

FACTORS ASSOCIATED WITH JEALOUSY OVER REAL AND IMAGINED INFIDELITY: AN EXAMINATION OF THE SOCIAL-COGNITIVE AND EVOLUTIONARY PSYCHOLOGY PERSPECTIVES

Christine R. Harris
University of California, San Diego

Three hundred fifty-eight undergraduates completed anonymous questionnaires regarding jealousy over a mate's infidelity. More men than women predicted that sexual infidelity would be worse than emotional infidelity when given the forced-choice hypothetical measures used in previous work. When some of the implications of hypothetical infidelity were controlled, the gender difference disappeared. One hundred twenty-seven participants reported having actual experience with a mate's infidelity. The two genders did not differ in degree of focus on the sexual versus emotional aspects of a mate's real betrayal. Sexual jealousy was correlated with having a greater number of sexual relationships and, for men but not women, with placing higher importance on sex in dating relationships. The results are discussed from a social-cognitive perspective.

Although jealousy is mentioned in literature as old as the Bible, empirical research on the topic has been relatively scarce over the past two millennia. This, however, has begun to change in the last two decades. One particular topic has been the focus of considerable debate: To what degree do men and women differ in how much they are bothered by a mate's sexual or emotional infidelity? Does the existing empirical evidence support claims that men and women have different innate specific adaptations that trigger jealousy? This paper examines this issue using a sample of heterosexual college students who were asked to answer a variety of questions about their experiences with actual infidelity as well as their reactions to hypothetical infidelity.

The Specific Innate Modular View of Gender Differences in Jealousy

Several evolutionary psychologists have argued that there are strong gender differences in how men and women feel

about a mate's infidelity: Men are predisposed to be upset by a mate's sexual infidelity, whereas women are predisposed to be upset by a mate's emotional infidelity (Symons, 1979; Daly, Wilson, & Weghorst, 1982; Buss, 2000). These differences are claimed to result from different adaptive pressures in humans' ancestral past. For men, cuckoldry was supposedly the major adaptive challenge. If a mate's infidelity resulted in pregnancy, a man risked spending resources on another man's progeny, which would be costly to his Darwinian fitness. To prevent this, it is hypothesized, evolution designed in men a sexual jealousy mechanism or module that is triggered by a mate's sexual betrayal. A module is a mechanism specifically designed to be attuned to only certain types of input, and when triggered, to produce an affective change (Barkow, Cosmides, & Tooby, 1992). In the case of male jealousy, the input presumably would be the thought of one's mate having sex with another and the output would be the emotion of jealousy. Because women never faced the problem of cuckoldry, they did not develop a sexual jealousy mechanism. Instead, ancestral woman faced a different inclusive fitness risk: the loss of a mate's resources for her and her offspring. This selection pressure, it is claimed, shaped a jealousy module in women that is activated by the thought that their mate might be developing an emotional attachment with another female (because a man's emotional involvement would presumably be a strong predictor that he will devote resources to a competitor). Therefore, modern day women

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Address correspondence and reprint requests to: Christine R. Harris, Department of Psychology—0109, University of California, San Diego, 9500 Gilman Drive, La Jolla, CA 92093-0109. E-mail: charris@psy.ucsd.edu

should be specifically concerned about a mate's emotional infidelity (whereas men should not be). This theory has been heralded by several writers as rigorously tested—a showcase example of the contribution of evolutionary psychology (Buss, 2000; Pinker, 1997). For example, Buunk, Angleitner, Oubaid, and Buss (1996, p. 375) wrote, "By all scientific standards—coherence, parsimony, predictive power, attempts at falsification—the evolutionary account [of jealousy] appears to be in good standing."

Evidence for Gender Differences in Jealousy Over Infidelity

The primary evidence for gender differences in jealousy over emotional and sexual infidelity comes from studies that use a forced-choice hypothetical scenario designed by Buss, Larsen, Westen, and Semmelroth (1992). Men and women, almost always college students, are asked to choose which would upset them more: their mate having sexual intercourse or falling in love with someone else. This forced-choice format has been used as the primary jealousy measure in at least 18 published studies and usually produces gender differences. Across U.S. studies, the majority of women (frequently around 75%) predict that emotional infidelity would be worse while a smaller percentage of men (usually between 40% and 60%) choose emotional infidelity (e.g., Buss et al., 1992; DeSteno & Salovey, 1996; Harris & Christenfeld, 1996a). Gender differences have also been found in other countries, although the percent of men choosing sexual infidelity as worse drops to as little as 25-30% in China, Germany, and Holland (e.g., Geary, Rumsey, Bow-Thomas, & Hoard, 1995; Buunk et al., 1996).

Although infrequently cited by proponents of the adaptationist position, there are scattered studies that suggest that such gender differences in jealousy over infidelity may not be so robust. For example, two studies found gender effects in the opposite direction from the adaptationist position, with women predicting that they would show greater aggression over sexual infidelity (de Weerth & Kalma, 1993; Paul & Galloway, 1994) while others have failed to find the predicted gender differences (DeSteno & Salovey, 1996; Nannini & Meyers, 2000). Only one published study (Harris, 2002) compared people's reactions to their mates' actual sexual infidelity and emotional infidelity, as opposed to hypothetical infidelity. In this older sample, both men and women reported focusing more on the emotional aspects of the infidelity relative to the sexual aspects: Given that age might impact jealousy reactions and that most work on the topic of gender differences in jealousy over infidelity have relied on college-age samples, it seems particularly important to determine whether college students do indeed show gender differences over real infidelity and how such reactions compare to hypothetical infidelity. Before turning to the present study, a few relevant theoretical issues will be briefly discussed.

The Nature of the Debate

Although the literature on jealousy sometimes refers to the specific adaptationist argument as the "evolutionary theory of jealousy," this label can be misleading. The theory of evolution by natural selection is not at issue in studies of jealousy. Rather, debate centers on whether men and women have different highly domain-specific psychological mechanisms that cause them to respond differently to the two forms of infidelity. Evolutionary psychologists tend to postulate many distinct innate mechanisms or modules, each designed by evolution to solve a distinct recurring problem in our ancestral past. According to alternative perspectives, natural selection may instead have created innate psychological tendencies and structures that are substantially less specific and more malleable or that are not sexually dimorphic (Caporael, 2000; Eagly & Wood, 1999; Miller & Fishkin, 1997). Therefore, as elsewhere (Harris, 2000), the theory proposed by researchers such as Buss will be referred to in the present paper as the "jealousy as a specific innate module" theory or JSIM.

