

From Vigilance to Violence: Mate Retention Tactics in Married Couples

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Although much research has explored the adaptive problems of mate selection and mate attraction, little research has investigated the adaptive problem of mate retention. We tested several evolutionary psychological hypotheses about the determinants of mate retention in 214 married people. We assessed the usage of 19 mate retention tactics ranging from vigilance to violence. Key hypothesized findings include the following: Men's, but not women's, mate retention positively covaried with partner's youth and physical attractiveness. Women's, but not men's, mate retention positively covaried with partner's income and status striving. Men's mate retention positively covaried with perceived probability of partner's infidelity. Men, more than women, reported using resource display, submission and debasement, and intrasexual threats to retain their mates. Women, more than men, reported using appearance enhancement and verbal signals of possession. Discussion includes an evolutionary psychological analysis of mate retention in married couples.

An individual's life, from the perspective of life history theory, consists of the allocation of effort to various adaptive problems (Charnov, 1993; Stearns, 1992). At the broadest level of analysis, these problems can be partitioned into survival and growth (somatic effort), mating (reproductive effort), parenting and grandparenting (parental and grandparental effort), and investments in nondescendant genetic relatives (roughly kin effort). Within the domain of reproductive effort, much research has been conducted on effort devoted to the adaptive problems of mate selection (Buss, 1989; Buss & Schmitt, 1993; Gangestad & Simpson, 1990; Kenrick & Keefe, 1992; Kenrick, Sadalla, Groth, & Trost, 1990) and mate attraction (Buss, 1988a; Cashden, 1993; Landolt, Lalumiere, & Quinsey, 1995; Schmitt & Buss, 1996; Toke & Camire, 1991). Relatively little research has focused on the adaptive problem of mate retention (Buss, 1988b; however, see Rusbult & Buunk, 1993, for a review of related research on relationship maintenance and commitment).

Once a mate is successfully selected and attracted, and a relationship established, why would mate retention be a profound adaptive problem? First, successfully attracted mates are often not successfully retained. In the United States, for example, the divorce rate hovers near 50% (Cherlin, 1981) and may be approaching figures as high as 67% (Gottman, 1994; Martin & Bumpass, 1989). Worldwide, divorce is present in all known cultures, traditional and modern, and is common across cultures ranging from the Ache of Paraguay (Hill & Hurtado, 1996) to the Zulu of South Africa (Betzig, 1989). Although the rates vary from culture to culture, the ubiquity of divorce suggests that failures of mate retention represent a common and

enduring adaptive problem for humans. There is no reason to believe that our hominid ancestors also did not confront the adaptive problem of mate retention.

Although divorce can represent the total loss of a mate, there is a second important context in which the adaptive problem of mate retention looms large: the threat of diversion of a portion of reproductively relevant resources to others outside the marriage. Sexual infidelities, for example, afflict 20–50% of American married couples and represent a partial loss of the reproductively relevant resources of a mate (see Buss, 1994, and Fisher, 1992, for summaries of this evidence). Evidence from studies of sperm volume and different sperm morphs suggest a long evolutionary history of sperm competition and hence nonmonogamous mating (Baker & Bellis, 1995). Controlling for time since last ejaculation, for example, the number of copulatory sperm inseminated increases with time spent apart from a long-term partner and hence with increased risk of a partner's infidelity and insemination by a rival male. The ratio of different sperm morphs in a man's copulatory ejaculate also appears to track the risk that his partner has been inseminated by a competitor's sperm: With increased time spent apart, and controlling for time since last ejaculation, sperm designed to compete with a rival's sperm increase in frequency relative to sperm designed to fertilize an egg. The power and prevalence of sexual jealousy further suggest a long evolutionary history in which men and women confronted the adaptive problem of mate retention (Buss, Larsen, Westen, & Semmelroth, 1992; M. Wilson & Daly, 1992).

In addition to sexual infidelity, the time, attention, energy, and resources channeled to others outside the marriage may represent partial failures at mate retention. Despite the formal wedding vows, the laws that legally bind couples, and the collective pressure of friends and extended kin to remain coupled, marriage carries no guarantee that a mate gained will be successfully retained.

Evolved psychological mechanisms are "designed" by selection to be sensitive to varying contexts. Mechanisms of mate retention should be no different. We hypothesize that the psy-

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chology of mate retention will be sensitive to at least three key adaptive contexts: the relative value of the mate (and hence the magnitude of the loss experienced by a mate retention failure); the discrepancy between members of the couple in their relative "mate value," which may provide a signal of conjugal dissolution; and the perceived probability of infidelity or defection (e.g., cues signaling that the adaptive problem is salient). We elaborate the logic underlying our evolutionary psychological hypotheses of mate retention.

Value of the Mate

There are many components to "mate value," so many that there is not yet a comprehensive measure of overall mate value. Nonetheless, a great deal is known about the features of mates that are especially valuable to men and women, respectively. From a man's perspective, a central component of a woman's mate value is her *reproductive value*, an actuarial statistic that refers to the woman's expected future reproduction, and her *fertility*, which is represented by the current probability of conception (Buss, 1989; Symons, 1979; Williams, 1975).

Reproductive value and fertility, of course, cannot be observed directly. Nonetheless, two powerful cues to reproductive value and fertility are youth and physical attractiveness, and these are qualities of potential mates known to be highly desirable to men across cultures (Buss, 1989; Symons, 1979). Among humans, female reproductive value peaks in the late teens and declines monotonically thereafter. Fertility peaks in the mid-20s and shows a similar decrement with increasing age. At age 40, reproductive value and fertility both are extremely low; at age 50, they are essentially zero. This leads to our first hypothesis about the determinants of mate retention effort.

Hypothesis 1: Men married to younger women (i.e., those who are more reproductively valuable) will devote more effort to mate retention than men married to older women.

In the social sciences in this century, a common view is that beauty is in the eyes of the beholder (Berscheid & Walster, 1974). Over the past decade, however, results of a large number of studies suggest that standards of physical attractiveness are not arbitrary and not infinitely variable across cultures. Specifically, standards of female physical attractiveness appear to be linked with cues to youth (e.g., smooth skin, good muscle tone), cues to health (e.g., absence of sores or lesions), symmetrical features and averageness (signaling good phenotypical quality and relative absence of environmental insults), and a low waist-to-hip ratio, a known correlate of fertility status (Cunningham, Roberts, Barbee, Druen, & Wu, 1995; Johnston & Franklin, 1993; Langlois & Roggman, 1990; Shackelford & Larsen, 1996, 1997; Singh, 1993; Thornhill & Gangestad, 1993, 1994; see Symons, 1995, for an excellent review of the empirical evidence). As Symons (1995) noted, "beauty is in the adaptations of the beholder" (p. 80). The link between physical attractiveness and a woman's reproductive value suggests a second hypothesis.

Hypothesis 2: Men married to women perceived to be physically attractive will devote more effort toward mate retention than men married to women perceived to be less physically attractive.

From a woman's perspective, a man's ability and willingness

to provide external resources are central to the man's mate value (Buss, 1989; Trivers, 1972). A man's ability to provide resources is more easily measured than his willingness. A man with an abundant income, for example, may channel a portion of his resources to surreptitious extramarital liaisons that are cloaked in secrecy and hence difficult to assess. Nonetheless, *ceteris paribus*, women should devote more effort to retaining men with many resources or excellent prospects for future resources than men with few resources or poor prospects for future resources. This leads to a third hypothesis.

Hypothesis 3: Women married to men with many resources or excellent prospects for future resources will devote more effort toward mate retention than women married to men with fewer resources or poorer prospects for future resources.

Perceived Mate Value Discrepancies

Effort allocated to mate retention also may be linked with perceived discrepancies between husband and wife in mate value. Theoretically, a man married to a woman who has higher mate value may be at greater risk of losing her (Buss, 1994). Because the higher mate-value woman will be able to attract a mate who more closely embodies her desires than her current mate, she may be more tempted to defect from the marriage. The greater risk of defection may prompt men married to such women to intensify their efforts at mate retention.

Hypothesis 4: Men married to women perceived as relatively higher in mate value will devote more effort to mate retention than men married to women equal to, or lower than, themselves in mate value.

