
Evolution, Sex, and Jealousy: Investigation With a Sample From Sweden

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When asked to choose which would be most upsetting, a mate's sexual or emotional infidelity, past research has demonstrated that men are more likely than women to choose sexual infidelity, whereas women are more likely than men to choose emotional infidelity. Explanation of this sex difference has been controversial. In the current study we attempted to replicate previous research by examining a sample of college students in Sweden. In doing so, we also investigated the "double-shot" explanation. In the current study, the majority of men chose the sexual infidelity scenario as most upsetting, whereas the majority of women chose the emotional infidelity scenario as most upsetting. Contrary to the double-shot explanation, choice of scenario was unrelated to attitudes regarding whether the other sex was capable of satisfying sexual relations outside of a love relationship. © 1999 Elsevier Science Inc.

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More than 50 years ago Alfred Kinsey noted that men appear to be more concerned about the sexual aspects of a mate's potential infidelity, whereas women appear to be more concerned about lost attention, emotional investment, and love from their mate (Kinsey et al. 1948: 592). More recently, writers have attempted to explain the evolutionary origins of these apparent sex differences (Daly and Wilson 1983; Daly et al. 1982; Wilson and Daly 1992). Specifically, sex differences in confidence of parenthood and the roles members of each sex play in childrearing have been used to explain why men and women can be expected to be differentially sensitive to cues of sexual versus emotional infidelity, respectively (Buss et al. 1992; Symons 1979; Wiederman and Allgeier 1993). Has recent empirical research supported such a claim?

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Buss et al. (1992) asked college students to imagine their dating partner "trying different sexual positions with another person" and to imagine their dating partner "falling in love with another person." The majority of men (60%) chose the sexual scenario as most upsetting, whereas the majority of women (83%) chose the emotional infidelity as most upsetting. Buss et al. (1992) performed a follow-up study in which these sex differences were replicated using measured physiological indications of upset rather than self-report measures. The self-reported sex differences were replicated further in college student samples using somewhat different scenarios (Wiederman and Allgeier 1993) and a variety of wordings (Buss et al., in press).

In a cross-cultural comparison, Buunk et al. (1996) presented the two jealousy-evoking scenarios used by Buss et al. (1992) to samples from the United States, Germany, and The Netherlands. In each sample, men were much more likely than women to choose the sexual infidelity as most upsetting. This sex difference was largest in the U.S. sample and more moderate in the other two samples. Examining these three countries was considered a rigorous test of evolutionary hypotheses, because The Netherlands is known for being much more egalitarian and liberal than the U.S. with regard to sexual attitudes (e.g., acceptability of extramarital sex) and codes of sexual conduct for men compared to women.

Buunk et al. (1996) interpreted the cross-cultural *consistency* in sex differences as evidence for sexually dimorphic psychological mechanisms regarding sensitivity to particular cues likely to elicit jealousy. The cross-cultural *differences* in the size of the sex difference were taken as an indication that these psychological mechanisms are sensitive to cultural norms and values having to do with sex role egalitarianism and sexual conduct.

Harris and Christenfeld (1996a) and DeSteno and Salovey (1996a) each criticized Buunk et al.'s interpretation of the findings. These commentators asserted that the apparent sex differences may be due to respondents' beliefs that women are less likely than men to have sex with an interloper without any emotional involvement. That is, if respondents assume that men may have sex with someone outside of the primary dyad and *not* experience any emotional involvement, but that women are unlikely to make such a sharp distinction between their own sexual and emotional involvement with an interloper, the apparent sex differences in elicitation of jealousy can be explained by such sex differences in the implications of the infidelity.