The Social-Cognitive Perspective of Jealousy

The theory of jealousy as a specific innate module is limited in two major respects. First, although it predicts sex differences in jealousy, it does not account for within-sex differences. Second, it only addresses jealousy as it occurs in a very narrow context, namely in response to infidelity, and sheds no light on the jealousy that emerges in other contexts (between siblings, friends, peers, etc.). Therefore, even if JSIM is correct, a more general theory is needed to explain jealousy in broader contexts.

Several theorists have offered accounts of jealousy that do not assume that sexual and romantic jealousy arise from sexually dimorphic mechanisms. Although lacking in strong theoretical cohesion, these social-cognitive perspectives share the view that cognitive appraisal plays a prominent role in the elicitation of jealousy and emphasize the importance of interpretation of a variety of threats, not just sexual and emotional betrayal (Harris, 2003; Hupka & Ryan, 1990; Mathes, 1991; Parrott, 1991; Salovey & Rothman, 1991; White, 1981; White & Mullen, 1989). These theorists have emphasized two factors that make a mate's involvement with another particularly threatening: (a) when it challenges some aspect of a person's self-concept, self-regard, or other self-representations, and (b) when it decreases the quality of the primary relationship. For example, Salovey and colleagues' "domain relevance hypothesis" (Salovey & Rothman, 1991; Salovey & Rodin, 1984) suggests that jealousy is likely to occur in response to rivals who outdo us in domains that we find particularly important and relevant to self-definition. This hypothesis was supported in studies that examined individual differences in jealousy and envy over wealth, fame, popularity, and physical attractiveness (Salovey & Rodin, 1991, 1984). Although Salovey and colleagues did not apply their theory to jealousy over infidelity,

The third aim, which is more exploratory, is to examine the relationship between jealousy over real infidelity and other social-cognitive variables. Various measures of relationship history are examined to assess whether sexual jealousy is particularly increased by experience within committed sexual relationships or more generally by an increase in any type of sexual experience. We also measure people's propensity to engage in sex without emotional commitment (sociosexuality). Previous work suggests that individuals with an unrestricted sociosexuality tend to have a greater number of sexual partners, more frequent sexual thoughts, and less love and commitment in their relationships relative to more sociosexually restricted individuals (Simpson & Gangestad, 1991). Participants were also asked about the importance of sexual and emotional intimacy in their relationships.

The social-cognitive position hypothesizes that jealousy should particularly arise over threats by a rival to one's self-concept or to important relationship rewards. Based on the Salovey and colleagues' domain hypothesis, people's attitudes about the relative importance of love and sex should correspond to relative upset over the two forms of infidelity (Salovey & Rothman, 1991). One way this is tested in the present work is by having people rate the importance of sexual activity and emotional closeness in their relationships. However, the importance of sex is multifaceted and could manifest itself in many ways. One possibility is that greater sexual experience and unrestricted sociosexuality might index people placing high importance on sex and thus may be associated with greater sexual jealousy. There are two possible ways this could arise. First, greater experience with sex might lead to greater incorporation of sexuality into the self-concepts of both men and women, thereby increasing their upset over sexual infidelity. Second, people prone to find sex more personally important may seek it out more and therefore may have more experiences in this domain. On this view, greater sexual experience may be a marker for an individual difference in sexuality. The only clear prediction that JSIM makes is that committed sexual relationship experience should make men more sexually jealous and women more emotionally jealous. JSIM offers no strong reason to expect that other aspects of sexuality, such as importance of sex, would be related to sexual jealousy.

METHOD

Participants

Participants were 139 male and 219 female students, who reported a heterosexual orientation. They participated in exchange for experimental credit toward their course grade. The recruitment form stated that people with at least two relationships were particularly needed. The sample was 45.5% Asian, 43% Caucasian, 9.5% Hispanic, and 1.4% African American and had a mean age of 20.5 ($SD = 2.9$) years (this mean age was based on the responses of 274 partic-

ipants because this question was inadvertently omitted on the remaining questionnaires).

Procedure

Participants, in groups of two to four, reported to the laboratory and were given a human subjects consent form that included a description of the types of questions that would be asked. Given the personal nature of the study and the importance of obtaining honest answers, several measures were taken to assure participants that their responses would be anonymous. The consent form and the experimenter both stressed that the participants were not to place their names on the questionnaire. The signed consent forms were placed in a file completely separate from the questionnaires so that names could never be associated with any participant's data. Participants were given a questionnaire and an envelope and then were escorted to a private room. After completing the survey, they dropped their sealed envelopes in a large box with the other participants' envelopes. These envelopes were not opened until the completion of the study. No one declined participation or expressed skepticism regarding the anonymity of the survey.

Measures

The target questions were interspersed among other questions about relationships (see Appendix). One set of inquiries focused on jealousy over sexual and emotional infidelity. Real infidelity was examined by asking participants who had such experience to recall how much they focused on the emotional and sexual aspects of the betrayal. Using hypothetical scenarios, participants also indicated which type of infidelity they thought would be worse and rated how distressed they would feel if their mate engaged in sexual or emotional infidelity. Relationship experience was assessed with questions about number of committed relationships, sexual experience partners, and sexual intercourse partners. Another set of questions consisted of the sociosexuality inventory (SOI). Participants also rated the importance they placed on emotional intimacy and sex in their dating relationships.

RESULTS

Responses to Hypothetical Infidelity

Both of the forced-choice hypothetical infidelity questions revealed significant gender differences: $\chi^2(1, N = 353) = 49.99, p < .001$ for scenario one and $\chi^2(1, N = 355) = 56.46, p < .001$ for scenario two. As shown in Table 1, women were more likely than men to predict that emotional infidelity would be the worse form of infidelity.

The next analysis examined the two continuous measures of upset over the two forms of hypothetical infidelity. These measures are different from the forced-choice question in that they specifically state that one form of infidelity has

the domain relevance hypothesis provides one possible account for whatever gender differences exist in this area. For example, men may place greater personal importance on sexual activity than women and thereby feel more threatened by rivals in this domain. Unlike JSIM, this view has the potential of addressing within-sex differences as well.