A similar logic may apply to men who are higher in mate value, but there also is a key difference. Men can more easily partition their reproductive value than can women. In polygynous societies, for example, a man can partition his resources among several wives, and in these contexts women sometimes choose to secure a fraction of a polygynous man's resources rather than all of a monogamous man's resources. In societies that are legally monogamous, a man can still be effectively polygynous by having mistresses or extramarital partners to whom he devotes some of his resources. In these contexts, a woman married to a man higher in mate value might "tolerate" her husband's extramarital liaisons, just as women married to polygynous men "tolerate" their husbands having sex with other cowives. By the same logic, a man who is higher in mate value than his wife might feel "entitled" to such outside relationships because of his higher mate value. To the degree that a woman's mate value is a function of her reproductive value, it is more difficult for women to fractionate it among various partners. A child that she carries is one man's and cannot be partitioned.

According to this reasoning, a mate-value discrepancy might have opposite effects depending on whether the man or the woman is higher. Women married to men higher in mate value might relax their retention efforts, an implicit acknowledgment that such a man is entitled to devote the surplus mate value to outside relationships. Alternatively, women married to men higher in mate value might intensify their mate retention efforts given the higher probability of defection, according to the same

logic as developed for men's mate retention of women higher in mate value.

One of the goals of the current study was to pit these competing evolutionary hypotheses against each other, and, given the relative novelty of evolutionary psychological analyses, it is perhaps worth commenting briefly about this metatheoretical issue. Much of science involves testing predictions derived from competing theories, and evolutionary psychology, in principle, is no different. Different evolutionary psychological models generate competing predictions, and, as in the rest of science, the empirical tests are the final arbiters.

Sometimes, the fact that alternative evolutionary accounts can be generated is derided, with accusations of telling "just-so stories." This accusation, however, betrays a confusion about levels of scientific analysis. Evolutionary psychology is viewed properly as a metatheory for psychology (Buss, 1995), but it is not in itself a theory about the contents of human nature. As such, hypothesis generation and testing occur among middle-level evolutionary psychological models. Just as in astronomy, in which all theories of cosmology have to be compatible with the modern laws of physics, all evolutionary psychological models have to be compatible with general evolutionary theory in its modern Hamiltonian formulation (Hamilton, 1964). The key point is that testing competing evolutionary hypotheses, as in the present case with competing hypotheses about women's mate retention efforts, is merely part of standard paradigm science.

Perceived Probability of Infidelity

Evolved mechanisms are hypothesized to lie dormant until they are activated by cues signaling that an adaptive problem is being confronted (Buss, 1995; Symons, 1987; Tooby & Cosmides, 1992). One of the most important cues signaling a failure at mate retention is the perception or suspicion of spousal infidelity. From a man's perspective, a sexual infidelity could jeopardize his certainty in paternity, thus risking the loss of all the effort he has expended in selecting, courting, and attracting the mate. He further risks investing in offspring sired by rival men, as well as incurring opportunity costs by forgoing other mating opportunities. Finally, the reputational damage a man incurs by being cuckolded may jeopardize his future mating opportunities (M. Wilson & Daly, 1992).

From a woman's perspective, a sexual infidelity does not jeopardize her certainty in genetic parenthood, but it could signal the diversion of her mate's time, energy, resources, and commitment to other women and their children. Women experiencing these losses also suffer the opportunity costs associated with foregone alternative mate choices. This reasoning leads to a fifth hypothesis.

Hypothesis 5: Individuals who suspect that their partners are likely to be unfaithful will devote more effort toward the adaptive problem of mate retention than will individuals who do not suspect that their partners are likely to be unfaithful.

Sex Differences in the Content of Mate Retention Tactics

We have focused thus far primarily on the effort devoted to the adaptive problem of mate retention. An evolutionary psycho-

logical model of mate retention, however, also can yield predictions about the *content of the tactics* used to retain mates. A comparative perspective can be used to place human mate retention tactics in some perspective (see Thornhill & Alcock, 1983, for an excellent summary of the research on insect mate retention).

The literature on nonhuman mate retention has focused nearly exclusively on the retention of females by males. The range of tactics used can only be described as staggering. They include driving off rival males, herding females to keep them under control, inserting sperm plugs to prevent rival males from gaining access to the female reproductive tract, emitting scents that repel rival males, engaging in prolonged copulation to prevent rival male access, remaining attached to the female after copulation has occurred, building a "fence" around the female, and physically removing the female from locations containing other males (Ghiselin, 1974; Thornhill & Alcock, 1983; E. O. Wilson, 1975; M. Wilson & Daly, 1992).

Among humans, the cross-cultural evidence suggests tactics such as placing women in harems guarded by eunuchs, using chastity belts, inflicting various forms of genital mutilation such as clitoridectomy and infibulation to discourage copulation with other men, physical violence and aggression against women to prevent infidelity or to retaliate for a suspected infidelity, and veiling women of high reproductive value, thus concealing their attractiveness from the eyes of other men (for useful reviews, see Buss, 1994; Dickemann, 1981; Smuts, 1991; M. Wilson & Daly, 1992). Furthermore, sexual jealousy has been proposed as an evolved psychological mechanism that activates mate retention efforts (Buss et al., 1992; Daly, Wilson, & Weghorst, 1982; Symons, 1979).

The most comprehensive taxonomy of human mate retention tactics was proposed by Buss (1988b), who identified 104 acts subsumed by 19 tactics ranging from vigilance to violence. A major limitation of that study, however, pertains to the limited scope and nature of the samples. Specifically, none of the aforementioned hypotheses was tested and the samples consisted of college undergraduates, for whom issues of mate retention may be less salient.

Despite the limitations of Buss's (1988b) study, the taxonomy of mate retention tactics provides a relatively differentiated assessment tool that can be used to test the aforementioned hypotheses. Furthermore, the taxonomy can be used to test two additional hypotheses about sex differences in the content of mate retention tactics.

Hypothesis 6: Men, more than women, will retain their mates by efforts devoted to providing them with the resources inherent in women's mate preferences.

Hypothesis 7: Women, more than men, will retain their mates by efforts devoted to enhancing their physical appearance, thus striving to embody a key element of men's mate preferences.

In summary, the goal of this study was to test seven evolutionary psychological hypotheses about the nature and content of mate retention tactics in a sample of married couples.

Method

Participants

Participants were 214 individuals, 107 men and 107 women, who had been married less than 1 year. Participants were obtained from the public

records of marriage licenses issued within a large county in the Midwest. All couples who had been married within the designated time period were contacted by letter and invited to participate in this study. The mean age of the male sample was 25.46 years ($SD = 6.55$ years). The mean age of the female sample was 24.78 years ($SD = 6.24$ years). Additional details about this sample can be found in Buss (1992).

Procedure

Participants engaged in three separate episodes of assessment. First, they received through the mail a battery of instruments to be completed at home in their spare time. This battery contained a confidential biographical questionnaire, the self-reported acts of mate retention, and a measure designed to assess tactics of hierarchy negotiation, which assessed the effort allocated to status striving (Kyl-Heku & Buss, 1996). Second, participants came to a laboratory testing session approximately 1 week after receiving the first battery. During this testing session, spouses were separated to preserve independence and to prevent contamination due to discussion. During this session, participants reported their perceptions of their partner's physical attractiveness and completed a measure of suspected future infidelity of their partner, as well as other measures designed for different studies. Third, couples were interviewed toward the end of the testing session to provide information about the relationship and to give the interviewers an opportunity to observe the participants so that they could provide independent assessments of physical attractiveness. Confidentiality of all responses was assured. Not even the participant's spouse could obtain responses without written permission from his or her partner.

Materials

Confidential biographical questionnaire. This questionnaire requested information about the participant's age, background socioeconomic status (SES), current yearly income in dollars, degree of religiosity (1 = *not at all religious*, 7 = *extremely religious*), political orientation (1 = *extremely conservative*, 7 = *extremely liberal*), height, weight, and other information.

Acts of mate retention. This instrument was based on the taxonomy developed by Buss (1988b) and contained 104 acts of mate retention randomized with respect to the tactic within which each act was subsumed. The instructions were as follows: "On the following pages are listed a series of acts or behaviors. In this study, we are interested in the acts that people perform in the context of their relationship with their romantic partner. Please circle the word that represents your most accurate estimate of *how often you have performed each act within the past year*. If you have not performed the act at all within the past year, circle 'NEVER' [coded 0]; circle 'RARELY' [coded 1], 'SOMETIMES' [coded 2], or 'OFTEN' [coded 3] to represent your best estimate of the relative frequency with which you have performed each act within the past year."

