Meta-Analyses of Sex Differences in Responses to Sexual Versus Emotional Infidelity: Men and
Women are More Similar than Different

Christopher J. Carpenter

Western Illinois University

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Author Note

Christopher J. Carpenter, Department of Communication, Western Illinois University.

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Correspondence concerning this article should be addressed to: Christopher J. Carpenter, Department of Communication, Western Illinois University, 318 Memorial Hall #1 University Circle, Macomb, IL 61455-1390. Email: cj-carpenter2@wiu.edu Twitter: @DrCJCarpenter

Abstract

From 54 articles, 172 effect sizes were meta-analyzed to determine if men and women are differentially distressed by emotional versus sexual infidelity. Predictions were derived and tested from an evolutionary psychology perspective (Buss, Larsen, Westen, & Semmelroth, 1992), a social-cognitive perspective (Harris, 2003a), and the double-shot perspective (DeSteno & Salovey, 1996). The data were not consistent with the evolutionary psychology predictions because men tended to respond in the predicted manner in only the U.S. student samples whereas the rest of the data were largely consistent with the social-cognitive theory. Specifically, both sexes tended to be more upset by emotional than sexual infidelity when forced to choose which type of infidelity was more distressing. Both sexes indicated that sexual infidelity was more distressing than emotional when asked to rate their level of distress separately for each using continuous measures. The lesbian and gay samples were mostly consistent with the double-shot hypothesis as they tended to respond in the opposite way as heterosexuals. Analysis of the scenarios designed to test the double-shot hypothesis found somewhat smaller effects when the possibility of both types of infidelity was ruled out. These findings suggest that professionals seeking to address problems associated with jealousy in romantic relationships would profit from avoiding sex-linked assumptions about which aspect of infidelity is likely to be more upsetting.

Keywords: infidelity, theory of evolution, social cognition, social perception, sexual attitudes, sexual orientation, sexual partners, human sex differences

INFIDELITY SEX DIFFERENCES

Meta-Analyses of Sex Differences in Responses to Sexual Versus Emotional Infidelity: Men and Women are More Similar than Different

A controversy has developed in the romantic jealousy literature concerning sex differences in response to different types of infidelity (Buss et al., 1992; Harris, 2003a; Sagarin, 2005). Sexual infidelity occurs in situations such that one partner has sex outside her or his primary romantic relationship. Emotional infidelity occurs when one partner develops an intense emotional attachment outside her or his primary romantic relationship. Some evolutionary psychologists (Buss et al., 1992) have argued that men are likely to be more upset if they discover their partner has engaged in sexual infidelity than if they discover their partner has engaged in emotional. They also argued that women are likely to be more upset if they discover that their partner has engaged in emotional infidelity than sexual. Other researchers working from a social-cognitive perspective have argued that such sex differences do not exist (Harris, 2003a) or that they can be explained by prevailing stereotypes about the co-occurrence of the two types of infidelity at once (DeSteno & Salovey, 1996).

Resolving this issue is of importance to social scientists for several reasons. First, Cano and O'Leary (1997) argued that jealousy is an important emotion to address in couple's therapy. The different reactions that men and women have to jealousy based on different types of infidelity can have an important impact on how therapists should seek to address jealousy in their sessions. Furthermore, this issue has become an important area of controversy regarding whether or not sex differences are rooted more in biology or socialization (Harris, 2003a). Several researchers have singled this prediction out as one of the most compelling demonstrations of the heuristic value of theories derived from an evolutionary psychology perspective (Goetz &

INFIDELITY SEX DIFFERENCES

Shackelford, 2006; Sesardic, 2003). Before presenting the results of a series of meta-analyses of the research in this area, I will review the varying perspectives concerning this issue.

Evolutionary Psychology Perspective

Buss (2000) explained that one of the fundamental postulates of evolutionary psychology (EP) is that men and women have always faced different challenges associated with reproduction. This theorizing focuses on the reproductive challenges of heterosexual couples. These separate problems produced different solutions as humans adapted to their environment. Specifically, men were predicted to be more upset at the discovery of their mate's extradyadic sex than their mate's extradyadic emotional involvement. Women were predicted to be more upset over the discovery of their mate's extradyadic emotional involvement than their mate's extradyadic sex.

Buss et al. (1992) suggested that this difference stems from evolutionary pressures. A man, they pointed out, could never be certain if he is the biological father of his mate's child during the long period of human evolution. Clearly a man can get genetic testing now, but from this perspective, jealousy is thought to be based on the human male's biological characteristics that were developed long before genetic testing. If his mate does not birth his children, his genes will not be passed on; therefore, any genetic variation that helps men prevent other men from having sex with his mate will be selected. Buss et al. claimed that sexual jealousy evolved to fill that need.

According to Buss et al. (1992), women face a different reproductive problem. Whenever a woman bears a child, she is absolutely certain that her genetic material will be passed on in that child so that the sexual faithfulness of her mate is irrelevant. However, if her mate becomes emotionally attached to another female, he may decide to devote his resources to the rearing of

INFIDELITY SEX DIFFERENCES

that woman's child rather than her own. The loss of her mate's resources may significantly reduce the survival of, and eventual reproduction by, her genetic child. Because of this problem, Buss et al. suggested that women were genetically predisposed to be motivated to prevent their mate from becoming emotionally attached to other women. They noted that "cues to the development of a deep emotional attachment have been reliable leading indicators to women of potential reduction or loss of their mate's investment" (p. 251). The EP perspective thus proposed that men would be more upset if their partner engaged in sexual infidelity than emotional infidelity whereas women would be more upset if their partner engaged in emotional infidelity than sexual.