From this perspective, women would be most upset by a mate's emotional infidelity because it is the choice that has the greatest implications for the continuation of the primary relationship (i.e., for men, emotional involvement implies sexual involvement, whereas sexual involvement does *not* necessarily imply emotional involvement). Men, however, would be most upset by a mate's sexual infidelity because it implies *both* sexual and emotional involvement with the interloper (as opposed to only emotional involvement). DeSteno and Salovey (1996a) called this the "double-shot" hypothesis, and both they and Harris and Christenfeld (1996a) provided data from U.S. college students indicating that respondents' beliefs regarding the emotional implications of men's versus women's sexual involvement with an interloper are different [also see Buss et al. (in press); Sprecher et al. 1998)]. Additionally, DeSteno and Salovey (1996b) and Harris and Christenfeld (1996b) noted that, across all three samples in Buunk et al. (1996), the majority of *both* men and

women chose the emotional infidelity scenario as most upsetting, thus calling into question the relative salience of sexual infidelity, even to men.

The current study was undertaken to investigate further the nature of sex differences in jealousy by presenting college students in Sweden with two scenarios, each designed to remove the potential overlap between emotional and sexual involvement. Sweden was chosen as a sampling source with the potential for a rigorous test of evolutionary predictions, because Sweden has been described as falling at the positive or liberal end of the continuum with regard to sex role egalitarianism, particularly with regard to sexual issues such as nonmarital involvement (Widmer et al. 1998). Such relatively permissive cultural attitudes have been said to be due to a long history of comprehensive sexuality education and a cultural climate emphasizing personal privacy (Reiss 1990; Trost and Bergstrom-Walan 1997). Compared to college students in the U.S., college students in Sweden are more permissive with regard to premarital sex (Schwartz 1993; Weinberg et al. 1995) and appear to hold more similar standards for men's versus women's sexual behavior (Weinberg et al. 1995). Accordingly, we expected that, similar to Buunk et al.'s data from The Netherlands, the aforementioned sex difference would be apparent, but it would be much more moderate than has been documented with samples of U.S. college students.

In addition to addressing the double-shot hypothesis by constructing the scenarios to each represent only emotional or sexual involvement, we also measured the extent to which respondents believed men versus women are able to experience enjoyable sexual interactions outside of a love relationship. In this way, we could test whether any apparent sex differences in patterns of response to the two jealousy-evoking scenarios can be explained statistically by corresponding sex differences in these relevant beliefs.

METHODS

Participants and Procedure

Research participants were initially 392 college students enrolled at Orebro University, a school of approximately 10,000 students in a small city in Sweden. Responses from three men and three women were excluded due to self-reported sexual attraction primarily to those of the same sex. Of the remaining 386 respondents, only six men and four women indicated *never* having been involved in a "sexual relationship." Excluding these few respondents resulted in a final sample of 173 men and 203 women, all of whom were heterosexual and had been involved in a sexual relationship. The age of these 376 participants ranged from 19 to 45 years ($M = 23.94$, $SD = 4.52$). There was no sex difference in age, $F(1, 374) = .25$, $p < .62$.

The brief questionnaires were administered by the second author in classroom settings with the permission of the respective instructors. Participants were instructed not to put any identifying information on the questionnaires, which typically were completed during the first few minutes of class. Given the anonymous, voluntary nature of the participation, as well as the need to administer the questionnaire as quickly as possible, no attempt was made to measure rates of refusal to participate. However, it was clear that the large majority of students asked to participate

did so. Classes in a variety of disciplines were surveyed, including psychology, nursing, business, economics, and culture.

Measures

Respondents were asked to indicate their sex, age, the sex toward whom they were primarily sexually attracted, and whether they had ever been involved in a sexual relationship. Next, respondents were presented with two scenarios, modified only slightly from Wiederman and Allgeier (1993). The scenarios were preceded with the instructions: "If you are not currently involved in a serious, romantic relationship, imagine for a moment that you are. Please read the following two scenarios and circle the one you would find more upsetting."

Your partner recently made friends with a co-worker of the other sex and has been spending more and more time with that person. You are sure that the two of them have not had sexual intercourse, but they seem to like each other very much. The two of them have many things in common and you suspect that they are falling in love.

