

Original Article

The Effect of Vividness of Experience on Sex Differences in Jealousy

Sarah L. Strout, James D. Laird, Aaron Shafer and Nicholas S. Thompson.

Address for correspondence: Sarah L. Strout, Program in Social, Evolutionary, and Cultural Psychology, Clark University, 950 Main St. Worcester MA 01610, USA. Email: sstrout@clarku.edu.

Abstract: Doubt has been raised about the validity of results that appear to demonstrate sex differences in the type of infidelity that elicits jealousy. Two studies explored proposed methodological weaknesses of this research. The first study distinguished participants who had experienced infidelity and those who had only imagined infidelity. The study found the classic sex differences when participants were "forced" to choose which kind of infidelity would be most upsetting, and these differences were more pronounced among participants who were recalling the actual infidelity of a partner. The second study explored the impact of the relatively brief, perhaps cursory response that is commonly evoked by questionnaires versus a slower, more vivid imagining of the infidelity experience. The classic forced choice results were found, and the vivid imagining produced effects that are more powerful. The overall results suggest that participants who had experienced infidelity or vividly imagined infidelity showed greater sex differences, suggesting that the usual format (filling out a questionnaire) may not trigger the evolved mechanism for jealousy.

Keywords: sex differences, human jealousy, infidelity.

Introduction

Several researchers have asserted that because men and women faced different adaptive problems during our evolutionary history, they differ in the type of infidelity that upsets them most. Since a man cannot be sure he is the father of his mate's children, he would be more upset by a mate's sexual infidelity than a woman would because women are always sure the child she is bearing is her own. In contrast, a woman who can benefit from a mate's contribution to child rearing, would be more upset by a mate's emotional infidelity (and the risk of economic abandonment it might presage) than a man. (Buss, Larsen, Westen and Semmelroth, 1992; Buunk, Angleitner, Oubaid, and Buss, 1996; Daly, Wilson, and Weghorst,

1982; Wiederman and Allgeier, 1993). It is important to note that this evolutionary perspective predicts that men, *relative to women*, will be more upset by sexual infidelity, and women, *relative to men*, will be more upset by emotional infidelity. This perspective does not assume a rank ordered difference within the sex. It is not that women are more upset by emotional infidelity than by sexual infidelity. The differences are between sexes, not within, which has been a common misconception in the literature on sex differences in jealousy. This sex difference has been robustly demonstrated, not only in the United States, (Buss et al., 1992; Buunk et al., 1996; DeSteno and Salovey, 1996; Harris and Christenfeld, 1996) but also in some Asian and European countries (Buunk et al., 1996; Geary, Rumsey, Bow-Thomas and Hoard, 1995; Wiederman and Kendall, 1999). These results have led many to the conclusion that sexual differences in the eliciting factors and/or responses are a human universal.

Recently some researchers have called into question the validity of this conclusion. Harris (2002) suggests that the evidence supporting this conclusion is weak because of limitations imposed by the methods by which the putative sex difference was demonstrated. The classic method for demonstrating these differences is a forced choice method in which subjects are asked to say which of two jealousy experiences they would find most upsetting. Among her most potent criticisms is that almost all research concerning this issue has used imagined infidelity as a substitute for the experience of actual infidelity, leaving open the possibility that the effect only occurs when people imagine infidelity, and not when it actually happens. If Harris is correct, then imagined and remembered infidelity should provoke very different reactions from subjects.

Harris (2002) reported that when people described their reactions to real life infidelity, the classic sex differences disappeared. However, variations in methods may have been responsible for the lack of sex differences. Harris used the classic forced choice question for participants who had only imagined infidelity, in which she asked participants to choose whether emotional or sexual infidelity would be more upsetting. She found, like many others, that when forced to choose between imagined types of infidelity, more men than women chose sexual infidelity as more upsetting, and more women than men chose emotional infidelity. However, to participants who had experienced actual infidelity she posed an entirely different question: “To what degree did you *focus on* the emotional aspects of your partner’s infidelity” and “To what degree did you *focus on* the sexual aspects of your partner’s infidelity (Harris, 2002, 9).” Obviously, what the participant focuses on is very different from what upsets the participant. Harris confounded these instructions by not using the same phrase consistently in the study, as well as not using the same phrase as in previous literature. In addition, Harris did not ask participants which type of infidelity they had experienced, and if most of these participants had experienced only sexual infidelity, it would explain why they answered that they focused on the sexual aspects of the infidelity. In this study, Harris was comparing what men and women who have experienced infidelity focus on to what upsets participants who

