved) to $+4$ (highly likely to become sexually involved) with 0 being neutral. Participants rated the male and female lists separately.

7.2. Results

7.2.1. Sex of rater effects and interactions

A repeated measures two-way ANOVA was conducted to test for sex of rater effects, sex of actor effects and interactions. Of the forty-seven different contexts, there were no significant sex of rater effects.

Three of the 47 contexts had significant interactions. These include: Her [his] financial prospects are much lower than her [his] current partner's ($F = 7.51$, $p = 0.007$), Sexual relations with her [his] current partner are satisfying ($F = 6.92$, $p = 0.009$), She [he] is emotionally dependent on her [his] current partner ($F = 6.82$, $p = 0.01$). Because there were no significant sex of rater effects and only three interactions, these results are not interpreted and further results deal only with main effects.

7.2.2. Overall scores

An overall mean was computed across all contexts for male and female actors. There was no significant difference between men and women and how likely they were to be encouraged to engage in short-term extra-pair sexual relationships by the different contexts (male mean $= 0.11$, female mean $= -0.23$, $F = 6.22$, $p = 0.014$).

7.2.3. The contexts rated most likely to promote extra-pair mating

Means and standard deviations were calculated for male and female actors. Contexts viewed

Table 6
The contexts that increase likelihood of women engaging in extra-pair relationships ($N = 165$)[a]

Context	Women		Men	
	Mean	S.D.	Mean	S.D.
Finds out current partner is having an affair	2.09	2.44	2.64	2.16
Current partner is unwilling to engage in sexual relations	1.97	2.42	2.63	2.19
Sexual relations with current partner have been unsatisfying for a long time	1.75	2.35	2.31	2.14
Has the opportunity to be with someone else, whom she/he finds attractive, with no chance of being discovered	1.57	2.48	2.11	2.32
Current partner is verbally abusive	1.46	2.30	1.58	2.08
Suspects current partner of having an affair	1.40	2.22	2.00	2.10
Current partner has physically abused her/him	1.34	2.61	1.22	2.20
Feels that she/he could find someone with whom she/he was more compatible than current partner	1.29	2.38	1.82	2.35
Current partner has lied to her several times about a major issue	1.17	2.39	1.48	2.21
Person she/he meets is willing to spend a lot of time with her/him	1.11	2.45	0.51	2.02
Current partner lives out of town	1.04	2.57	1.39	2.58
Sexual relations with current partner are too infrequent	0.94	2.43	1.81	2.31
The person she/he meets acts as if they like her/him very much	0.72	2.41	0.32	2.17
Current partner can't hold down a job	0.67	2.35	0.10	2.12
Current partner does not want children and she/he does	0.66	2.82	0.55	2.23
Meets someone who is better looking than current partner who seems interested in her/him	0.58	2.52	1.48	2.42
The person she/he meets understands there is no possibility of a committed relationship with her/him	0.36	2.65	1.47	2.46
She lives in a large city where it is unlikely she/he would be seen	0.29	2.41	0.71	2.49

[a] +4 = highly likely, 0 = neutral, -4 = highly unlikely.

Table 7
Sex differences in the contexts that affect the decision to become involved in an extra-pair relationship[a] (***$p < 0.001$, **$p < 0.01$, +$p = 0.01$)

Context	Sex of Actor		F (d.f.)
	men m	women m	
Women higher			
The person she meets wants a commitment	−1.47	−0.24	22.12 (1,111)***
Men higher			
Current partner stops taking care of physique	0.97	−0.08	20.56 (1,145)***
He is substantially less successful than his current partner	−0.06	−1.06	18.63(1,143)***
He meets someone who is better looking than his current partner who seems interested in him	1.48	0.58	16.92 (1,144)***
Person he meets understands that there is no possibility of commitment	1.53	0.39	16.24 (1,107)***
His current partner threatened to physically harm him if he was with someone else	−0.06	−0.96	16.11 (1,138)***
Sexual relations with his current partner are too infrequent for him	1.86	0.97	14.65 (1,142)***
His current partner is unwilling to engage in sexual relations with him	2.71	2.06	12.28 (1,141)+
He suspects his current partner of an affair	2.09	1.46	10.51 (1,143)+
He relies on his current partner for financial security	−1.44	−2.13	9.59 (1,141)**
He finds out his current partner is having an affair	2.26	2.17	8.63 (1,142)**
His financial prospects are much lower than his current partner's	−0.50	−1.21	8.49 (1,143)**
He has children with his current partner	−1.47	−2.10	7.37 (1,141)**
Sexual relations with his current partner have been unsatisfying for a long time	2.36	1.84	7.04 (1,144)**

[a] +4 = highly likely, 0 = neutral, −4 = highly unlikely.

as likely to encourage *women* to engage in extra-pair mating include finding out that her partner is having an affair, her partner is no longer willing to engage in sexual relations with her, sexual relations with her partner have been unsatisfying for a long time and she has the opportunity to be with someone else, whom she finds attractive, with no chance of being discovered (Table 6).