You discover that, while your partner was away on vacation, your partner met someone and had sexual intercourse once with that person. You are sure that your partner loves you very much and highly values your relationship together. You also realize that, even though your partner did have sexual intercourse while on vacation, it was a "one-night stand" and your partner would never see that other person again.

The order of presentation of the two scenarios was counterbalanced to offset any effect for considering one of the forms of infidelity prior to consideration of the other. Buunk et al. (1996) translated their instructions and scenarios from English into German and Dutch. However, they noted the difficulty comparing results across cultures when the stimuli used are not absolutely the same. Fortunately, due to compulsory English classes during grade school, contemporary college students in Sweden are proficient in English. As we were replicating Wiederman and Allgeier (1993), we constructed the questionnaires in English, which appeared to pose no problem for respondents.

On the reverse side of the one-page questionnaire respondents were asked to complete an eight-item measure of Sex-Love-Marriage Association (Weis et al. 1986). Embedded within this measure are two items relevant to the current study: "A man can't have a satisfactory and satisfying sex life without being in love with his partner" and "A woman can't have a satisfactory and satisfying sex life without being in love with her partner." Respondents indicated their degree of agreement with each of these statements using a five-point scale (1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree).

RESULTS

The scenario chosen most upsetting was unrelated to the order in which the scenarios were presented [$X^2(1, N = 376) = .45, p < .51$]. However, sex of respondent was highly related to which scenario was deemed most upsetting. The majority (61.8%) of men chose the sexual infidelity scenario as most upsetting, whereas the

majority (63.1%) of women chose the emotional infidelity scenario as most upsetting [$\chi^2(1, N = 376) = 23.19, p < .00001$].

Was the sex difference in choice of scenario due to corresponding sex differences in beliefs about whether members of the other sex were capable of satisfying sexual relations outside of a love relationship? To answer this question, we examined responses to the two items measuring such beliefs. First, for descriptive purposes, note that men gave similar ratings to the statement that men cannot experience satisfying sexual activity without love ($M = 2.61, SD = 1.09$) as they did to the statement that women cannot experience satisfying sexual activity without love [$M = 2.73, SD = .97, t(172) = -1.44, p < .16$]. However, women indicated greater agreement that love was a prerequisite for satisfying sexual activity for a female ($M = 2.86, SD = 1.21$) than for a male [$M = 2.39, SD = 1.11, t(202) = -4.88, p < .001$], although both means were below the midpoint of the scale. There were not a sex difference with regard to beliefs about love as a prerequisite for women [$F(1, 374) = 1.15, p < .29$]; however, there was a marginal sex difference in beliefs about love being a prerequisite for men [$F(1, 374) = 3.85, p < .06$].

To illustrate that these beliefs differ from those endorsed by U.S. college students, we compared them to responses from a comparable sample of Ball State University students (data collected previously as part of an unpublished study). Compared to the Swedish students, the U.S. students were moderately more likely to indicate beliefs that love was a prerequisite for satisfying sexual activity for both men ($d = .29$) and women ($d = .33$), and scoring the overall eight-item measure resulted in moderately higher (more traditional) scores for the U.S. college students ($d = .43$).

To test the “double-shot” hypothesis, we performed a series of logistic regression analyses with scenario chosen by the respondent as the dependent variable (0 = emotional infidelity, 1 = sexual infidelity). In the first equation we simultaneously entered respondent sex (1 = male, 2 = female) as well as the responses to the item having to do with perceptions of the other sex. That is, we believed that the important element would be respondents’ beliefs about the motivation of members of the other sex. In this analysis, while simultaneously controlling for effects of the other variable in the equation, sex of respondent was significantly related to scenario chosen (Wald = 23.04, $p < .0001$, partial $r = -.20$), whereas beliefs about the degree to which love is a prerequisite for satisfying sexual activity for members of the other sex was unrelated (Wald = .47, $p < .50$, partial $r = .00$). In the next step we entered the term for the statistical interaction between respondent sex and beliefs, and it was unrelated to scenario chosen (Wald = .15, $p < .70$, partial $r = .00$).