Generally, social-cognitive proponents have not focused specifically on contrasting sexual jealousy with emotional jealousy. One exception is DeSteno and Salovey's "double-shot" hypothesis (1996) and Harris and Christenfeld's "two-for-one" hypothesis (1996a, 1996b), which suggest that the gender difference on the forced-choice hypothetical infidelity questions stems from different implications that each gender draws regarding infidelity. Men tend to think that if a woman has sex with another man then she is probably also in love with that man. Therefore, sexual infidelity is seen as worse because it implies that both forms of infidelity are occurring. Women, however, tend to believe that men can have sex without being in love. Hence, sexual infidelity does not necessarily imply emotional infidelity. Instead, women reason that if a man is in love he is also likely to be having sex, therefore emotional infidelity is chosen as worse. This hypothesis has been supported in two American studies and one Dutch study (DeSteno & Salovey, 1996; Dijkstra et al., 2001; Harris & Christenfeld, 1996a). However, other work suggests that this is not the only factor that contributes to gender differences on such measures (Sheets & Wolfe, 2001; Voracek, Stieger, & Gindl, 2001; Wiederman & Kendall, 1999).

Relationship Experience and Jealousy

Relationship experience is one experiential factor that both social-cognitive theorists and JSIM proponents have focused on. Although Buss and colleagues (1992) proposed that gender differences in jealousy over infidelity are innate, they suggested that relationship experience can influence the "activation of jealousy." They hypothesized that committed sexual relationship experience would lead women to feel even greater upset over emotional infidelity while leading men to feel even greater upset over sexual infidelity. This was partially supported by their finding that on the forced-choice hypothetical infidelity measure, men who had a committed sexual relationship were more likely to predict that sexual infidelity would be more upsetting (55%) compared to men who did not have such experience (29%). No significant relationship was found for women. Geary et al. (1995) used similar measures in work comparing Chinese and American undergraduates. Few Chinese (<3%) had sexual relationship experience and few chose sexual infidelity as the worse infidelity. However, analyses did not reveal significant effects of relationship history on infidelity responses.

In a psychophysiological study, Harris (2000) reported that women who had experienced a committed sexual re-

lationship showed greater blood pressure increases when imagining a mate engaging in sexual infidelity, whereas women without such experience showed greater increases when imagining a mate engaging in emotional infidelity. Although men's sexual history was not examined, the results raise the possibility that, rather than polarizing the sexes, sexual experience may instead lead both men and women to have greater upset in response to sexual infidelity. In sum, the few studies that have examined relationship experience and responses to infidelity have produced an unclear picture.

Relationship Experience and Jealousy

The current work has three primary goals. The first, as noted above, is to test for gender differences in jealousy over a mate's *actual* infidelity. Hypothetical situations may evoke complex inferential thinking more than immediate emotional reactions (DeSteno, Bartlett, Braverman, & Salovey, 2002) and therefore, may not reflect how people actually feel when confronted with a mate's infidelity. Examining real reactions to infidelity is particularly important given that some studies have failed to find gender differences with hypothetical measures and given recent challenges to the validity of the forced-choice questions. For example, responses to such measures were not correlated with responses to a mate's actual infidelity (Harris, 2002) nor with the amount of physiological activation to imagining different kinds of infidelity (Harris, 2000). Based on JSIM, participants' reactions to actual incidents of betrayal should reflect the alleged intense male focus on sexual infidelity even more strongly than reactions to hypothetical scenarios. For example, Daly et al. (1982) have claimed that male, but not female, jealousy over a mate's sexual infidelity is one of the leading causes of homicide and spousal abuse (however, see Harris, 2003, for evidence challenging this claim). The present work also examines jealousy over a mate's past sexual relationships.

A second aim is to examine the robustness of gender differences to hypothetical infidelity. JSIM proponents have assumed that gender differences on forced-choice hypothetical scenarios reflect innate differences. However, social-cognitive theorists have argued that such findings may reflect men and women making different appraisals and drawing different conclusions about the meaning of the infidelity. The present work employs the forced-choice hypothetical infidelity scenarios used in previous work, but also includes other hypothetical infidelity scenarios in which some of the implications of the infidelity are controlled (a one-time infidelity while on vacation). Following the reasoning of JSIM proponents, an act of sex in a faraway location with little likelihood of a continuing relationship is exactly the sort of occurrence that could impose a great Darwinian cost to a man but only a negligible Darwinian cost to a woman. Thus, males should be far more upset by this than females.

Table 1
Responses by Gender to Questions About Jealousy and Infidelity (*SD*)

	Males	Females
<i>Hypothetical Infidelity</i>		
(Q1) More upset by mate		
having passionate sex with other	61%	23.5%
forming emotional attachment to other	39%	76.5%
(Q2) More upset by a mate		
trying different sexual positions with other	56%	17.5%
falling in love with each other	44%	82.5%
<i>Actual Experience With Infidelity</i>		
Amount of upset over mate having one night stand while on vacation ^a	8.05 (1.39)	8.22 (1.18)
Amount of upset over mate falling love with other while on vacation ^a	7.63 (1.65)	8.04 (1.21)
Amount of emotional distress over infidelity ^b	4.11 (1.12)	4.37 (0.99)
Degree of focus on sexual aspects of partner's infidelity ^c	3.30 (1.31)	3.34 (1.28)
Degree of focus on emotional aspects of partner's infidelity ^c	3.39 (1.22)	3.52 (1.25)
Relationship ended over infidelity	59 % (<i>n</i> = 27)	62% (<i>n</i> = 50)
<i>Jealousy Over Mate's Past</i>		
Participant terminated relationship	75% (<i>n</i> = 18)	94% (<i>n</i> = 44)
Percentage of people who have had uncomfortable feelings about mate's ex-lovers	69% (<i>n</i> = 91)	78% (<i>n</i> = 165)
Degree to which bothered by mate's sexual past ^c	3.65 (1.09)	3.51 (0.98)

Note. *n*'s may be slightly reduced for some individual analyses due to missing data points.

^a9-pt. scale (1 = not at all upset, 9 = extremely upset).

^b5-pt scale (1 = not at all distressed, 5 = very distressed).

^c5-pt scale (1 = not at all, 5 = completely).

occurred, but is unlikely to continue in the future. In contrast to JSIM, a 2 (Infidelity Type) x 2 (Gender) ANOVA revealed that both men and women rated sexual infidelity as more upsetting than emotional infidelity: $F(1, 355) = 18.38, p < .001$ for Infidelity Type. There was also a main effect of gender, $F(1, 355) = 5.31, p < .03$, such that women rated both types of infidelity as more upsetting than men. The interaction term was not significant, $F(1, 355) = 2.86, p = .09$, nor were the means in the direction predicted by the JSIM model (see Table 1).

