
Betrayal in Mateships, Friendships, and Coalitions

Todd K. Shackelford

David M. Buss

University of Texas at Austin

Over evolutionary history, different benefits have been gained and lost from long-term mateships, friendships, and coalitions. Humans have evolved psychological mechanisms that are sensitive to cues to possible diversion of benefits to people outside the relationship. Mateships, friendships, and coalitions are predicted to share some of the same benefits but also to differ in some of the resources conferred. Accordingly, the psychological mechanisms sensitive to betrayal are predicted to operate in the same manner in those domains in which benefits are common across relationships and to operate differently in those domains in which benefits are unique to relationship type. Three interpersonal domains are investigated with regard to perceived betrayal: extrarelationship intimate involvement, intrarelationship reciprocity, and relationship commitment. Eight hypotheses are tested across the three relationship domains via perceived betrayal judgments. Results support a model of betrayal entailing some degree of domain specificity but also some generality across domains.

Long-term mateships, close friendships, and coalitions are cross-culturally universal human relationships (Argyle & Henderson, 1984; Brown, 1991; Buss & Schmitt, 1993; Daly & Wilson, 1988; Harcourt & deWaal, 1992). The relevance of these relationships to the human social experience has not been overlooked by psychology. Much of social psychology, for instance, has its base in the study of interpersonal relations (Clark & Reis, 1988; Kelley et al., 1983).

Interest in relationship betrayal and the costs associated with participation in different relationships is not a recent development (Cupuch & Spitzberg, 1994). A substantial body of empirical work has employed the Prisoner's Dilemma and other mixed-motive games in part to identify perceived violations and their relational and participant consequences in different relationship contexts (see, e.g., Axelrod, 1984; Poundstone, 1992; Powers, 1988; Rapoport & Chammah, 1965). Mixed-motive

game research notwithstanding, social psychological research on betrayal across different contexts is sparse and has developed more recently (e.g., Clark & Waddell, 1985; Jones & Burdette, 1994; Metts, 1994).

Identifying the costs, benefits, and violations of relationships is a first step toward understanding the dynamics of relationship betrayal. The mixed-motive and social psychological literatures tend not to offer explicit explanations for why certain relationship contexts entail some costs but not others, some benefits but not others, and why some actions are regarded as a betrayal in some contexts but not others.

Previous work seeking to identify the costs, benefits, and violations of various relationships has tended to lack the direction provided by a coherent, integrative theory of human behavior and psychology. Instead, much of the previous work on relationship betrayal (especially work with the Prisoner's Dilemma and other mixed-motive games; e.g., Poundstone, 1992; Powers, 1988; Rapoport & Chammah, 1965) has been conducted relatively free of any guiding theoretical paradigm, producing hundreds of empirical investigations that have yet to be weaved into a conceptually revealing tapestry of human interpersonal life. One general goal of this article is to demonstrate the utility of employing a well-supported, integrative theory of human behavior and psychology to answer the "why" questions that demand answers if we are to gain a comprehensive understanding of relationship betrayal.

Authors' Note: This article was written while the first author was a Jacob K. Javits Graduate Research Fellow. We thank John Dovidio, Heidi Greiling, Randy Larsen, Randy Thornhill, and three anonymous reviewers for helpful suggestions on an earlier version of this article. Address correspondence to Todd K. Shackelford, University of Texas at Austin, Department of Psychology, Austin, TX 78712, E-mail Shackelford@psy.utexas.edu.

PSPB, Vol. 22 No. 11, November 1996 1151-1164
© 1996 by the Society for Personality and Social Psychology, Inc.

All theories of human interpersonal behavior and functioning imply the selective operation of psychological mechanisms (Buss, 1995; Symons, 1987). With a very few exceptions (e.g., Axelrod, 1984; Buss, 1990, 1994), the existing empirical work on relationship betrayal does not identify and elucidate the operation of the underlying evolved psychological mechanisms that motivate all interpersonal behavior. A second general goal of this article is to investigate this underlying evolved psychological architecture.

In attempting to predict and explain which actions will be judged a betrayal of a given relationship type, we have adopted an evolutionary psychological perspective (Buss, 1995; Daly & Wilson, 1988; Kenrick, Sadalla, Groth, & Trost, 1990; Symons, 1992; Tooby & Cosmides, 1992). One way to predict and explain which behaviors will be interpreted as a betrayal of a relationship is to identify the adaptive benefits that might have accrued to ancestral humans forming that relationship. The psychological mechanisms, or sets of decision rules, activated in the relationship context will have evolved a sensitivity to the provisionment of those resources. Those early humans who were not sensitive to whether they received particular adaptive benefits would have suffered in fitness currencies relative to those who were sensitive (Cosmides, 1989).

A key proposal of this article is that humans possess psychological mechanisms evolved to solve the adaptive problems presented by the potential diversion of resources to persons outside the relationship. This evolved *psychology of betrayal* might serve two functions: (a) to deter the other from committing future betrayals or (b) to motivate the betrayed to terminate the relationship and search for one in which the expected benefits are not diverted. The psychological mechanisms sensitive to betrayal are predicted to operate in the same manner in those domains in which benefits are common across relationships and to operate differently in those domains in which benefits are unique to relationship type. We investigated three interpersonal domains with regard to perceived betrayal: extrarelationship intimate involvement, intrarelationship reciprocity, and relationship commitment. We tested eight hypotheses across the three relationship domains via perceived betrayal judgments.

In this article, a *mateship* refers to a heterosexual, presumptively monogamous, romantic, sexual relationship between two persons. A *close same-sex friendship* refers to a close, nonromantic, nonsexual relationship between two persons of the same sex. A *same-sex coalitional relationship* refers to a nonromantic, nonsexual relationship between two members of a single-sex group that is organized to accomplish specific goals. These definitions are consistent with previous definitions of the three contexts (e.g., Argyle & Henderson, 1984; Daly & Wilson, 1988).

We present hypotheses regarding human evolved betrayal psychology first for the domain of extrarelationship intimate involvement. We then present hypotheses for the domain of intrarelationship reciprocity, highlighting the subdomain of an insistence on immediate reciprocity. Finally, we present hypotheses regarding the betrayal psychology of humans with respect to the domain of relationship commitment. Within this third domain, we consider two subdomains—sharing intimate feelings and countering public derogation of a relationship partner.

Extrarelationship Intimate Involvement

In a presumptively monogamous society, exclusive sexual access is a resource expected by both partners in a committed mateship (Buss, Larsen, Westen, & Semmelroth, 1992; Buss & Schmitt, 1993; Wiederman & Allgeier, 1993; Wilson & Daly, 1992). Human reproduction entails fertilization internal to women. Consequently, men—but not women—over evolutionary history confronted the adaptive problem of uncertain parentage in their offspring. A mate's sexual infidelity placed ancestral men at risk of investing in offspring to whom they were genetically unrelated. Those men who were indifferent to the sexual fidelity of their mates are less likely to be our evolutionary ancestors, for they would have been out-reproduced by men who invested effort in retaining exclusive sexual access to their mates.

Additionally, because romantic involvement might foreshadow sexual involvement (Buss, 1994; Buss et al., 1992), early human men who were not affected by their mates' romantic involvement with other men are likely to have been less reproductively successful than ancestral men who were concerned with and took action in response to this cue to threatened cuckoldry. A psychology of betrayal in a man sensitive to the sexual or romantic infidelity of his mate can be understood as a solution to the adaptive problem of threatened cuckoldry.