Sample acts include the following: "I called her at unexpected times to see who she was with," "I did not take him to the party where other females would be present," "I spent all my free time with her so that she could not meet anyone else," "I yelled at another woman who looked at him," "I picked a fight with the man who seemed interested in her," "I acted sexy to take his mind off other women," "I gave her jewelry to signify that she was taken," "I kissed him when other women were around," "I stared coldly at the other man who was looking at her," and "I threatened to harm myself if he ever left me." Endorsements of these acts were summed to form 19 composite tactics of mate retention according to the taxonomy developed by Buss (1988b).

Perceived attractiveness. We obtained two measures of perceived physical attractiveness. One assessed each participant's perceptions of his or her partner's physical attractiveness, using the California Observer

Evaluation Scales (COES; Phinney & Gough, 1986). The COES contains a Physical Evaluation scale that includes the following items: his/her physical attractiveness (*extremely attractive*, *extremely unattractive*), his/her physical beauty (*extremely beautiful or handsome*, *almost ugly*), his/her physique or figure (*extremely good*, *extremely poor*), and his or her personal appearance (*extremely good*, *extremely poor*). Items are evaluated on a 9-point scale, with each point being anchored by a written description, the endpoints of which are indicated in parentheses.

Two interviewers independently rated the overall physical attractiveness of each participant using a 7-point scale (1 = *overall unattractive*, 7 = *overall attractive*). The interviewers' ratings were highly correlated ($r_s = .60$ and $.66$ for men and women, respectively, both $p_s < .001$) and therefore were composited to form a more reliable index of overall physical attractiveness.

Tactics of hierarchy negotiation. An act-report measure was constructed in which participants rated the likelihood of their performing each of 109 acts of hierarchy negotiation, an instrument previously validated (Kyl-Heku & Buss, 1996). The instructions were as follows: "We all do things to get ahead. Below is a list of things people sometimes do to get ahead. Please read each item carefully and decide how likely you are to perform this behavior *to get ahead*."

Participants rated each of the 109 acts on a scale ranging from 1 (*very unlikely to perform the behavior*) to 7 (*extremely likely to perform the behavior*). Subsequently, the ratings of individual acts were summed into 26 composite measures representing the effort devoted to different tactics of hierarchy negotiation. Example of tactics and acts are as follows: work hard (I put in extra time and effort), organize and strategize (I prioritized my goals), socialize selectively (I attended certain social events where certain "key" people would be present), assume leadership (I made decisions for the group), impress others (I worked hard to impress someone), ingratiate self with superiors (I did anything the boss wanted), and advance professionally (I quit a job to take one that paid more).

We conducted a principal-components analysis followed by varimax rotation on the 26 tactics of status striving. Four interpretable factors with eigenvalues greater than 1.0 were retained, accounting for 60% of the total intertactic covariance. Twenty-five of the 26 tactics loaded at least .44 on one of the four factors. We summed with unit weighting the tactics loading on each factor to create a composite scale indexing each factor. The four factors of status striving were (alpha coefficients and sample tactics are in parentheses): Deception/Manipulation (.87; deceptive self-promotion, derogate others, use sex), Industriousness/Knowledge Acquisition (.86; work hard, organize and strategize, obtain education), Social Display/Networking (.87; social participation, cultivate friendships, socialize selectively), and Ingratiate Superiors/Conform (two tactics, .68; ingratiate self with superiors, conform). Details about the validity of this measure of effort allocated to getting ahead are reported in Kyl-Heku and Buss (1996).

Perceived probability of future partner infidelity. This instrument, titled "events with others," contained the following instructional set: "Below are listed a series of events. We would like you to make three responses to each event: 1) estimate the probability or likelihood that the event would occur *within the next year*; 2) estimate the probability or likelihood that *if the event occurred*, you would end the relationship; and 3) estimate the probability that *if the event occurred*, your partner would end the relationship. Circle the number that best corresponds to your estimate of each of these probabilities of occurrence; then, insert estimates on the following items." Response options ranged from 0% to 100%, presented in 10% increments.

The events were arranged in order of increasing severity of infidelity: Partner flirts with a member of the opposite sex within the next year, partner passionately kisses a member of the opposite sex within the next year, partner goes on a romantic date with someone else within the next year, partner has a one-night stand with someone else within the next

Table 1
Demographic and Background Characteristics

Characteristic	Husbands		Wives	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Age	25.46	6.55	24.78	6.24
Socioeconomic status raised in (1 = low, 5 = high)	3.08	0.69	3.15	0.72
Salary (thousands of dollars/year)	20.68	11.87	17.73	11.12
Religiosity (1 = not at all, 7 = extremely)	3.28	1.74	3.83	1.80
Political orientation (1 = extremely conservative, 7 = extremely liberal)	4.36	1.50	4.51	1.44
Height (in.)	70.77	2.60	65.30	2.61
Weight (lb)	174.37	26.05	131.43	23.31

Note. Data were based on responses from 107 husbands and 107 wives.

year, partner has a brief affair within the next year, and partner has a serious affair within the next year.

We conducted a principal-components analysis followed by oblimin (oblique) rotation on the six estimates of perceived infidelity threat. Cattell's (1966) scree test suggested retention of two factors that accounted for 76% of the interestimate covariance and correlated .34. The first factor included the estimates that partner would engage in the five more serious types of infidelity: kissing, dating, having a one-night stand, a brief affair, and a serious affair. Estimates that partner would flirt defined the second factor. In terms of the magnitude of the diverted resources, time, effort, and attention, flirting represents a much less severe form of unfaithfulness than do dating, kissing, having a one-night stand, or a brief or serious affair. That flirting is conceptually distinct from the other types of infidelity was further suggested by the results of the principal-components analysis. Therefore, to focus our analyses, we created a composite index of perceived infidelity threat by summing with unit weighting estimates of the five more serious types of partner infidelity. The α for this index was .83.

Results

Demographic and Background Characteristics

The demographic and background characteristics are shown in Table 1. The sample of couples were in their mid-20s on average, with reasonable variance around that average to allow tests of the age hypotheses. The average background SES of the participants was middle class, with some variation around this average. Religiosity and political orientation were roughly at the midpoints of the scales, with substantial variance around the midpoints. Thus, the sample varied considerably in whether they were religious, and whether they tended to be liberal or conservative politically.

Reported Performance of Mate Retention Tactics

We conducted a repeated measures multivariate analysis of variance (MANOVA) on the differences between husband's and wife's performance of the 19 mate retention tactics. The MANOVA revealed a significant multivariate effect, $F(18, 1080) = 14.06, p < .001$. We followed this multivariate test with univariate tests of sex differences in mean performance of the 19 tactics.

Table 2 shows the means, standard deviations, and correlated means *t* statistics for sex differences for the 19 tactics of mate retention. Examination of the base-rate endorsement of the 19 tactics revealed that 90% of husbands and 96% of wives reported never performing any of the component acts of violence against rivals. Results of analyses involving this tactic therefore should be interpreted with special caution and tentativeness. We report analyses for this tactic for reportorial completeness and, more important, because intrasexual violence can have serious conse-

Table 2
Reported Performance of Mate Retention Tactics

Tactic	Husbands		Wives		Correlated means (<i>t</i>) ^a
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
Vigilance	0.58	0.39	0.59	0.34	-0.47
Concealment of mate	0.11	0.25	0.12	0.30	-0.38
Monopolization of time	0.35	0.47	0.41	0.45	-0.95
Jealousy induction	0.21	0.33	0.26	0.38	-1.41
Punish mate's infidelity threat	0.29	0.39	0.42	0.47	-3.52***
Emotional manipulation	0.32	0.34	0.36	0.39	-1.04
Commitment manipulation	0.88	0.66	0.73	0.52	1.90
Derogation of competitors	0.27	0.33	0.34	0.33	-1.68
Resource display	1.82	0.45	1.43	0.46	7.51***
Sexual inducements	0.94	0.55	0.86	0.52	1.66
Appearance enhancement	1.41	0.54	2.07	0.60	-11.46***
Love and care	2.50	0.42	2.58	0.35	-1.68
Submission and debasement	0.98	0.49	0.76	0.43	3.56***
Verbal possession signals	1.40	0.48	1.51	0.48	-2.06*
Physical possession signals	1.92	0.52	1.91	0.50	0.16
Possessive ornamentation	0.63	0.59	0.54	0.52	1.71
Derogation of mate	0.11	0.22	0.16	0.27	-1.69
Intrasexual threats	0.20	0.38	0.11	0.21	2.35*
Violence against rivals	0.05	0.21	0.01	0.07	1.72

Note. Data were based on responses from 107 husbands and 107 wives. Means and standard deviations were computed by summing the acts composing each tactic and then dividing by the number of acts in each tactic; the transformed scale paralleled the original act performance scale, such that 0 = never perform this tactic, 1 = rarely perform this tactic, 2 = sometimes perform this tactic, and 3 = often perform this tactic.