Reactions to Actual Infidelity

When asked if they had ever had experiences in which a romantic partner cheated on them, 33% of the men and 37% of the women answered "yes." The following analyses (see Table 1 for details) are based on the subset of participants who had such an experience. The genders did not differ in their reports of the amount of overall emotional distress that they experienced over their partner's infidelity: $t(125) = 1.36, ns$. Two additional questions asked about the specific focus of participants' upset. A 2 (Gender) x 2 (Type of Focus of Infidelity) ANOVA did not reveal significant main effects of Gender, $F(1, 124) = .23, ns$, or Type of Focus of Infidelity, $F(1, 124) = .75, ns$. The interaction term was not significant: $F(1, 124) = .10, ns$. Hence, the genders did not appear to differ in the degree to which they focused on the sexual versus emotional aspects of their partners infidelity. As can be seen in Table 1, approximately 40% of both men and women continued their relationships despite

a mate's infidelity. Of those people who reported their relationship ended over the partner's infidelity, significantly fewer men reported that they were the one to end it compared to women: $\chi^2(1, N = 71) = 4.98, p < .03$.

The next analysis looked at jealousy in a slightly different context, namely, upset over a mate's past relationships. (See Table 1 for details.) Over two-thirds of the sample reported that they had experienced uncomfortable feelings about their mate's ex-lovers. When asked how much they were specifically bothered by their mate's sexual past, men and women did not significantly differ in their ratings: $t(253) = 1.11, ns$.

Factors Related to Upset Over Real Infidelity

Correlations between the various social-cognitive factors and participants' reports of upset over a mate's actual infidelity are presented in Table 2. SOI items were aggregated (Cronbach's alpha = .76) to create one index. Using backward elimination multiple regression, amount of focus on the sexual aspects of mate's infidelity was regressed on all six of the social-cognitive variables and on gender (female was coded as -1 and male was coded as 1). Social-cognitive factors by gender interaction terms were computed and included in the analysis in order to determine whether the predictive slopes of these factors differed for the two genders. This process resulted in a final model consisting of four predictor variables: $F(4, 109) = 4.86, p < .002$. Focusing on the sexual aspects of a mate's affair was significantly predicted by gender, $\beta = -.61, t = -2.82, p < .01$, with being

Table 2

Correlations Between Reactions to a Mate's Actual Infidelity and Relationship History, Sexual Experience, Sociosexuality, and Relationship Rewards

	<i>Degree of Focus on Sexual Aspects</i>			<i>Degree of Focus on Emotional Aspects</i>		
	<i>All</i>	<i>Males</i>	<i>Females</i>	<i>All</i>	<i>Males</i>	<i>Females</i>
Number of Sexual relationships	.25**	.20	.30**	-.14	-.08	-.17
Number of partners for sexual intercourse	.17†	.22	.16	.04	.21	-.08
Number of partners for sexual experiences	.10	.11	.14	.04	.17	-.09
Sociosexuality Inventory	.12	.25	.09	-.13	-.06	-.08
Importance of sexual activity	.24**	.51**	.12	-.05	-.05	-.03
Importance of emotional intimacy	-.004	.07	-.09	.11	.24	-.02

Note. $n = 46$ for males and $n = 81$ for females, although n 's may be slightly reduced for some individual analyses due to missing data points.

† $p < .10$; * $p < .05$; ** $p < .01$.

female predicting increased focus, number of committed sexual relationships, $\beta = .24$, $t = 2.65$, $p < .01$, and importance placed on sexual activity in relationships, $\beta = .29$, $t = 2.86$, $p < .01$. One interaction term was significant: gender \times importance of sex, $\beta = .51$, $t = 2.40$, $p < .02$, suggesting that importance of sex was a stronger predictor of male sexual jealousy.

Amount of focus on the emotional aspects of the affair was not significantly correlated with any of the predictor variables; therefore, follow-up regression analyses were not performed.

Relationship Between Recall of Actual Infidelity and Hypothetical Infidelity

The forced-choice questions do not permit separate examination of sexual infidelity and emotional infidelity. Therefore, to compare these responses with those regarding real infidelity, we did the following: Responses to the two hypothetical forced-choice questions were added together to yield a single response variable for upset over hypothetical infidelity, with higher values representing greater upset over sexual infidelity (Cronbach alpha = .73). Then, for responses regarding a mate's actual infidelity, a difference score for relative focus of infidelity was created by subtracting degree of focus on emotional aspects from degree of focus on sexual aspects. Correlational analysis failed to reveal a significant association between hypothetical and real infidelity responses: $r(125) = .11$, *ns*.

DISCUSSION

According to the JSIM hypothesis, natural selection has shaped men and women to have jealousy modules that are triggered by different types of input. For men, the trigger is the thought that their mate is having sex with another; for women, the trigger is the thought that their mate is emotionally involved with another. Men, therefore, should care primarily about sexual infidelity and women, primar-

ily about emotional infidelity. The current study produced several results that bear on evidence for JSIM, and also on determinants of reactions to infidelity more generally.

Hypothetical Responses to Jealousy

Only one result from the present investigation supported JSIM: The typical gender difference on the hypothetical forced-choice infidelity questions was replicated such that when forced to predict which form of infidelity would be worse, more men than woman chose sexual infidelity. However, other queries regarding imagined infidelity did not yield support for the view that the genders have different predispositions for jealousy. Both men and women estimated that they would be more upset by a mate having a one-night-stand while on vacation than they would be by a mate falling in love with someone else while on vacation. This finding is hard to square with JSIM. In particular, the JSIM hypothesis should predict that women should be relatively unbothered by this sexual infidelity scenario, since it poses minimal threat of loss of resources. For men, on the other hand, the inclusive fitness threat is substantial. If sexual jealousy is an adaptation to prevent cuckoldry, then why do women report comparably strong reactions to this scenario?

These data seem consistent with other research which has shown that men and women's inferences about the degree to which one form of infidelity is likely to imply the other is one factor that impacts which form is chosen as worse on hypothetical measures (DeSteno & Salovey, 1996; Harris & Christenfeld, 1996a). In essence, the various hypothetical questions vary in the degree to which they control the types of inferences that a participant makes. When questions offered a plausible scenario in which some implications for infidelity were controlled (i.e., one form of infidelity has occurred but is unlikely to continue), the genders responded in the same way. Similarity of men's and women's responses to infidelity provides evidence against JSIM.