The contexts judged as likely to encourage *men* to engage in extra-pair mating include finding out his partner is having an affair, his partner is no longer willing to engage in sexual relations with him, sexual relations with his partner have been unsatisfying for a long time, he has the opportunity to be with someone else, whom he finds attractive, with no chance of being discovered and he suspects his partner of having an affair.

7.2.4. Sex differences in promoting contexts

Women were seen to be significantly more encouraged than men to have an extra-pair relationship in only one situation: The other person she meets wants a commitment. Men, however, were judged to be significantly more likely than women to have an extra-pair mating in 13 different contexts. These include: Current partner stops taking care of physique, He is substantially less successful than his current partner, He meets someone who is better looking than his current partner who seems interested in him, The person he meets understands there is no possibility of commitment and His current partner threatened to physically abuse him if he was with someone else. Further results are found in Table 7.

7.3. Discussion

The context seen rated as most likely to increase the likelihood of a woman engaging in extra-pair mating was finding out her partner was having an affair. Indirectly this could be a cue to potential resource loss and hence a woman may feel that it is time to find a potential replacement for her mate or a replacement of his resources. This lends indirect support to the Revenge Hypothesis, Mate Switching Hypothesis, or Resource Acquisition Hypothesis. Two of the top five contexts deal with unsatisfying or non-existent sexual relations, for which there was no a priori hypothesis. One speculation is that lack of sexual relations may be a cue to ending a relationship, in which case the woman may benefit from finding a replacement mate. This is indirect evidence for the Mate Switching Hypothesis. Another possibility is that in this situation a woman could increase her chances of bearing children if she were to engage in sexual relations with someone other than her regular partner. This lends indirect support for the Fertility Backup Hypothesis.

The analysis of sex differences offered further support for the Mate Switching Hypothesis. Women were rated as significantly more likely to engage in extra-pair mating when the person she meets is interested in a commitment.

An unexpected set of contexts favored men to engage in affairs more than women: when the man is substantially less successful than his partner, when the man relies on his partner for financial security and when the man has much lower financial prospects than his current partner. These contexts suggest men who are either lower than their partners in 'mate value', or alternatively, men who fail to embody the traditional criteria that women desire in a mate are more likely to have extra-pair affairs (Buss, 1988, p. 294; Hatfield et al., 1979; Symons,

1979; Trivers, 1985). One speculation is that such men may anticipate an inability to retain their partner in the long run and so engage in extra-pair copulations as an anticipatory strategy of defection. Alternatively, such men may be with their current partner precisely because of the economic resources their partner provides and so seek extra-pair mates who embody their other mate selection criteria, such as sexual attractiveness. These speculations remain for future research to be tested.

8. Study 4: individual differences and sociosexuality

Another perspective from which to view women's short-term extra-pair mating is to contrast women who actually pursue or engage in short-term extra-pair matings with those who do not. Do women who pursue a short-term extra-pair mating strategy have a different cost-benefit evaluation than women who do not? Do they perceive more benefits to short-term extra-pair mating and if so, precisely which potential benefits of short-term extra-pair mating do they view as especially beneficial? Some women, for example, might be better able to reap benefits than other women. And some resources may be more beneficial to some women than to others. A woman with her own economic resources, for example, may not perceive immediate economic resources to be an especially beneficial consequence of short-term extra-pair mating, whereas a penurious woman might perceive these as enormously beneficial.

One measure of individual variation in women's sexual strategies is the Sociosexuality Inventory (Gangestad & Simpson, 1990) which measures the type of sexual strategy women are pursuing (short-term or long-term). Women who score high on this inventory have more sexual partners, require less time before engaging in sexual relations with a partner and fantasize about having sex with someone other than their current partner more than women who score low on this inventory. Gangestad and Simpson defined these ends as unrestricted and restricted. We prefer to refer to these ends using the more descriptively neutral phrases ''short-term sexual strategy'' and ''long-term sexual strategy'' (Buss & Schmitt, 1993).