Although women have not faced the adaptive problem of uncertain parentage in their offspring, the sexual or romantic infidelity of their mates likely provided a cue to the potential or current loss of other reproductively valuable resources (Daly, Wilson, & Weghorst, 1982). A woman may fear that the resources her mate contributes will be diverted to another woman and her children (Buss & Schmitt, 1993; Daly & Wilson, 1988). A psychology of betrayal in a woman sensitive to the sexual or romantic infidelity of her mate can be understood as a solution to the adaptive problem of threatened loss of reproductively valuable resources (Buss et al., 1992; Buss & Schmitt, 1993).

We hypothesize that the betrayal felt by a mate's sexual infidelity will be more intense when it occurs with an enemy of the mate's partner, relative to when it occurs

with a stranger: Not only is exclusive sexual access lost; in addition, it is lost to a competitor. More damaging would be the case in which one's mate engages sexual relations with one's close friend. A close reciprocal alliance is disrupted in addition to the loss of exclusive sexual access. A mate's sexual involvement with the partner's enemy similarly damages the mateship. Yet, such involvement does not threaten a valuable reciprocal relationship in the process. We hypothesize that betrayal will be greater in response to a mate's sexual relations with the partner's close friend than with the partner's enemy. A parallel set of hypotheses is offered with respect to a mate's romantic infidelity.

In the context of close same-sex friendships and coalitions, sexual or romantic involvement outside of the relationship is not predicted to engender feelings of betrayal. Exclusive sexual or romantic involvement is typically not a resource garnered from these relationships (Argyle & Henderson, 1984). If the involvement of a close friend or coalition member is with one's mate or with a personal or coalitional enemy, however, feelings of betrayal will ensue. In both contexts, feelings of betrayal will be greatest when the sexual or romantic involvement is with the mate of the other relationship member. This is expected because loss of exclusive sexual access to a mate or the diversion of other reproductively valuable resources are likely to prove more reproductively damaging than is the loss of an alliance to a personal or coalitional enemy.

Hypothesis 1: Extrarelationship sexual or romantic involvement will be perceived to be a greater betrayal of a mateship than of a same-sex friendship or coalitional relationship.

Hypothesis 2: Perceived betrayal will be greatest when a mate's sexual or romantic involvement is with a close friend of the mate's partner, next greatest when the involvement is with an enemy of the mate's partner, and least when the involvement is with someone previously unknown to the mate's partner.

Hypothesis 3: Perceived betrayal will be greatest when sexual or romantic involvement is with a close friend's or coalition member's mate, next greatest when the involvement is with a close friend's enemy or coalitional enemy, and least when such involvement is with someone previously unknown to the close friend or coalition member.

Men display greater psychological and physiological distress while imagining a mate's sexual infidelity, whereas women manifest greater distress while imagining a mate's romantic infidelity (Buss et al., 1992; Wiederman & Allgeier, 1993). The pressing adaptive problem for mated men is the threat of cuckoldry associated with a mate's sexual infidelity. For the mated woman, the adaptive concern confronted is not the sexual infidelity

of her mate per se; rather, it is the threatened diversion of his time and resources to another woman.

Hypothesis 4: Men will perceive greater betrayal in the sexual infidelity of a mate, whereas women will perceive greater betrayal in the romantic infidelity of a mate, regardless of the identity of the third party (not previously known, close friend, or enemy).

Intrarelationship Reciprocity

One of the most important characteristics of close relationships is a reciprocity of time, resources, and effort expended by one relationship member for the benefit of the other. This exchange of costs and benefits between relationship parties has been termed *reciprocal altruism* (Trivers, 1971, 1985) and *tit for tat* (Axelrod, 1984; Axelrod & Hamilton, 1981). The time frame of expected reciprocity characterizing different relationship contexts is determined by what Axelrod (1984) terms the *shadow of the future*. When the shadow of the future is short—that is, when the relationship parties have little reason to assume that they will interact in the future—an emphasis on immediate reciprocity develops. When future interaction is uncertain, the potential for cheating arises: A might receive a benefit from B now, promise a reciprocation at some future interaction, then defect from the relationship before that interaction happens.

Cosmides (1989) and Cosmides and Tooby (1992) argue for a collection of species-typical, evolved psychological mechanisms governing social exchange. Cosmides and Tooby offer an account of the evolution of a mechanism for detecting relationship cheaters. We suggest that an important source of input into this "cheater-detector" mechanism is the likelihood that the relationship parties will interact in the future. When the probability of future interaction is low, the mechanism will take as relevant input the extent to which immediate reciprocity is observed. A relationship partner who avoids immediate reciprocity will be registered as a potential cheater. When the probability of future interaction is high, a concern with reciprocity will remain, but adjustments will be made in the decision rules of this cheater-detector mechanism to allow for an extension in the acceptable delay of reciprocation. When the shadow of the future ostensibly looms large, as in close friendships and mateships, what sort of information might be communicated with an insistence on immediate reciprocity?

We hypothesize that A's insistence on immediate reciprocity is a cue that A perceives the likelihood of future interaction with B to be low. To the extent that B also perceives their relationship to have an uncertain future, as when the two are members of a relatively temporary coalition, B will respect A's insistence on immediate reciprocity. If B believes that the likelihood of future

interaction is high, as when the two are ostensibly long-term mates or close friends, he or she will interpret A's insistence on immediate reciprocity as a betrayal of their relationship.

Hypothesis 5: A mate's or close friend's insistence on immediate reciprocity will be perceived to be a greater betrayal of the relationship relative to an analogous betrayal in the context of a coalition.

Relationship Commitment

One of the central foci of close friendships and mateships is a willingness to exchange intimate feelings (Derlega & Berg, 1987; Derlega, Metts, Petronio, & Margulis, 1993). A disinterest in the immediacy of reciprocity cues the perception of an extended future for relationship interaction—that is, that one is committed to the relationship. Sharing intimate feelings with one's partner might indicate commitment to the relationship.

If A opts to share intimate feelings with B, the underlying message is that A is so certain their relationship will continue into the future that he or she is willing to offer access to his or her intimate feelings. Intimate revelations are a form of investment in a relationship that cannot be repossessed following dissolution. In the event that the relationship folded in bitterness, B could strategically employ these revelations against A in the competitive context likely to follow. Intimate revelation may have evolved as a reliable cue to relationship commitment because it is such a potentially costly investment (cf. Zahavi, 1975).

A reluctance to exchange intimate feelings with one's relationship partner is hypothesized to constitute a betrayal of a close friendship and mateship but not a coalition. As we defined it to subjects in our study, a relationship between coalition members is a relatively temporary alliance. The relationship between coalition members is characterized by a relative uncertainty regarding future interaction.

Women tend to self-disclose more than men across a variety of relationships (Cohn & Strassberg, 1983; Cozby, 1973; Derlega et al., 1993; Hill & Stull, 1987; Morton, 1978). A close friendship is not immune to dissolution. When a friendship collapses, the former relationship members often harbor negative feelings toward each other (Argyle & Henderson, 1984). Intimate revelations may bolster an existing friendship. After dissolution, they may be employed to tarnish a reputation: A's confidant turned potential competitor has irretrievable information about A's deepest fears, weaknesses, fantasies, and hopes. In the ensuing task of reassuring current and potential allies that A is a reputable reciprocator who is not to be held responsible for the breakup of their relationship, A might use B's intimate revelations—especially the

less flattering ones—to paint B as an unreciprocating relationship traitor. B might pursue the same malicious strategy.

We speculate that the competition for retention of mutual social alliances following the failure of a same-sex friendship may be more intense for men than for women. The loss of same-sex alliances is likely to have been more reproductively damaging for ancestral men. The ability of ancestral men to successfully acquire and retain a reproductively valuable mate in part required acquisition of various resources needed to support a mate and their offspring (Buss, 1989; Buss & Schmitt, 1993). Because women bear the time and caloric expenses of gestation, parturition, and lactation, they may have relied in part on their mate to provide them and their offspring with the resources necessary for their own and their offsprings' current and future survival and reproduction.

