

Sexual Coercion and Forced In-Pair Copulation as Sperm Competition Tactics in Humans

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Rape of women by men might be generated either by a specialized rape adaptation or as a by-product of other psychological adaptations. Although increasing number of sexual partners is a proposed benefit of rape according to the “rape as an adaptation” and the “rape as a by-product” hypotheses, neither hypothesis addresses directly why some men rape their long-term partners, to whom they already have sexual access. In two studies we tested specific hypotheses derived from the general hypothesis that sexual coercion in the context of an intimate relationship may function as a sperm competition tactic. We hypothesized that men’s sexual coercion in the context of an intimate relationship is related positively to his partner’s perceived infidelities and that men’s sexual coercion is related positively to their mate retention behaviors (behaviors designed to prevent a partner’s infidelity). The results from Study 1 (self-reports from 246 men) and Study 2 (partner-reports from 276 women) supported the hypotheses. The Discussion section addresses limitations of this research and highlights future directions for research on sexual coercion in intimate relationships.

KEY WORDS Anti-cuckoldry; Forced in-pair copulation; Mate retention; Sexual coercion; Sperm competition

Rape in humans may or may not be generated by a specialized psychological adaptation (Alexander and Noonan 1979; Palmer 1991; Thornhill and Palmer 2000; Thornhill and Thornhill 1992). Although several hypotheses have been proposed, there are only two likely candidates for evolutionary explanations of rape in humans. One hypothesis posits that rape is generated by an adaptation that func-

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tions as a facultative male reproductive tactic that contributes directly to reproductive success by increasing number of sexual partners (e.g., Shields and Shields 1983; Thornhill and Thornhill 1983). The other hypothesis posits that there was no direct selection for rape over evolutionary history, but instead it is a by-product of other male psychological adaptations, particularly those associated with sexual variety and aggression (Palmer 1991; Thornhill and Palmer 2000).

Although the debate continues about whether human rape is generated by specialized adaptation or as a by-product, a special case of human rape presents an equally interesting question. If human rape is due either to selection pressures to increase number of sexual partners or to other psychological adaptations, such as those associated with obtaining numerous sexual partners, then *why do men in committed sexual relationships sometimes rape their partner?* Researchers estimate that between 10% and 17% of women experience rape in marriage (Finkelhor and Yllo 1985; Painter and Farrington 1999; Russell 1982). Moreover, particular subgroups of women may be especially at risk of experiencing rape in their marriage: 23% to 50% of physically abused women experience rape by their husbands (Bowker 1983; Campbell 1989; Frieze 1983; Pagelow 1981; Shields and Hanneke 1983). Rape by an intimate partner poses an interesting evolutionary question, given that men in committed sexual relationships already have sexual access to their partner and, thus, will not increase number of sexual partners by raping her.

Although sometimes referred to as *marital rape*, *spouse rape*, or *wife rape*, we use the term *forced in-pair copulation* (FIPC) to refer to the forceful act of sexual intercourse by a man against his partner's will. Before considering the case of FIPC in humans, we review briefly the animal literature on FIPC. Examining the adaptive problems and resultant evolved solutions to these problems in nonhuman animals may provide insight into the adaptive problems and evolved solutions in humans (and vice versa). Shackelford and LeBlanc (2001), for example, argued that because humans share with some avian species a similar mating system (social monogamy) and similar adaptive problems (e.g., paternity uncertainty in males, mate retention, cuckoldry), humans and some birds may have evolved similar solutions to these adaptive problems. Identifying the contexts and circumstances in which FIPC occurs in nonhuman species may help us to understand why FIPC occurs in humans.

FORCED IN-PAIR COPULATION IN NONHUMAN ANIMALS

Instances of FIPC are relatively rare in the animal kingdom, primarily because males and females of most species (more than 95%) do not form long-term pair-bonds (Andersson 1994). Without the formation of a pair-bond, FIPC, by definition, cannot occur. Many avian species form long-term pair-bonds, and researchers have documented FIPC in several of these species (Bailey, Seymour, and Stewart 1978; Barash 1977; Birkhead, Hunter, and Pellatt 1989; Cheng, Burns, and McKinney 1983; Goodwin 1955; McKinney, Cheng, and Bruggers 1984; McKinney and Sto-

len 1982). FIPC is not performed randomly, however. FIPC reliably occurs immediately after extra-pair copulations, intrusions by rival males, and female absence in many species of waterfowl (e.g., Bailey et al. 1978; Barash 1977; Cheng et al. 1983; McKinney, Derrickson, and Mineau 1983; McKinney and Stolen 1982; Seymour and Titman 1979) and other avian species (e.g., Birkhead et al. 1989; Goodwin 1955; Valera, Hoi, and Kristin 2003). FIPC following observed or suspected extra-pair copulation in these avian species is often interpreted as a sperm competition tactic (Barash 1977; Cheng et al. 1983; Lalumi_re et al. 2005; McKinney et al. 1984).

Sperm competition is a form of male postcopulatory competition. Sperm competition occurs when the sperm of two or more males simultaneously occupy the reproductive tract of a female and compete to fertilize her egg (Parker 1970). Males can compete for mates, but if two or more males have copulated with a female within a sufficiently short period of time, males must compete for fertilizations. Thus, the observation in many avian species that FIPC immediately follows extra-pair copulations has been interpreted as a sperm competition tactic because the in-pair male's FIPC places his sperm in competition with sperm from an extra-pair male (Birkhead et al. 1989; Cheng et al. 1983). Reports of FIPC in nonhuman species are theoretically beneficial in that they make it difficult to claim that males rape their partners to humiliate, punish, or control them—as is often argued by some social scientists who study rape in humans (e.g., Pagelow 1981).