Social-Cognitive Perspective

Harris's (2003a) social-cognitive theory of jealousy offers predictions that are distinct from those derived from the EP hypothesis. Harris argued that evolving a mechanism that focuses on either type of infidelity would not have been adaptive. She suggested that men would not want to focus on cues to sexual infidelity because it would likely be too late for them to prevent infidelity by the time overt sexual cues were present. She also pointed out that in many cases the cues of emotional and sexual infidelity overlap substantially and vary from culture to culture. These problems would necessitate a general mechanism for detecting infidelity rather than a content-specific one.

Harris (2003a, p. 119) argued that "jealousy can be induced when any important aspect of an interpersonal relationship is threatened." Whenever a rival appears to be threatening an individual's relationship, that individual makes a judgment about how threatening that behavior is and what he or she should do about it. Harris noted that the cognitive appraisal literature on jealousy finds that interpretation of the partner's behavior is a key part of jealousy arousal. For

INFIDELITY SEX DIFFERENCES

example, when an individual sees her or his mate talking to a desirable potential rival, evaluations are made of how threatening the rival is and what the meaning of their interaction is. If the mate is acting in ways that can be interpreted as flirtatious in one's culture, then jealousy is aroused. This general detection mechanism allows both cultural and cognitive elements to play a role in jealousy arousal. Harris pointed out that an overall drive to make appraisals about threats to one's primary relationship could just as easily have evolved similarly for both sexes and would have provided an adaptive advantage for both. Thus Harris proposed that there are no sex differences in the types of jealousy that are upsetting to women and men.

Double-Shot Perspective

Another critique of the EP position was provided by DeSteno and Salovey (1996) who proposed what they called the "double-shot hypothesis." In the original Buss et al. (1992) studies, participants were shown two pairs of scenarios (referred to in this paper as scenario pair 1 and 2). In each pair of scenarios, one of them described emotional infidelity and the other described sexual infidelity. The participants were asked to choose which situation was more distressing. The double-shot hypothesis argued that the participants do not perceive each scenario as presenting only one type of infidelity; rather, because of common stereotypes about how each sex becomes romantically attached, emotional and sexual infidelities were perceived intertwined in a "double shot."

DeSteno and Salovey (1996) argued that when a man learns that his female partner has had sex with another man, he assumes that she is also in love with him because women are stereotypically believed to have sex only with individuals with whom they are also emotionally involved. Thus sexual infidelity by women is perceived by stereotyping men as both sexual and emotional. In contrast, stereotyping men can envision emotional attachments by women devoid

INFIDELITY SEX DIFFERENCES

of sexuality. If the double-shot interpretation then was an accurate description of how women's sexual infidelity is perceived by men, men would logically choose sexual infidelity as more distressing because it probably involves both forms of infidelity.

At the same time, DeSteno and Salovey (1996) predicted that gender stereotyping by women would follow an opposite logic. They argued that stereotyping women believe that men who form deep emotional attachments with women are probably also having sex with them whereas men often have sex without emotional attachment. So for the women, emotional infidelity should be rated as more distressing because women assume that sexual infidelity is also occurring. Both forms of gender stereotyping then would work in tandem to increase the gap in women's and men's infidelity ratings, and indeed this hypothesized similarity was what DeSteno and Salovey found. Furthermore, the description of sexual infidelity they showed to participants in Buss et al.'s (1992) study described it as “passionate sexual intercourse” (see Table 1, scenario pair 1), possibly further conflating sexual with emotional infidelity.

In order to tease apart the influence of sexuality and emotions, Buss et al. (1999) developed four additional pairs of scenarios that directly addressed both sexual and emotional infidelity. The first added scenario pair asked participants to imagine that both types of infidelity had occurred and then asked which was more distressing (see Question 3 in Table 1). This forced-choice directly takes the differential base rates of both occurring suggested by the double-shot into account by forcing the participants to consider both types at one time. The additional three scenarios specify one transgression without the other (see Scenario pairs 4, 5, and 6 in Table 1). In these meta-analyses, if the predicted sex difference emerges across studies using these scenario pairs, such a finding would be inconsistent with the double-shot hypothesis. Several researchers have examined the problem using this methodology (e.g., Brase, Caprar, &

INFIDELITY SEX DIFFERENCES

Voracek, 2004; Henline, Lamke, & Howard, 2007; Ward & Voracek, 2004), and these results will be included in the present meta-analyses. These studies generally find the statistically significant interactions predicted by EP between sex of the participant and the type of infidelity chosen as more distressing. Yet it remains to be seen if the effect sizes associated with responses to the double-shot scenarios are as large as those found for the original scenarios.

Other researchers have argued that the double-shot hypothesis can be tested by examining the responses of gay men and lesbians. Dijkstra and colleagues (2001) suggested that gay men and lesbians perceive infidelity similarly to heterosexuals of the other sex, basing their stereotyped expectations on the sex of their partner rather than on their own sex. Based on this interpretation, stereotyping gay men, like heterosexual women, would assume that if their male partner had committed emotional infidelity, that partner was also having sex; however, they would not necessarily equate sexual involvement with emotional connection. Stereotyping lesbians, like heterosexual men, would assume that the sexual infidelity of their female partner implies emotional infidelity as well, whereas they would not necessarily equate emotional sharing with sexual transgression. Dijkstra et al. claimed that consistently finding that gay men are more concerned about emotional, and lesbians with sexual, infidelity would be consistent with the double-shot hypothesis. This prediction suggests that the sex difference in infidelity reactions is not a product of innate differences in jealousy, but rather a stereotypic response to the expected behavior of one's partner. If gay and lesbian samples show a parallel pattern then based on the sex of their partner, then that finding would be consistent with the double-shot hypothesis.