An ancestral man's acquisition of these various resources may have been in part a function of the extent to which he was reciprocally allied with other men in the local population. Any intimate revelations that might be employed to mar the social reputation of an estranged friend may prove more reproductively damaging for a man than a woman, and thus men will tend to avoid intimate revelation in the context of close same-sex friendships.

Hypothesis 6: A reluctance of one mate or close friend to exchange intimate feelings with the other will be perceived to be a greater betrayal of the relationship relative to an analogous betrayal in the context of a coalition.

Hypothesis 7: Women, relative to men, will perceive greater betrayal when a same-sex friend is reluctant to exchange intimate feelings.

According to Argyle and Henderson (1984), one of the basic rules of close friendships is that friends should stick up for one another in each other's absence, as when their personal character is being publicly derogated by others. We suggest that this is also a rule of mateships and coalitional relationships. In the case of coalitions, however, the rule may be slightly altered in that what is demanded is that a coalition member stick up for the character of the coalition as a whole.¹

Our evolutionary ancestors are those who were sensitive to a relationship member's failure to counter public derogation of them, or their coalition, in their absence. Interpreting such a failure as a cue to the other's lack of commitment to the relationship, our ancestors would have terminated these costly relationships, opting to redirect their efforts to more beneficial arrangements. Those protohumans who did not experience and act on this sensitivity are less likely to be our ancestors, for they will not have as effectively negotiated their relationships.

We hypothesize that a failure to counter public derogation of the relevant relationship members will be perceived as a greater betrayal of a mateship and friendship than of a coalition. Mateships and close friendships offer relatively more direct and salient reproductive benefits. These relationships also threaten more direct and salient reproductive costs.

Hypothesis 8: A mate's or close friend's failure to counter public derogation of a relationship partner in that partner's absence will be perceived to be a greater betrayal of the relationship relative to the betrayal elicited by a coalition member's failure to counter public derogation of the coalition in the absence of the coalition members.

METHOD

Subjects

Subjects were 204 undergraduates (89 men, 115 women) at a large midwestern university, fulfilling a requirement for their introductory psychology course. Of the subjects, 82% were Caucasian. The mean age of the subjects was 18.76 years, with a range of 17 to 27 years.

Materials

The survey completed by subjects opened with several biographical questions. Next, subjects responded to three sets of 22 items in which the target person interacted with his or her mate, close same-sex friend, and same-sex coalition member. A given item was presented across the three contexts in identical form, except for the substitution of the words *partner*, *close friend*, and *fellow coalition member*. The sex of the target person matched the sex of the respondent, so that men responded to items about John, whereas women responded to items about Mary.

The instructions given to women for the mateship section read: "Mary S., a female college student, is involved in a committed, romantic, sexual relationship. The statements below contain acts that might occur in Mary's committed, romantic, sexual relationship." The instructions given to women for the friendship section read: "Mary S., a female college student, is involved in a close friendship with another female. Mary is also involved in a committed, romantic, sexual relationship. The statements below contain acts that might occur in Mary's close friendship." The instructions given to women for the coalition section read:

Mary S., a female college student, is a member of a coalition. A coalition is a group of people who work together to accomplish specific goals. In the following statements, Mary's fellow coalition member is a female. Importantly, Mary is NOT close friends with this particular coalition member. Mary is also involved in a committed, romantic,

sexual relationship. The statements below are acts that might occur in Mary's coalition.

For each section, men read similar instructions, with *John* substituted for *Mary*, in addition to the substitution of appropriate sex-referent words.

Subjects were instructed to rate how betrayed the target person would feel if the act or event had occurred. The rating scale ranged from 0 (*Not at all betrayed*) to 8 (*Unbearably betrayed*). The three sections were presented in all six possible orderings across the 204 subjects.

Subjects also responded to a set of forced-choice questions: 11 for the mateship context, and 8 each for the friendship and coalitional contexts. The forced-choice questions were included to provide an alternative means of testing several of the hypotheses. The two items comprising a forced-choice question were identical to two of the items presented in the main section of the survey. Subjects were asked to select which one of the two events would lead the target person to experience greater feelings of betrayal.

Procedures

Subjects from a larger departmental subject pool were randomly scheduled to participate in an experiment entitled "Relationship Betrayal," with approximately 30 subjects of the same sex participating in each session.

RESULTS

Regardless of the content of the item, subjects perceived the greatest betrayal when a given act occurred in the mateship context, next greatest in the friendship context, and least in the coalition context. By the sign test for two groups (Hays, 1988, pp. 139-141), the probability that all 66 rated survey items would elicit greater betrayal in mateships than in friendships, and greater betrayal in friendships than in coalitions, assuming an equal likelihood that either context might elicit the greater betrayal, is $p = 1.36 \times 10^{-20}$.

We sought to determine whether differences in perceived betrayal occur as a function of the relationship context in which the act is embedded, over and above the general tendency for an act to elicit greater perceived betrayal of a mateship than of a friendship or coalition, and of a friendship than of a coalition. It was therefore necessary to ipsatize ratings to accurately test our hypotheses.

For each subject's ratings of the 22 items of a given context, we calculated the discrepancy of each item from the mean rating for all 22 items, then divided this discrepancy by the standard deviation of the ratings for all 22 items. This ipsatization transforms a subject's rating for an item into a relative discrepancy from the "typical" rating given to other items embedded in that context.

TABLE 1: Ipsatized Betrayal Ratings as a Function of Relationship Context

Item (Male Form)	Relationship Context		
	Mateship Mean (SD)	Friendship Mean (SD)	Coalition Mean (SD)
Extrarelationship intimate involvement			
John witnessed his [relationship partner] ¹ having sex with someone previously unknown to John.	1.08 _a (0.37)	-0.94 _b (0.78)	-0.82 _c (0.54)
John's [relationship partner] fell in love with someone previously unknown to John.	0.58 _a (0.44)	-1.25 _b (0.63)	-0.80 _c (0.49)
Intrarelationship reciprocity			
John's [relationship partner] insisted on immediately returning a favor, so that they would be even.	-1.26 _a (0.60)	-0.81 _b (0.63)	-0.64 _c (0.56)
John's [relationship partner] immediately returned a favor, to keep things even between them.	-1.21 _a (0.71)	-0.89 _b (0.57)	-0.73 _c (0.45)
John's [relationship partner] insisted that John immediately return the favor, so that they would be even.	-0.86 _a (0.66)	-0.38 _b (0.64)	-0.29 _b (0.62)
John's [relationship partner] felt cheated because John did not immediately return a favor.	-0.68 _a (0.67)	-0.26 _b (0.55)	-0.18 _b (0.60)
Sharing intimate feelings			
John's [relationship partner] felt uncomfortable about sharing intimate feelings with him.	0.06 _a (0.60)	0.06 _a (0.62)	-0.50 _b (0.49)
John's [relationship partner] insisted it would be inappropriate to reveal intimate feelings to John.	0.08 _a (0.62)	0.06 _a (0.66)	-0.53 _b (0.43)
John's [relationship partner] insisted it would be inappropriate for John to reveal his intimate feelings.	0.08 _a (0.67)	0.11 _a (0.67)	-0.53 _b (0.53)
John's [relationship partner] felt uncomfortable when John shared his intimate feelings.	-0.18 _a (0.62)	-0.05 _a (0.63)	-0.44 _b (0.49)
Countering public derogation			
John found out that a group of people his [relationship partner] was with said bad things about him, and his [relationship partner] did not defend him.	0.22 _a (0.56)	0.55 _b (0.52)	0.18 _a (0.58)
John found out that his [relationship partner] did not stick up for him when others said bad things about him.	0.12 _a (0.57)	0.64 _b (0.53)	0.46 _c (0.65)

NOTE: $N = 204$. Mean ipsatized ratings with different subscripts differ at $p \leq .001$, correlated means t tests (one-tailed).