^a Because of missing data, the degrees of freedom vary from 88 to 103. * $p \leq .05$. *** $p \leq .001$. Probability values for correlations with resource display and appearance enhancement are one-tailed; all others are two-tailed.

quences. Daly and Wilson (1988) documented, for example, that cases of male intrasexual homicide often begin as "trivial altercations" that quickly escalate from raised voices to pushing and punching, until one or the other party wields a lethal weapon. Across the remaining 18 tactics of mate retention, approximately 75% of husbands and wives reported some nonzero level of performance of the relevant component acts.

Supporting Hypothesis 6, men reported significantly greater use of resource display (e.g., "He spent a lot of money on her"). Additionally, men reported significantly greater use of submission and debasement (e.g., "He gave in to her every wish") and intrasexual threats (e.g., "He threatened to hit the guy who was making moves on her"). Supporting Hypothesis 7, women reported significantly greater use of appearance enhancement (e.g., "She made herself 'extra attractive' for him"). Additionally, women reported significantly greater use of verbal possession signals (e.g., "She mentioned to other women that he was taken") and punishment of mate's infidelity threat (e.g., "She threatened to break up if he ever cheated on her").

A Note on Statistical Significance

To test Hypotheses 1–5, we conducted many correlations and partial correlations. To mitigate increased risk of Type I error, we reset our alpha criterion from .05 to .01. We interpret individual results only when they meet or exceed this more conservative alpha criterion. With the alpha level set to .01, 1 in 100 significant statistics will have achieved significance by chance. Our analyses revealed significant results several orders of magnitude beyond this chance level.

Mate Retention as a Function of Partner's Age

One of our key hypotheses was that a man's mate retention effort would be a function of the youth, and hence reproductive value, of his partner (Hypothesis 1). To test this hypothesis, we correlated men's tactics of mate retention with the independently assessed age of their wives, as shown in Table 3.

Men married to younger wives clearly reported devoting greater effort to the adaptive problem of mate retention. Men married to younger wives, compared with men married to older wives, reported greater partner concealment, emotional manipulation, commitment manipulation, verbal signals of possession, possessive ornamentation, intrasexual threats, and violence against rival men. Hypothesis 1 appeared to be strongly supported by these data.

A potential confound or alternative hypothesis is that men's mate retention is a function of the length of the relationship, such that couples early in their relationship engage in more intense mate retention, which then relaxes as the couple becomes more secure in their relationship. A second potential confound is that perhaps the age of the man, rather than the age of his wife, influences the intensity of mate retention. Perhaps younger men are more insecure about holding on to their partners.

To examine these potential confounds or alternative hypotheses, we first correlated the ages of men and the length of the couple's relationship with the intensity of their tactics of mate retention. These are shown in Table 3. Length of relationship was marginally linked with men's mate retention efforts, with only 1 of the 19 correlations emerging as statistically significant at the .01 level. Length of relationship positively covaried with men's reported use of jealousy induction. The man's age was

Table 3
Correlations of Husband's Mate Retention With Wife's Age, Husband's Age, and Length of Relationship

Tactic	Wife's age	Husband's age	LOR	Wife's age, controlling for husband's age and LOR ^a
Vigilance	-.13	-.14	.10	-.06
Concealment of mate	-.22**	-.22*	.20*	-.12
Monopolization of time	-.18*	-.12	.09	-.14
Jealousy induction	.09	.02	.28**	.08
Punish mate's infidelity threat	-.20*	-.06	.07	-.23*
Emotional manipulation	-.26**	-.06	.09	-.31***
Commitment manipulation	-.28**	-.09	-.12	-.28**
Derogation of competitors	-.14	-.06	.21*	-.16
Resource display	-.19*	-.03	.05	-.24**
Sexual inducements	-.05	.00	.04	-.08
Appearance enhancement	-.20*	-.15	.11	-.16
Love and care	-.04	-.04	.03	-.01
Submission and debasement	-.10	-.01	.09	-.14
Verbal possession signals	-.25**	-.22*	.14	-.15
Physical possession signals	-.20*	-.11	.09	-.19*
Possessive ornamentation	-.29***	-.09	.07	-.32***
Derogation of mate	-.01	-.07	.22*	.03
Intrasexual threats	-.37***	-.17	.00	-.35***
Violence against rivals	-.21**	.04	-.01	-.33***

Note. Data were based on responses from 107 husbands and 107 wives. LOR = length of relationship.

^a After partialing, there were 89 couples.

* $p \leq .05$. ** $p \leq .01$. *** $p \leq .001$. The probability values for correlations with wife's age are one-tailed; all others are two-tailed.

even less related to his mate retention efforts, with none of the 19 correlations reaching statistical significance. In contrast to these few and relatively weak relationships, however, the age of the man's partner showed 12 significant correlations, 7 of which met or exceeded the .01 level of statistical significance.

To examine the independent contribution of the wife's age to men's mate retention, we conducted partial correlations, controlling for the age of the man and the length of the relationship. These are shown in the last column of Table 3. These analyses clearly showed that the men devoted more effort to mate retention when they were married to younger wives, independent of their own age and independent of the length of the relationship.

Comparable analyses were conducted for women's mate retention tactics and are reported in Table 4. Women married to younger men, compared with women married to older men, engaged in more emotional manipulation and intrasexual threats. Additionally, younger women, compared with older women, reported greater use of the tactics of punishing their partner's infidelity threat, emotional manipulation, derogation of competitors, and intrasexual threats. In contrast to the results for men's mate retention, however, all of these relationships disappeared when controlling for the age of the woman engaging in mate retention and the length of the couple's relationship.

In summary, the results suggest that men's mate retention efforts were linked clearly with the youth, and hence reproductive value, of their spouses, even after controlling for the potential confounding variables of relationship length and the man's age. Women's mate retention efforts, by contrast, were only weakly linked with their spouse's age, and these links were removed when wife's age and length of relationship were statistically controlled. Women's mate retention appeared to be linked

with their own age, with younger women guarding their partners more intensely than older women.

Mate Retention as a Function of Perceived Attractiveness

To test Hypothesis 2, that men's mate retention effort tracks the perceived physical attractiveness of their partners, we computed correlations between men's mate retention tactics and their perceptions of their partner's physical attractiveness. We also computed correlations between men's mate retention tactics and the independently assessed interviewer judgments of the woman's attractiveness. Analogous correlations were computed for women's mate retention tactics and husband's attractiveness. These results are shown in Table 5.

Men's mate retention tactics were clearly linked with their perceptions of their partner's physical attractiveness, supporting Hypothesis 2. Men married to women they perceived to be physically attractive reported greater resource display, appearance enhancement, verbal signals of possession, and intrasexual threats than did men married to women they perceived to be less physically attractive.

These relationships were not obtained for the interviewer-assessed measure of women's physical attractiveness, which correlated .43 ($p < .001$, one-tailed) with husbands' assessments. A single mate retention tactic, jealousy induction, negatively covaried with the interviewer index of women's attractiveness. Men's mate retention appeared to be more a function of their subjective perceptions of their partner's attractiveness than of independently assessed interviewer judgments of their partner's attractiveness.

Table 4
Correlations of Wife's Mate Retention With Husband's Age, Wife's Age, and Length of Relationship

Tactic	Husband's age	Wife's age	LOR	Husband's age, controlling for wife's age and LOR ^a
Vigilance	-.15	-.19	-.02	-.02
Concealment of mate	-.16	-.20*	-.09	-.04
Monopolization of time	-.13	-.18	-.06	-.02
Jealousy induction	-.07	-.13	.08	.03
Punish mate's infidelity threat	-.22*	-.35***	.00	.02
Emotional manipulation	-.26**	-.30**	-.06	-.07
Commitment manipulation	.13	-.02	.07	.20
Derogation of competitors	-.21*	-.29**	-.04	-.02
Resource display	-.01	-.03	.18	.03
Sexual inducements	-.04	-.10	.16	.04
Appearance enhancement	-.02	-.18	-.11	.13
Love and care	.08	-.04	.09	.16
Submission and debasement	-.06	-.06	.00	-.03
Verbal possession signals	.00	-.19*	-.07	.18
Physical possession signals	.07	-.03	.00	.13
Possessive ornamentation	-.08	-.10	.05	.00
Derogation of mate	-.01	-.01	.04	.00
Intrasexual threats	-.30**	-.30**	.07	-.14
Violence against rivals	-.03	.04	.05	-.07

Note. Data were based on the responses of 107 husbands and 107 wives. LOR = length of relationship.