Mounting evidence suggests that sperm competition has been a recurrent and important feature of human evolutionary history. Psychological, behavioral, physiological, anatomical, and genetic evidence reveals that ancestral women sometimes mated with multiple men within sufficiently short time periods so that sperm from two or more males simultaneously occupied the reproductive tract of one woman (Baker and Bellis 1993; Gallup et al. 2003; Goetz et al. 2005; Kilgallon and Simmons 2005; Pound 2002; Shackelford et al. 2002, 2004; Shackelford, Pound, and Goetz 2005; Smith 1984; Wyckoff, Wang, and Wu 2000). This adaptive problem led to the evolution of adaptive solutions to sperm competition. For example, men display copulatory urgency, perform semen-displacing behaviors, and adjust their ejaculates to include more sperm when the likelihood of female infidelity is high (Baker and Bellis 1993; Goetz et al. 2005; Shackelford et al. 2002).

The selective importance of sperm competition in humans, however, is an issue of scholarly debate. Those questioning the application of sperm competition to humans (e.g., Birkhead 2000; Dixson 1998; Gomendio, Harcourt, and Rold-n 1998) do not contend that sperm competition in humans is not possible or unlikely, but that it may not be as intense as in other species with adaptations to sperm competition. Recent work on the psychological, physiological, behavioral, anatomical, and genetic evidence of human sperm competition (cited above), however, was not considered in these previous critiques of human sperm competition. When all of the evidence of adaptations to sperm competition in men and in women and current nonpaternity rates are considered (for reviews, see Anderson 2006; Bellis et al.

2005), it is reasonable to conclude that sperm competition may have been a recurrent and selectively important feature of human evolutionary history.

FORCED IN-PAIR COPULATION IN HUMANS

Noting the instances of FIPC followed by extra-pair copulations in waterfowl and documentation that FIPC in humans often follows accusations of female infidelity (e.g., Finkelhor and Yllo 1985; Russell 1982), Wilson and Daly (1992) suggested that “sexual insistence” in the context of a relationship might act as a sperm competition tactic in humans as well. Sexual coercion in response to cues of his partner’s sexual infidelity might function to introduce a male’s sperm into his partner’s reproductive tract at a time when there is a high risk of cuckoldry.

Thornhill and Thornhill (1992) also hypothesized that FIPC may be an anti-cuckoldry tactic designed over human evolutionary history by selective pressures associated with sperm competition. Thornhill and Thornhill argued that a woman who resists or avoids copulating with her partner might thereby be signaling to him that she has been sexually unfaithful and that the FIPC functions to decrease his paternity uncertainty. Thornhill and Thornhill argued that the fact that the rape of a woman by her partner is more likely to occur during or after a breakup—times in which men express great concern about female sexual infidelity—provides preliminary support for the hypothesis. Finkelhor and Yllo (1985), for example, found that more than two-thirds of the women in their sample were raped by their partner at the end of the relationship, whereas only 31% were raped early in the relationship and 40% were raped in the middle of the relationship. Thornhill and Thornhill also cited research by Frieze (1983) indicating that women who were physically abused and raped by their husbands rated them to be more sexually jealous than did women who were abused but not raped. Similar arguments were presented by Thornhill and Palmer (2000), and Lalumi_re et al. (2005) suggested that antisocial men who suspect that their female partner has been sexually unfaithful may be motivated to engage in FIPC.

FIPC and Sexual Coercion in Intimate Relationships

FIPC is just one aspect of a constellation of behaviors that comprise sexual coercion in intimate relationships (Koss and Oros 1982; Shackelford and Goetz 2004; Weis and Borges 1973), but the explicit use of force to obtain sexual intercourse is likely the most costly, to both the victims and perpetrators. The severity of FIPC is demonstrated in the finding that physically abused women who experience FIPC have significantly more negative health symptoms and gynecological problems than women who are physically abused but not raped by their partner (e.g., Campbell and Soeken 1999). Moreover, FIPC may be more traumatizing than forced copulation by a stranger (Bart 1975; Russell 1982). Given the potentially devastating costs associated with FIPC, sexual coercion is likely to take more subtle forms. Shackelford

and Goetz (2004), for example, documented that men sexually coerce their partner by hinting about withholding benefits, threatening relationship defection, and manipulating their partner's commitment to the relationship (e.g., "If you love me, you'll have sex with me"). By using more discreet forms of sexual coercion (as opposed to using explicit force), men may avoid inflicting on their partner some of the costs associated with FIPC and they may avoid their partner's defection from the relationship.

Given this reasoning, subtle forms of sexual coercion in the context of an intimate relationship are likely more prevalent than more explicit forms such as FIPC. Therefore, not only may FIPC function as a sperm competition tactic, but all forms of sexual coercion in the context of an intimate relationship may be a product of sperm competition. This leads to the first hypothesis.

Hypothesis 1: Men's sexual coercion in the context of an intimate relationship is related positively to their partner's infidelities.

Sexual Coercion and Mate Retention

Men engage in an assortment of behaviors designed to prevent their partner's infidelity. Buss (1988) identified specific "mate retention" behaviors that men use to guard or to retain their mates. Subsequent research has found that men increase their mate retention behaviors when their partner is of greater reproductive value (as indexed by her age and physical attractiveness), when she is more likely to engage in extra-pair copulations, and when she is near ovulation (Buss and Shackelford 1997; Gangestad, Thornhill, and Garver 2002; Goetz et al. 2005). Moreover, research has documented that men use mate retention behaviors in conjunction with, and not instead of, other anti-cuckoldry tactics (e.g., Goetz et al. 2005; Shackelford, Goetz, Guta, and Schmitt 2006). In other words, men who perceive that their likelihood of being cuckolded is high use an arsenal of anti-cuckoldry tactics to guard their paternity. If sexual coercion is a sperm competition tactic designed to "correct" a partner's sexual infidelity, then men who sexually coerce their partner also should perform more mate retention behaviors. This leads to the second hypothesis.