1. In the survey completed by subjects, the position occupied by *relationship partner* reads *partner*, *close friend*, or *fellow coalition member*.

This a statistically reasonable transformation (Hays, 1988). Moreover, with very few exceptions, the ipsatized ratings are normally distributed, allowing for the appropriate use of parametric statistics (Hays, 1988).

Because many (a priori) t tests were conducted, and because we ipsatized betrayal ratings post hoc, we have adopted the conservative strategy of resetting alpha from .05 to .001. We present the results by relationship domain.²

Extrarelationship Intimate Involvement

Table 1 displays ipsatized betrayal ratings as a function of context. Betrayal ratings given in response to discovering a relationship partner in flagrante delicto with someone previously unknown to the target are highest when the relationship partner is the target's mate. Also shown in Table 1, betrayal ratings for the case in which the relationship partner falls in love with someone previously unknown to the target are highest when the relationship partner is the target's mate. Hypothesis 1 is supported.

Table 2 displays ipsatized betrayal ratings as a function of the identity of the third party and is organized according to type of extrarelationship involvement. Table 2 shows that betrayal ratings are highest when the target discovers his or her mate having sex with the target's best friend, relative to when the third party is the target's enemy or someone previously unknown to the target. Betrayal ratings given when the target discovers his or her mate having sex with an enemy are not significantly different from those given when the third party is someone previously unknown to the target.

Table 2 also shows that betrayal ratings are highest when the target's mate falls in love with the target's best friend, next highest when the target's mate falls in love with the target's enemy, and least when he or she falls in love with someone previously unknown to the target. Thus Hypothesis 2 is supported, with the exception that betrayal ratings given when the target discovers his or her mate having sex with an enemy do not exceed those

TABLE 2: Ipsatized Betrayal Ratings as a Function of Identity of Third Party (Nonrelationship Member)

Item (Male Form)	Identity of Third Party			
	Previously Unknown Mean (SD)	Best Friend Mean (SD)	Enemy Mean (SD)	Mate Mean (SD)
Extrarelationship sexual involvement				
John witnessed his partner having sex with . . .	1.08 _a (0.37)	1.18 _b (0.36)	1.10 _a (0.35)	N/A
John witnessed his close friend having sex with . . .	-0.94 _a (0.78)	N/A	-0.15 _b (0.83)	1.70 _c (0.57)
John witnessed his coalition member having sex with . . .	-0.82 _a (0.54)	N/A	-0.07 _b (0.78)	2.06 _c (0.81)
Extrarelationship romantic involvement				
John's partner fell in love with . . .	0.58 _a (0.44)	0.91 _b (0.43)	0.78 _c (0.40)	N/A
John's close friend fell in love with . . .	-1.24 _a (0.64)	N/A	-0.46 _b (0.68)	1.13 _c (0.67)
John's coalition member fell in love with . . .	-0.80 _a (0.49)	N/A	-0.40 _b (0.61)	1.08 _c (0.80)

NOTE: $N = 204$. Mean ipsatized ratings with different subscripts differ at $p \leq .001$, correlated means t tests (one-tailed).

given when the third party is someone previously unknown to the target.

Table 2 reveals that subjects provide the highest betrayal ratings when the target's close friend or coalition member has sex with or falls in love with the target's mate, the next highest ratings when the third party is the target's personal or coalitional enemy, and the lowest ratings when the third party is someone previously unknown to the target. Hypothesis 3 is supported.

Table 3 displays ipsatized betrayal ratings as a function of sex of subject. Men perceive greater betrayal than do women when a mate is sexually unfaithful, regardless of the identity of the third party. Women perceive somewhat greater betrayal than do men when a mate falls in love with the target's best friend. The sexes perceive equal betrayal when a mate falls in love with an enemy of the target and with someone previously unknown to the target. Thus, for the rated items, Hypothesis 4 is partially supported.

Table 4 displays betrayal ratings given in response to a mate's extrarelationship sexual versus romantic involvement as a function of sex of subject. When subjects are forced to select which situation would elicit greater betrayal, men select sexual infidelity more often than do women, whereas women select romantic infidelity more often than do men, regardless of the identity of the third party. Thus Hypothesis 4 is supported by the forced-choice probes.

Intrarelationship Reciprocity

Table 1 reveals that Hypothesis 5 is not supported. Betrayal ratings are highest when a coalition member

insists on immediate reciprocity, next highest when a friend insists on immediate reciprocity, and least when a mate insists on immediate reciprocity.

Relationship Commitment

Table 1 shows that greater betrayal is perceived when a mate or friend, relative to a coalition member, is reluctant to exchange intimate feelings with the target, supporting Hypothesis 6. Table 3 reveals that women perceive greater betrayal than do men when a same-sex friend is reluctant to exchange intimate feelings, supporting Hypothesis 7.

Table 1 reveals that Hypothesis 8 is partially supported. A friend's, but not a mate's, failure to counter public derogation of a relationship partner was rated a greater betrayal than was a coalition member's failure to back up the coalition when it was publicly derogated.

DISCUSSION

The formation of coalitions, close friendships, and long-term mateships appears to be cross-culturally universal (Argyle & Henderson, 1984; Brown, 1991; Buss & Schmitt, 1993; Daly & Wilson, 1988; Harcourt & deWaal, 1992). The importance of these relationships to human social life is reflected in the many journals on interpersonal relations. Several areas of psychology—social psychology, for instance—are organized around the study of interpersonal relations (Clark & Reis, 1988; Kelley et al., 1983).

Interest in relationship betrayal is not a recent development (Cupuch & Spitzberg, 1994). The Prisoner's Dilemma and other mixed-motive games have been used

TABLE 3: Ipsatized Betrayal Ratings as a Function of Sex of Subject

Item	Sex		Significance ^a
	Male Mean (SD)	Female Mean (SD)	
Extramarital sexual involvement			
Mary/John witnessed her/his partner having sex with someone s/he did not know.	1.16 (0.40)	1.02 (0.32)	$p = .003$
Mary/John witnessed her/his partner having sex with her/his best friend.	1.24 (0.36)	1.13 (0.36)	$p = .012$
Mary/John witnessed her/his partner having sex with someone s/he considered an enemy.	1.18 (0.39)	1.04 (0.31)	$p = .002$
Extramarital romantic involvement			
Mary's/John's partner fell in love with her/his best friend.	0.85 (0.48)	0.96 (0.38)	$p = .038$
Mary's/John's partner fell in love with someone s/he considered an enemy.	0.84 (0.38)	0.74 (0.42)	$n.s.$
Mary's/John's partner fell in with someone s/he did not know.	0.63 (0.46)	0.54 (0.43)	$n.s.$
Sharing intimate feelings in a friendship			
Mary's/John's close friend insisted it would be inappropriate for Mary/John to reveal her/his intimate feelings.	-0.09 (0.60)	0.27 (0.68)	$p < .001$
Mary's/John's close friend felt uncomfortable about sharing intimate feelings with Mary/John.	-0.18 (0.58)	0.23 (0.60)	$p < .001$
Mary's/John's close friend insisted it would be inappropriate for her/him to reveal intimate feelings to Mary/John.	-0.11 (0.63)	0.19 (0.65)	$p < .001$
Mary's/John's close friend felt uncomfortable when Mary/John shared her/his intimate feelings.	-0.22 (0.59)	0.08 (0.64)	$p < .001$

NOTE: ns = 115 women and 89 men.a. As per independent means t test (one-tailed).