8.1. Methods

8.1.1. Participants

Participants ($N = 185$) were the same as those in all previous studies in this paper. In each of the previous three studies, all participants were administered a Sociosexuality Inventory. For further details of the participants, please see the previous studies.

8.1.2. Measure

Participants received the seven item inventory as part of larger studies they were completing. The inventory asks the following: (1) With how many different partners have you had sex (sexual intercourse) within the past year? (2) How many partners do you foresee yourself having sex with during the next five years? (3) With how many partners have you had sex on *one and only one* occasion? (4) How often do you fantasize about having sex with someone other than your current partner? (5) Sex without love is O.K., (6) I can imagine myself being comfortable and enjoying 'casual' sex with different partners and (7) I would have to be closely

attached to someone (both emotionally and psychologically) before I could feel comfortable and fully enjoy having sex with him or her. Questions 1 through 3 are open-ended answers, while questions 4–7 are answered on a Likert-type scale.

8.2. Results

Sociosexuality scores were computed by first reverse scoring item seven and standardizing scores for each item within sex. Question four was dropped because it assumes the participant is in a relationship and this assumption did not fit some of the participants in these studies. A mean score was then computed for six of the seven items within sex. The overall Sociosexuality score was then correlated with the benefits and contexts of short-term extra-pair mating.

8.2.1. Overall correlations

Sociosexuality was correlated with each of the overall scores from all of the studies for both sexes. Women high in Sociosexuality perceived the benefits to short-term mating as more beneficial than did women who scored on the lower end of this inventory. There were no significant overall correlations for men.

8.2.2. Sociosexuality and the likelihood of receiving benefits from short-term extra-pair mating

Sociosexuality correlated with the perceived likelihood of receiving two individual benefits for women. These benefits are Likelihood she would receive sexual gratification ($r = 0.38$, $p < 0.01$) and Likelihood she would feel good about herself because she had more than one sexual partner ($r = 0.38$, $p < 0.01$). In men, there were no significant correlations.

8.2.3. Sociosexuality and the magnitude of the benefits from short-term extra-pair mating

Sociosexuality and the magnitude of potential benefits produced 18 significant correlations for women. These results are found in Table 8 and include: Her sexual partner was willing to experiment sexually, She improved her skills of attraction and seduction, She experienced orgasms with her sexual partner, Her reputation was increased among other potential short-term sexual partners and She received expensive and designer clothing from her sexual partner. In men, Sociosexuality did not significantly correlate with any of the perceived benefits.

8.2.4. Sociosexuality and the contexts that increase likelihood of short-term extra-pair mating

Sociosexuality positively correlated with 2 contexts in women. These include Her current partner gets fired ($r = 0.29$, $p < 0.01$), She suspects her current partner of having an affair ($r = 0.29$, $p < 0.01$). Sociosexuality did not significantly correlate with any of the contexts for men.

8.3. Discussion

Based upon the correlations with the overall scores, women who engage in short-term mating perceive the benefits as more beneficial than those women who do not engage in short-term mating. Based upon the individual item correlations, sexual gratification appears to be a clear benefit from short-term mating. High SOI women rated the following as more beneficial than low SOI women: having a sexual partner who was willing to experiment sexually,

Table 8
Correlations between women's sociosexuality and the beneficial aspects of extra-pair short-term mating (**$p < 0.01$)

Benefit	r
Her sexual partner was willing to experiment sexually	0.51**
She improved her skills of attraction and seduction	0.50**
She experienced orgasms with her sexual partner	0.47**
Her reputation was increased among other potential short-term sexual partners	0.46**
She received expensive designer clothing from her sexual partner	0.45**
She got to know her sexual partner's friends whom she also viewed as attractive	0.43**
She discovered other available partners through her sexual partner	0.43**
She discovered other partners who were interested in her	0.43**
She felt she was better able to seduce a man because she gained experience through her sexual partner	0.42**
Because her sexual partner was extremely intelligent, she was very sexually aroused by him	0.41**
She received pleasurable sexual stimulation from her sexual partner, but not necessarily orgasms	0.41**
Having a sexual partner decreased her feelings of loneliness	0.40**
It advanced her career (promotion, pay raise, better grades)	0.40**
She experienced great sexual pleasure because her sexual partner was extremely physically attractive	0.39**
Her sexual partner was willing to engage in oral sex, whereas her steady partner was no longer willing to do so	0.39**
She experienced sexual gratification because her sexual partner was a skilled lover	0.39**
She felt good about herself because she had more than one sexual partner	0.33**
She became friends with people she viewed as high in status through her sexual partner	0.31**