Hypothesis 2: Men's sexual coercion in the context of an intimate relationship is related positively to their mate retention behaviors.

It may be that some sexually coercive behaviors (in the context of an intimate relationship) are performed by antisocial men who aim to punish, humiliate, or control their partner *independent of their perception of cuckoldry risk*. We are not arguing that all sexual coercion and FIPCs are the output of evolved psychological mechanisms designed to reduce the risk of being cuckolded. Instead, we are suggesting that sexual coercion might sometimes be the result of an evolved psychology associated with guarding paternity.

In addition to testing the general hypothesis that sexual coercion in the context of an intimate relationship may function as a sperm competition tactic, a secondary goal of this research was to obtain from a relatively young sample of adults prevalence estimates of FIPC. Previous studies have only assessed the prevalence of FIPC in marriages and have restricted their sample to women (Finkelhor and Yllo 1985; Painter and Farrington 1999; Russell 1982). This research will uniquely contribute to the existing literature by securing prevalence estimates for FIPC from men and women who are in a committed relationship (for a minimum of one year) and not necessarily married.

In two studies, we investigated men's sexual coercion, their risk of sperm competition, and their mate retention behaviors. Study 1 focused on men's reports of their own sexual coercion in the current relationship, their perception of their partner's infidelities, and their own mate retention behaviors. Study 2 focused on women's reports of their partner's sexual coercion in the current relationship, their own infidelities, and their partner's mate retention behaviors.

STUDY 1: MEN'S SELF-REPORTS

Methods

Participants. Two hundred forty-six men, each of whom was in a committed, sexual relationship with a woman for at least one year, participated in this study. About half of the participants were drawn from a university in southern Florida and the other half from surrounding communities. Unfortunately, we did not code whether the participant was a student and, therefore, cannot include this variable in any analyses. The mean age of the participants was 25.1 years (s.d. = 7.1), the mean age of the participants' partners was 23.8 years (s.d. = 6.7), and the mean relationship length was 46.3 months (s.d. = 49.1).

Materials. Participants completed a survey that contained several sections. The first section requested demographic information, including the participant's age, his partner's age, and the length of his current relationship. The second section asked four questions to assess his partner's past sexual and emotional infidelities and her likelihood of committing a sexual and emotional infidelity in the future: "As far as you know, has your current partner had sexual intercourse with someone other than you since you have been involved in a relationship together?" "As far as you know, has your current partner fallen in love with someone other than you since you have been involved in a relationship together?" "How likely do you think it is that your current partner will in the future have sexual intercourse with someone other than you, while in a relationship with you?" "How likely do you think it is that your current partner will in the future fall in love with someone other than you, while in a relationship with you?" Responses were recorded using a 10-point Likert-type scale ranging from 0 (Definitely No/Not at all Likely) to 9 (Definitely Yes/Extremely Likely).

To assess men's mate retention behaviors, the third section of the survey included the Mate Retention Inventory (MRI; Buss 1988; Buss and Shackelford 1997; Shackelford, Goetz, and Buss 2005) which asked how often the participant performed 104 mate retention acts in the last month, ranging from 0 (Never) to 3 (Often). Example acts include: "Did not let my partner talk to other men," "Held my partner's hand when other men were around," and "Introduced my partner as my spouse or romantic partner." Buss (1988) grouped these 104 acts into 19 tactics of mate retention. Previous research has established the reliability, validity, and utility of the MRI as an assessment of mate retention behaviors (Buss 1988; Buss and Shackelford 1997; Shackelford, Goetz, and Buss 2005).

To assess men's sexual coercion in the current relationship, the last section of the survey included the male version of the Sexual Coercion in Intimate Relationships Scale (SCIRS; Shackelford and Goetz 2004). The SCIRS asked how often the participant performed 34 sexually coercive acts in the past month. Responses were recorded using a 6-point Likert-type scale with the following values: 0 = Act did not occur in the past month, 1 = Act occurred 1 time in the past month, 2 = Act occurred 2 times in the past month, 3 = Act occurred 3 to 5 times in the past month, 4 = Act occurred 6 to 10 times in the past month, and 5 = Act occurred 11 or more times in the past month. Items in the SCIRS vary in subtlety, ranging from hinting and subtle manipulations to outright physical force. Example items include: "I hinted that I would withhold benefits that my partner depends on if she did not have sex with me," "I told my partner that if she loved me, she would have sex with me," and "I threatened to have sex with another woman if my partner did not have sex with me." Previous research has established the reliability, validity, and utility of the SCIRS as an assessment of sexual coercion in intimate relationships (Shackelford and Goetz 2004).

Procedure. Three criteria must have been met to qualify for participation. The prospective participant must be (1) male, (2) at least 18 years of age, and (3) currently involved in a committed, sexual relationship with a woman for at least one year. Upon the prospective participant's arrival at the scheduled time and location, the researcher confirmed that the prospective participant met the three participation criteria. If the criteria were met, the researcher handed the participant a consent form, the survey, and a security envelope. The participant was instructed to read and sign the consent form, complete the survey, place the completed survey in the envelope, and then seal the envelope. To maintain anonymity, the participant was instructed not to seal the consent form inside the envelope. Upon completion of the survey, the researcher explained to the participant the purpose of the study, answered any questions, and thanked the participant for his participation.

Results and Discussion

Prior to analyses, we created the composite variable *female infidelity* ($\alpha = .72$). Female infidelity is the sum of four variables: (1) partner's past sexual infidelity,

(2) partner's past emotional infidelity, (3) partner's likelihood of future sexual infidelity, and (4) partner's likelihood of future emotional infidelity.