Reactions to Actual Occurrences of Infidelity

The current work went beyond the existing literature on hypothetical data to inquire about *actual* experiences with infidelity. Retrospective descriptions of actual events have the virtue of depending on participants' ability to recall actual experiences they have had, rather than their ability to imagine people, relationships, and events that do not exist. Thirty-six percent of participants reported having personal experience with a mate cheating. Their responses did not corroborate the gender differences alleged by the JSIM hypothesis. Both females and males reported focusing slightly more on emotional aspects of their partner's infidelity. When faced with an unfaithful mate, women were significantly more likely to end the relationship. The apparent greater willingness of men to tolerate infidelity seems at odds with the view that evolution shaped sexual jealousy to prevent cuckoldry. Questions regarding a mate's past also offered no support for JSIM. While roughly 75% of the sample reported being bothered by a mate's past lovers, women and men were not differentially upset by a mate's sexual past. The present work found no evidence that responses to the forced-choice infidelity questions were correlated with how much people focused on the sexual versus emotional aspects of a mate's actual affair. This result casts further doubt that hypothetical infidelity responses are valid indicators of jealousy over real infidelity.

As mentioned previously, Harris (2002) also directly compared reactions to real sexual and emotion infidelity. Contrary to JSIM, both women and men in this older sample focused significantly more on the emotional aspects of a mate's affair. This raises some interesting possibilities: (a) that upset over sexual infidelity may decrease with age for both men and women or (b) that in more committed relationships one focuses more on the potential of emotional loss. The lack of a gender difference in sexual jealousy is also consistent with a study of older New Zealand adults, which found that females and males did not differ in their concern over loss of sexual exclusivity (Mullen & Martin, 1994).

One issue that should be discussed is the possible ambiguity in asking about upset over the two forms of infidelity. Due to people's reluctance to admit to feeling jealousy, research in this area tends to substitute the word "upset" for "jealousy." Therefore, when people respond to questions regarding their upset over a mate's sexual infidelity, they may also be thinking of other ramifications of that infidelity such as the possibility of sexually transmitted diseases (STDs). This potential ambiguity exists in all previous work on this topic (including the forced-choice scenarios) as well as in the present work. However, there is some work that bears on this issue as it pertains to reactions to real infidelity. Harris (2002) administered the same questions employed here and found that homosexual men did not report greater focus on their mate's actual sexual infidelity than heterosexual men and women and lesbian women, although gay men tend to

be at greater risk for STDs. It is also possible that asking people about how much they focused on the emotional aspects of the infidelity tapped into factors other than their mate's emotional attachment to another. However, the ambiguity of this question likely reflects the ambiguity of infidelity in real life. Threat to romantic love probably encompasses a variety of factors.

This highlights one major theoretical weakness in JSIM. The content that is hypothesized to trigger jealousy is probably too specific (and likely to be manifested too late) to provide effective solutions to cuckoldry and resource loss. Buss (1995) claimed that "the inputs that activate jealousy for men will focus heavily on the sex act per se" (p. 14) and the inputs for women will focus on a mate falling in love with another. However, such cues probably would only be evident once the infidelity was *fait accompli*. All support for JSIM, including the forced-choice scenarios, comes from situations in which the infidelity has supposedly already occurred or is presently occurring. Yet, the function of the jealousy mechanisms is to *prevent* infidelity. For example, a man who did not become jealous until there were clear signs of his mate's sexual betrayal is likely already in danger of having been cuckolded. A parallel case can be made for female jealousy and emotional betrayal. Thus, such content-specific triggers would be quite poor at preventing cuckoldry and resource loss and would not provide great inclusive fitness benefits.

Instead, as argued elsewhere (Harris, 2003), a seemingly better strategy would be to be vigilant to any cues of possible impending infidelity so that one could prevent it. Infidelity rarely occurs abruptly; instead, people usually first engage in flirting behaviors (e.g., increased eye contact, smiling, hugging). These same behaviors can be signals of the beginning of sexual interest, emotional interest, or both. Thus, there would be no need for men and women to have evolved different innate triggers for jealousy. Instead, both genders could prevent either form of infidelity from occurring by being alert to the same flirtatious behaviors. Unlike JSIM, this hypothesis is consistent with the emerging evidence that men and women are not differentially jealous over the two forms of infidelity.

Individual Differences in Responses to a Mate's Actual Infidelity

The second major goal of the present work was to use a social-cognitive framework to examine some factors that might contribute to individual differences in jealousy over a mate's actual infidelity. Whereas JSIM has offered no account for individual differences in reactions to infidelity, the social-cognitive perspective offers some possibilities. This approach argues that neither gender relishes the idea of a mate falling in love or having sex with someone else. - However, the extent to which an individual becomes jealous over any given act of infidelity will depend on his or her self-concept and beliefs regarding the loss of relationship

rewards. The domain relevance hypothesis of Salovey and colleagues predicts that people tend to experience jealousy in areas that are particularly important to them (Salovey & Rothman, 1991). Some of the current findings fit well with this view, although other findings are somewhat less clear-cut.

In contrast to JSIM predictions, greater experience with committed sexual relationships was positively associated with greater sexual jealousy over a mate's actual infidelity for both genders. The number of lifetime sexual intercourse partners was also positively correlated with sexual jealousy over real infidelity, although to a lesser degree than committed sexual relationship experience. This raises some interesting possibilities. At first blush, it might appear that variables assessing the total number of sexual partners regardless of relationship status would be the best indicators of importance of sex. However, it may be the case that the personal relevance and meaning of sex changes as it is experienced within a committed sexual relationship. For example, Miller and her colleagues found that early emotional bonding in a relationship was associated with greater subsequent sexual enjoyment for both husbands and wives (Miller, Fishkin, Gonzales-Tumey, & Rothspan, 1996). Hence, the development of emotional attachment in committed relationships may be an important path *by* which sex becomes self-relevant. A mate's sexual infidelity then may be seen as particularly threatening to this relationship reward. Another factor may also contribute to the poorer predictive power of the general sexual history measures. Some people may refrain from sex because they view it as extremely important (e.g., for religious reasons, etc.). For these individuals, sexual history would be a poor indicator of the self-relevance of sex. Yet, they might too experience greater upset over a mate's sexual betrayal. Future work could explore this possibility with real infidelity.

The finding that men who placed greater importance on sexual activity in dating relationships reported having focused more on a mate's sexual infidelity than individuals who placed less importance on sexual activity is consistent with social-cognitive perspective in general, and particularly with Salovey's domain relevance hypothesis (Salovey & Rothman, 1991). However, this relationship was significantly weaker for women. There are several possible accounts of this intriguing sex effect, ranging from neurohormonal differences to social role differences.