experiencing orgasms with her sexual partner, receiving pleasurable sexual stimulation with her partner, but not necessarily orgasms, experiencing great sexual pleasure because her sexual partner was extremely physically attractive and a skilled lover and having a sexual partner who was willing to engage in oral sex.

The Resource Acquisition Hypothesis was also supported across studies. High SOI women rated the benefits of receiving expensive designer clothing from her sexual partner. Sociosexuality was significantly positively correlated with the context of when her current partner gets fired. It appears that these women may be using a short-term sexual strategy as a way to gain resources.

Other hypotheses supported include Honing Skills of Mate Attraction (she improved her skills of attraction and seduction, she felt she was better able to seduce a man because she gained experience through her sexual partner), Mate Switching Hypothesis (she discovered other available partners through her sexual partner, she discovered other partners who were interested in her), the Self Esteem Hypothesis (she felt good about herself because she had more than one sexual partner) and the Status Enhancement Hypothesis (her reputation was increased among other potential short-term sexual partners, she became friends with people she viewed as high in status through her sexual partner).

9. General discussion

It is clear that women, as well as men, engage in short-term mating outside the bounds and bonds of a long-term committed relationship. Mathematically, the number of short-term sex acts must be identical on average for the sexes, given an equal sex ratio in the mating pool. Prior theorists and researchers have focused primarily on the adaptive benefits to men of engaging in short-term extra-pair mating in the currency of offspring production. Women's short-term extra-pair mating has remained relatively hidden from theoretical and empirical examination. Perhaps this is because the potential adaptive benefits for women are less obvious and less direct than those for men, perhaps it is because most of the researchers and the theorists have been men, or perhaps because the topic of women's short-term sexuality has remained taboo.

This discussion first examines the provisional conclusions that can be drawn from the four empirical studies. We focus on the hypotheses that receive the strongest support across studies, the hypotheses that receive partial support and the hypotheses that receive little or no support (see Table 9). We next examine sex differences and individual differences. Third, we examine several conceptual issues, such as the distinction between "beneficial effect" and "function." Fourth, we outline the various methodological limitations of these studies and point to a research agenda for the further examination of women's short-term extra-pair mating.

9.1. Hypotheses strongly supported across studies: resource acquisition, mate switching and sexual gratification

Two hypotheses received strong support across studies, the Mate Switching Hypothesis and the Resource Acquisition Hypothesis. Study 1 found that engaging in an extra-pair mating was

Table 9
Summary of supported hypotheses by study[ab]

Hypothesis	Study 1: likelihood	Study 2: magnitude	Study 3: contexts	Study 4: SOI
Resource accrual	✓	✓	✓	✓
Mate switching	✓	✓	✓	✓
Sexual gratification	✓	✓	✓	✓
Honing skills of mate attraction	✓		N/T	✓
Elevating self-esteem to improve mating decisions	✓	✓	N/T	
Preference clarification	✓	✓	N/T	
Status elevation	✓	✓	N/T	
Protection		✓	N/T	
Sexy son genes			✓	✓
Fertility backup	✓		✓	
Mate expulsion	✓		N/T	
Revenge to deter mate's infidelity	✓		✓	
Increasing commitment of long-term mate		✓	N/T	

[a] ✓ = supported, N/T = not tested.
[b] Three hypotheses were not tested in any of the studies. They include the *Paternity Confusion Hypothesis*, the *Better Genes Hypothesis* and the *Genetic Diversity Hypothesis*.

perceived to make it more likely that a woman would find a partner whom she felt was more desirable than her current partner and more likely that a woman would secure a back-up potential mate. Study 2 found that discovering a sexual partner who was interested in a commitment to her, willing to spend a lot of time with her and able to replace her steady partner were judged to be highly beneficial for women, if received through a short-term extra-pair mating. Study 3 found that contexts most likely to promote an extra-pair mating include feeling that she can find someone with whom she is more compatible than her current partner, meeting someone who is willing to spend a lot of time with her and meeting someone who is better looking than her current partner who seems interested in her. These findings across studies provide support for the hypothesis that mate switching may be a key function of short-term mating for women.