We calculated scores for men's sexual coercion using responses to the Sexual Coercion in Intimate Relationships Scale (SCIRS; Shackelford and Goetz 2004). The alpha reliability for the summed responses to the 34 items of the SCIRS was .95. We calculated scores for 19 mate retention tactics using the 104 items in the Mate Retention Inventory (MRI; Buss 1988; Shackelford, Goetz, and Buss 2005). The alpha reliability for the entire inventory (with responses summed across items) was .96. Alpha reliabilities for the 19 mate retention tactics varied in this study from .51 to .90, with a mean of .75.

Hypothesis 1 stated that men's sexual coercion in the context of an intimate relationship is related positively to their partner's infidelities. Consistent with this hypothesis, men's sexual coercion correlated positively with their perceptions of their partner's infidelities: $r_{244} = 0.25$ ($p < .001$, two-tailed; all p values generated to test the hypotheses in both studies are two-tailed). Men who reported that their partner had been or was likely to be unfaithful reported using more sexual coercion with their partner.

Hypothesis 2 stated that men's sexual coercion in the context of an intimate relationship is related positively to their mate retention behaviors. Consistent with this hypothesis, men's sexual coercion correlated positively with their mate retention behaviors: $r_{244} = 0.15$ ($p < .05$). Men who reported using more sexual coercion in their relationship reported using more mate retention behaviors. Although the focus of Hypothesis 2 was the relationship between men's sexual coercion and their broad use of mate retention behaviors, we also report in Table 1 correlations between men's sexual coercion and the 19 mate retention tactics identified by Buss (1988) and his colleagues (Buss and Shackelford 1997; Shackelford, Goetz, and Buss 2005). Nine of the 19 mate retention tactics showed significant positive correlations with men's use of sexual coercion in the current relationship: Vigilance, Monopolization of Time, Jealousy Induction, Punish Mate's Infidelity Threat, Emotional Manipulation, Derogation of Competitors, Sexual Inducements, Intrasexual Threats, and Violence Against Rivals.

A secondary goal of this study was to obtain a prevalence estimate of FIPC in a sample of young adults. We asked men if they had ever physically forced their current partner to have sex with them or if they had ever initiated sex with their current partner when she was unaware (e.g., when she was asleep, drunk, or on medication) and continued against her will. Eighteen of the 246 men in this sample (7.3%) admitted to engaging in at least one FIPC with their current partner. Previous studies generating prevalence estimates of FIPC assessed whether FIPCs occurred in the current or previous marriages (Finkelhor and Yllo 1985; Painter and Farrington 1999; Russell 1982). Data presented in the current study are unique in that they were secured from a sample of relatively young men who are in a committed relationship (for a minimum of one year) and not necessarily married. The prevalence of FIPC in this study may be lower than that reported in previous studies

Table 1. Correlations between Men's Sexual Coercion and Men's Mate Retention According to Men's Self-Reports (Study 1) and Women's Partner Reports (Study 2)

Mate Retention Tactic	Men's Reports of Sexual Coercion	Women's Reports of Sexual Coercion	Difference between Correlations (<i>z</i>)
Vigilance	.18**	.35***	-2.08*
Concealment of Mate	.06	.56***	-6.49***
Monopolization of Time	.22***	.43***	-2.68**
Jealousy Induction	.26***	.36***	-1.26
Punish Mate's Infidelity Threat	.23***	.33***	-1.23
Emotional Manipulation	.15*	.46***	-3.93***
Commitment Manipulation	.04	.23***	-2.20*
Derogation of Competitors	.14*	.18**	-0.47
Resource Display	-.05	.12*	-1.94*
Sexual Inducements	.16**	.33***	-2.06*
Appearance Enhancement	-.01	.12*	-1.48
Love and Care	-.10	-.05	-0.57
Submission and Debasement	.09	.24***	-1.75*
Verbal Possession Signals	.07	.07	0.00
Physical Possession Signals	-.04	.06	-1.14
Possessive Ornamentation	.03	.22***	-2.20*
Derogation of Mate	.11	.05	0.69
Intrasexual Threats	.17**	.30***	-1.56
Violence against Rivals	.14*	.04	1.14

N = 246 for Study 1, *N* = 276 for Study 2. Difference between correlations assessed via Fisher's *r*-to-*z* transformation procedure.

* *p* < .05; ** *p* < .01; *** *p* < .001 (two-tailed)

because we sampled men, who are known to underreport sexual coercion of intimate partners (e.g., Dobash et al. 1998), and because we measured whether it occurred in the current relationship and not whether it has ever occurred in any relationship.

STUDY 2: WOMEN'S REPORTS

Men's self-reports of their violence, controlling behavior, and sexual coercion may not be accurate depictions of reality (Dobash et al. 1998; Edleson and Brygger 1986; Magdol et al. 1997; O'Leary and Arias 1988; Shackelford, Goetz, Buss et al. 2005). The reliability of men's reports of their sexual coercion and mate retention behaviors, in particular, can be questioned on several fronts. First, men may be reluctant to report their sexual coercion, or if they do, they may underreport the

most severe forms of sexual coercion (e.g., Dobash et al. 1998; Edleson and Brygger 1986). Second, men sometimes underreport their mate retention behaviors and controlling behaviors, whereas women report these behaviors with relative accuracy (e.g., Magdol et al. 1997; Shackelford, Goetz, Buss et al. 2005). Women's reports of their partner's sexual coercion and mate retention behaviors may reflect more accurately the incidence of such behaviors. In addition, men's perceptions of their partner's infidelities may not be accurate. Using an independent sample of women in committed, sexual relationships, Study 2 examined women's observations of their partner's sexual coercion and mate retention behaviors. These independent reports offered an additional test of the hypotheses tested in Study 1.