have imagined infidelity, rather than comparing which kind of infidelity was more distressing to the two groups. To test the latter question more directly, our first study attempts to assess directly whether having experienced real infidelity *versus* imagining infidelity makes a difference by asking participants who have and have not experienced infidelity which kind of infidelity upsets them the most.

Study 1: Real versus imagined infidelity

This study was designed to test Harris' (2002) suggestion that while people who are imagining infidelity would show the usual sex differences, (men will be more upset by sexual infidelity than women and women will be most upset by emotional infidelity than men), these differences would not be reported by people reporting on their own experiences of real life infidelity.

Method

Participants

Participants included ninety-seven undergraduate students at Clark University. Fifty-three participants were male and forty-four were female, their ages ranged from seventeen to twenty-two.

Procedure

After participants signed a consent form, they were randomly assigned to read one of two counter-balanced descriptions of jealousy-provoking situations. The first situation was a description of emotional infidelity, asking the participants if they had ever been in a romantic relationship in which the person they were dating was beginning to fall in love with someone else, but definitely not having sexual relations. The second situation was a description of sexual infidelity, asking the participants if they had ever dated someone who was having sex with someone else, but definitely not forming an emotional attachment. If the participants reported having had either experience, they were asked to recall the situations as best they could. If they said they had not, they were asked to imagine such a scenario, again to the best of their ability.

After reading the first jealousy description, participants were asked to rate their feelings about the infidelity on a questionnaire that consisted of seven 30-point scales labeled with one of seven emotions: anger, fear, sadness, anxiety, rage, betrayal, and vindictiveness. One end of the linear scale was labeled "Don't feel at all" and the other was labeled "Feel very strongly." After completing the emotion ratings for the first type of infidelity, they read the description of the other type, and again described their feelings on the ratings scales. When the second task was completed, the last question of the questionnaire, derived from the traditional forced-

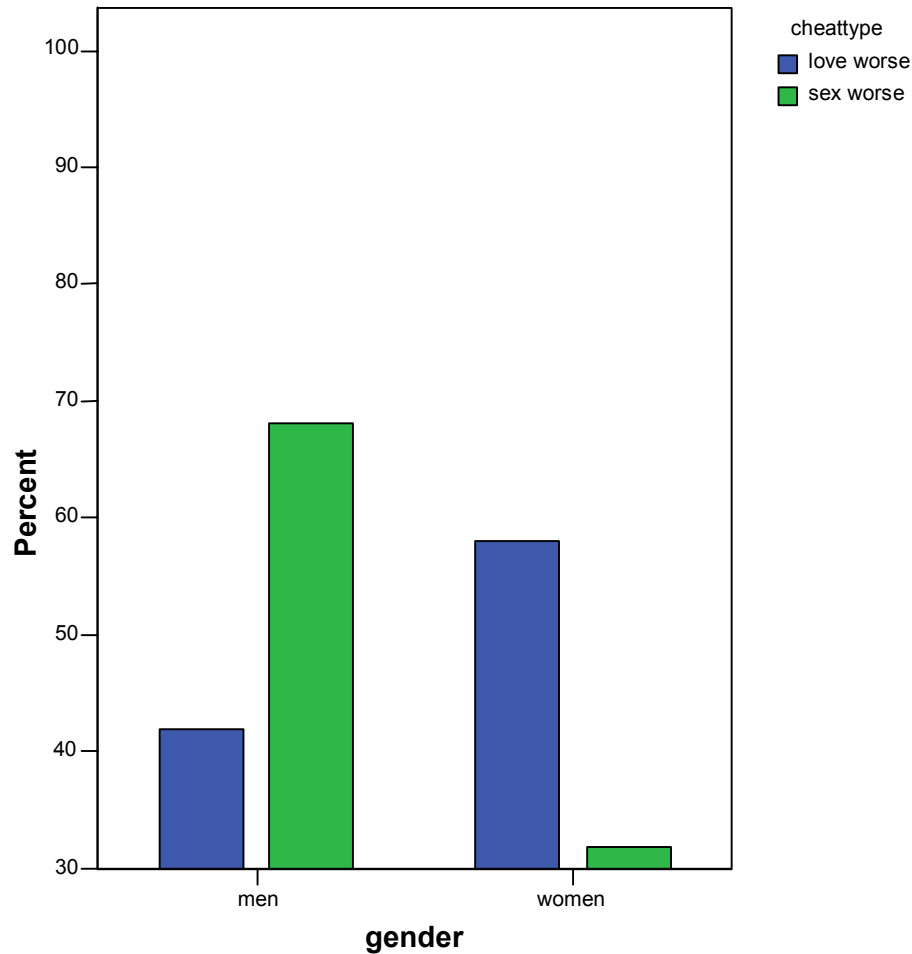
choice methodology, asked the participants to choose which type of infidelity, i.e. emotional or sexual, would upset them most.