TABLE 4: Perceived Betrayal of Mate's Extrarelatioship Sexual Versus Romantic Involvement as a Function of Sex

	Sex		Significance ^a
	Male Count (%)	Female Count (%)	
<i>Endorsed as a Greater Betrayal</i>			
Third party: someone previously unknown to mate			
Sexual infidelity	68 (77.3)	72 (62.6)	<i>p</i> = .02
Romantic infidelity	20 (22.7)	43 (37.4)	
Third party: mate's best friend			
Sexual infidelity	66 (74.2)	71 (61.7)	<i>p</i> = .06
Romantic infidelity	23 (25.8)	44 (38.3)	
Third party: mate's enemy			
Sexual infidelity	67 (75.3)	68 (59.1)	<i>p</i> = .01
Romantic infidelity	22 (24.7)	47 (40.9)	

NOTE: ns = 115 women and 89 men.

a. As per Pearson chi-square test for independence.

to identify the costs, benefits, and perceived violations of various relationship contexts (see, e.g., Axelrod, 1984; Poundstone, 1992; Powers, 1988; Rapoport & Chammah, 1965). With the exception of the mixed-motive literature, social psychological research on relational violations across different contexts appears to have developed only recently (see, e.g., Clark & Waddell, 1985; Jones & Burdette, 1994; Metts, 1994).

The mixed-motive and social psychological literatures, however, tend not to offer explicit accounts for why certain relationship contexts evoke expectations of some benefits but not others, necessitate some costs but not others, and why some actions are regarded as a violation in some contexts but not in others.

An evolutionary psychological perspective has been profitably applied to heterosexual mating (Buss, 1989, 1994; Greiling, 1995), homosexual mating (Bailey, Gaulin, Agyei, & Gladue, 1994; Kenrick, Keefe, Bryan, Barr, & Brown, 1995), attraction (Langlois & Roggman, 1990), criminology and homicide (Daly & Wilson, 1988; Wilson & Daly, 1992), social exchange (Cosmides, 1989; Cosmides & Tooby, 1992), psychophysical perception (Shepard, 1984, 1992), language (Pinker, 1994; Pinker & Bloom, 1992), self-deception (Lockard & Paulhus,

1988), environmental aesthetics (Kaplan, 1992; Orians & Heerwagen, 1992), and numerous other disciplines. One goal of this article was to demonstrate the utility of employing this comprehensive and well-supported theory of human behavior and psychology to answer the critical "why" questions that must be answered if we are to gain a full understanding of relationship betrayal.

All theories of human interpersonal functioning imply the operation of psychological mechanisms (Buss, 1995; Symons, 1987). Much of the existing empirical work on relationship betrayal, however, fails to specify the design and functioning of the underlying psychological mechanisms that motivate all interpersonal behavior. A second general goal of this article was to initiate the difficult but essential task of making explicit the design and functioning of the psychological mechanisms that are sensitive to betrayal in three panhuman relationship contexts. In this section, we discuss the results of our study with reference to the relationship domains we investigated.

Extrarelationship Intimate Involvement

The extrarelationship intimate involvement of a mate, relative to that of a friend or coalition member, elicited greater feelings of betrayal regardless of the identity of the third party, supporting Hypothesis 1. In a presumptively monogamous society, exclusive sexual access is a primary benefit expected of and by both persons involved in a committed mateship (Buss, 1994; Wiederman & Allgeier, 1993; Wilson & Daly, 1992). Because human fertilization is internal to women, men have faced the adaptive problem of uncertain paternity. A woman's sexual infidelity placed her mate at risk of investing in another man's child. Those men who were not concerned with the sexual fidelity of their mates would have been out-reproduced by men—our evolutionary ancestors—who were so concerned.

Additionally, because romantic involvement might foreshadow sexual involvement (Buss et al., 1992), early human men who were not concerned with their mates' romantic involvement with rival men are likely to have been less reproductively successful than ancestral men who were attentive to and took action in response to this cue to threatened cuckoldry.

Although women have not faced the adaptive problem of uncertain maternity in their children, the sexual infidelity of a mate likely foreshadowed the potential loss of reproductively valuable resources to another woman and her children (Daly et al., 1982). Those women who were sensitive to this possibility are likely to have been more successful in the reproductive realm and hence are more likely to be our ancestors (Buss et al., 1992; Buss & Schmitt, 1993).

We hypothesized (Hypothesis 2) that perceived betrayal would be greatest when a mate's sexual or roman-

tic involvement is with a close friend of the mate's partner, next greatest when the involvement is with an enemy of the mate's partner, and least when the involvement is with someone previously unknown to the mate's partner. We found strong support for this hypothesis, with one exception. Subjects in our study did not impute greater betrayal to a mate's sexual involvement with their partner's enemy, relative to when such involvement occurred with someone previously unknown to their partner. Although we suspect the operation of a ceiling effect, the failure of this component of Hypothesis 2 is as yet inexplicable.

Extrarelationship intimate involvement was not predicted to engender feelings of betrayal in same-sex friendships and coalitions, because sexual and romantic exclusivity are not expected benefits of these relationships (Argyle & Henderson, 1984; Buss, 1990). Hypothesis 3 offered that feelings of betrayal would arise, however, if a close friend or coalition member became intimately involved with a relationship partner's mate or with a personal or coalitional enemy.

We found strong support for the hypothesis (Hypothesis 3) that the highest betrayal ratings would be provided when a friend or coalitional member became involved with a mate, the next highest when involvement occurred with a personal or coalitional enemy, and the least when involvement occurred with someone previously unknown to the target person. These results support our contention that the loss of exclusive sexual and romantic access to a mate was more reproductively damaging to early humans than was the loss of an ally to a personal or coalitional enemy. The differential magnitude of these costs is manifested in the perceptions of betrayal produced by the evolved psychological mechanisms of modern humans.

Men manifest greater upset in response to a mate's sexual infidelity, whereas women are more distraught by a mate's romantic or emotional infidelity (Buss et al., 1992). Over evolutionary history, men have faced the adaptive problem of uncertain paternity, a problem that is fundamentally exacerbated by a mate's sexual infidelity per se. For a mated woman, the adaptive concern is not the sexual infidelity per se of her partner but the associated diversion of his commitments and investments to another woman and that woman's children.

Hypothesis 4 stated that men would perceive greater betrayal in a mate's sexual infidelity, whereas women would perceive greater betrayal in a mate's romantic infidelity, regardless of the identity of the third party. To test this hypothesis, we employed ratings along a continuous dimension of betrayal, in addition to a set of forced-choice items asking subjects to select which of the two types of infidelity would elicit greater betrayal in the target person. For both methods of data collection,

we found that men perceived a mate's sexual infidelity to be a greater betrayal than did women. Inconsistent with one component of Hypothesis 4, women and men provided equal ratings of betrayal in response to a mate's romantic infidelity. When forced to select which was the greater betrayal, however, women selected romantic infidelity more often than did men.

The wording of the sexual and romantic infidelity items may not have been comparable in the intensity of infidelity presented. The sexual infidelity scenario had the mate walking in on his or her partner having sex with someone else. The romantic infidelity scenario presented one mate telling the other that he or she had fallen in love with someone else. A comparable romantic infidelity situation might entail one mate discovering the other investing extensive resources in another person. For example, one mate could find an expensive piece of jewelry together with an affectionate card addressed to an illicit lover. Were such an item employed, we might find that women perceive greater betrayal than do men in the romantic infidelity of a mate.

Intrarelationship Reciprocity

Reciprocity of investment is expected in most relationships (Axelrod, 1984; Axelrod & Hamilton, 1981; Trivers, 1971, 1985). The time frame of expected reciprocity, however, varies across contexts. According to Axelrod (1984), when the relationship parties have no expectation of interacting in the future, an emphasis on immediate reciprocity develops to temper the potential for nonreciprocation. The cheater-detector mechanism identified by Cosmides (1989) and Cosmides and Tooby (1992) might operate on different decision rules, according to the certainty of future relationship interaction: When future interaction is likely, adjustments in the decision rules would allow for an extension in the acceptable delay of reciprocation. When future interaction is unlikely, a relationship partner who avoids immediate reciprocation will be registered as a potential cheater.