It is important to note that this hypothesis does not imply that lesbians are more likely than heterosexual women to possess male characteristics or that gay men are more likely to

INFIDELITY SEX DIFFERENCES

possess female characteristics than heterosexual men. Instead, the hypothesis proposes that everyone has the same gender-stereotypical assumptions about men and women and that they apply those assumptions to their partner's behavior. Theoretically, bisexual individuals of either sex would be more upset by sexual infidelity when they happen to have a female partner but would be more upset by emotional infidelity when they have a male partner. Unfortunately, no research has been conducted on that hypothesis. Thus samples of gay men and lesbians will be used to test the double-shot hypothesis in the present meta-analyses.

Previous Meta-Analyses

Harris's (2003a) meta-analysis of 32 studies found insubstantial and inconsistent sex differences in response to the different types of infidelity consistent with the social-cognitive perspective Harris proposed. That meta-analysis also found that sexual orientation moderated the relationship between sex and response to infidelity such that the same partner-focused pattern was found for samples of gay men and lesbians. This finding was consistent with the double-shot perspective. The Harris meta-analysis also found that the effect sizes were larger when student samples were used than non-student samples. Harris proposed that student samples find a larger effect because young males have a heightened sex drive than they do at other points in their life which might cause them to have an increased focus on sex.

The current meta-analyses will expand on Harris's (2003a) excellent review in several ways. First, the 66 new studies that have been conducted since then will triple the total size of the sample of studies. Furthermore, Harris also argued that continuous measures of jealousy do not find sex differences in the amount of jealousy aroused by the two types of infidelity. At the time of Harris's publication, there were not enough studies employing continuous measures to test that assertion meta-analytically. The current meta-analyses will be able to test the claim that the

INFIDELITY SEX DIFFERENCES

effects are smaller when the participants are rating each type of infidelity on continuous response scales instead of the dichotomous forced-choice items. Also, the current meta-analyses will examine the average effect size for the first time for the studies that employed the four new pairs of scenarios (Buss et al., 1999) that were designed to test the double-shot hypothesis.

Furthermore, Harris's (2003a) meta-analysis examined the issue of cross-cultural variability but did not have enough international samples to determine the effects of different cultures on reactions to emotional and sexual infidelity. Although some minor cultural variability is expected under the EP predictions (Sagarin, 2005), as Buss et al. (1999) explained in their seminal article:

...the underlying psychology of jealousy is proposed to contain design features that reflect solutions to the recurrent adaptive problems that each sex faced over the long expanse of human evolutionary history. These design features are hypothesized to be universal, and hence are predicted to be found across cultures. This provides an additional arena for empirical testing and potential falsification. (p. 126)

In order to test this hypothesis, samples from different cultures will be compared in the present meta-analyses. If the predicted set of findings emerges in some cultures and the opposite pattern in others, Harris argues that such differences would be consistent with the social-cognitive perspective because the circumstances that indicate threats to the relationship vary from culture to culture. These two perspectives thus offer competing hypotheses. Although the current meta-analyses do not contain enough international samples for a culture-by-culture comparison, there is sufficient data to test whether the United States differs from the rest of the world. Ideally, cultural-specific hypotheses would be derived and tested from the social-cognitive theory based

INFIDELITY SEX DIFFERENCES

on culture specific triggers of jealousy; however, such detailed comparisons await future research.

Method

Literature Search

Several steps were taken in order to find the maximum number of studies. Two databases were searched using the term “infidelity” including *Communication and Mass Media Complete* and *PsychINFO*. *Web of Science* was used in order to find all the articles that cited the seminal work in this area by Buss et al. (1992). The references sections of all obtained articles, especially the research reviews by Harris (2003a) and Buss (2000, 2007), were also combed to find additional research articles. The possibility of my search missing an unacceptable number of null unpublished findings is belied by the presence of several articles that were published focusing on null findings in this area (DeSteno, Bartlett, Braverman, & Salovey, 2002; Grice & Seely, 2000; Harris, 2000, 2003a, 2003b; Sheets & Wolfe, 2001).

Study Selection

There have been several other dependent variables examined including using fMRI scans (Takahashi et al., 2006), physiological measures (Buss et al., 1992; Grice & Seely, 2000) and purely cognitive reactions (Schützwohl & Koch, 2004). Because there are not enough articles using any of these methodologies to be meta-analyzed, my review is limited to articles that report studies using participant self-report of emotional reactions to both types of infidelity. From this set of articles, 172 effect sizes were coded. For scenario pair 1, there were 54 studies ($N = 10,632$); for scenario pair 2, 29 ($N = 5,035$); for scenario pair 3, 14 ($N = 2,519$); for scenario pair 4, 18 ($N = 4,115$); for scenario pair 5, 7 ($N = 1,561$); and for scenario pair 6, 8 ($N = 1,561$). There were 42 ($N = 7,876$) studies that reported data from continuous measures.

INFIDELITY SEX DIFFERENCES

Coding

The coding and effect sizes for each study can be obtained by contacting the author.

Aspects of the sample that were coded include whether or not it used a student sample, the region from which the sample was drawn (U.S. or international), the sexual orientation of the sample (heterosexual or lesbian and gay), and the size of the sample including the breakdown by participants' sex. Next the methodology of the studies was coded for whether the study used the forced-choice format or a continuous measure as well as the infidelity scenarios presented to the participants. Reliabilities for the continuous measures were also recorded when they were reported.