^a After partialing, there were 95 couples.

* $p \leq .05$. ** $p \leq .01$. *** $p \leq .001$, two-tailed.

Table 5
Correlations of Mate Retention With Spousal and Interviewer Assessments of Attractiveness

Tactic	Husbands		Wives	
	Husband's assessment of wife's attractiveness	Interviewer's assessment of wife's attractiveness	Wife's assessment of husband's attractiveness	Interviewer's assessment of husband's attractiveness
Vigilance	.22*	.06	-.16	-.12
Concealment of mate	-.09	.01	-.18	-.06
Monopolization of time	.11	-.03	-.16	-.13
Jealousy induction	-.10	-.23**	-.26**	-.11
Punish mate's infidelity threat	.14	.09	-.29**	-.20*
Emotional manipulation	.10	.01	-.16	-.04
Commitment manipulation	.22*	.01	-.10	.04
Derogation of competitors	.15	.05	-.20*	-.01
Resource display	.28**	.15	.04	-.04
Sexual inducements	.14	-.05	-.26**	-.11
Appearance enhancement	.46***	.17*	.21*	.17
Love and care	.17*	-.09	.14	.10
Submission and debasement	.14	-.18*	-.02	.00
Verbal possession signals	.25**	.02	.09	-.06
Physical possession signals	.21*	.01	.06	-.11
Possessive ornamentation	.16	.11	-.12	-.26**
Derogation of mate	.03	.13	-.25**	-.17
Intrasexual threats	.28**	.10	-.15	-.24**
Violence against rivals	.20*	.17*	-.07	-.15

Note. Data were based on the responses of 107 husbands and 107 wives.

* $p \leq .05$. ** $p \leq .01$. *** $p \leq .001$. The probability values for correlations with wife's attractiveness are one-tailed; those for correlations with husband's attractiveness are two-tailed.

Analogous correlations for women's mate retention tactics also are shown in Table 5, although no predictions were made about the nature of these relationships. Women who perceived their husbands to be physically attractive devoted less effort to mate retention than did women who perceived their husbands to be less attractive. Women married to men they perceived to be attractive reported less use of jealousy induction, punishing their partner's threats to be unfaithful, sexual inducements, and husband derogation than did women married to men they perceived to be unattractive. As for men, these findings were not replicated with interviewer assessments of the husband's attractiveness, which correlated .39 ($p < .001$, one-tailed) with women's assessments. Women's reported use of possessive ornamentation and intrasexual threats negatively covaried with interviewer ratings of husband's physical attractiveness.

Mate Retention as a Function of Age Discrepancies and Attractiveness Discrepancies

Beyond the age and attractiveness of the partner, perhaps discrepancies between the partners in age or attractiveness might be linked with efforts at mate retention. Because of the many potential confounds and competing hypotheses about discrepancies, these analyses must be regarded as exploratory. People selecting partners who are substantially different from themselves in age or attractiveness might be substantially different from others in a number of respects, such as cohort or sexual proclivities. Nonetheless, the data permit an exploratory analysis of age and attractiveness discrepancies. Perhaps men married to women who are much younger than themselves, or more physi-

cally attractive than themselves, might engage in more intense efforts at mate retention. Perhaps women married to men who are considerably more attractive than they are will engage in more intense efforts at mate retention, according to mate value logic analogous to that outlined for men, or less intense efforts at mate retention stemming from an implicit recognition that men can channel surplus mate value into extrapair copulations. Table 6 shows the correlations between age and attractiveness discrepancy scores and mate retention tactics.

For husband's mate retention efforts, 5 of the 19 correlations reached the .01 level of statistical significance, all suggesting that men married to women substantially younger than themselves engaged in more intense mate retention efforts. These 5 tactics were emotional manipulation, commitment manipulation, possessive ornamentation, intrasexual threats, and violence against rivals.

Similarly, men married to women who were more physically attractive than they were engaged in more intense mate retention efforts, reaching the .01 level of statistical significance for 5 of the 19 retention tactics. These 5 tactics were emotional manipulation, possessive ornamentation, wife derogation, intrasexual threats, and violence against rivals.

We computed analogous correlations for women's mate retention tactics, also shown in Table 6. Age discrepancies between husband and wife were correlated significantly at the .01 level with women's reported use of verbal possession signals. Discrepancies between spouses on physical attractiveness were correlated significantly at the .01 level with women's reported use of possessive ornamentation and violence against rivals. The

Table 6
Correlations of Mate Retention With Interviewer-Rated Attractiveness Discrepancy and Age Discrepancy (Husband Minus Wife)

Tactic	Interviewer-rated attractiveness discrepancy		Age discrepancy	
	Husbands	Wives	Husbands	Wives
Vigilance	-.13	-.20	.01	.07
Concealment of mate	.04	-.04	.04	.08
Monopolization of time	-.07	-.19*	.10	.09
Jealousy induction	.00	-.19*	-.07	.06
Punish mate's infidelity threat	-.21*	-.20*	.17*	.20*
Emotional manipulation	-.24**	-.14	.28**	.12
Commitment manipulation	-.15	-.04	.26**	.16*
Derogation of competitors	-.20*	-.21*	.14	.15
Resource display	-.03	.05	.21*	.00
Sexual inducements	-.04	-.15	.21*	.06
Appearance enhancement	-.10	-.20*	.10	.20*
Love and care	.16	.00	-.02	.12
Submission and debasement	.19*	.01	.11	-.04
Verbal possession signals	-.09	-.19*	.08	.24**
Physical possession signals	-.07	-.19*	.15	.13
Possessive ornamentation	-.22**	-.33***	.28**	-.02
Derogation of mate	-.27**	-.20*	-.05	-.04
Intrasexual threats	-.23**	-.18*	.30***	.04
Violence against rivals	-.34***	-.22**	.32***	-.08

Note. Data were based on the responses of 107 husbands and 107 wives.

* $p \leq .05$. ** $p \leq .01$. *** $p \leq .001$, two-tailed.

three significant correlations suggested that women who are relatively older and less attractive than their husbands engage in less mate retention.

As a final method for testing discrepancies between husbands and wives, we computed difference scores between the husband's and wife's perceptions of his or her partner's attractiveness and independently assessed interviewer judgments of his or her partner's attractiveness, as well as between the husband's perceptions of his wife's attractiveness and the wife's perceptions of her husband's attractiveness. These discrepancy scores then were correlated with mate retention tactics, both controlling and not controlling for husband's age, wife's age, and length of relationship. These correlations are shown in Table 7.

Men who perceived their spouse as being more attractive than their spouse perceived them reported engaging in greater efforts at mate retention, even after controlling for his age, her age, and the length of relationship. Similarly, men who perceived their partner as being relatively more attractive than the interviewers did also engaged in more intense mate retention. Thus, when men perceived their partners as being more attractive than their partners perceived them, as well as more attractive than interviewers perceived their spouses, effort allocated to mate retention increased.

These relationships did not emerge for women's mate retention. Discrepancies between women's perceptions of their husband's attractiveness and interviewers' judgments of their husband's attractiveness were uncorrelated with women's efforts at mate retention. Women who perceived their husbands to be relatively more attractive than their husbands perceived their spouses to be expended less effort toward mate retention. Al-

though these data must be regarded as exploratory, they suggest that perceived attractiveness discrepancies have much different consequences for men's and women's mate retention.

Mate Retention as a Function of Partner's Resources and Effort Allocated to Status Striving

According to Hypothesis 3, women's mate retention efforts were predicted to be partly a function of the man's resources and future resource potential. To test this hypothesis, we correlated mate retention tactics with partner's income and with factor composites of tactics of hierarchy negotiation, which index effort allocated toward getting ahead. Table 8 shows the correlations between women's mate retention and their husband's current yearly income, controlling and not controlling for husband's age, wife's age, and the length of the couple's relationship.