One relationship member's insistence on immediate reciprocity might serve as a cue to the other relationship member that the former perceives future interaction to be unlikely. This should not elicit betrayal when both partners perceive an uncertain future for their relationship, as in a coalition in which members are known only in the coalitional context. In close relationships such as friendships and mateships—in which the likelihood of future interaction is presumably high—an insistence on immediate reciprocity may elicit feelings of betrayal insofar as it suggests the perception that future interaction is unlikely. Hypothesis 5 suggested that a mate's and close friend's insistence on immediate reciprocity would elicit greater feelings of betrayal than would a coalition member's insistence on immediate reciprocation. When

the ipsatized betrayal ratings were entered into the analyses, we found no support for this hypothesis.

When the nonipsatized ratings (i.e., not controlling for variation within context) were entered into the analyses post hoc, Hypothesis 5 was strongly supported. Perhaps the intensity of mateships and close friendships attenuates the perceived betrayal associated with actions such as insisting on immediate reciprocity. Relative to a mate's or friend's sexual involvement with the relationship partner's enemy, for example, an insistence on immediate reciprocity may appear innocuous.

Clark and her colleagues found several differences in the expectations people adopt in exchange and communal relationships (Clark, 1984; Clark & Mills, 1979; Clark, Mills, & Powell, 1986; Clark & Waddell, 1985; Mills & Clark, 1982). As we have defined it, a relationship between coalition members might be crudely categorized as an exchange relationship, whereas mateships and friendships fall within Clark's conceptualization of communal relationships. Consistent with Hypothesis 5, people in exchange relationships feel betrayed by a partner's reluctance to reciprocate without delay. People in communal relationships, on the other hand, feel betrayed by a partner's insistence on immediate reciprocation.

Because the analyses on the nonipsatized ratings were conducted post hoc, our speculation regarding the support of Hypothesis 5 when the nonipsatized ratings are analyzed must remain speculation. The interesting inconsistency of the results employing ipsatized relative to nonipsatized ratings merits additional research.

Relationship Commitment

We found strong support for Hypothesis 6—that the reluctance of a mate or close friend to exchange intimate feelings would elicit greater feelings of betrayal than a similar reluctance by a coalition member. An important characteristic of close friendships and mateships is a willingness to exchange intimate feelings with one another (Derlega & Berg, 1987; Derlega et al., 1993). Sharing inner feelings could cue commitment to a presumably close relationship, as intimate revelations are an investment that cannot be reclaimed following relationship dissolution.

A reluctance to exchange intimate feelings with a close friend or mate may signal a lack of commitment to the relationship and so elicit feelings of betrayal in these contexts. The relationship between coalition members is, as we have defined it, a more temporary alliance. Coalitional relationships are characterized by a relative uncertainty that the two parties will interact in the same dyadic alliance in the future.

In a series of studies designed to clarify the rules of same-sex friendships, Argyle and Henderson (1984) found that women, relative to men, place greater weight

on rules stipulating intimate conversation, affectionate display, and emotional support. Moreover, women blamed the breakup of same-sex friendships on lack of emotional intimacy and support more than did men.

Consistent with the work of Argyle and Henderson (1984) and confirming Hypothesis 7, women in our study perceive greater betrayal than do men when a same-sex friend is reluctant to exchange intimate feelings. Intimate revelations may bolster an existing friendship. If the friendship dissolves, however, these self-revelations can be employed to enhance one person's reputation while marring the other's. Both may seek to demonstrate to others that they are not to be faulted for the relationship failure and should still be considered reputable friendship material.

In the event of a rancorous fallout between close friends, the ensuing efforts to retain previous alliances and to acquire new ones may be more intense for men than for women. Men's more intense efforts at social alliance management might be related to the selective pressures of women's mating preferences, many of which center on a man's ability to invest in a woman and any children she may bear (Buss, 1989; Buss & Schmitt, 1993). An ancestral man's acquisition of these various resources is likely to have been a function of the degree to which he was reciprocally united with other men in the local populace. Poor social connections may inhibit a man's resource acquisition, and meager resource acquisition may substantially decrease a man's attractiveness as a long-term or short-term mate. Any intimate revelations that might be turned against a previous ally may prove more reproductively damaging for a man than a woman, and thus men avoid sharing intimate feelings with their close same-sex friends.

We hypothesized (Hypothesis 8) that a mate's or close friend's failure to counter public derogation of a relationship partner would be perceived to be a greater betrayal of the relationship relative to the betrayal elicited by a coalition member's failure to counter public derogation of the coalition. Failure to counter public derogation of a relationship partner is rated a greater betrayal of a coalition than of a mateship, refuting this component of Hypothesis 8. A friend's failure to counter public derogation elicited greater betrayal than did a similar failure on the part of a coalition member, supporting this component of Hypothesis 8.

When nonipsatized ratings were entered into the analyses post hoc, Hypothesis 8 was fully supported. As with an insistence on immediate reciprocity, perhaps the intensity of mateships attenuates the perceived betrayal associated with failing to stick up for a mate. Relative to extrarerelationship involvement, for example, failing to challenge public derogation of a mate may appear benign. The inconsistency of the results obtained upon

analysis of ipsatized relative to nonipsatized ratings merits additional research.

A Note on Alternative Theoretical Explanations

Using an evolutionary psychological framework, we generated eight specific hypotheses about perceptions of betrayal across three contexts. Alternative theories of interpersonal relationships such as social exchange theory (Thibaut & Kelley, 1959), equity theory (Walster, Walster, & Berscheid, 1978), and the theory of communal and exchange relationships (Clark & Mills, 1979; Clark & Waddell, 1985) are theories of general relationship functioning. These theories tend not to make specific predictions about particular relationship contexts, as we have done. Additionally, the predictions we tested were generated a priori from an evolutionary psychological perspective. Although alternative theories of interpersonal functioning might be able to explain some of our findings, they can only do so post hoc.

CONCLUSION

This research was guided by the following premises: (a) Over evolutionary history, different resources have been gained and lost from long-term mateships, close same-sex friendships, and coalitions; and (b) humans have evolved psychological mechanisms that are sensitive to cues to possible diversion of benefits to persons outside the relationship. Working from these premises, we offered two general proposals. First, mateships, friendships, and coalitions share some of the same benefits. The psychological mechanisms sensitive to betrayal operate in the same manner in those domains in which benefits transcend relationship type. Second, mateships, friendships, and coalitions also differ in terms of the resources exchanged within them. The psychological mechanisms sensitive to betrayal operate differently in those domains in which benefits are unique to relationship type.

The results of the study suggest that two expectations hold across all three contexts. These cross-context expectations include avoiding extrarerelationship intimate involvement with an enemy and countering public derogation of relationship partners. Employing an evolutionary psychological perspective, we predicted which benefits are context specific. Feelings of betrayal were predicted and discovered only in those contexts that include the relevant expectation. Two expectations hold for the mateship and friendship contexts only: a disinterest in immediate reciprocity, and a willingness to exchange intimate feelings. One expectation holds for the mateship context only: avoiding extrarerelationship intimate involvement with someone previously unknown to the other party in the relationship.³

The results of this study suggest that the psychology of betrayal is, to some extent, domain specific. Different psychological procedures seem tailored to the different sorts of problems entailed by relationship betrayal. Cosmides (1989) and Cosmides and Tooby (1992) postulate a general cheater-detector mechanism that is assumed to operate uniformly as long as a problem is structured as a social contract. We have demonstrated at least some domain specificity to the cheater-detection mechanism, in that perceived betrayal varies with the type of social contract relationship and with the domains within a given social contract relationship.