In addition, several different effect sizes were calculated. For the forced-choice measures, the man:woman odds ratio was computed by calculating the odds of a man choosing sexual infidelity as more distressing than emotional infidelity divided by the odds of a woman choosing sexual as more distressing than emotional. The natural log of each odds ratio was used to calculate the weighted mean odds ratio in order to place a null effect at zero and allow more accurate statistical analysis (Haddock, Rindskopf, & Shadish, 1998). From the odds ratio, Digby's (1983) tetrachoric correlation approximation was calculated. Positive correlations would indicate that men are more likely than women to choose sexual infidelity as more distressing than emotional; negative correlations, that women are more likely. The correlation coefficient was not transformed to Fisher's z because recent simulation studies have shown that this transformation tends to reduce accuracy in meta-analyses (Schulze, 2007).

Correlations were also calculated using the continuous measure data. The correlation was computed by calculating the d statistic and converting it to the correlation coefficient. Both the within-subject comparisons and the between-subject comparisons were calculated this way as per

INFIDELITY SEX DIFFERENCES

the recommendations in Dunlap, Cortina, Vaslow, and Burke (1996). There were four correlations calculated for each study. First, the difference between men's scores in response to sexual versus emotional infidelity were created. Positive correlations indicate that the men reported that sexual infidelity would cause stronger emotional reactions than emotional infidelity. The second correlation calculated was the same difference women, with positive scores indicating that the women in that sample thought sexual infidelity would cause them to feel more distress than emotional. The third and fourth were when men and women were then compared within type of infidelity, and scores were calculated to show if men thought each kind of infidelity would produce stronger emotions than reported by the women in their sample (as indicated by positive correlations).

Controversies have arisen concerning which statistical comparison is the proper way to test the EP predictions (Buller, 2005; Buss & Haselton, 2005; Harris, 2005, Sagarin, 2005). Buller (2005) explained that when one conducts a study measuring which type of infidelity is more upsetting to which sex, there are a number of ways to analyze the resulting dataset. Buller suggested that each sex should be examined separately, and the size of the preference for that sex's predicted type of infidelity should be measured. Essentially, one looks at how much more men are distressed by sexual infidelity than emotional and then one looks at how much more women are distressed by emotional infidelity than sexual. This choice preserves the original EP predictions of Buss et al. (1992) that men would be more likely to be upset by sexual infidelity than emotional and women would be more likely to be upset by emotional than sexual (Lishner, Nguyen, Stocks, & Zillmer, 2008). Buller's recommendations will be used here to analyze my data.

INFIDELITY SEX DIFFERENCES

Data Analysis

The effect sizes were averaged using the sample size weighting method outlined in Hunter and Schmidt (2004). There were several pairs of scenarios commonly used in the literature that were based on Buss et al.'s (1992) and Buss et al.'s (1999) scenarios. Many of the studies using Buss et al.'s (1999) forced-choice items asked participants to respond to more than one of the six pairs of scenarios. Effect sizes for the forced-choice data were grouped and averaged based on which of Buss et al.'s (1992; 1999) pairs of scenarios they tested in order to determine if the different pairs of scenarios are substantially different from each other and to avoid non-independence of data. The scenarios in the studies were coded based on which of the Buss et al. pairs of scenarios the authors used (see Table 1 for the scenarios).

Some of the studies that used the forced-choice items asked the participants to indicate which type of infidelity would produce a stronger emotional reaction for several different emotions. In such cases, participants' ratings of "distress" were used in keeping with the seminal Buss et al. (1992) study. If distress was not measured, upset (followed by jealousy) was used. For those studies using continuous measures, the effect sizes were corrected for attenuation due to error of measurement using Hunter and Schmidt's (2004) artifact distribution method.

The correlation coefficient was used to perform the statistical tests to determine if further moderator searches were necessary. If 75% or more of the obtained variance can be explained by sampling error and artifacts, the remainder can be assumed to be accounted for by uncorrected artifacts so that further moderator analysis is deemed unnecessary (Hunter & Schmidt, 2004). Accounting for more than 75% of the obtained variance also indicates that the estimate of the population correlation probably represents one population of studies (a fixed effects estimate, also called a homogeneous effect), whereas if less than 75% of the variance can be explained,

INFIDELITY SEX DIFFERENCES

then the estimate is the mean of a range of population correlations (a random effects estimate, also called a heterogeneous effect).

Credibility intervals indicate how wide the population effect sizes are expected to vary because of the undetected moderators and uncorrected artifacts (Hunter & Schmidt, 2000). They represent an index of how heterogeneous the findings are. The wider the credibility interval, the more heterogeneous the body of studies is. If 100% of the variance can be attributed to sampling error and artifacts, then there is no credibility interval, and the effect is thought to be an accurate point estimate of the population parameter. Confidence intervals were not calculated because they are often biased in the presence of heterogeneity (Hunter & Schmidt, 2000). Hunter and Schmidt (2000) noted that the same problem applies to calculating statistical significance tests of effect size estimates. Because of these considerations, credibility intervals were reported, and neither confidence intervals nor statistical significance tests were calculated.

Results

Summary

In general, the results were not consistent with the EP predictions. For the most part, both men and women were more likely to report that emotional infidelity would be more distressing than sexual infidelity when forced to choose. For the continuous data, both men and women indicated that sexual infidelity would be more upsetting. The data were consistent with the social-cognitive predictions because there were no consistent sex effects, especially for the continuous data. The data were also consistent with the double-shot hypothesis prediction concerning gay men and lesbians such that the effect was parallel according to the sex of the raters' partner. Below, I first will examine the data tables, followed by the data relevant to each perspective.