Results

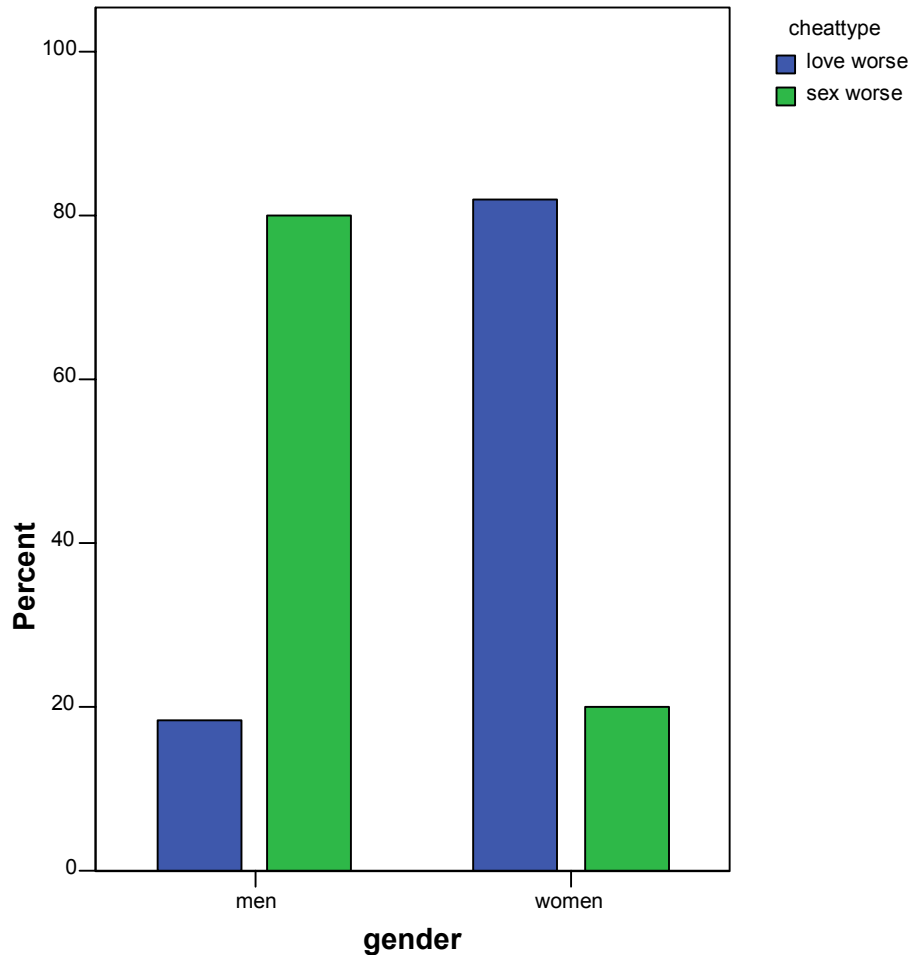
Forced Choice

Twenty-six of the ninety-seven participants reported that they had experienced infidelity, whether emotional or sexual in nature. Women and men were equally likely to report having experienced infidelity (fourteen of fifty-three men, twelve of forty-four women).