Methods

Participants. Two hundred seventy-six women, each of whom was in a committed, sexual relationship with a man for at least one year, participated in this study. About half of the participants were drawn from a university in southern Florida and the other half from surrounding communities. Unfortunately, we did not code whether the participant was a student and, therefore, cannot include this variable in any analyses. The mean age of the participants was 22.3 years (s.d. = 5.7), the mean age of the participants' partners was 24.4 years (s.d. = 6.9), and the mean relationship length was 41.3 months (s.d. = 39.6). None of the women in Study 2 were partners of the men who participated in Study 1, making the two studies independent.

Materials. The survey for Study 2 paralleled the one used in Study 1. Participants in Study 2 reported on their past infidelities and likelihood of committing future infidelities, their partner's mate retention behaviors, and their partner's sexual coercion in the current relationship.

Procedure. Paralleling Study 1, three criteria must have been met to qualify for participation. The prospective participant must be (1) female, (2) at least 18 years of age, and (3) currently involved in a committed, sexual relationship with a man for at least one year. Upon the prospective participant's arrival at the schedule time and location, the researcher confirmed that the prospective participant met the three participation criteria. The same procedure was followed as in Study 1.

Results and Discussion. As in Study 1, we created the composite variable *female infidelity* ($\alpha = .74$) by summing four variables: (1) past sexual infidelity, (2) past emotional infidelity, (3) likelihood of future sexual infidelity, and (4) likelihood of future emotional infidelity.

We then calculated scores for men's sexual coercion using women's responses to the Sexual Coercion in Intimate Relationships Scale (SCIRS; Shackelford and Goetz 2004). The alpha reliability for the summed responses to the 34 items of the SCIRS was .97. We calculated scores for 19 mate retention tactics using the 104 items in the Mate Retention Inventory (MRI; Buss 1988; Shackelford, Goetz, and Buss 2005). The alpha reliability for the entire inventory (with responses summed across items)

was .97. Alpha reliabilities for the 19 mate retention tactics varied in this study from .50 to .91, with a mean of .78.

Hypothesis 1 stated that men's sexual coercion in the context of an intimate relationship is related positively to their partner's infidelities. Consistent with this hypothesis, women's reports of their partner's sexual coercion correlated positively with their infidelities, $r_{274} = 0.32$ ($p < .001$). Women who reported that they had been or were likely to be unfaithful reported that their partner used more sexual coercion.

Hypothesis 2 stated that men's sexual coercion in the context of an intimate relationship is related positively to their mate retention behaviors. Consistent with this hypothesis, women's reports of their partner's sexual coercion correlated positively with their partner's use of mate retention behaviors, $r_{274} = 0.34$ ($p < .001$). Women who reported higher levels of sexual coercion in their relationship also reported that their partner used more mate retention behaviors. Although the focus of Hypothesis 2 was the relationship between men's sexual coercion and their broad use of mate retention behaviors, we also report in Table 1 correlations between women's reports of their partner's sexual coercion and the 19 mate retention tactics identified by Buss (1988) and his colleagues (Buss and Shackelford 1997; Shackelford, Goetz, and Buss 2005). Fourteen of the 19 mate retention tactics showed significant positive correlations with women's reports of their partner's use of sexual coercion in the current relationship: Vigilance, Concealment of Mate, Monopolization of Time, Jealousy Induction, Punish Mate's Infidelity Threat, Emotional Manipulation, Commitment Manipulation, Derogation of Competitors, Resource Display, Sexual Inducements, Appearance Enhancement, Submission and Debasement, Possessive Ornamentation, and Intrasexual Threats.

As in Study 1, a secondary goal of Study 2 was to obtain a prevalence estimate of FIPC in a sample of young adults. We asked women if their current partner had ever physically forced them to have sex or if their current partner had ever initiated sex with them when they were unaware (e.g., when they were asleep, drunk, or on medication) and continued against their will. Twenty-five of the 276 women in this sample (9.1%) admitted that they had experienced at least one FIPC by their current partner. The prevalence of FIPC in this study approaches Finkelhor and Yllo's (1985) figure of 10% despite the fact that we measured whether it occurred in the current relationship and not whether it has ever occurred in any relationship.

COMPARISONS BETWEEN MEN'S SELF-REPORTS (STUDY 1) AND WOMEN'S REPORTS (STUDY 2)

Because research indicates that men's reports of their sexual coercion and mate retention may be less reliable or less accurate than women's reports of their partner's coercive and mate retention behaviors (Dobash et al. 1998; Magdol et al. 1997), it may be appropriate to place greater weight on women's reports. We performed Fisher's r -to- z transformations to compare the magnitude of correlations generated

by men's self-reports (Study 1) and women's reports (Study 2). For Hypothesis 1, the correlation obtained from the men's data ($r = .25$) was not significantly different than the correlation obtained from the women's data ($r = .32$), $z = -0.86$ (ns). The magnitudes of the relationship between men's sexual coercion and their partner's infidelities were not significantly different between the samples. For Hypothesis 2, the correlation obtained from the men's data ($r = .15$) was significantly lower than the correlation obtained from the women's data ($r = .34$), $z = -2.30$ ($p < .05$). The magnitude of the relationship between men's sexual coercion and mate retention was significantly greater for women's partner-reports than for men's self-reports.

Next, we performed Fisher's r -to- z transformations to identify differences between the correlations of sexual coercion with each of the 19 mate retention tactics for the data provided by men (correlations in the first column of Table 1) and the correlations of sexual coercion with each of the 19 mate retention tactics for the data provided by women (correlations in the second column of Table 1). We identified significant differences in correlations for nine mate retention tactics: Vigilance, Concealment of Mate, Monopolization of Time, Emotional Manipulation, Commitment Manipulation, Resource Display, Sexual Inducements, Submission and Debasement, and Possessive Ornamentation. For each of these tactics, correlations of sexual coercion with mate retention for the self-report data provided by men were significantly lower than correlations of sexual coercion with mate retention for the data provided by women.