One possibility is that social norms that restrict women's sexuality may lead women to be less likely to endorse a statement about the importance of sex in dating relationships. Although sexual norms, particularly regarding premarital sex, have loosened over the years, it still remains the case that acceptable sexual behavior, particularly outside of relationships, is still more restricted for women than for men (Milhausen & Herold, 1999). Perhaps other statements such as the importance of sex in marriage might help reveal a stronger effect in women, given that sex within

marriage is more socially sanctioned. Another possible account of this gender difference is that sex as a relationship reward may be more intimately connected to male self-esteem than to female self-esteem. Male and female sexual roles have some notable differences. For example, relative to women, men instigate sexual activity more often, tend to endorse more items related to sexual self-esteem, and find a mate's desire for sexual variety more threatening (Baumeister, Catanese, & Vohs, 2001; Buunk, 1984). Hence, the association between sexual jealousy and greater endorsements of the importance of sex in dating relationships may be greater for men because sex has greater self-relevance for them than it has for women. A third possibility is that the gender difference in endorsement of sexual activity may reflect a difference in sexual circuitry for men and women. In humans, the ability to have sex (receptivity) can be uncoupled from sexual motivation (proceptivity; Dixon, 1998). For women, sexual motivation varies across the menstrual cycle with it peaking at estrus whereas, for men, sexual motivation appears to be more constant (Miller, 2002). Thus, individual differences in importance of sex may still play a role in women's sexual jealousy, but this effect may be obscured by not taking into account where women are in their menstrual cycle. To pursue these possibilities, future work could benefit from examining these various factors in older and married women as well as assessing phase of menstrual cycle.

In contrast to sexual jealousy, none of the factors examined here showed a strong relationship to emotional jealousy. Buss et al. (1999) have attempted to argue for the superiority of the forced-choice format over methods that separately examine sexual and emotional jealousy. The current findings illustrate an inherent problem in pitting sexual versus emotional jealousy in a single response format: such a method prevents one from identifying factors that selectively impact one form of jealousy and not the other.

Concluding Remarks

In closing, when reactions to real infidelity were examined, there was no support for the claim that women and men are innately wired up to be bothered by different forms of infidelity. This work also focused on a few of the factors that might be associated with sexual jealousy. Although some experiential variables such as committed relationship history had a similar association with jealousy for both genders, another variable, sexual relationship rewards, was differentially associated in women and men.

The current work is limited in that it focused on a young sample with fairly restricted life and relationship experiences (e.g., only 3% of the participants had children). Future work could benefit from examining additional factors that are associated with jealousy in older populations. By doing so one can examine the roles that factors such as children, marriage, more extended sexual relationship experience, etc. play in jealousy over infidelity.

Reactions to Actual Occurrences of Infidelity

The current work went beyond the existing literature on hypothetical data to inquire about *actual* experiences with infidelity. Retrospective descriptions of actual events have the virtue of depending on participants' ability to recall actual experiences they have had, rather than their ability to imagine people, relationships, and events that do not exist. Thirty-six percent of participants reported having personal experience with a mate cheating. Their responses did not corroborate the gender differences alleged by the JSIM hypothesis. Both females and males reported focusing slightly more on emotional aspects of their partners infidelity. When faced with an unfaithful mate, women were significantly more likely to end the relationship. The apparent greater willingness of men to tolerate infidelity seems at odds with the view that evolution shaped sexual jealousy to prevent cuckoldry. Questions regarding a mate's past also offered no support for JSIM. While roughly 75% of the sample reported being bothered by a mate's past lovers, women and men were not differentially upset by a mate's sexual past. The present work found no evidence that responses to the forced-choice infidelity questions were correlated with how much people focused on the sexual versus emotional aspects of a mate's actual affair. This result casts further doubt that hypothetical infidelity responses are valid indicators of jealousy over real infidelity.

As mentioned previously, Harris (2002) also directly compared reactions to real sexual and emotion infidelity. Contrary to JSIM, both women and men in this older sample focused significantly more on the emotional aspects of a mate's affair. This raises some interesting possibilities: (a) that upset over sexual infidelity may decrease with age for both men and women or (b) that in more committed relationships one focuses more on the potential of emotional loss. The lack of a gender difference in sexual jealousy is also consistent with a study of older New Zealand adults, which found that females and males did not differ in their concern over loss of sexual exclusivity (Mullen & Martin, 1994).

One issue that should be discussed is the possible ambiguity in asking about upset over the two forms of infidelity. Due to people's reluctance to admit to feeling jealousy, research in this area tends to substitute the word "upset" for "jealousy." Therefore, when people respond to questions regarding their upset over a mate's sexual infidelity, they may also be thinking of other ramifications of that infidelity such as the possibility of sexually transmitted diseases (STDs). This potential ambiguity exists in all previous work on this topic (including the forced-choice scenarios) as well as in the present work. However, there is some work that bears on this issue as it pertains to reactions to real infidelity. Harris (2002) administered the same questions employed here and found that homosexual men did not report greater focus on their mate's actual sexual infidelity than heterosexual men and women and lesbian women, although gay men tend to

be at greater risk for STDs. It is also possible that asking people about how much they focused on the emotional aspects of the infidelity tapped into factors other than their mate's emotional attachment to another. However, the ambiguity of this question likely reflects the ambiguity of infidelity in real life. Threat to romantic love probably encompasses a variety of factors.

This highlights one major theoretical weakness in JSIM. The content that is hypothesized to trigger jealousy is probably too specific (and likely to be manifested too late) to provide effective solutions to cuckoldry and resource loss. Buss (1995) claimed that "the inputs that activate jealousy for men will focus heavily on the sex act per se" (p. 14) and the inputs for women will focus on a mate falling in love with another. However, such cues probably would only be evident once the infidelity *was fait accompli*. All support for JSIM, including the forced-choice scenarios, comes from situations in which the infidelity has supposedly already occurred or is presently occurring. Yet, the function of the jealousy mechanisms is to *prevent* infidelity. For example, a man who did not become jealous until there were clear signs of his mate's sexual betrayal is likely already in danger of having been cuckolded. A parallel case can be made for female jealousy and emotional betrayal. Thus, such content-specific triggers would be quite poor at preventing cuckoldry and resource loss and would not provide great inclusive fitness benefits.