The pattern of correlations between women's mate retention and husband's income appeared to become stronger after partialing out effects due to husband's age, wife's age, and length of relationship. Six of the 19 mate retention tactics significantly and positively covaried with husband's income, with 2 of these reaching the .01 level of statistical significance. Women married to men with higher incomes reported greater vigilance and punishment of their partner's infidelity threats than did women married to men with lower incomes, controlling for his age, her age, and relationship length. Although unimpressive, the pattern of findings for the relationship between women's mate retention and their husband's income is consistent with Hypothesis 3. Women's income, by contrast, did not predict men's use of any of the 19 mate retention tactics at even the .05 level of statistical

Table 7
Correlations of Mate Retention With Spousal-Spousal and Spousal-Interviewer Attractiveness Discrepancies^{a,b}

Tactic	Husbands				Wives			
	SSD	SID	Partialed ^c		SSD	SID	Partialed ^d	
			SSD	SID			SSD	SID
Vigilance	.29**	.17	.27*	.19	.29**	.03	.29**	.04
Concealment of mate	.05	-.03	-.01	-.01	.01	.12	.01	.14
Monopolization of time	.26**	.16	.25*	.19	.24*	.03	.24*	.04
Jealousy induction	.06	.13	.01	.15	.21*	.14	.21	.13
Punish mate's infidelity threat	.31**	.09	.31**	.13	.18	.09	.18	.10
Emotional manipulation	.28**	.12	.28**	.18	.21*	.12	.21	.14
Commitment manipulation	.16	.27*	.19	.31**	.17	.11	.18	.10
Derogation of competitors	.29**	.03	.26*	.08	.13	.18	.12	.20*
Resource display	.13	.16	.13	.20	-.01	-.08	-.02	-.11
Sexual inducements	.22*	.21*	.22*	.22*	.29**	.14	.29**	.12
Appearance enhancement	.23*	.27**	.21	.31**	.19	.00	.20	.01
Love and care	-.03	.26**	-.04	.27*	.13	-.04	.14	-.06
Submission and debasement	.20	.30**	.19	.33**	.12	.04	.11	.04
Verbal possession signals	.17	.20*	.13	.24*	.15	-.14	.16	-.14
Physical possession signals	.18	.20	.16	.24*	.20	-.13	.21	-.13
Possessive ornamentation	.17	.05	.16	.10	.27**	-.12	.27**	.13
Derogation of mate	.09	-.11	.05	-.10	.14	.08	.14	.08
Intrasexual threats	.39***	.19	.42***	.26*	.12	-.06	.09	-.07
Violence against rivals	.29**	.03	.31**	.08	.08	-.07	.07	-.08

Note. Data were based on responses from 107 husbands and 107 wives.

^a Spousal-spousal discrepancy (SSD) = husband's assessment of wife's attractiveness minus wife's assessment of husband's attractiveness; spousal-interviewer discrepancy (SID) = spouse's assessment of target's attractiveness minus interviewer's assessment of target's attractiveness. ^b Correlations in the Partialled columns controlled for husband's age, wife's age, and length of relationship. ^c After partialing, there were 79 couples.

^d After partialing, there were 92 couples.

* $p \leq .05$. ** $p \leq .01$. *** $p \leq .001$, two-tailed.

Table 8
Correlations of Wife's Mate Retention With Husband's Income

Tactic	Husband's income	Husband's income, controlling for husband's age, wife's age, and LOR ^a
Vigilance	.23**	.29**
Concealment of mate	.05	.10
Monopolization of time	.14	.19*
Jealousy induction	.08	.12
Punish mate's infidelity threat	.15	.25**
Emotional manipulation	.05	.14
Commitment manipulation	.15	.13
Derogation of competitors	-.02	.04
Resource display	-.01	.01
Sexual inducements	.04	.07
Appearance enhancement	.17*	.18*
Love and care	.05	.04
Submission and debasement	.14	.17*
Verbal possession signals	.03	.04
Physical possession signals	.06	.04
Possessive ornamentation	.17*	.21*
Derogation of mate	.05	.06
Intrasexual threats	-.04	.06
Violence against rivals	-.04	-.04

Note. Data were based on responses from 107 husbands and 107 wives. LOR = length of relationship.

^a After partialing, there were 93 couples.

* $p \leq .05$, one-tailed. ** $p \leq .01$, one-tailed.

significance, both controlling and not controlling for his age, her age, and relationship length.

Table 9 shows the correlations between men's self-reported efforts at getting ahead and women's efforts at mate retention after partialing out effects due to husband's income, husband's age, wife's age, wife's status striving, and relationship length. Even after controlling for several potentially confounding variables, women married to status-striving men engaged in more intense mate retention, supporting Hypothesis 3. The dimension of status striving most predictive of women's mate retention was Social Display/Networking. Women married to men reporting greater effort allocated to Social Display/Networking reported significantly more emotional manipulation, resource display, appearance enhancement, verbal possession signals, and possessive ornamentation. At the .01 level of statistical significance, the Ingratiate Superiors/Conform dimension of men's self-reported status striving also predicted women's mate retention, although much less strongly than did the Social Display/Networking dimension. Women's reported use of emotional manipulation and sexual inducements positively covaried with men's self-reported ingratiation of superiors and conformity in the workplace.

Analogous correlations for men's mate retention did not yield this pattern. Of the 76 partial correlations between men's mate retention and women's status striving, 2 reached statistical significance at the .01 level, only slightly above what was expected to have obtained by chance. Men married to women reporting greater Industriousness/Knowledge-Seeking and Social Display/Networking reported less use of violence against rivals.

Table 9
Correlations of Wife's Mate Retention With Husband's Status Striving, Controlling for Husband's Age and Income, Wife's Age and Status Striving, and Length of Relationship

Tactic	Deception/ Manipulation	Industrious/ Knowledge	Social Display/ Networking	Ingratiate Superiors/ Conform
Vigilance	.17	.07	.21*	.12
Concealment of mate	.05	.00	.05	.13
Monopolization of time	.04	.08	.15	.11
Jealousy induction	.21*	.01	.17*	.15
Punish mate's infidelity threat	.22*	.01	.18*	.18*
Emotional manipulation	.18*	.06	.23**	.23**
Commitment manipulation	.04	-.03	.12	.05
Derogation of competitors	.03	-.14	.12	.05
Resource display	.20*	.08	.25**	.11
Sexual inducements	.15	.09	.22*	.25**
Appearance enhancement	.09	.02	.23**	.21*
Love and care	.01	.02	.08	-.01
Submission and debasement	-.06	-.02	.11	.01
Verbal possession signals	.12	.08	.26**	.22*
Physical possession signals	.14	.02	.14	.08
Possessive ornamentation	.21*	.15	.32***	.18*
Derogation of mate	.13	-.10	.07	.17*
Intrasexual threats	.08	-.11	.10	.21*
Violence against rivals	.03	-.12	.02	.07

Note. Data were based on responses from 107 husbands and 107 wives. After partialing, there were 91 couples.

* $p \leq .05$. ** $p \leq .01$. *** $p \leq .001$, one-tailed.

In summary, women's mate retention, but not men's mate retention, appeared to be partly a function of spouse's income and, independently, effort allocated by the spouse to getting ahead. Men's mate retention, by contrast, was essentially unrelated to their wife's income and wife's effort allocated to getting ahead.

Mate Retention as a Function of Perceived Infidelity

We computed correlations between the tactics of mate retention and the composite index of perceived infidelity threat, both controlling and not controlling for husband's age, wife's age, relationship length, and perceived attractiveness of spouse. Although we found no simple relationship between perceived infidelity threat and perceived attractiveness of spouse ($r_s = -.12$ and $-.02$ for men and women, respectively, both $p_s > .10$, two-tailed), we included the latter as a control variable to ensure that any discovered relationship between perceived infidelity threat and mate retention effort was not attributable to a complex relationship between perceived attractiveness of the spouse and one or more of the other control variables.

For women, none of the 38 standard or partial correlations reached even the .05 level of statistical significance. Men's intensity of mate retention effort, however, was significantly linked with their perceptions of the likelihood that their wife would be unfaithful within the next year. These results are shown in Table 10.

Men's perceptions of the likelihood that their wife will be unfaithful within the next year positively covaried with their reported use of partner concealment, punishing a partner's threat to be unfaithful, and derogation of rival men. These relationships remained significant even after partialing out effects due to hus-

band's age, wife's age, relationship length, and the husband's perceptions of his wife's physical attractiveness. In summary, the hypothesis that mate retention efforts track the perceived salience of the adaptive problem of partial or total mate defection (Hypothesis 5) was supported for men, but not for women.