Finally, we tested the difference between the prevalence estimates of FIPC generated by men's self-reports and women's partner-reports. The prevalence of FIPC obtained from the men's self-report data (7.3%) was not significantly different than the prevalence of FIPC obtained from the women's data (9.1%), $z = -0.75$ (ns). Although the prevalence of FIPC is numerically greater according to women's reports, the percentages were not significantly different between the samples.

DISCUSSION

Forced in-pair copulation (FIPC) has been documented in several avian species and reliably occurs immediately after an observed or suspected extra-pair copulation (see Lalumi_re et al. 2005 for a review). This behavior has been interpreted as a sperm competition tactic because the in-pair male's FIPC functions to place his sperm in competition with sperm from an extra-pair male (Birkhead et al. 1989; Cheng et al. 1983). FIPC is not unique to birds; researchers estimate that between 10% and 17% of women experience FIPC in marriage (Finkelhor and Yllo 1985; Painter and Farrington 1999; Russell 1982). Narratives provided by victims of FIPC reveal that a remarkable proportion of FIPCs follow accusations of female infidelity and suggest a strong and reliable link between male sexual jealousy and the occurrence of FIPC (see, e.g., Bergen 1996; Finkelhor and Yllo 1985; Frieze 1983; Russell 1982; Walker 1979). Consequently, several researchers have interpreted

FIPC in humans as a sperm competition tactic (Lalumi_re et al. 2005; Thornhill and Thornhill 1992; Wilson and Daly 1992).

The current studies tested specific hypotheses derived from the general hypothesis that sexual coercion in the context of an intimate relationship may function as a sperm competition tactic. We hypothesized that men's sexual coercion in the context of an intimate relationship is related positively to their partner's infidelities and that men's sexual coercion is related positively to their mate retention behaviors. The results from Study 1 and Study 2 supported the hypotheses. According to men self-reports and women's partner-reports, men who used more sexual coercion in their relationship are mated to women who had been or were likely to be unfaithful, and these men also are likely to use more mate retention behaviors.

Although the correlations of the tests of the hypotheses and the prevalence of FIPC were only significantly different between the sexes in the test of Hypothesis 2 (i.e., the relationship between sexual coercion and mate retention), the correlations and prevalence of FIPC were greater in the women's data. Because women's reports are likely to be more accurate and more reliable than men's reports (Dobash et al. 1998; Magdol et al. 1997), it may be appropriate to place greater weight on women's reports of men's sexual coercion and mate retention.

A hypothesis that might be offered to account for the observations that men's sexual coercion and mate retention are related to their partner's sexual infidelity is that men are punishing their partner's past or future likelihood of infidelity (see Pagelow 1981). We concede that men who sexually coerce their partner may report that they do so to punish (or humiliate, or hurt) their partner. This hypothesis, however, reflects a different level of analysis than the hypothesis examined in the current research. We argue that the men may sexually coerce their partner because, ultimately, this behavior functions as a sperm competition tactic designed to reduce the likelihood of cuckoldry. Arguing that men sexually coerce their partner to punish her is a proximate explanation of this behavior. Men may consciously report that their sexual coercion is a form of punishment because they are not aware of the ultimate function of their behavior. A proponent of this "punishment" hypothesis must ask why men are punishing their partner in this particular way (i.e., sexual intercourse) for this particular deed (sexual infidelity).

One limitation of the current research is in its design. We present correlational analyses that prevent strong statements about causal relationships. We speculate that women's infidelities cause men to use sexual coercion as a paternity guard. The data are consistent with this interpretation, but we cannot yet rule out an alternative, reverse causal relationship—that men's sexual coercion causes women to become unfaithful. A methodology that includes repeated assessments of the key variables over time, such as a daily diary study, would allow for the identification of causal relationships.

A clear future direction is to identify the environmental inputs that activate the proposed psychological mechanisms associated with sexual coercion and FIPC.

Cues to a partner's sexual infidelity may be unequivocal, such as admission or observation of the infidelity, but most cues are probably more cryptic, such as apathy toward her partner, sudden decreased sexual interest in her partner, and subtle changes in her normal routine (Shackelford and Buss 1997). It would be valuable to identify the specific cues that motivate, in some men, sexual coercion and FIPC.

Another future avenue of research could involve measuring phallometry in men convicted of FIPC. Phallometry is the research method of measuring erectile responses while presenting stories or pictures of sexual and nonsexual stimuli. Meta-analyses of phallometric studies strongly suggest that rapists respond differently to sexual stimuli than other men (Hall, Shondrick, and Hirschman 1993; Lalumi_re and Quinsey 1994). If FIPC is unrelated to rape in general (e.g., stranger rape), then men convicted of FIPC should show phallometric responses that differ from men convicted of stranger rape. For example, men convicted of FIPC might have phallometric responses more like "normal" men, because the motivation underlying FIPC is different than that underlying general forced copulation.

CONCLUSION

Because cuckoldry poses a substantial reproductive cost for males of paternally investing species, men are expected to have evolved a host of adaptations to confront the adaptive problem of cuckoldry. One such adaptation may be a sperm competition tactic whereby sexual coercion and FIPC function to increase the likelihood that the in-pair male, and not a rival male, sires the offspring that his partner might produce.

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REFERENCES

- Alexander, R., and K. Noonan
 1979 Concealment of Ovulation, Parental Care, and Human Social Evolution. In *Evolutionary Biology and Human Social Behavior*; N. Chagnon and W. Irons, eds. Pp. 436–453. North Scituate, MA: Duxbury Press.
- Anderson, K. G.
 2006 How Well Does Paternity Confidence Match Actual Paternity? Results from Worldwide Nonpaternity Rates. *Current Anthropology* 48:511–518.
- Andersson, M.
 1994 *Sexual Selection*. Princeton, NJ: Princeton University Press.
- Bailey, R. O., N. R. Seymour, and G. R. Stewart
 1978 Rape Behavior in Blue-winged Teal. *Auk* 95:188–190.