INFIDELITY SEX DIFFERENCES

Data Tables

Table 2 contains the forced-choice data such that participants were asked to indicate which type of infidelity would be more distressing. It is divided according to which of the six pairs of scenarios participants were responding and further subdivided by moderator (students, region, and sexual orientation). Table 3 presents the summary of the meta-analyses of the studies that used continuous measures of emotional reaction to each type of infidelity separately. The effect sizes are broken down by the comparisons of sexual with emotional infidelity and of men and women.

Evolutionary Psychology Perspective's Predictions

Recall that according to the EP predictions men would consider sexual infidelity to be more distressing than emotional. Examination of Column 6 in Table 2 shows the extent to which men consider sexual infidelity to be more distressing than emotional. For the first and fourth pairs of scenarios, heterosexual men tended to be slightly more likely to be more distressed by sexual infidelity than emotional as indicated by the odds being higher than 1.0. For the other four pairs of scenarios, men were consistently more likely to consider emotional infidelity to be more distressing as indicated by the odds of men choosing sexual infidelity to be more distressing than emotional being consistently below 1.0. Table 3 shows that men's ratings of how distressing sexual infidelity would be are higher than their ratings of how distressing emotional infidelity would be. For none of these estimates did sampling error explain enough variance to indicate a homogeneous set of effect sizes. This heterogeneity suggests the presence of moderators. The forced-choice data are not consistent with the prediction that men would find sexual infidelity more distressing than emotional but the continuous data were consistent with that prediction.

INFIDELITY SEX DIFFERENCES

According to the predictions derived from EP, it was also predicted that women would consider emotional infidelity to be more distressing than sexual. Table 2 shows that the odds of a heterosexual woman choosing sexual infidelity as more distressing than emotional are consistently below 1.0 for every pair of scenarios. This finding is consistent with the EP hypothesis. On the other hand, Table 3 shows that women who rated how distressing each type of infidelity was separately consistently rated sexual infidelity as more distressing than emotional. This finding is inconsistent with the EP hypothesis. Essentially, the forced-choice data show that both sexes tended to regard emotional infidelity as more distressing but the continuous data showed that both sexes regarded sexual infidelity as more distressing. Although the two measurement techniques produce different results, both sexes generally chose the same type of infidelity as more distressing.

According to Buss et al. (1999), EP would predict that although the effect size may vary, men in every culture would perceive sexual infidelity as more distressing than emotional whereas women would consistently perceive emotional infidelity as more distressing than sexual. Examination of the odds of heterosexual men reporting that sexual infidelity would be more distressing than emotional found in Column 6 of Table 2 shows that the odds are in the predicted direction (greater than 1.0) for the U.S. samples for scenario pairs 1, 3, 4, 5, and 6, but not 2. The odds for the international samples are in the predicted direction only for scenario pair 4. In every other case, heterosexual men living in countries outside the United States were more likely to indicate that emotional infidelity by their partner would be more distressing than sexual. Given that U.S. men do tend to find sexual infidelity to be more distressing than emotional, but the men from the rest of the world do not, the data are not consistent with the EP-derived prediction of cross-cultural consistency. Heterosexual women were consistently more likely to indicate that

INFIDELITY SEX DIFFERENCES

emotional infidelity would be more distressing than sexual – every moderator subdivision for heterosexual women contained odds of less than 1.0. This finding was consistent with the EP hypothesis of cross-cultural consistency for women.

Social-Cognitive Perspective's Predictions

Social-cognitive theory predicted that there would be no substantial sex differences concerning which type of infidelity participants would rate as more distressing. As stated above, for most subsamples responding to the force-choice items, both sexes tended to report that emotional infidelity would be more distressing than sexual. Also, both sexes indicated that sexual infidelity would be more distressing than emotional on the continuous measures data displayed in Table 2. This result is consistent with the social-cognitive hypothesis.

In the explication of the social-cognitive hypothesis, Harris (2003a) also included the prediction that student status would increase the size of the sex differences because young men tend to be more focused on sexuality than older men. There were only enough non-student samples to subdivide the results for scenario pairs 1 and 2. The only subsample of heterosexual men who responded to scenario pair 1 who were likely to indicate that sexual infidelity would be more distressing than emotional were the group of samples from U.S. students. American non-students and the international samples of men were consistently more likely to choose emotional infidelity as more distressing than sexual. This finding is consistent with the social-cognitive perspective. Every subsample of male heterosexual participants who responded to scenario pair 2 was more likely to indicate that emotional infidelity would be more distressing than sexual. Although the meta-analysis of scenario pair 2 did suggest that students responded in the same way as non-students, none of the samples who responded to this scenario produced results consistent with the EP perspective.

INFIDELITY SEX DIFFERENCES

Double-shot Perspective's Predictions

According to the double-shot prediction, when the possibility of one type of infidelity implying the presence of both was controlled for, the sex differences were predicted to be insubstantial. There is some support for this hypothesis in that the point estimates of the overall effect sizes found in Column 2 of Table 2 are somewhat larger for the first two scenario pairs than the effect sizes for the remaining four double-shot scenario pairs. This finding should be considered with caution because the credibility intervals are so wide given the heterogeneity of variance that there appear to be moderators that could make the effect sizes equivalent.