Regardless of experience with infidelity, the classic forced choice result emerged with thirty-two of fifty-three men saying that sexual infidelity would be worse, and twenty-nine of forty-four women saying that sexual infidelity was worse. (See Figure 1 below) This difference was significant, ($\chi^2=6.651$, $df= 1$, $p=.01$).



The same analysis was repeated on the two groups (experienced infidelity and imagined infidelity) separately. Contrary to Harris' results, participants who had experienced infidelity did show the anticipated sex differences in their responses ($\chi^2=9.758$, $df=1$, $p<.01$). Eighty-six percent of men said that sexual infidelity would be worse, while seventy-five percent of women said that emotional infidelity would be worse (see Figure 2 below). In marked contrast, those who had not experienced infidelity did not show the sex differences ($\chi^2=1.349$, $df=1$, $p=.264$). Only fifty-one percent of men said that sexual infidelity would be worse, and only sixty-three percent of thirty-two women said that emotional infidelity would be worse.



In sum, for the forced choice question, the sample as a whole produced the usual sex differences in which kind of infidelity was judged worse, but these differences seem to be accounted for almost entirely by the portion of the sample who reported they had actually experienced infidelity. Results from the study done by Buss et al. (1992) also support these findings. Buss et al. found that men who had experienced a committed relationship were much more upset than sexual than

emotional fidelity (55%) while for men who had not experienced a committed relationship only 29% of men were more upset by emotional infidelity.

Emotion Rating Scales

Although we did not find a difference between sexes for the emotion rating scales, we did find within sex differences in whether emotional or sexual infidelity affected them emotionally. For the ratings of all the emotions except anxiety, there were significant main effects of type of infidelity. Both men and women reported feeling significantly more rage ($F=32.77$, $df=1$, 96 , $p<.001$) anger ($F=20.78$, $df=1$, 96 , $p<.001$) betrayal ($F=5.95$, $df=1$, 96 , $p<.02$) and vengeful ($F=8.27$, $df=1$, 96 , $p<.005$) in response to sexual infidelity compared to emotional infidelity. Both sexes reported more fear and sadness at emotional infidelity than sexual infidelity ($F=13.16$, $df=1$, 96 , $p=.001$) In addition, as noted, there were no significant differences between men and women in these reactions. Also, in none of these analyses was there any main effect or interaction for whether participants had experienced infidelity or not.

Overall, the results for the forced choice question were consistent with past research, and suggested that people who had experienced infidelity were especially likely to demonstrate sex differences in which kind of infidelity they found most upsetting. However, the rating scale responses that immediately preceded the forced choice question did not reveal any sex differences.

Discussion

This study generated two apparently inconsistent sets of results for the emotion rating scales and for the forced choice question. Although we did not find any sex differences in the rating scale results, when men and women reported their feelings after either sexual or emotional infidelity, both sexes reported more intense Rage, Anger, Betrayal, and Vengefulness in response to sexual infidelity and more Sadness and Fear in response to emotional infidelity. These differences seem reasonable, but do not, of course, replicate earlier studies in which sex differences in responses occurred (e.g. Pietrzak et al, 2002), and did not reveal any differences between people who had or had not had actual experiences of infidelity. Apparently, regardless of sex or previous experience of infidelity, all participants felt that sexual infidelity was an occasion for angry emotions, and emotional infidelity for longer term, more wistful emotions.

These results are not consistent with those of Harris, 2002. Harris reported that participants who had experienced infidelity in the past, focused on the emotional aspects rather than the sexual aspects of infidelity. In addition, the rating scale results in this study were not consistent with our own earlier results (Pietrzak et al, 2002) in which sex differences in rating scales were observed and the results of Shackelford, LeBlanc, and Drass (2000) who also found significant sex differences using emotion rating scales. These inconsistent results require some further exploration.