The present research efforts could be extended by investigating other relationship contexts. Do perceptions of betrayal vary across different parent-child contexts such as genetic, step-, and adoptive? Do certain actions elicit betrayal in the context of a same-sex friendship but not in the context of an opposite-sex friendship? Are the same or different psychological mechanisms operative in homosexual as in heterosexual mateships? Do mixed-sex coalitions engage different evolved mechanisms for processing instances of betrayal than those enacted in same-sex coalitions?

Perceived betrayal could also be investigated with respect to other relationship domains. Intrarelationship sexuality would be a fruitful domain to examine. Within this general domain, researchers could investigate perceived betrayal associated with presumptions of sexual access or with an insistence on sexual relations.

Our definitions and conceptualizations of mateships, friendships, and coalitions admittedly simplify the real-world complexities of these relationship contexts. A mate, for example, might also be a close friend, and a close friend might also be a coalition member. Future research could profitably investigate how some of these complexities affect perceived betrayal judgements.

Another future direction for research is identifying the tactical, behavioral, and emotional output of the psychology of betrayal. Once a perceived betrayal has occurred, what is done about it? What determines decisions to terminate the relationship? What actions deter future betrayals? Are there sex differences in what is considered a reasonable or appropriate response to a particular betrayal in a certain relationship context? Future research might also investigate the emotional reactions to a perceived betrayal, such as outrage, sadness, and humiliation (see, e.g., Jones & Burdette, 1994; Metts, 1994).

We limited our consideration of mateships to monogamous mateships. The mechanisms we have identified may or may not operate, or may operate differently, in the minds of people engaged in polygamous mateships. The relevant psychological mechanisms of a co-wife in a polygynous marriage, for example, are likely

to process her mate's extrarelationship sexual involvement in a profoundly different way than the same evolved mechanisms instantiated in the mind of a woman involved in an ostensibly monogamous marriage.

Betrayal is not a unidimensional emotion. Previous research has documented that the experience of betrayal can include the emotions of anger, sadness, humiliation, hatred, depression, irritation, and upset, for example (Buunk & van Driel, 1989; Jones & Burdette, 1994; Lawson, 1988; Metts, 1994). Importantly, however, the experience of the various components of betrayal might be context dependent. Certain emotions might be more descriptive of betrayal elicited by a mateship violation, for example, than by a friendship violation. Additionally, certain emotional components of betrayal might be more reliably evoked by a violation within one domain of a particular context relative to a violation in other domains of that context.

Subjects in our study responded to the same acts of betrayal across three relationship contexts. The within-subject nature of our design generates the potential for subject demand. For example, subjects may have felt obligated to indicate different levels of perceived betrayal for a particular item, given its appearance in three different contexts. Although it is unlikely that the substantial support we found for most of our hypotheses is entirely attributable to the within-subjects design of our study, future research might replicate our study employing a between-subjects design.

An additional methodological concern of our study is relevant to our assessment of betrayal in response to a mate's extrarelationship involvement. Subjects imagined infidelity with a mate's enemy, best friend, or someone previously unknown to the mate. Given our use of *best friend*, a more comparable condition may have been to have a target's mate involved with the target's *worst enemy*. Whether this possible asymmetry might have confounded our results could be empirically determined.

Subjects in our study responded to betrayal scenarios generated by the authors. A useful extension of our investigation would be to have subjects themselves generate actions they perceive as betrayals of various relationship contexts (e.g., Jones & Burdette, 1994; Metts, 1994). This article has introduced the task of identifying the evolved betrayal psychology of humans. We have provided an initial sketch of several of the basic components of this betrayal psychology with respect to mateships, friendships, and coalitions. Further research is needed to afford an integral description of the psychology of relationship betrayal.

NOTES

1. The relationships between every possible pair of coalition members may vary across a continuum spanning hatred, moderate dislike,

close friendship, and mateship. Although this variability of intracoalitional relationship quality will likely have interesting implications for the degree to which a coalition member feels obligated to counter public derogation of a fellow coalition member's character in his or her absence, this is not a concern of the present investigation and must be left to future research. We instructed our subjects to assume that the target fellow coalition member is not a close friend but is known only in the context of the coalition.

2. Intercorrelations between the dependent variables (ipsatized and nonipsatized) are available upon request.

3. One of the anonymous reviewers of this article noted that "compared to sexual and emotional infidelity, [an insistence on immediate reciprocity, failure to share intimate feelings, and failure to counter public derogation] seem to have weak evolutionary significance." Certainly, the infidelity of a long-term partner is likely to involve greater potential costs in reproductive currencies than is an insistence on immediate reciprocity, failure to share intimate feelings, and failure to counter public derogation. The process of evolution, however, has and continues to work on large and small fitness differentials alike. That the likely costs associated with the latter three betrayals may be relatively less than the costs associated with a long-term partner's infidelities does not mean that natural selection will therefore not have favored those ancestral humans who better solved the relevant adaptive problems.