The double-shot hypothesis also predicted that gay men would consider emotional infidelity to be more distressing than sexual infidelity. Table 2 shows that gay men considered emotional infidelity to be more distressing for every scenario pair for which there was enough samples to calculate an average effect. (For scenario pairs for which there is not a set with lesbians and gay men listed in Table 2, it is because there was only one study with lesbians and gay men in the set of studies available for that scenario pair). This finding is consistent with the double-shot hypothesis. The double-shot hypothesis also predicted that lesbians would consider sexual infidelity to be more distressing than emotional. The data were consistent with this prediction such that lesbians were much more likely to consider sexual infidelity as more distressing than emotional. For scenario pair 1, the odds of a lesbian choosing sexual infidelity as more distressing was nearly equal to her chances of choosing emotional. For scenario pair 2, lesbians were more likely to report that emotional infidelity would be more distressing than sexual. Despite this inconsistency, for scenario pairs 1 and 4, lesbians were more likely than gay men to choose sexual infidelity as more distressing than emotional. This finding is the exact opposite of the standard EP prediction for women; instead, the data from lesbians were largely

INFIDELITY SEX DIFFERENCES

consistent with the double-shot hypothesis. Overall, the support for the double-shot hypotheses was somewhat equivocal, but the data did tend towards consistency with the double-shot predictions.

Discussion

The EP hypotheses predicted that men would be more likely to indicate that sexual infidelity would be more distressing than emotional. In general, the data were not consistent with this hypothesis because most samples who responded to the forced-choice questions indicated that emotional infidelity was more distressing than sexual, regardless of their sex. Furthermore, the samples who responded to the continuous questions consistently indicated that sexual infidelity was more distressing than emotional, again regardless of their biological sex.

The EP hypothesis found the strongest support from U.S. students. Most non-student men and men from other countries were more likely to indicate that emotional infidelity would be more distressing than sexual. These data suggest that the EP predictions are only able to explain the choices of American heterosexual male students. If, however, the EP hypothesis can only explain the behavior of these U.S. students, it seems unlikely that an evolutionary hypothesis is an appropriate explanatory mechanism. Perhaps these data show a case where student samples produce the distorted view of human nature that Sears (1986) predicted. Harris (2003a) suggested this difference was due to young men's heightened interest in sexuality.

The EP hypothesis also predicted that women would find emotional infidelity to be more upsetting than sexual. The data were largely consistent with this hypothesis, although this finding may simply be a reflection of the more general pattern that both men and women tend to choose emotional infidelity as more distressing than sexual. On the other hand, even though most people chose emotional infidelity as more distressing, heterosexual women were more likely to choose

INFIDELITY SEX DIFFERENCES

emotional infidelity as more distressing than heterosexual men. This result is consistent with EP predictions if one uses the more liberal criteria of Sagarin (2005) that only required an interaction between participants' sex and the type of infidelity that distresses them more.

The findings were largely consistent with Harris's (2003a) social-cognitive approach. She argued that men and women did not evolve separate, content-specific mechanisms for detecting relational cheating. Instead, she argued that they both evolved a general vigilance against indicators of infidelity. This general vigilance causes people to look for cues of infidelity and to use their specific cultural lens to interpret them. From this perspective, both types of infidelity would probably be perceived as threatening. Thus she predicted no sex differences and cultural variability in the direction of the effects. The forced-choice data found that for the most part, men and women are likely to consider emotional infidelity to be more distressing than sexual. The finding that American male students tended to consider sexual infidelity more distressing whereas most other samples of men did not is consistent with her prediction of cultural variability.

The continuous data were the most inconsistent with the EP predictions and most consistent with Harris's (2003a) social-cognitive prediction of no sex differences. Harris predicted that both sexes would simply make an assessment of a given behavior by their partner and use their cultural lens to determine if there is a threat to their relationship. There was no substantial interaction between sex and type of infidelity. Both sexes rated sexual infidelity as more distressing than emotional and women in general rated both types of infidelity as more distressing than men. All the findings in the continuous response scale data, even after correcting for measurement error, were still quite small.

INFIDELITY SEX DIFFERENCES

The present evidence was more consistent than inconsistent with the double-shot predictions. The double-shot scenarios did find smaller sex differences than the original scenarios, but the heterogeneity of variance in those added sets of effect sizes makes this conclusion tenuous. When comparing gay men's and lesbians' responses to those of heterosexuals, they were similar based on the sex of the rater's partner. These results are consistent with the double-shot hypothesis (Dijkstra et al., 2001) in that: (a) most people whose partner is a man (i.e., gay men and heterosexual women) will consider a report of emotional infidelity to likely imply the co-occurrence of sexual infidelity whereas sexual infidelity does not imply emotional and (b) most people whose partner is a woman (i.e., lesbians and heterosexual men) will believe that if their partner is having extradyadic sex, there is also an emotional attachment whereas an emotional attachment does not imply a sexual one. This line of research suggests that the effects found in previous studies were not rooted in the nature of their participants' sexual orientation, but rather in their perceptions of the likely pattern of behavior appropriate to stereotyping of their partner's gender.

Interestingly enough, this pattern emerged for the studies using samples of gay men and lesbians who responded to scenario 4 which stated clearly that only one type of infidelity was occurring and that the other was not. The scenarios designed to test the double-shot hypothesis may have failed to convince people that the presence of one type of infidelity did not imply that the other was also occurring. Dijkstra et al. (2001) suggested that even if the scenario specifies that only one type of infidelity is taking place, the devastating effect of the co-occurrence of both warrants increased vigilance even if only one type appears to be present. It is also possible that an explanation other than the double-shot is required to explain the results from the samples of gay men and lesbians.