The results of the forced choice questions are inconsistent with Harris' earlier results, probably because our forced choice questions assessed what situations would make people more distressed, not what aspects of infidelity men and women focus on. Our forced choice results demonstrated that men and women were differently affected by emotional and sexual infidelity, and that these differences were more pronounced among people who say they have experienced infidelity. In fact, in our sample, people who had not had such an experience showed only a slight and entirely non-significant tendency toward the classic sex differences. We cannot assume, of course, that the sex differences found in previous studies were provided only by the portion of those samples who had direct experience of infidelity, but it is certainly a possibility. Similarly, earlier failures to find sex differences may have occurred because too few of the sample members had direct experience.

Why might those who had experienced infidelity show stronger results? One possibility is that the remembered experience is more vivid and engaging than the hypothetical examples that the inexperienced must conjure up. This possibility is bolstered by the fact that in our earlier study where robust sex differences were found, the participants were required to go through a fairly elaborate reliving or imagining procedure, whereas we observed during Study 1 that some participants seemed to respond rather casually to the questionnaires. Study 2 explored directly the effect of the vividness of the participants' experience.

Study 2: Vivid imagination

Having found in Study 1 that participants who had experienced infidelity were more likely to show the expected sex differences, in Study 2 we attempted to induce a more realistic experience of infidelity while the participants filled out their questionnaires. A previous study done by our lab, (Pietrzak, Laird, Stevens, and Thompson, 2002) found strong results by evoking vivid, imagined jealousy in participants. These results highlight the possibility that participants (usually college students filling out surveys) may not show expected results because the methods used do not trigger the simulation need to evoke the evolved mechanism. Since participants are usually recruited in dining halls and student centers, it may be that participants are not truly imagining the infidelity scenario, but may in fact be rushing through the questionnaire. There is a possibility that the mechanism is triggered when the participant vividly recalls or imagines the experience, which may be a closer representation of a real infidelity experience.

Method

Participants

Participants included ninety-three undergraduate students at Clark University. Forty-seven participants were female and forty-six were male. The ages ranged from

seventeen to twenty-two.

Procedure

After participants had consented to participate, researchers randomly assigned half of the participants to one of two counter-balanced conditions. The participants in the “Usual” condition received the questionnaires to fill out independently, in a quiet room. The participants in the “Vivid” condition received the same questionnaires but first listened to instructions designed to encourage them to experience the scenarios as powerfully as possible.

The instructions for participants in the vivid condition were as follows. (The order of infidelity type was counter-balanced) “Close your eyes and try to visualize what I am going to say to you. Let the characters- you, your partner, and your partner’s new partner- come to life. Now I want you to first visualize every positive characteristic about your partner...take some time with that and really try to bring them to life in your mind. Tell me when you have thought about your partner in depth. Now imagine or remember your partner slowly drifting away to another romantic partner. Please actually visualize your partner falling in love (without sexual relations) with another person, picture them spending time together, talking, sharing secrets and becoming close to one another.”

Then the participant heard the second instructions: “Close your eyes and try to visualize what I am going to say to you. Let the characters- you, your partner, and your partner’s new partner- come to life. Now I want you to visualize your partner in a sexually appealing way to you. Take some time to think of your sexual and romantic closeness with this attractive person. Imagine or recall your last sexual encounter with your partner. Tell me when you have imagined or recalled this. Now imagine or remember finding out that your sexual partner was now sexually active with someone other than you. Please visualize your partner and that person naked in a bed together engaging in sexual activity. Now please turn the page, fill out the questions, and write any other comments/feelings that you may have.

Although participants were asked to visualize characteristics of their partner as well as the infidelity, we do not believe this confounded the results of the study. In order for the participants to visualize an accurate occurrence of infidelity we felt it important for the participant to first visualize their partner including their attributes. The questionnaires used were the same as in Study 1.

Results

As in Study 1 participants reported whether they had experienced either sexual or emotional infidelity of a partner. Twenty-three of the men and eleven of the women reported experiencing infidelity.