Acquiring resources also emerges as one possible adaptive function of short-term extra-pair mating. Study 1 found women are likely to receive jewelry, money, free dinners, or clothing by engaging in an extra-pair mating. Similarly, women judged the benefit of career advancement as highly beneficial in Study 2. Contexts judged to increase the likelihood of women engaging in extra-pair mating included when her current partner could not hold down a job, when she meets someone who has better financial prospects than her current partner and seems interested in her and when she meets someone who is more successful than her current partner (Study 3). Study 4 found that women who engage in short-term extra-pair mating perceive the resource benefit as highly beneficial.

Receiving sexual gratification also appears to be a key benefit that emerges across studies. Indeed, Study 1 found that the benefit judged to be most likely to be received by women is sexual gratification. Study 2 found that having a short-term partner who cuddled with her and with whom she experienced orgasms and sexual gratification were judged to be highly beneficial. Study 3 found that having a regular partner who was unwilling to engage in sexual relations with her, with whom sexual relations have been unsatisfying for a long time, or with whom sexual relations have been too infrequent were among the contexts most likely to be perceived as encouraging a woman to have an extra-pair sexual relationship. Finally, Study 4 found that women who engage in short-term mating perceive sexual gratification as more beneficial than women who tend to avoid short-term mating.

Despite the consistency of the importance of sexual problems prompting an affair and sexual gratification being a benefit of an affair, the current studies do not permit inferences about the precise function attached to sexual benefits. Over human evolutionary history, one benefit might have been a fertility backup. An ancestral woman married to a man uninterested in sex may have had a more difficult time getting pregnant. If this is correct, then fertility backup is a possible function of women's short-term mating. Alternatively, a partner's lack of sexual interest may signal to the woman that he is channeling his sexual interest and perhaps commitment elsewhere, in which case the woman might benefit by doing likewise. If this inference is correct, it would support one variant of the mate switching function. A third possibility is that the sexual gratification a woman might gain from an extra-pair mating is not a "function" at all, but instead merely a "beneficial effect" in current environments that did not provide the adaptive impetus for short-term mating in ancestral environments. Which of these interpretations is correct must await future research.

9.2. Hypotheses moderately supported across studies: mate-acquisition skills and status enhancement

Honing skills of mate attraction received support in both Study 1 and Study 4. Although it was rated as likely to be received by women who engage in short-term extra-pair mating, those women who actually do engage in this type of behavior rated it as more likely to occur than women who do not.

Two of the mate skill-acquisition hypotheses received support in both benefit studies, although they were not tested in the context study — clarifying one's mate preferences and elevating self-esteem. Study 1 found that a woman would be likely to clarify the characteristics she thought were important in a potential long-term marriage partner and increase her self-esteem. Study 2 found that among the most beneficial consequences of an extra-pair mating for a woman were clarifying the characteristics she thought were important in a long-term marriage partner, feeling good about herself because her sexual partner respected her, feeling emotionally satisfied because her sexual partner would listen to her problems and experiencing an increase in self-esteem, especially because her sexual partner would make her feel beautiful, intelligent and important. Evolutionary theorists have conceived of the self-esteem elevation as functioning to permit better mating decisions (Miller, 1991, personal communication; Thornhill, 1992).

Improving one's status via short-term extra-pair mating received support in Study 1 where women were found to be likely to meet high status people through her extra-pair partner. Study 2 found that this consequence was rated as moderately beneficial. Although this hypothesis received support in two studies, we hesitate to fully endorse it as a function of short-term extra-pair mating. In each study, it was the only one of the items dealing with status enhancement to be supported and the rating the item received was barely above the median in each study.

9.3. Hypotheses receiving little or no support: mate manipulation, protection, fertility back-up, mate insurance and mate expulsion

Both of the Mate Manipulation Hypotheses — revenge to deter a mate's future infidelity and increasing the commitment of a current mate — received little empirical support. Although the context seen as the most likely to encourage a woman to have an extra-pair mate is when her current partner has had an affair, revenge was *not* rated as a highly beneficial consequence. And although increasing the commitment of a current partner was seen as beneficial *if* it were to occur, participants in Study 1 deemed it highly *unlikely* to occur. Indeed, given that sexual infidelity on the part of the woman is one of the two leading causes of divorce across cultures (Betzig, 1989), it seems more likely that an affair would have the opposite effect, that is decrease the commitment of the woman's regular mate. Although in any individual case, an affair might defy the general trend and have the effect of increasing a regular mate's commitment, the current evidence suggests that this effect is unlikely to have provided the functional impetus for women's extra-pair matings.