Discussion

To our knowledge, this is the first research to examine in detail a wide variety of mate retention tactics used by married individuals. Before discussing the implications of this research, however, several limitations should be pointed out. First, the effort allocated to the problem of mate retention was assessed via self-report, carrying all of the limitations associated with this data source. Future studies could provide independent assessments of mate retention, perhaps by spouses, or by those with detailed knowledge about the couples, or even elicited through experimental procedures. Second, this study is limited in examining a single sample composed primarily of relatively young married couples. Further research could examine a wider range of couples, including couples who have been married for longer periods of time and couples in other cultures. Third, this study was limited in providing rigorous tests of the competing hypotheses about mate-value discrepancies. Further research could profitably develop more adequate measures of overall mate value to test these hypotheses. With these limitations in mind, we now turn to the implications of the findings.

Men's Mate Retention as a Function of Women's Reproductive Value

Two of the most powerful cues to a woman's reproductive value are youth and physical attractiveness (Buss, 1989; Sy-

Table 10
Correlations of Husband's Mate Retention With
Perceived Infidelity Threat

Tactic	Perceived infidelity threat	Perceived infidelity threat, controlling for husband's age, wife's age, husband's assessment of wife's attractiveness, and LOR ^a
Vigilance	.15	.19*
Concealment of mate	.32***	.35***
Monopolization of time	.20*	.22*
Jealousy induction	.13	.17
Punish mate's infidelity threat	.25**	.26**
Emotional manipulation	.10	.09
Commitment manipulation	-.03	-.06
Derogation of competitors	.25**	.30**
Resource display	-.09	-.09
Sexual inducements	.10	.12
Appearance enhancement	-.13	-.09
Love and care	-.05	-.03
Submission and debasement	.21*	.23*
Verbal possession signals	.04	.08
Physical possession signals	-.06	-.05
Possessive ornamentation	-.08	-.10
Derogation of mate	.06	.10
Intrasexual threats	.01	.00
Violence against rivals	-.07	-.10

Note. Data were based on responses from 107 husbands and 107 wives. LOR = length of relationship.

^a After partialing, there were 78 couples.

* $p \leq .05$. ** $p \leq .01$. *** $p \leq .001$, one-tailed.

mons, 1979; Williams, 1975). Therefore, men's mate retention efforts were hypothesized to increase as a function of the youth (Hypothesis 1) and perceived physical attractiveness (Hypothesis 2) of their wife. Because age and physical attractiveness are far less closely linked with men's reproductive value, women's mate retention was not predicted to be closely linked with these variables.

The results strongly confirm these sex-linked hypotheses. Men married to younger women allocate more effort to mate retention than men married to older women. Manifestations of the retention of younger wives range from resource display and investment to intrasexual threats and violence. These results remain strong, even after statistically controlling for obvious "confounds" such as the husband's age and the length of the relationship. In sharp contrast, women's mate retention efforts were only weakly linked with the age of their husband, and even these weak relationships disappeared when controlling for the age of the women and relationship length. Hypothesis 1 thus received strong support in these data.

A similar pattern of results occurs for the husband's perceptions of his wife's physical attractiveness. Men married to women they perceived to be especially attractive engaged in greater resource display and appearance enhancement, reported sending more verbal signals of possession, and made more intrasexual threats. Interestingly, the same links were not found for the interviewer-based measure of physical attractiveness. On the assumption that interviewer judgments provided reasonably valid measures of physical attractiveness, these results suggest

that the activation of men's mate retention is a function of their personal perceptions of their partner's beauty rather than more "objective" or "market value" measures of attractiveness based on the evaluations of independent interviewers.

From an evolutionary psychological perspective, an important question for future research is why men's perceptions of their spouse's physical attractiveness might deviate from parallel objective assessments. In our sample, men judged their wife to be significantly more attractive than did the interviewers (analyses available on request). One hypothesis is that men's enhanced perceptions of their spouse's attractiveness (relative to objective parallel assessments) in part tracked perceived risk of wifely infidelity or desertion. Enhanced attractiveness perceptions, on this account, might stimulate increased mate retention efforts in response to increases in the perceived probability of infidelity or desertion. One prediction deduced from this hypothesis is that the positive relationships we documented between men's reported use of several of the 19 mate retention tactics and the discrepancy between the husband's and interviewers' assessments of the wife's attractiveness (see Table 7) should diminish or disappear if we add to the control variables men's perceptions of their wife's probable infidelity. We conducted these partial correlations and found that, controlling for husband's age, wife's age, relationship length, and husband's perceived infidelity threat, the partial correlations between men's reported mate retention and husband-interviewer discrepancy in judgments of wife's attractiveness in general remained significantly positive. Two of the partial correlations changed in the predicted direction: Looking at Table 7, the partial correlations between the spouse-interviewer discrepancy (SID) and husband's commitment manipulation decreased from .31 ($p < .01$) to .25 ($p < .05$) and between the SID and husband's reported use of verbal possession signals decreased from .24 ($p < .05$) to .16 ($p > .05$). Three of the partial correlations increased, however, once the control on husband's perceived infidelity threat was implemented: The partial correlations between the SID and husband's reported resource display increased from .20 ($p > .05$) to .32 ($p < .01$), between the SID and husband's appearance enhancement increased from .31 ($p < .01$) to .46 ($p < .001$), and between the SID and husband's intrasexual threats increased from .26 ($p < .05$) to .33 ($p < .01$).

On the basis of these exploratory analyses, the documented positive relationships between men's mate retention and the discrepancy between husband's and interviewers' assessments of the wife's attractiveness do not appear to be obviously attributable to the husband's increased estimates of the wife's infidelity. We note, however, that our index of perceived infidelity threat reflected estimates of likely infidelity within the next year. The mate retention measure, by contrast, indexed self-reported mate retention within the past year. A more appropriate test of the hypothesis that enhanced perceptions of spousal attractiveness mediate the link between increased perceived infidelity threat and increased mate retention effort might be possible by constraining the perceived infidelity threat and mate retention indexes to cover the same time period. Additionally, if perceived infidelity threat and mate retention efforts vary considerably over time spans shorter than 1 year—as we suspect they probably do—then it would be useful to secure estimates of probable infidelity and mate retention that reflect the more variable nature

of these phenomena. Daily diary studies with married couples—in which each partner provides information on a daily basis, perhaps over a period of several months—might be particularly useful in testing the hypothesis that men's enhanced perceptions of their wife's attractiveness provide a mediating link between estimates of likely wife's infidelity and husband's increased mate retention efforts.

Women's mate retention, like men's, appears to be a function of subjective perceptions of spousal attractiveness rather than of objective assessments of his attractiveness. Unlike the relationships found for men, however, women's perceptions of their spouse's attractiveness predicted less effort allocated to mate retention. These results are consistent with the hypothesis that women married to men they perceive to be relatively higher in mate value relax their retention efforts, an implicit acknowledgment that such men are entitled to devote the surplus mate value to extramarital relationships. This hypothesis rests fundamentally on the "partitionability" of the reproductive resources a man has to offer. Women's reproductive offerings, tied as they are to gestation, lactation, and child care, cannot be divided between her husband and an extramarital lover, at least not within a single childbearing cycle. Because men's reproductive contributions can be divided among several women, however, a woman might sometimes reap greater reproductive benefits for herself and her children by mating with a man with substantial resources who will divert some portion of those resources to other women and their children (as in polygyny or extramarital relationships) rather than by mating with a man with fewer resources that are unlikely to be diverted to outside relationships.

The analyses of attractiveness and age discrepancies add additional insight into the determinants of mate retention. The men whose wives were substantially more attractive or substantially younger than they were tended to allocate more effort to mate retention than did men whose wives were similar to themselves in age and attractiveness. These findings parallel those found by Daly and Wilson (1988), who discovered an increase in spousal homicides as the age discrepancy between husband and wife increased. Daly and Wilson offered two possible explanations for the greater homicides among age-discrepant partners. One explanation invokes a hyperactivated sexual jealousy mechanism among the older men, perhaps sensitive to a greater probability of spousal defection. The second explanation invokes a generation gap in understandings within the marriage and hence greater conflict as a result. Results of the current study, which showed greater mate retention effort among men whose wives were considerably younger than they were, lend support to Daly and Wilson's activated jealousy explanation.