Instead, as argued elsewhere (Harris, 2003), a seemingly better strategy would be to be vigilant to any cues of possible impending infidelity so that one could prevent it. Infidelity rarely occurs abruptly; instead, people usually first engage in flirting behaviors (e.g., increased eye contact, smiling, hugging). These same behaviors can be signals of the beginning of sexual interest, emotional interest, or both. Thus, there would be no need for men and women to have evolved different innate triggers for jealousy. Instead, both genders could prevent either form of infidelity from occurring by being alert to the same flirtatious behaviors. Unlike JSIM, this hypothesis is consistent with the emerging evidence that men and women are not differentially jealous over the two forms of infidelity.

Individual Differences in Responses to a Mate's Actual Infidelity

The second major goal of the present work was to use a social-cognitive framework to examine some factors that might contribute to individual differences in jealousy over a mate's actual infidelity. Whereas JSIM has offered no account for individual differences in reactions to infidelity, the social-cognitive perspective offers some possibilities. This approach argues that neither gender relishes the idea of a mate falling in love or having sex with someone else. However, the extent to which an individual becomes jealous over any given act of infidelity will depend on his or her self-concept and beliefs regarding the loss of relationship

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The factors that impact jealous feelings and behaviors are no doubt multifaceted and further work is clearly needed to unravel these mysteries. In some cases, we may find gender differences. Such differences are likely to be the result of complex and dynamic interactions, some of which may even have their distant roots in biological differences between the sexes. However, any such biological differences will probably have their effects via more circuitous paths than those proposed in the JSIM theory. Further theoretical development of the social-cognitive perspective may be one fruitful avenue to pursue to unravel such paths.

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REFERENCES

- Barkow, J. H., Cosmides, L., & Tooby, J. (Eds.) (1992). *The adapted mind: evolutionary psychology and the generation of culture*. New York: Oxford University Press.
- Baumeister, R. F., Catanese, K. R., & Vohs, K. D. (2001). Is there a gender difference in strength of sex drive: Theoretical views, conceptual distinctions, and a review of relevant evidence. *Personality and Social Psychology Review*, 5, 242-273.
- Buss, D. M. (1995). Evolutionary psychology: A new paradigm for psychological science. *Psychological Inquiry*, 6, 1-30.
- Buss, D. M. (2000). *The dangerous passion: Why jealousy is as necessary as love and sex*. New York: Free Press.
- 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., Shackelford, T. K., Kirkpatrick, L. A., Choe, J. C., Lim, H. K., Hasegawa, M., Hasegawa, T., & Bennett, K. (1999). Jealousy and the nature of beliefs about infidelity: Tests of competing hypotheses about sex differences in the United States, Korea, and Japan. *Personal Relationships*, 6, 125-150.
- Buunk, B. (1984). Jealousy as related to attributions for the partner's behavior. *Social Psychology Quarterly*, 47, 107-112.
- Buunk, B. P., Angleitner, A., Oubaid, V., & Buss, D. M. (1996). Sex differences in jealousy in evolutionary and cultural perspective: Tests from the Netherlands, Germany, and the United States. *Psychological Science*, 7, 359-363.
- Caporael, L. R. (2000). Evolutionary psychology: Toward a unifying theory and a hybrid science. *Annual Review of Psychology*, 52, 607-628.
- Daly, M., Wilson, M., & Weghorst, S. J. (1982). Male Sexual Jealousy. *Ethology and Sociobiology*, 3, 11-27.
- DeSteno, D., Bartlett, M., Braverman, J., & Salovey, P. (2002). Sex differences in jealousy: Evolutionary mechanism or artifact of measurement? *Journal of Personality and Social Psychology*, 83, 1103-1116.
- DeSteno, D. A., & Salovey, P. (1996). Evolutionary origins of sex differences in jealousy? Questioning the "fitness" of the model. *Psychological Science*, 7, 367-372.
- de Weerth, C., & Kahna, A. P. (1993). Female aggression as a response to sexual jealousy: A sex role reversal? *Aggressive Behavior*, 19, 265-279.
- Dijkstra, P., Groothof, H., Poel, G., Laverman, T., Schrier, M., & Buunk, B. (2001). Sex differences in the events that elicit jealousy among homosexuals. *Personal Relationships*, 8, 41-54.
- Dixson, A. F. (1998). *Primate sexuality: Comparative studies of the prosimians, monkeys, apes, and human beings*. New York: Oxford University Press.
- Eagly, A. H., & Wood, W. (1999). The origins of sex differences in human behavior: Evolved dispositions versus social roles. *American Psychologist*, 54, 408-423.
- Geary, D. C., Rumsey, M., Bow-Thomas, C. C., & Hoard, M. K. (1995). Sexual jealousy as a facultative trait: Evidence from the pattern of sex differences in adults from China and the United States. *Ethology & Sociobiology*, 16, 355-383.
- Harris, C. R. (2000). Psychophysiological responses to imagined infidelity: The specific innate modular view of jealousy reconsidered. *Journal of Personality and Social Psychology*, 78, 1082-1091.
- Harris, C. R. (2002). Sexual and romantic jealousy in heterosexual and homosexual adults. *Psychological Science*, 13, 7-12.
- Harris, C. R. (2003). A review of sex differences in sexual jealousy, including self-report data, psychophysiological responses, interpersonal violence, and morbid jealousy. *Personality and Social Psychology Review*, 7, 102-128.
- Harris, C. R., & Christenfeld, N. (1996a). Gender, jealousy, and reason. *Psychological Science*, 7, 364-366.
- Harris, C. R., & Christenfeld, N. (1996b). Jealousy and rational responses to infidelity across gender and culture. *Psychological Science*, 7, 378-379.
- Hupka, R. B., & Ryan, J. M. (1990). The cultural contribution to jealousy: cross-cultural aggression in sexual jealousy situations. *Behavioral Science Research*, 24, 51-71.
- Mathes, E. W. (1991). A cognitive theory of jealousy. In P. Salovey (Ed.), *The psychology of jealousy and envy* (pp. 52-78). New York: Guilford Press.
- Milhausen, R. R., & Herold, E. S. (1999). Does the sexual double standard still exist? Perceptions of university women. *Journal of Sex Research*, 36, 361-368.
- Miller, L. C., & Fishkin, S. A. (1997). On the dynamics of human bonding and reproductive success: Seeking windows on the adapted-for human-environmental interface. In J. A. Simpson & D. T. Kenrick (Eds.), *Evolutionary social psychology* (pp. 197-236). Mahwah, NJ: Lawrence Erlbaum.
- Miller, L. C., Fishkin, S. A., Gonzales-Tumey, C., & Rothspan, S. (1996). When sex is hot and when its not: For women do attachments matter? Unpublished manuscript.
- Miller, L. C., Pederson, W. C., & Putcha, A. D. (2002). *Mating mechanisms for men and women: from smoke, mirrors, leaps of faith...toward a mindful evolutionary dynamics*. Manuscript submitted for publication.
- Mullen, P. E., & Martin, J. (1994). Jealousy: A community study. *British Journal of Psychiatry*, 164, 35-43.
- Nannini, D. K., & Meyers, L. S. (2000). Jealousy in sexual and emotional infidelity: An alternative to the evolutionary explanation. *The Journal of Sex Research*, 37, 117-122.
- Parrott, W. G. (1991). The emotional experience of envy and jealousy. In P. Salovey (Ed.), *The psychology of jealousy and envy* (pp. 3-30). New York: Guilford Press.