Consequences of extra-pair mating seen as highly likely to occur, but not very beneficial when they do occur, include getting rid of a current partner (Mate Expulsion Hypothesis) and

increasing the chances of getting pregnant (Fertility Back-up Hypothesis). Conversely, receiving protection from an abusive mate or family is rated as very beneficial when it does occur, but very unlikely to occur.

The current four studies were not able to provide tests of the various genetic benefits that might potentially accrue from short-term extra-pair mating. Whether short-term extra-pair mating affords a woman adaptive advantages in currencies of better genes, more diverse genes, or sexy son genes must await future research using different methodologies than those currently employed.

9.4. Sex differences in the causal conditions of short-term mating

Although the central focus of this paper is on women's short-term mating strategies, many of the conclusions drawn for women can also be drawn for men. The mate switching hypotheses, for example, are as strongly supported for men as they are for women. Study 1 found that a highly likely benefit for men would be the discovery of someone more desirable than his current partner. Study 3 found that one of the contexts that would most increase the likelihood of an extra-pair copulation for a man would be his feeling that he could find someone with whom he is more compatible than his current partner. Also like women, sexual gratification and self-esteem enhancement figured prominently in the men's perceived benefits and facilitating contexts. These results suggest that the contextual conditions and potential benefits are similar for the sexes in some domains.

In other domains, however, men and women differ in the benefits, costs and contexts associated with extra-pair mating. Women are perceived to be more likely than men to receive immediate resources such as dinners, gifts and jewelry. Women are perceived to be more likely than men to receive physical protection and when received, it is viewed as more beneficial to women than to men. Women are perceived to be more likely than men to clarify what they really want in a long-term mate through extra-pair sex. And a context that is more likely to increase the probability of extra-pair sex for women than for men is meeting another man who wants a commitment.

Men, in contrast, are viewed as more likely to increase their status and reputation and more likely to increase their self-esteem through extra-pair sex, although if a woman were to increase her self-esteem, it is perceived to be more beneficial to her than to a man were he to increase his self-esteem. One unexpected sex difference pertained to two contexts judged to increase the likelihood of extra-pair mating more for men than for women: being substantially *less* successful than one's current partner and relying on the current partner for financial security. Two speculations may be worth exploring. First, a man who is less financially successful than his current partner may violate the desires of the partner, given the higher premium that women place on economic resources in a mate (Buss, 1989). Such a man might reasonably anticipate that his regular mate might leave him and this may prompt the search for mates outside the relationship (Buss, 1988; Hatfield et al., 1979; Symons, 1979; Trivers, 1985). A woman who is less financially successful than her regular mate does not violate the regular mate's desires, since men place less of a premium on economic resources in a mate. Thus, the greater proclivity for men who have relatively fewer resources to have affairs more may constitute an anticipatory strategy of dealing with an impending defection by the woman.

A second possibility is that men whose regular mates are more financially successful than

they are might be with such mates precisely because they are more financially successful, rather than for reasons of love, lust, or sexual attraction. Such women may have settled for men who were lower precisely because such women may be relatively lacking in other qualities men find attractive, such as physical attractiveness or sexiness. Thus, men in this context may be securing economic resources through their regular mates, but sexual gratification through affairs. These speculations await future research.

9.5. Individual differences in short-term mating

Another window for viewing short-term mating is to contrast women who actively pursue short-term mating with those who do not in their subjective cost-benefit evaluations. Study 4 found that women who pursue short-term mating have substantially different perceptions of the benefits of short-term mating when contrasted with women who tend not to pursue short-term mating. This is especially true of their perceptions of the magnitude of benefits associated with short-term mating. Women who tend to pursue short-term mating view four classes of benefits as more beneficial. One pertains to sexual resources. High SOI women, compared with low SOI women, view as highly beneficial having a sexual partner who is willing to experiment sexually, experiencing orgasms with the sexual partner, becoming more aroused, being more sexually appreciated and delighting in the novelty of a new sex partner.