In summary, there were striking sex differences in the variables correlated with mate retention. The reproductive value of the woman, as indexed by her youth and perceived attractiveness, was consistently linked with men's increased efforts at mate retention. These findings add to a large and growing literature supporting the evolutionary importance of women's reproductive value and the degree to which men have evolved psychological mechanisms sensitive to that value.

Mate Retention as a Function of Resources and Resource Potential of Spouse

We hypothesized that women's mate retention, but not men's mate retention, would be affected by the current resources and

resource potential of the spouse. When effects due to husband's age, wife's age, and relationship length were statistically controlled, the correlations between women's mate retention and husband's income provided some support for this hypothesis. Women married to men with higher incomes reported engaging in greater vigilance and were more punishing of their husband's infidelity threats than were women married to men with lower incomes. Men's mate retention efforts, by contrast, were unrelated to their wife's income.

Perhaps a better indicator of a man's future prospects is the effort he allocates to getting ahead. We found support for this hypothesis in the correlations between women's mate retention efforts and men's independent reports of the effort they allocated to getting ahead. These relationships emerged even after controlling for husband's age and income, wife's age and status striving, and relationship length. The links were positive for all four composite dimensions of hierarchy negotiation, but they were especially consistent for the Social Display/Networking dimension. Women married to men higher on this dimension engaged in greater emotional manipulation, appearance enhancement, resource display, verbal possession signaling, and possessive ornamentation than did women married to men lower on this dimension of status striving. Men's mate retention efforts, by contrast, were unrelated to their partner's effort allocated to getting ahead. In summary, these data provide support for Hypothesis 3. Future studies could profitably examine whether a man's actual resource outcomes that occur over time—income, job promotions, and job losses—affect his wife's mate retention.

Mate Retention and Perceived Infidelity Threat

From an evolutionary psychological perspective, psychological mechanisms are hypothesized to lie dormant until they are activated on confronting the relevant adaptive problem. This framework leads to the expectation that mate retention tactics will be highly context dependent rather than invariantly manifested. We hypothesized (Hypothesis 5) that perceived probability of spousal infidelity would be one contextual activator among several of effort allocated to mate retention.

We found support for this hypothesis among married men. Men who suspected that their wife might be unfaithful over the next year engaged in greater wife concealment; exacted greater punishment for a known, suspected, or threatened infidelity; and derogated rivals more than men who did not anticipate future infidelities. These relationships remained even after statistically controlling for husband's age, husband's assessment of his wife's attractiveness, wife's age, and relationship length. The results for men thus are consistent with the hypothesis that mate retention is driven partly by the degree to which the adaptive problem is faced; in this case, a suspected defection that signals a partial loss of the value of one's mate.

By contrast, women's perceptions of the likelihood of their partner's infidelity over the next year were not significantly correlated with effort allocated to mate retention. One could speculate that a partner's sexual infidelity signals less of a loss for women than for men given the reproductive logic of paternity uncertainty, but this explanation does not square with the findings that women become just as upset as men by a partner's

infidelity, particularly when it represents a serious, emotionally involved relationship (Buss et al., 1992).

Alternatively, one could speculate that women married to men they perceive to be likely to have affairs also perceive their partner to be higher in mate value and so do not feel justified or in a position to constrain him by increased mate retention efforts. In our sample, however, women's estimates that their husbands will be unfaithful within the next year were unrelated to several indexes of husband's relative and absolute mate value, including husband's income ($r = -.07$), husband's status striving ($r_s = .02, .13, .04, \text{ and } .05$, for Deception/Manipulation, Industriousness/Knowledge-seeking, Social Display/Networking, and Ingratiation of Superiors/Conformity, respectively), husband's physical attractiveness (whether wife assessed, $r = -.02$, or interviewer assessed, $r = .02$), the discrepancy between the wife's and husband's assessments of one another's physical attractiveness ($r = .09$), and the discrepancy between the wife's and interviewers' assessments of the husband's physical attractiveness ($r = -.02$, all $p_s > .15$, two-tailed). This list of potential male mate value correlates is, of course, not exhaustive. The husband's mate value, accurately and comprehensively assessed, might yet reliably covary with the wife's likelihood estimates of her husband's future infidelity. One immediate goal for future research is to construct a psychometrically sound index of men's and women's value as a potential mate.

Conclusions

The results of this study provide strong support for the general hypothesis that the sexes differ not merely in the tactics used to retain mates but also in the variables that affect the intensity of mate retention efforts. Men, more than women, clearly used resource display as a mate retention tactic, as hypothesized. Also as hypothesized, women were more likely than men to use appearance enhancement as a mate retention tactic.

Several sex differences in reported tactic performance were discovered that were not anticipated. Men reported greater use of submission and debasement and intrasexual threats. The finding that men, more than women, used intrasexual threats as a mate retention tactic replicates Buss's (1988b) research with college students and is consistent with cross-cultural work documenting the prominence of sexual jealousy as a motive in male-male homicides that begin as "trivial altercations," as with one man's brusque comments about the sexual attractiveness of another man's wife (Daly & Wilson, 1988; Daly et al., 1982). Married men's greater reported use of submission and debasement also replicates Buss (1988b). This tactic includes acts such as "He told her he would change in order to please her" and "Her gave in to her every wish." Submission and debasement is not perceived as differentially effective as a mate retention tactic when used by men compared with women (Buss, 1988b). Nor is this tactic performed especially frequently or infrequently, relative to other retention tactics, by dating or married men and women (Buss, 1988b). It is not clear to us at this time what underlies this replicable sex difference in reported tactic usage.

Women reported greater use of verbal possession signals and were more punishing of their partner's infidelity threats. Punishing a partner's infidelity threat included acts such as "She threatened to break up if he ever cheated on her" and "She

yelled at him after he showed interest in other women." Estimates of marital infidelity consistently document men's greater likelihood of becoming extramaritally involved (Athanasίου, Shaver, & Tavis, 1970; Glass & Wright, 1992; Hunt, 1974; Kinsey, Pomeroy, & Martin, 1948; Kinsey, Pomeroy, Martin, & Gebhard, 1953; Levin, 1975; Petersen, 1983). In addition, men are more likely than women to see their own extramarital sex as justified and experience less guilt when they engage in it (Athanasίου et al., 1970; Johnson, 1970; Spanier & Margolis, 1983). Women's greater use of punishing their partner's infidelity threat might reflect an accurate perception of and apparent counter to men's greater susceptibility to infidelity.

The verbal possession signals tactic included acts such as "She told her female friends how much they were in love" and "She mentioned to other women that he was taken." Both men and women risk incurring substantial costs as a consequence of a partner's extramarital liaisons. Women risk losing their spouse's time, energy, and investment to other women and their children, whereas men risk squandering their resources on offspring to whom they are genetically unrelated (Buss et al., 1992). There thus is strong evolutionary psychological rationale for predicting that both men and women might prevent severe cost infliction by making it clear to potential rivals that their spouse is "taken." Why married women appear to use the verbal possession signals tactic more than do men remains a question for future research.

Men and women not only differed in some key ways in the nature of the mate retention tactics they reported, but, perhaps more important, they differed in the variables that seemed to affect how much effort they allocated to the task. Men's, but not women's, mate retention tactics were consistently linked with the youth and perceived physical attractiveness of their wife, precisely as predicted by our evolutionary hypothesis. Women's, but not men's, mate retention tactics were consistently linked with the effort their spouses allocated to status striving, also as predicted by our evolutionary hypothesis. Although alternative hypotheses might be fashioned post hoc to fit these findings, we know of no existing theory in psychology that would have predicted this precise patterning of sex differences in the contents and correlates of mate retention.

Finally, it is worth noting a potentially powerful practical implication of this research: that particular forms of mate retention may be early indicators of the physical abuse of wives. In a recent article, M. Wilson and Daly (1996) reported that women who had been subjected to "serious violence" at the hands of their husband, 72% of which required medical attention, frequently endorsed items such as "He tries to limit your contact with family or friends" (concealment of mate), "He insists on knowing who you are with and where you are at all times" (vigilance), and "He calls you names to put you down or make you feel bad" (derogation of mate). Although that study was cross-sectional and only examined a few reported acts of mate retention, future studies could profitably follow couples longitudinally and assess a fuller array of mate retention tactics, such as those investigated in the current research, to identify the specific tactics that provide early warning signs for later violence against wives.

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