INFIDELITY SEX DIFFERENCES

Methodology Differences

The results from the forced-choice meta-analyses consistently found that heterosexual women were more likely to indicate that emotional infidelity would be more distressing than sexual. On the other hand, the results from the meta-analyses of the continuous scale studies found that women were consistently more likely to be distressed by sexual infidelity than emotional. DeSteno et al. (2002) argued that when faced with the forced-choice methodology, participants put forth more cognitive effort than when rating emotional responses on Likert scales. They demonstrated that when their participants were under cognitive load, the sex difference was substantially diminished. They suggested that continuous measures are a better indicator of jealousy because they tap a less thoughtful and more emotional reaction. Shackelford, Buss, and Bennett (2002) argued that continuous measures are problematic because they allow respondents to indicate that both types of infidelity would be equally distressing. This possibility did not appear to be a problem in the continuous measure studies reviewed here because differences were reliably detected. These differences, however, were not in the direction specified by the hypotheses derived from EP.

Comparison to the Harris Meta-Analysis

The current analysis replicated Harris's (2003a) findings concerning the effects of sexual orientation and student status. That meta-analysis did not find that culture moderated the size of the sex difference, but Harris noted there may not have been enough international studies to detect differences. The current meta-analyses included more international samples and was able to detect a difference between U.S. and international samples. These findings greatly expanded Harris's initial work on the nature of jealousy. Also, the current meta-analyses of the continuous response scale data provided the strongest rebuttal to the EP hypothesis. By examining these

INFIDELITY SEX DIFFERENCES

additional data (including dozens of additional studies), the current meta-analyses were able to strengthen Harris's critique of the EP explanation of jealousy. Future work should expand Harris's argument by empirically demonstrating the particular features of cultures that moderate the types of behaviors that arouse jealousy. This expansion would make Harris's position more falsifiable than the current broad prediction of cultural heterogeneity.

Limitations

First, the lack of more studies conducted outside the United States prevented these meta-analyses from conducting a stronger test of the competing hypotheses concerning cross-cultural consistency of the direction of the predicted sex difference. Until more research is conducted in more countries, especially based on aspects of the particular cultures in question, the support for the social-cognitive perspective must remain tentative. Given the small sample of non-U.S. countries, my sample may also be biased towards particular regions of the world. As it stands, American students seem to be the only group in which men are consistently more likely to perceive sexual infidelity as more distressing than emotional in response to a forced-choice question. Future work is needed to identify the moderators of this effect. Harris (2003a) suggested it was young men's elevated focus on sex. Future work might find cultures with a heightened focus on sex to determine if one or both sexes are more or less distressed by sexual infidelity in that culture. Additionally, the meta-analyses reported are only related to self-reports of distress in reaction to hypothetical scenarios. More recent work has been conducted on recall of cues to each type of infidelity (Schützwohl & Koch, 2004) and if cognitive load can change how individuals react to each type of infidelity (DeSteno et al., 2002). Research that goes beyond the simple self-report of distress will continue to enrich this literature.

INFIDELITY SEX DIFFERENCES

Conclusion

The evidence was not consistent with the EP predictions. My meta-analyses failed to consistently find that men are more likely to perceive sexual infidelity as more distressing than emotional, and this finding weakens the explanatory power of the EP hypothesis about jealousy. The continuous response scale data suggested that both sexes perceive sexual infidelity as more distressing than emotional. The data were largely consistent with Harris's (2003a) social-cognitive perspective and the double-shot perspective (DeSteno & Salovey, 1996).

Rather than conducting further replications of the same six forced-choice scenarios, future work would profit from using the various perspectives to test different cognitive and behavioral predictions. For example, Schützwohl (2008a) has conducted some intriguing studies demonstrating that men are more distracted by cues to sexual infidelity and women are more distracted by emotional cues. Schützwohl (2008b) has also expanded the research in this area beyond jealousy and into relief – such that men are more relieved when sexual jealousy is disconfirmed and women are more relieved when emotional jealousy is disconfirmed. Although the traditional self-report measures in this area are not consistent with the EP predictions, more subtle means for investigating the proposed sex differences (such as Schützwohl's program of research) may find additional evidence consistent with the EP predictions. Also, research with bisexual samples would provide an interesting test of the double-shot hypothesis given that these individuals would be predicted to respond based on their current partner rather than their own sex.

Broadly speaking, these meta-analyses suggest that men and women do not differ in the types of infidelity that they find distressing. Instead, men and women seem to become distressed to the extent that their partner's behavior threatens their relationship rather than affects their

INFIDELITY SEX DIFFERENCES

long-term reproductive ability. This finding is fitting given that jealousy was thought to evolve in order to help individuals maintain their close relationships in a hostile environment that required help from others for survival.

INFIDELITY SEX DIFFERENCES

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INFIDELITY SEX DIFFERENCES

Table 1

Buss et al.'s (1999) Items

Scenario Pair 1: Which of the following events would be more distressing?

- A. Imagining your partner forming a deep emotional attachment to that other person (*emotional infidelity*), or
- B. Imagining your partner enjoying passionate sexual intercourse with that other person (*sexual infidelity*).

Scenario Pair 2: Which of the following events would be more distressing?

- A. Imagining your partner falling in love with that other person (*emotional infidelity*), or
- B. Imagining your partner trying different sexual positions with that person (*sexual infidelity*).

Scenario Pair 3: Imagine your partner both formed an emotional attachment to another person and had sexual intercourse with that other person. Which aspect of your partner's involvement would upset you more?