REFERENCES

- Argyle, M., & Henderson, H. (1984). The rules of friendship. *Journal of Social and Personal Relationships*, 1, 211-237.
- Axelrod, R. (1984). *The evolution of cooperation*. New York: Basic Books.
- Axelrod, R., & Hamilton, W. D. (1981). The evolution of cooperation. *Science*, 211, 1390-1396.
- Bailey, J. M., Gaulin, S., Agyei, Y., & Gladue, B. A. (1994). Effects of gender and sexual orientation on evolutionarily relevant aspects of human mating psychology. *Journal of Personality and Social Psychology*, 66, 1081-1093.
- Brown, D. (1991). *Human universals*. New York: McGraw-Hill.
- Buss, D. M. (1989). Sex differences in human mate preferences: Evolutionary hypotheses tested in 37 cultures. *Behavioral and Brain Sciences*, 12, 1-49.
- Buss, D. M. (1990). Evolutionary social psychology: Prospects and pitfalls. *Motivation and Emotion*, 14, 265-286.
- Buss, D. M. (1994). *The evolution of desire: Strategies of human mating*. New York: Basic Books.
- Buss, D. M. (1995). Evolutionary psychology: A new paradigm for psychological science. *Psychological Science*, 6, 1-30.
- Buss, D. M., Larsen, R. J., Westen, D., & Semmelroth, J. (1992). Sex differences in jealousy: Evolution, physiology, and psychology. *Psychological Science*, 3, 251-255.
- Buss, D. M., & Schmitt, D. P. (1993). Sexual strategies theory: An evolutionary perspective on human mating. *Psychological Review*, 100, 204-232.
- Buunk, B., & van Driel, B. (1989). *Variant lifestyles and relationships*. London: Sage.
- Clark, M. S. (1984). Record keeping in two types of relationships. *Journal of Personality and Social Psychology*, 47, 549-557.
- Clark, M. S., & Mills, J. (1979). Interpersonal attraction in exchange and communal relationships. *Journal of Personality and Social Psychology*, 37, 12-24.
- Clark, M. S., Mills, J., & Powell, M. (1986). Keeping track of needs in communal and exchange relationships. *Journal of Personality and Social Psychology*, 51, 333-338.
- Clark, M. S., & Reis, H. T. (1988). Interpersonal processes in close relationships. *Annual Review of Psychology*, 39, 609-672.
- Clark, M. S., & Waddell, B. (1985). Perceptions of exploitation in communal and exchange relationships. *Journal of Social and Personal Relationships*, 2, 403-418.
- Cohn, N. B., & Strassberg, D. S. (1983). Self-disclosure reciprocity among preadolescents. *Personality and Social Psychology Bulletin*, 9, 97-102.
- Cosmides, L. (1989). The logic of social exchange: Has natural selection shaped how humans reason? Studies with the Wason selection task. *Cognition*, 31, 187-276.
- Cosmides, L., & Tooby, J. (1992). Cognitive expectations for social exchange. In J. Barkow, L. Cosmides, & J. Tooby (Eds.), *The adapted mind: Evolutionary psychology and the generation of culture* (pp. 163-228). New York: Oxford University Press.
- Cozby, P. C. (1973). Self-disclosure: A literature review. *Psychological Bulletin*, 79, 73-91.
- Cupuch, W. R., & Spitzberg, B. H. (Eds.). (1994). *The dark side of interpersonal communication*. Hillsdale, NJ: Lawrence Erlbaum.
- Daly, M., & Wilson, M. (1983). *Sex, evolution, and behavior* (2nd ed.). Boston: Willard Grant.
- Daly, M., & Wilson, M. (1988). *Homicide*. Hawthorne, NY: Aldine de Gruyter.
- Daly, M., Wilson, M., & Weghorst, S. J. (1982). Male sexual jealousy. *Ethology and Sociobiology*, 3, 11-27.
- Derlega, V. J., & Berg, J. H. (Eds.). (1987). *Self-disclosure: Theory, research, and therapy*. New York: Plenum.
- Derlega, V. J., Metts, S., Petronio, S., & Margulis, S. T. (1993). *Self-disclosure*. Newbury Park, CA: Sage.
- Greiling, H. (1995, July). *Women's mate preferences across contexts*. Paper presented at the Seventh Annual Convention of the Human Behavior and Evolution Society, Santa Barbara, CA.
- Harcourt, A. H., & deWaal, F. B. M. (Eds.). (1992). *Coalitions and alliances in humans and other animals*. New York: Oxford University Press.
- Hays, W. L. (1988). *Statistics* (4th ed.). Chicago: Holt, Rinehart & Winston.
- Hill, C. T., & Stull, D. E. (1987). Gender and self-disclosure: Strategies for exploring the issues. In V. J. Derlega & J. H. Berg (Eds.), *Self-disclosure: Theory, research, and therapy* (pp. 81-100). New York: Plenum.
- Jones, W. H., & Burdette, M. P. (1994). Betrayal in relationships. In A. L. Weber & J. H. Harvey (Eds.), *Perspectives on close relationships* (pp. 243-262). Boston: Allyn & Bacon.
- Kaplan, S. (1992). Environmental preference in a knowledge-seeking, knowledge-using organism. In J. Barkow, L. Cosmides, & J. Tooby (Eds.), *The adapted mind: Evolutionary psychology and the generation of culture* (pp. 581-598). New York: Oxford University Press.
- Kelley, H. H., Berscheid, E., Christensen, A., Harvey, J., Huston, T. L., Levinger, G., McClintock, E., Peplau, A., & Peterson, D. R. (Eds.). (1983). *Close relationships*. San Francisco: Freeman.
- Kenrick, D. T., Keefe, R. C., Bryan, A., Barr, A., & Brown, S. (1995). Age preferences and mate choice among homosexuals and heterosexuals: A case for modular psychological mechanisms. *Journal of Personality and Social Psychology*, 69, 1166-1172.
- Kenrick, D. T., Sadalla, E. K., Groth, G., & Trost, M. R. (1990). Evolution, traits, and the stages of humans courtship: Qualifying the parental investment model. *Journal of Personality*, 58, 97-116.
- Langlois, J. H., & Roggman, L. A. (1990). Attractive faces are only average. *Psychological Science*, 1, 115-121.
- Lawson, A. (1988). *Adultery*. New York: Basic Books.
- Lockard, J. S., & Paulhus, D. L. (1988). *Self-deception: An adaptive mechanism?* Englewood Cliffs, NJ: Prentice Hall.
- Metts, S. (1994). Relational transgressions. In W. R. Cupuch & B. H. Spitzberg (Eds.), *The dark side of interpersonal communication* (pp. 217-240). Hillsdale, NJ: Lawrence Erlbaum.
- Mills, J., & Clark, M. S. (1982). Exchange and communal relationships. In L. Wheeler (Ed.), *Annual review of personality and social psychology* (pp. 121-144). Beverly Hills, CA: Sage.
- Morton, T. L. (1978). Intimacy and reciprocity of exchange: A comparison of spouses and strangers. *Journal of Personality and Social Psychology*, 36, 72-81.
- Orians, G. H., & Heerwagen, J. H. (1992). Evolved responses to landscapes. In J. Barkow, L. Cosmides, & J. Tooby (Eds.), *The adapted mind: Evolutionary psychology and the generation of culture* (pp. 555-580). New York: Oxford University Press.
- Pinker, S. (1994). *The language instinct: How the mind creates language*. New York: William Morrow.

- Pinker, S., & Bloom, P. (1992). Natural language and natural selection. In J. Barkow, L. Cosmides, & J. Tooby (Eds.), *The adapted mind: Evolutionary psychology and the generation of culture* (pp. 451-494). New York: Oxford University Press.
- Poundstone, W. (1992). *Prisoner's dilemma*. New York: Doubleday.
- Powers, R. (1988). *Prisoner's dilemma*. New York: Collier.
- Rapoport, A., & Chammah, A. M. (1965). *Prisoner's dilemma: A study in conflict and cooperation*. Ann Arbor: University of Michigan Press.
- Shepard, R. N. (1984). Ecological constraints on internal representation: Resonant kinematics of perceiving, imagining, thinking, and dreaming. *Psychological Review*, 91, 417-447.
- Shepard, R. N. (1992). The perceptual organization of colors: An adaptation to regularities of the terrestrial world? In J. Barkow, L. Cosmides, & J. Tooby (Eds.), *The adapted mind: Evolutionary psychology and the generation of culture* (pp. 495-532). New York: Oxford University Press.
- Symons, D. (1987). If we're all Darwinians, what's the fuss about? In C. Crawford, M. F. Smith, & D. Krebs (Eds.), *Sociobiology and psychology: Ideas, issues, applications* (pp. 121-146). Hillsdale, NJ: Lawrence Erlbaum.
- Symons, D. (1992). On the use and misuse of Darwinism in the study of human behavior. In J. Barkow, L. Cosmides, & J. Tooby (Eds.), *The adapted mind: Evolutionary psychology and the generation of culture* (pp. 137-159). New York: Oxford University Press.
- Thibaut, J. W., & Kelley, H. H. (1959). *The social psychology of groups*. New York: John Wiley.
- Tooby, J., & Cosmides, L. (1992). The psychological foundations of culture. In J. Barkow, L. Cosmides, & J. Tooby (Eds.), *The adapted mind: Evolutionary psychology and the generation of culture* (pp. 19-136). New York: Oxford University Press.
- Trivers, R. L. (1971). The evolution of reciprocal altruism. *Quarterly Review of Biology*, 46, 35-57.
- Trivers, R. (1985). *Social evolution*. Menlo Park, CA: Benjamin/Cummings.
- Walster, E., Walster, G. W., & Berscheid, E. (1978). *Equity: Theory and research*. Boston: Allyn & Bacon.
- Wiederman, M. W., & Allgeier, E. R. (1993). Gender differences in sexual jealousy: Adaptationist or social learning explanation? *Ethology and Sociobiology*, 14, 115-140.
- Wilson, M., & Daly, M. (1992). The man who mistook his wife for chattel. In J. Barkow, L. Cosmides, & J. Tooby (Eds.), *The adapted mind: Evolutionary psychology and the generation of culture* (pp. 289-322). New York: Oxford University Press.
- Zahavi, A. (1975). Mate selection—A selection for a handicap. *Journal of Theoretical Biology*, 53, 205-214.

Received April 24, 1995

Revision accepted January 14, 1996