Analyses examined the effect of the vivid and usual conditions on the association between sex and forced choice response. First, the usual sex difference

was observed for the sample as a whole, with sixty-eight percent men choosing sexual infidelity as more upsetting, and sixty-three percent of women choosing emotional infidelity, ($\chi^2=13.415$, $df=1$, $p= .001$). When the vivid and usual conditions were analyzed separately, as expected, the vivid imagination condition did produce much more powerful results. In the vivid condition, again, sixty-eight percent of men chose sexual infidelity as most upsetting, while ninety-eight percent of women chose emotional ($\chi^2_{\text{imagination}}=13.13$, $df=1$, $p= .001$.) In the “usual” condition, sixty-eight percent of men chose sexual, but only sixty percent of women chose emotional infidelity, and the difference was not statistically reliable, ($\chi^2_{\text{no imagination}}=3.15$, $p= .076$). These results are comparable to those in Study 1, in that overall, women were more upset than men by emotional infidelity and men were more upset about sexual infidelity than women. However, the bulk of that effect seems to occur in the vivid condition. One question that these results raise is why women are more likely to be affected by the vivid imagination than men. In the study done by DeSteno et al. the results show that women were more affected by the cognitive load condition than men. These results seem to suggest that women need to visualize the jealousy simulation in more detail than men for the emotional response to occur. Further studies could look at the detail of visualization needed for men and women to become upset by the jealousy scenario.

The next set of analyses examined the rating scale responses, within the vivid and usual conditions. The initial analyses were three way ANOVAs with sex of participant and response condition as between participant measures, and emotional versus sexual infidelity type as a repeated measures factor. None of the three way interactions with response condition were significant, indicating that the vivid versus usual condition differences did not affect the interaction of sex and type of infidelity. Participants reported stronger feelings of Rage ($t=2.982$, $df=1$, $p= .004$), Anger ($t=2.903$, $df=1$, $p= .005$), and Vengeance ($t=3.090$, $df=1$, $p= .003$) in the vivid imagination group than the read only group, suggesting that the vivid condition was successful in producing stronger negative feelings. Men and women were equally affected by the conditions.

The next set of analyses was two-way ANOVAS of the vivid and usual conditions separately, comparing men and women’s responses to the two kinds of infidelity scenario. The anticipated difference between men and women did not emerge, in either condition group, with none of the rating scale results involving a significant sex of participant by type of scenario interaction. Instead, the pattern for most of the ratings were significant main effects of sex of participant. T-tests revealed that women rated their feelings for Rage Anger, Betrayal, Anxious and Sadness to be more intense than were men’s feelings in the emotional infidelity scenario Rage ($t=2.447$, $df=1$, $p= .016$), Anger ($t=2.382$, $df=1$, $p= .019$), Betrayal ($t=2.197$, $df=1$, $p= .030$), Fear ($t=3.084$, $df=1$, $p= .003$), and Sadness ($t=4.453$, $df=1$, $p= .000$). For the sexual infidelity scenario women also rated their feelings as more intense relative to men’s for Fear ($t=2.191$, $df=1$, $p= .031$) and Betrayal ($t=2.242$, $df=1$, $p= .027$).

In sum, for the rating scale analyses we saw main effects, and virtually no interactions. Women reported stronger reactions than did men, and both sexes in response to both kinds of infidelity reported stronger feelings in the Vivid condition. Further research could focus on the question of why women seem to respond more intensely to the emotion rating scales, regardless of infidelity scenario.