Another way to test the “double-shot” hypothesis is to examine whether perceptions that one sex is more motivated by love compared to the other sex explains the apparent sex difference in response to the two jealousy scenarios. In other words, perhaps it is not the absolute agreement with the statements about the requirement of love for members of the other sex, but rather the relative view of the other sex compared to one’s own sex that best explains which scenario would be most upsetting (DeSteno and Salovey 1996a). To test this possibility, we calculated a difference index by subtracting the score men gave on the item about women from the score men gave on the item about men. Conversely, for women we subtracted the score they assigned to the item about men from the score they assigned to the

item about women. In this way a relatively higher score indicates the belief that love is more of a prerequisite for satisfying sexual activity for members of one's own sex compared to members of the other sex.

First, we simultaneously entered respondent sex and each respondent's score on this difference index into a logistic regression analysis to predict scenario chosen as most upsetting. Similar to before, respondent sex was significantly related (Wald = 20.39, $p < .0001$, partial $r = -.19$), whereas scores on the difference index were not (Wald = .37, $p < .55$, partial $r = .00$). Last, we entered the term representing the statistical interaction between respondent sex and the difference index. It was not a significant predictor (Wald = .21, $p < .65$, partial $r = .00$).

DISCUSSION

The results of the current study were remarkably similar to those of Wiederman and Allgeier (1993), who used the same scenarios with U.S. college students. They found that 63.7% of men chose the sexual infidelity scenario as most upsetting (compare to 61.8% of men in the current sample), whereas 59.2% of women chose the emotional infidelity scenario as most upsetting (compare to 63.1% of women in the current sample). Thus, the sex difference was robust across the two cultures, despite marked cultural differences in sexual attitudes and degree of egalitarianism with regard to sexual conduct for men compared to women.

The current results support the evolutionary explanation involving sexually dimorphic psychological mechanisms having to do with jealousy-evoking stimuli. The scenarios we used were intentionally designed to avoid confounding of a mate's emotional versus sexual involvement with an interloper. Still, male respondents might have been less likely to see women as able to engage in sex without love than female respondents might have seen men as able to engage in sex without love (i.e., the "double-shot" hypothesis). DeSteno and Salovey (1996a) found that statistically controlling for beliefs about the implications of one form of fidelity leading to the other resulted in a lack of association between sex and choice of scenario. We investigated this possibility and found that beliefs about whether the other sex was capable of satisfying sexual relations without love were not related to choice of scenario. There was no evidence that the sex difference in upset over the emotional infidelity versus the sexual infidelity was related to corresponding sex differences in beliefs that sexual involvement implied love among members of the other sex.

Of course, the results of past research as well as the current study do not imply that all men and women differ, that men are oblivious to their mate's emotional involvement with other men, or that women are apathetic regarding their mate's sexual involvement with other women. Both forms of infidelity are liable to be upsetting to both men and women, particularly when one form of involvement with an interloper implies the existence of the other form. However, it does appear that sexual infidelity may be more salient to men than is emotional infidelity, and vice versa for women.

Wiederman and Allgeier (1993) found that when a mate is spending time alone with someone of the other sex, men were more likely than women to indicate concerns that sexual activity might occur, whereas women were more likely than men to indicate concern that their partner might fall in love. Wiederman and Allgeier (1993) also found the apparent sex difference in sensitivity to sexual versus emotional infidelity was not due to sex differences in the value placed on sexual versus emotional intimacy in one's romantic relationships. In the current study, we found that the sex difference in jealousy was *not* due to corresponding sex differences in beliefs regarding whether members of the other sex were capable of satisfying sexual relations outside of a love relationship.

Despite the robustness of the sex difference across cultures and across scenarios used, there is a fair amount of within-sex variation. Future research should focus on accounting for differential reactions among men and among women. It is possible that those individuals who deviate from the statistical norm for their sex are pursuing different mating strategies (Ellis 1998) or hold different perceptions regarding their own mate value and/or that of competitors (Buss 1988).

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