- Paul, L., & Galloway, J. (1994). Sexual jealousy: Gender differences in response to partner and rival. *Aggressive Behavior, 20*, 203-211.
- Pinker, S. (1997). *How the mind works*. New York: W. W. Norton & Co.
- Salovey, P., & Rodin, J. (1984). Some antecedents and consequences of social-comparison jealousy. *Journal of Personality and Social Psychology, 47*, 780-792.
- Salovey, P., & Rodin, J. (1991). Provoking jealousy and envy: Domain relevance and self-esteem threat. *Journal of Social & Clinical Psychology, 10*, 395-413.
- Salovey, P., & Rothman, A. (1991). Envy and jealousy: self and society. In P. Salovey (Ed.), *The psychology of jealousy and envy* (pp. 271-286). New York: Guilford Press.
- Sheets, V., & Wolfe, M. (2001). Sexual jealousy in heterosexuals, lesbians, and gays. *Sex Roles, 44*, 255-276.
- Simpson, J. A., & Gangestad, S. W. (1991). Individual differences in sociosexuality: Evidence for convergent and discriminant validity. *Journal of Personality and Social Psychology, 60*, 870-883.
- Symons, D. (1979). *The evolution of human sexuality*. New York: Oxford University Press.
- Voracek, M., Stieger, S., & Gindl, A. (2001). Online replication of evolutionary psychological evidence: Sex differences in sexual jealousy in imagined scenarios of mate's sexual versus emotional infidelity. In U. Reips & M. Bosnjak (Eds.), *Dimensions of internet science* (pp. 91-112). Lengerich, Germany: Pabst Science Publishers.
- White, G. L. (1981). A model of romantic jealousy. *Motivation and Emotion, 5*, 295-310.
- White, G. L., & Mullen, P. E. (1989). *Jealousy: Theory, research, and clinical strategies*. New York: Guilford Press.
- Wiederman, M. W., & Allgeier, E. R. (1993). Gender differences in sexual jealousy: Adaptionist or social learning explanation? *Ethology and Sociobiology, 14*, 115-140.
- Wiederman, M. W., & Kendall, E. (1999). Evolution, sex, and jealousy: Investigation with a sample from Sweden. *Evolution and Human Behavior, 20*, 121-128.

APPENDIX

Items on Relationships Questionnaire

Hypothetical Jealousy Reactions to Infidelity [Buss et al., 1992]

Forced-choice infidelity questions: Please think of a serious romantic relationship you've had in the past, currently have, or would like to have. Imagine that you discover that your partner has become interested in someone else. What would upset you more?

- (a) Imagining your partner forming a deep emotional attachment to that other person. (b) Imagining your partner enjoying passionate sexual intercourse with that other person.
- (a) Imagining your partner trying different sexual positions with that other person. (b) Imagining your partner falling in love with that other person.

Additional hypothetical infidelity questions [similar to items by Weiderman & Allgeier, 1993]:

- You suspect that while your boyfriend/girlfriend was on vacation s/he had a one night stand. You realize that even if s/he did have sex with this other person, they will probably never see each other again. How upset do you think you would feel if this happened?
- You suspect that while your boyfriend/girlfriend was on a trip s/he fell in love with someone else. You realize that even if s/he did develop these feelings, s/he will probably never see this other person again. How upset do you think you would feel if this happened?

[Both answered on a 9-pt scale: 1 = *not at all*, 9 = *extremely*]

Experience With Real Jealousy and Infidelity

- Have you had any experiences in which someone you were romantically involved with "cheated on" you?

[Participants were asked to report on their most recent experience of this sort.]

- How emotionally distressed were you upon discovering this infidelity? [5-pt scale: 1 = *not at all*, 5 = *very*]
- To what degree did you focus on the emotional aspects of your partners infidelity? [5-pt scale: 1 = *not at all*, 5 = *completely*]
- To what degree did you focus on the sexual aspects of your partners infidelity? [5-pt scale: 1 = *not at all*, 5 = *completely*]
- Did your relationship continue after this infidelity?
- If it ended, who terminated it?

Jealousy Over a Mate's Past

- Have you ever had uncomfortable feelings about your mate's ex-lovers?
- If yes, to what degree were you bothered by your mate's sexual past? [5-pt scale: 1 = *not at all*, 5 = *completely*]

Relationship Experience

- How many committed sexual relationships have you had?
- How many different partners have you had sex with in your lifetime?
- How many people have you had sexual experiences with (this includes oral sex, genital stimulation, penetration, etc.)?

Relationship Rewards: Importance of Sex and Love in Relationships [Weiderman & Allgeier, 1993]

- It is important that my dating relationships include a great deal of emotional intimacy and sharing.

2. It is important that my steady dating relationships include sexual activity.

[Both rated on a 9-pt scale: 1 = *strongly disagree*, 9 = *strongly agree*]

Sociosexual Orientation Inventory [Simpson & Gangestad, 1991]

1. With how many different partners have you had sex (sexual intercourse) within the past year?
2. How many different partners do you foresee yourself having sex with during the next five years? (Please give a *specific, realistic* estimate.)
3. With how many different partners have you had sex

on *one and only one* occasion?

4. How often do you fantasize about having sex with someone other than your current dating partner? [8-point scale: 1 = *never*, 8 = *at least once a day*]

[The remaining items were rated on a 9-point scale: 1 = *strongly disagree*, 9 = *strongly agree*.]

5. Sex without love is OK.
6. I can imagine myself being comfortable and enjoying "casual" sex with different partners.
7. I would have to be closely attached to someone (both emotionally and psychologically) before I could feel comfortable and fully enjoy having sex with him or her. [reverse scored]