- Baker, R. R., and M. A. Bellis
1993 Human Sperm Competition: Ejaculate Adjustment by Males and the Function of Masturbation. *Animal Behaviour* 46:861–885.
- Barash, D. P.
1977 Sociobiology of Rape in Mallards (*Anas platyrhynchos*): Response of the Mated Male. *Science* 197:788–789.
- Bart, P.
1975 Rape Doesn't End with a Kiss. *Viva* 40–42:101–107.
- Bellis, M. A., K. Hughes, S. Hughes, and J. R. Ashton
2005 Measuring Paternal Discrepancy and Its Public Health Consequences. *Journal of Epidemiology and Community Health* 59:749–754.
- Bergen, R. K.
1996 *Wife Rape*. Thousand Oaks, CA: Sage.
- Birkhead, T.
2000 *Promiscuity*. London: Faber and Faber.
- Birkhead, T. R., F. M. Hunter, and J. E. Pellatt
1989 Sperm Competition in the Zebra Finch, *Taeniopygia guttata*. *Animal Behaviour* 38:935–950.
- Bowker, L. H.
1983 Marital Rape: A Distinct Syndrome? *Social Casework: The Journal of Contemporary Social Work* 64:347–352.
- Buss, D. M.
1988 From Vigilance to Violence: Tactics of Mate Retention in American Undergraduates. *Ethology and Sociobiology* 9:291–317.
- Buss, D. M., and T. K. Shackelford
1997 From Vigilance to Violence: Mate Retention Tactics in Married Couples. *Journal of Personality and Social Psychology* 72:346–361.
- Campbell, J. C.
1989 Women's Responses to Sexual Abuse in Intimate Relationships. *Women's Health Care International* 8:335–347.
- Campbell, J. C., and K. L. Soeken
1999 Forced Sex and Intimate Partner Violence: Effects on Women's Risk and Women's Health. *Violence against Women* 5:1017–1035.
- Cheng, K. M., J. T. Burns, and F. McKinney
1983 Forced Copulation in Captive Mallards, III: Sperm Competition. *Auk* 100:302–310.
- Dixson, A. F.
1998 *Primate Sexuality*. Oxford: Oxford University Press.
- Dobash, R. E., R. P. Dobash, K. Cavanagh, and R. Lewis
1998 Separate and Intersecting Realities: A Comparison of Men's and Women's Accounts of Violence against Women. *Violence against Women* 4:382–414.
- Edleson, J., and M. Brygger
1986 Gender Differences in Reporting of Battering Incidents. *Family Relations* 35:377–382.
- Finkelhor, D., and K. Yllo
1985 *License to Rape*. New York: Holt, Rinehart, and Winston.
- Frieze, I. H.
1983 Investigating the Causes and Consequences of Marital Rape. *Signs: Journal of Women in Culture and Society* 8:532–553.
- Gallup G. G., R. L. Burch, M. L. Zappieri, R. A. Parvez, M. L. Stockwell, and J. A. Davis
2003 The Human Penis as a Semen Displacement Device. *Evolution and Human Behavior* 24:277–289.
- Gangestad, S. W., R. Thornhill, and C. E. Garver
2002 Changes in Women's Sexual Interests and Their Partner's Mate-Retention Tactics across the Menstrual Cycle: Evidence for Shifting Conflicts of Interest. *Proceedings of the Royal Society of London* 269:975–982.

- Goetz, A. T., T. K. Shackelford, V. A. Weekes-Shackelford, H. A. Euler, S. Hoier, D. P. Schmitt, and C. W. LaMunyon
2005 Mate Retention, Semen Displacement, and Human Sperm Competition: A Preliminary Investigation of Tactics to Prevent and Correct Female Infidelity. *Personality and Individual Differences* 38:749–763.
- Gomendio, M., A. H. Harcourt, and E. R. S. Roldan
1998 Sperm Competition in Mammals. In *Sperm Competition and Sexual Selection*, T. R. Birkhead and A. P. Møller, eds. Pp. 667–756. New York: Academic Press.
- Goodwin, D.
1955 Some Observations on the Reproductive Behavior of Rooks. *British Birds* 48:97–107.
- Hall, G. C. N., D. D. Shondrick, and R. Hirschman
1993 The Role of Sexual Arousal in Sexually Aggressive Behavior: A Meta-analysis. *Journal of Consulting and Clinical Psychology* 61:1091–1095.
- Kilgallon, S. J., and L. W. Simmons
2005 Image Content Influences Men's Semen Quality. *Biology Letters* 1:253–255.
- Koss, M. P., and C. J. Oros
1982 Sexual Experiences Survey: A Research Instrument Investigating Sexual Aggression and Victimization. *Journal of Consulting and Clinical Psychology* 50:455–457.
- Lalumi_re, M. L., G. T. Harris, V. L. Quinsey, and M. E. Rice
2005 *The Causes of Rape*. Washington, DC: APA Press.
- Lalumi_re, M. L., and V. L. Quinsey
1994 The Discriminability of Rapists from Non-Sex Offenders using Phallometric Measures: A Meta-analysis. *Criminal Justice and Behavior* 21:33–48.
- Magdol, L., T. E. Moffitt, A. Caspi, D. L. Newman, J. Fagan, and P. A. Silva
1997 Gender Differences in Partner Violence in a Birth Cohort of 21-year-olds: Bridging the Gap between Clinical and Epidemiological Approaches. *Journal of Consulting and Clinical Psychology* 65:68–78.
- McKinney, F., K. M. Cheng, and D. J. Bruggers
1984 Sperm Competition in Apparently Monogamous Birds. In *Sperm Competition and Evolution of Animal Mating Systems*, R. L. Smith, ed. Pp. 523–545. New York: Academic Press.
- McKinney, F., S. R. Derrickson, and P. Mineau
1983 Forced Copulation in Waterfowl. *Behavior* 86:250–294.
- McKinney, F., and P. Stolen
1982 Extra-pair-bond Courtship and Forced Copulation among Captive Green-Winged Teal (*Anas crecca carolinensis*). *Animal Behaviour* 30:461–474.
- O'Leary, K. D., and I. Arias
1988 Assessing Agreement of Reports of Spouse Abuse. In *Family Abuse and its Consequences*, G. T. Hotaling, D. Finkelhor, J. T. Kirkpatrick, and M. Straus, eds. Pp. 218–227. Newbury Park, CA: Sage.
- Pagelow, M. D.
1981 *Woman-battering*. Beverly Hills, CA: Sage.
- Painter, K., and D. P. Farrington
1999 Wife Rape in Great Britain. In *Women and Justice*, R. Muraskin, ed. Pp. 135–164. New York: Gordon and Breach.
- Parker, G. A.
1970 Sperm Competition and Its Evolutionary Consequences in the Insects. *Biological Reviews* 45:525–567.
- Palmer, C. T.
1991 Human Rape: Adaptation or By-product? *Journal of Sex Research* 28:365–386.
- Pound, N.
2002 Male Interest in Visual Cues of Sperm Competition Risk. *Evolution and Human Behavior* 23:443–466.
- Russell, D. E. H.
1982 *Rape in Marriage*. New York: Macmillan Press.