Discussion

These two studies demonstrate that men and women who have experienced infidelity or who have been induced to vividly imagine infidelity showed expected sex differences on the forced choice method. It is interesting to note that in both studies the condition that is closest to actual infidelity, i.e., actual infidelity or vivid imagination results in the expected effect. The results suggest that it may be the case that the evolved mechanism of differential jealousy is in fact only triggered when in a situation that actually resembles infidelity. If this is the case, these results strengthen the evolutionary hypothesis that men and women differ in which type of infidelity elicits jealousy. However, while we theorize that the evolved mechanism is specific and only triggered when the situation resembles one in which infidelity was likely to occur, other researchers (DeSteno, Bartlett, Braverman, and Salovey, 2002) have theorized that all evolved mechanisms should be automatic and occur under all levels of cognitive strain, regardless of the intensity of the experience. However, evolutionary psychology does not assume that evolved mechanisms must be automatic. While DeSteno and colleagues (2002) do show that when under cognitive load participants do not show expected sex differences, this does not contradict the evolutionary theory. In fact, this study does not even test whether jealousy is automatic or not. Their cognitive load condition might well have reduced response because the participants were insufficiently engaged with the scenario they were being asked to respond to. It would be very difficult to simultaneously imagine being cheated on while remembering a list of digits and typing them on a computer screen. DeSteno and colleagues seem to imply that the jealousy instinct can be evoked by responding to questions on a computer screen. DeSteno and colleagues also report that their results show that this classic result is an artifact, however, the reader is never quite sure what it is an artifact of. The main result of the DeSteno et al. study was that both men and women chose sexual infidelity as more upsetting while under cognitive load, but the authors never provide an explanation for this result. Perhaps for most people, there are stronger semantic ties between sexual and infidelity than emotional and infidelity, however, the authors do not discuss this. In general, the study by DeSteno et al., does not support any criticisms of the evolutionary account.

In addition, the first study also challenges Harris' (2002) suggestion that sex differences disappear when participants recall actual infidelity. Participants who had experienced emotional infidelity showed the anticipated sex differences in their responses when instructed to choose which type of infidelity was more upsetting. Due to the small number of participants who reported having experienced sexual

infidelity, it was not possible to examine whether this effect was true for victims of sexual infidelity as well. Lastly, we did not find expected sex differences using the emotion rating scale. This consistent finding has led us to believe that the emotions used on the emotion rating scale are not appropriate to the hypothesis. For instance, the word “jealousy” is never used on the emotion rating scale. Future studies should focus on testing the results of emotion rating scales as a measurement of jealousy, considering that most research in this area has not found results using a continuous rating scale. Further research should also focus on replicating actual infidelity scenarios in order to provide participants with an experience as close as possible to actual infidelity.

Acknowledgements:

We are indebted to Martie Haselton for comments on earlier drafts and we would like to thank Sarah Bush, Rebecca Chernin, Sarah Hymes, and Rose Sokol for their assistance at various stages in this project.

Received 30 October, 2004, Revision received 5 April, 2005, Accepted 29 April, 2005.

References

- Buss, D. M., Larsen, R., Westen, D. and Semmelroth, J. (1992). Sex differences in jealousy: Evolution, physiology, and psychology. *Psychological Science*, 3, 251-255.
- Buunk, B. P., Angleitner, A., Oubaid, V. and 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
- Daly, M., Wilson, M. and Weghorst, S. J. (1982). Male sexual jealousy. *Ethology and Sociobiology*, 3, 11-27.
- DeSteno, D., Bartlett, M. Y., Braverman, J. and Salovey, P. (2002). Sex differences in jealousy: Evolutionary Mechanism or Artifact of Measurement? *Journal of Personality and Social Psychology*, 83, 1103-1116.
- Geary, D. C., Rumsey, M., Bow-Thomas, C. C. and 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 and Sociobiology*, 16, 355-383.
- Harris, C. R. (2002). Sexual and romantic jealousy in homosexuals and heterosexuals. *Psychological Science*, 13, 7-12.
- Harris, C. R. and Christenfeld, N. (1996). Gender, jealousy, and reason. *Psychological Science*, 7, 364-366.
- Pietrzak, R. H., Laird, J. D., Stevens, D. A. and Thompson, N. S. (2002). Sex differences in human jealousy: A coordinated study of forced-choice,

- continuous rating-scale, and physiological responses on the same participants. *Evolution and Human Behavior*, 23, 83-94.
- Shackelford, T.K., LeBlanc, G. J. and Drass, E. (2000). Emotional reactions to infidelity. *Cognition and Emotion*, 14, 643-659.
- Wiederman, M. W. and Allgeier, E. R. (1993). Gender differences in sexual jealousy: Adaptationist or social learning explanation? *Ethology and Sociobiology*, 14, 11-140.
- Wiederman, M. W. and Kendall, E. (1999). Evolution, sex, and jealousy; Investigation with a sample from Sweden. *Evolution and Human Behavior*, 20, 121-128.