High SOI women also see more benefits to improving skills of attraction and seduction, supporting the Mate Skill Acquisition Hypothesis. High SOI women view the resources from short-term mating as more beneficial, including expensive designer clothing, career advancement, jewelry and use of a partner's car. Access to additional partners was seen as more beneficial by high SOI than low SOI women.

Women who tend to pursue short-term mating also have different perceptions of the contexts likely to promote short-term extra-pair mating. Having a regular partner who gets fired is viewed by high SOI women as more likely to lead to a short-term extra-pair mating, providing further support for the Mate Switching Hypothesis. Furthermore, finding out a current partner is having an affair is perceived by high SOI women as more likely to lead to a short-term extra-pair mating, providing evidence for the Revenge Hypothesis.

Taken together, these findings provide support for several of the hypothesized benefits of short-term extra-pair mating, especially sexual benefits, resource benefits and mate switching benefits. A fascinating issue for future research is why the cost-benefit perceptions of high SOI women differ so dramatically from those of low SOI women. One possibility is that high SOI women, because they are more practiced in short-term mating, are better able to reap benefits and avoid costs. A second possibility is that something about the quality or circumstances of high SOI women change the cost-benefit perceptions. Women who have difficulty keeping a long-term mate, for example, may see the benefits of short-term mating as more advantageous. Other women, perhaps those high in mate value, may be able to reap the benefits of short-term mating without sustaining serious costs. Still another possibility is that women who tend not to pursue short-term mating may not have the relevant short-term mating psychological mechanisms activated and when compounded with lack of experience with short-term mating may overestimate the costs and underestimate the benefits. Which of these alternative causes of individual differences among women in their perceptions is correct must await future research.

9.6. Conceptual complexities: function versus beneficial effect and current versus ancestral environments

Several conceptual complexities require discussion in order to place the current findings in proper perspective. One pertains to the critical distinction between benefits that qualify as 'functions' of short-term mating versus those that are merely 'beneficial effects.' For example, "securing a part as an actress in a movie" may be a beneficial effect of short-term mating, but could not have been a 'function' of short-term mating because motion pictures are a recent invention and not a part of the selective environment in which humans evolved. Of course, this does not preclude "exchanging sex for position or privilege" as a more general function of short-term mating.

For a benefit to qualify as a function of short-term mating means that: (1) there was recurrent selection pressure over human evolutionary history such that (2) the benefit was recurrently reaped by women who engaged in short-term mating under some conditions, (3) that the costs in fitness currencies of pursuing short-term mating were less than the benefits under some conditions and (4) that selection favored the evolution of at least one psychological mechanism specifically designed to promote short-term mating in specific circumstances (Symons, personal communication).

Since we cannot go back in evolutionary time, we must use various standards of evidence for inferring the evolution of a psychological mechanism in women specifically designed to promote short-term mating, much like cosmologists use standards of evidence for making inferences about the origins and evolution of the universe. Among the criteria we can adopt are: (1) Do women in most or all cultures engage in short-term mating under particular conditions when not physically constrained from doing so? (2) Are there specific contexts that predispose women to engage in short-term mating that would imply the existence of psychological mechanisms sensitive to those contexts? (3) Based on our knowledge of ancestral environments, is it reasonable to infer that those specific contexts would have provided recurrent opportunities for women to engage in short-term mating? (4) Is a potential benefit likely to be received by a woman engaging in a short-term mating in those contexts? (5) Is the benefit sufficiently large in magnitude to outweigh the potential costs of short-term mating? (6) Are the contexts in which women engage in short-term mating those in which the costs incurred are minimized and benefits maximized?

The four studies in the current paper cannot address all of these questions and hence cannot unambiguously distinguish those benefits that may be proper functions of short-term mating from those that are merely beneficial effects. Nonetheless, the current studies do provide a guide to those that are reasonably good candidates for function and those that are poor candidates. Given the prevalence of short-term mating across all known cultures, including tribal cultures such as the Ache (Hill & Hurtado, 1996), the Tiwi (Hart & Pilling 1960), the !Kung (Shostak, 1981), the Hiwi (Hill & Hurtado, 1989) and the Yanomamo (Chagnon, 1983), the prevalence of infidelity in plays and novels dating back centuries (Thiessen & Umezawa, 1998), the evidence for human sperm competition (Baker & Bellis, 1994) and the prevalence of male sexuality jealousy (which implies a response to an adaptive problem of female infidelity), we view it as reasonable to infer that ancestral conditions would have permitted recurrent opportunities for women to benefit from short-term mating some of the time.