- A. The sexual intercourse with that other person (*sexual infidelity*), or
- B. The emotional attachment to that other person (*emotional infidelity*).

Scenario Pair 4: Which would upset or distress you more?

- A. Imagining your partner having sexual intercourse with that person, but you are certain that they will not form a deep emotional attachment (*sexual, without emotional infidelity*), or
- B. Imagining your partner forming a deep emotional attachment to that person, but you are certain that they will not have sexual intercourse (*emotional, without sexual, infidelity*).

Scenario Pair 5: Which would upset or distress you more?

- A. Imagining that your partner is still sexually interested in the former lover, but is no longer in love with this person (*sexual, without emotional infidelity*), or
- B. Imagining that your partner is still emotionally involved with the former lover, but is no longer sexually interested in this person (*emotional, without sexual, infidelity*).

Scenario Pair 6: Which would upset or distress you more?

- A. Imagining your partner having sexual intercourse for just one night with another person, with no chance of any further involvement (*sexual, without emotional infidelity*), or
 - B. Imagining your partner becoming emotionally involved with another person, with no chance of any sexual involvement (*emotional, without sexual, infidelity*).
-

INFIDELITY SEX DIFFERENCES

Table 2

Results of the Forced-Choice Measures Separated by Scenario and Moderator

Column	1	2	3	4	5	6	7
Scenario Moderator	Number of Studies	Weighted Mean r for the overall sex dif- ference ^a	80% Credibility interval ^b	% of variance explained by sampling error	Weighted mean odds ratio ^c	Weighted mean odds of men choosing sexual over emotional	Weighted mean odds of women choosing sexual over emotional
Scenario 1: Emotional vs. Sexual	54	0.40	.15 < ρ < .65	8.60	3.23	1.12	0.35
U.S. Students	37	0.45	.32 < ρ < .58	24.26	3.88	1.51	0.37
U.S. Non-students	4	0.31	.18 < ρ < .44	25.83	2.42	0.82	0.34
International Students	8	0.40	.23 < ρ < .58	13.51	3.22	0.74	0.25
International Non-students	3	0.23	.12 < ρ < .35	32.88	1.91	0.56	0.29
Lesbian and Gay	2	-0.23	-.29 < ρ < -.18	74.21	0.53	0.51	0.97
Scenario 2: Love vs. Sexual Positions	29	0.49	.25 < ρ < .72	9.01	4.25	0.64	0.14
U.S. Students	17	0.32	.10 < ρ < .54	28.97	5.74	0.91	0.15
International Students	8	0.43	-.06 < ρ < .92	4.89	3.60	0.52	0.13
Non-students	2	0.49	-	100.00	4.27	0.41	0.09
Lesbian and Gay	2	0.09	-.48 < ρ < .66	2.93	1.31	0.26	0.18
Scenario 3: Both Occurred	14	0.27	-.06 < ρ < .59	6.95	2.21	0.78	0.37
U.S.	7	0.44	-.05 < ρ < .91	6.42	3.72	1.45	0.39
International	6	0.22	-.07 < ρ < .52	17.06	1.85	0.52	0.29
Scenario 4: One Not the Other	18	0.33	.05 < ρ < .60	7.05	2.62	1.30	0.41
U.S.	8	0.44	.31 < ρ < .57	19.93	3.61	1.14	0.29
International	7	0.28	.04 < ρ < .54	9.05	2.32	1.60	0.58
Lesbian and Gay	2	-.18	-	100.00	0.62	0.87	1.40
Scenario 5: Former Lover	7	0.22	-.01 < ρ < .45	11.36	1.83	0.88	0.48
U.S.	2	0.42	-	100.00	3.27	1.24	0.38
International	4	0.24	.18 < ρ < .30	61.27	1.93	0.77	0.42
Scenario 6: One But No Chance of Other	8	0.13	.01 < ρ < .50	10.76	2.15	0.57	0.59
U.S.	2	0.65	-	100.00	8.03	1.64	0.20
International	5	0.13	-.03 < ρ < .30	23.25	2.72	0.57	0.33

Note. The subdivisions by world region and student status do not include the samples of gay men and lesbians.

INFIDELITY SEX DIFFERENCES

^aA positive correlation indicates that men are more likely than women to report that sexual infidelity is more distressing than emotional infidelity; a negative correlation, that women are more likely than men to report that sexual infidelity is more distressing than emotional infidelity.

^bShows how widely the effect size is expected to vary based on the influence of moderators.

^cCalculated by taking the odds of a man indicating that sexual infidelity was more distressing than emotional and dividing it by the odds of a woman indicating that sexual infidelity was more distressing than emotional.

INFIDELITY SEX DIFFERENCES

Table 3

Results of the Continuous Measures

Comparison	Weighted and corrected mean r	80% credibility interval	% of variance explained by sampling error and corrected artifacts
By Type of Infidelity			
Men: Sexual - Emotional ^a	0.24	.06 < p < .42	41.69
Women: Sexual - Emotional ^b	0.09	-.18 < p < .35	21.93
Of Men and Women			
Sexual: Men - Women ^c	-0.06	-.20 < p < .08	36.34
Emotional: Men - Women ^d	-0.21	-.33 < p < -.10	43.60

^aThe extent to which men reported that sexual infidelity was more distressing than emotional.

^bThe extent to which women reported that sexual infidelity was more distressing than emotional.

^cHow much more distressing men considered sexual infidelity to be than women did.

^dHow much more distressing men considered emotional infidelity to be than women did.