- Seymour, N. R., and R. D. Titman
1979 Behaviour of Unpaired Male Black Ducks (*Anas rufripes*) during the Breeding Season in a Nova Scotia Tidal Marsh. *Canadian Journal of Zoology* 57:2412–2428.
- Shackelford, T. K., and D. M. Buss
1997 Cues to Infidelity. *Personality and Social Psychology Bulletin* 23:1034–1045.
- Shackelford, T. K., and A. T. Goetz
2004 Men's Sexual Coercion in Intimate Relationships: Development and Initial Validation of the Sexual Coercion in Intimate Relationships Scale. *Violence and Victims* 19:21–36.
- Shackelford, T. K., A. T. Goetz, and D. M. Buss
2005 Mate Retention in Marriage: Further Evidence of the Reliability of the Mate Retention Inventory. *Personality and Individual Differences* 39:415–425.
- Shackelford, T. K., A. T. Goetz, D. M. Buss, H. A. Euler, and S. Hoier
2005 When We Hurt the Ones We Love: Predicting Violence against Women from Men's Mate Retention. *Personal Relationships* 12:447–463.
- Shackelford, T. K., A. T. Goetz, F. E. Guta, and D. P. Schmitt
2006 Mate Guarding and Frequent In-pair Copulation in Humans: Complementary Anti-cuckoldry Tactics. *Human Nature* 17:00–00.
- Shackelford, T. K., A. T. Goetz, C. W. LaMunyon, B. J. Quintus, and V. A. Weekes-Shackelford
2004 Sex Differences in Sexual Psychology Produce Sex-Similar Preferences for a Short-term Mate. *Archives of Sexual Behavior* 33:405–412.
- Shackelford, T. K., and G. J. LeBlanc
2001 Sperm Competition in Insects, Birds, and Humans: Insights from a Comparative Evolutionary Perspective. *Evolution and Cognition* 7:194–202.
- Shackelford, T. K., G. J. LeBlanc, V. A. Weekes-Shackelford, A. L. Bleske-Rechek, H. A. Euler, and S. Hoier
2002 Psychological Adaptation to Human Sperm Competition. *Evolution and Human Behavior* 23:123–138.
- Shackelford, T. K., N. Pound, and A. T. Goetz
2005 Psychological and Physiological Adaptation to Human Sperm Competition. *Review of General Psychology* 9:228–248.
- Shields, N. M., and C. R. Hanneke
1983 Battered Wives' Reactions to Marital Rape. In *The Dark Side of Families*, R. Gelles, G. Hotaling, M. Straus, and D. Finkelhor, eds. Pp. 131–148. Beverly Hills, CA: Sage.
- Shields, W. M., and L. M. Shields
1983 Forcible Rape: An Evolutionary Perspective. *Ethology and Sociobiology* 4:115–136.
- Smith, R. L.
1984 Human Sperm Competition. In *Sperm Competition and the Evolution of Animal Mating Systems*, R. L. Smith, ed. Pp. 601–660. New York: Academic Press.
- Thornhill, R., and C. T. Palmer
2000 *A Natural History of Rape*. Cambridge, MA: MIT Press.
- Thornhill, R., and N. W. Thornhill
1983 Human Rape: An Evolutionary Analysis. *Ethology and Sociobiology* 4:137–173.
1992 The Evolutionary Psychology of Men's Coercive Sexuality. *Behavioral and Brain Sciences* 15:363–421.
- Tooby, J., and L. Cosmides
1992 The Psychological Foundations of Culture. In *The Adapted Mind*, J. H. Barkow, L. Cosmides, and J. Tooby, eds. Pp. 19–136. New York: Oxford University Press.
- Valera, F., H. Hoi, and A. Kristin
2003 Male Shrikes Punish Unfaithful Females. *Behavioral Ecology* 14:403–408.
- Walker, L. E.
1979 *The Battered Woman*. New York: Harper and Row.
- Weis, K., and S. S. Borges
1973 Victimology and Rape: The Case of the Legitimate Victim. *Issues in Criminology* 8:71–115.

Wilson, M., and M. Daly

1992 The Man Who Mistook His Wife for a Chattel. In *The Adapted Mind*, J. H. Barkow, L. Cosmides, and J. Tooby, eds. Pp. 289–322. New York: Oxford University Press.

Wyckoff, G. J., W. Wang, and C. Wu

2000 Rapid Evolution of Male Reproductive Genes in the Descent of Man. *Nature* 403:304–308.