We view as low-probability candidates those benefits that are perceived to be unlikely to be secured and whose magnitude of benefit is perceived to be trivial. On the other hand, when a benefit is highly likely to be received by a woman from short-term mating, when it is perceived as highly beneficial when received and when a context favoring the reaping of such a benefit is shown to promote short-term mating, then we view the benefit as a reasonable candidate function of short-term mating. Resource acquisition and mate switching are two potential benefits that pass preliminary tests of these three criteria. Clearly, additional tests across different cultures and using different methods to circumvent the limitations of the current methods are needed to evaluate these candidates further.

A second conceptual complexity, related to the first, pertains to differences between the modern environment and the ancestral environment. The modern environment may minimize the costs of short-term mating compared with the ancestral environment. In particular, large cities afford opportunities to engage in short-term mating in relative anonymity. Hence, the reputational damage that might be sustained from short-term mating is minimized. In an ancestral environment of small-group living, it would have been much more difficult to conceal a short-term mating (Hill & Hurtado, 1996). Moreover, the costs of an unwanted or untimely pregnancy are far less today than would have been the case in ancestral environments because of the prevalence of reliable birth control and the availability of abortion. Both of these changes would operate in concert to render short-term mating less costly and hence perhaps more common today than in the ancestral past. On the other hand, the prevalence of deadly sexually transmitted diseases, such as AIDS, may operate against this trend.

These differences between ancestral and modern environments afford windows of insight as well as conceptual difficulties. Fast food restaurants, brimming with concentrated packets of fat, sugar, salt and protein, provide a window into our evolved food preferences, perhaps more so than an analysis of the diet in a tribal society (Symons, August 12, 1993, personal communication). They provide this window because we have far greater latitude to design our 'food environment' in ways that correspond more precisely to our evolved food preferences. Similarly, the fact that modern conditions allow women to design their 'mating environments' because of the lowered costs of short-term mating may provide a clearer window for evaluating women's evolved short-term mating mechanisms than might an analysis of short-term mating in a more restricted or socially constrained society.

9.7. Limitations and future research directions

One methodological limitation pertains to assessing conscious versus unconscious motivations for short-term mating. The current studies are limited in only assessing conscious motives and observations and cannot access those that lie outside of consciousness. There may be other contexts that might prompt a woman to engage in an extra-pair mating, such as when she meets a man who resembles some unconscious archetype of her father, that have been missed entirely by the current methods. Future studies could use alternative methods, such as projective techniques, to circumvent this limitation.

A second limitation pertains to the assessment of perceived benefits and contexts. We view it as reasonable to assume that widespread consensual perceptions of contexts and benefits are likely to have at least some correspondence with actual contexts and benefits that accrue to

those who engage in short-term mating. There is independent evidence that women receive resources such as money, dinners and jewelry from short-term mating (Buss, 1994) and participants indeed perceive that this is a benefit that a woman is likely to reap. Thus, there is no a priori reason to believe that participants are deluded or off-base in their perceptions of the costs and benefits of short-term mating. Nonetheless, an important next step, albeit one that poses formidable methodological difficulties, is to track subjects who actually engage in short-term mating and assess whether those individuals actually reap the benefits identified here and do so under the contexts identified here.

This next research step is linked with a third limitation — the nature of our samples of subjects. While our subjects varied in age and many had had experience with short-term mating, it will be desirable to study samples who are actively grappling with extra-pair mating. Furthermore, a critical next step is to expand the study subjects to include different cultures, especially those that offer different opportunity structures for engaging in extra-pair mating.

In this sense, we view the current four studies as merely one step toward exploring the hidden dimension of short-term mating. The results are consistent enough and powerful enough to call into question some long-held assumptions about human mating. Our studies call into question the long-held premises that men alone benefit from short-term mating and that women benefit primarily from long-term committed mating. Short-term mating carries an abundance of potential benefits for women and there appear to be predictable contexts in which these benefits can be reaped. The idea that women engage in short-term mating is not new. From an evolutionary perspective, however, it is unlikely that so pervasive a pattern would be pursued by women unless there were contexts in which it was advantageous and benefits sufficiently large to be reaped in those contexts. The current studies provide an empirical glimpse of what they might be.

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