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Sex differences in jealousy: The case of Internet infidelity

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ABSTRACT

Studies investigating the events that elicit men's and women's jealousy consistently show that men's jealousy, more than women's jealousy, is triggered by a mate's sexual infidelity, and women's jealousy, more than men's jealousy, is triggered by a mate's emotional infidelity. Internet infidelity poses new challenges for modern couples. Therefore, the present study investigated men's and women's responses to emotional and sexual infidelity over the Internet. Results from both a student sample ($n = 254$), and a sample from the general population ($n = 483$) showed that sex differences in response to Internet infidelity parallels those for offline infidelity. Implications and explanations for this finding, as well as different results between both samples, are discussed.

KEY WORDS: infidelity • Internet • jealousy • psychology • sex differences

Jealousy is often defined as a romantic partner's negative reaction to the actual, imagined or expected emotional or sexual involvement of the partner with someone else (Bringle & Buunk, 1991). According to evolutionary psychologists, jealousy has evolved as a mechanism to protect the pair bond from rivals (e.g. Buunk, Massar, & Dijkstra, 2007; Daly, Wilson, & Weghorst, 1982). The manifestation of jealousy differs for men and women, however, due to differing evolutionary pressures. In general, men particularly fear

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that their mate will have sex with someone else, because, in that case, they risk investing their time and resources in another man's offspring. In contrast, women will feel most upset when their mate invests resources, such as time, energy and money, in another woman. As a result, men, when compared with women, will be more jealous in response to signs of a mate's sexual infidelity than in response to signs of a mate's emotional infidelity. On the other hand, women, when compared with men, will be more jealous in response to signs of a mate's emotional infidelity than in response to signs of a mate's sexual infidelity.

Studies focused on sex difference in jealousy have primarily used a forced-choice paradigm, in which people indicate which type of infidelity (sexual or emotional) they would find most upsetting. Indeed, this line of research has consistently found that, as predicted, more men than women indicate that their mate's sexual infidelity would upset them most, whereas more women than men indicate that their mate's emotional infidelity would upset them most (see Buss, 2008, for an overview). It must be noted, however, that, although evolutionary psychologists have often framed men's and women's responses to jealousy cues in absolute terms (e.g. men primarily experience jealousy to sexual infidelity cues), men have frequently been equally split when choosing which type of infidelity they find most upsetting (e.g. Buss et al., 1999; DeSteno & Salovey, 1996; Harris & Christenfeld, 1996). In contrast, women more consistently chose emotional infidelity (over sexual infidelity) as the more upsetting event. However, when scholars compare men's and women's relative responses to sexual and emotional infidelity, results consistently show that men are more likely than women to choose sexual infidelity as the most upsetting event, whereas women are more likely than men to choose emotional infidelity as the most upsetting event. Thus, the evolutionary psychological prediction is usually only supported when framed in relative terms, not in absolute terms.

Jealousy and modern society

Developed society differs in many respects from the circumstances early humans faced in our evolutionary past. In the last few centuries medical and technological developments have advanced rapidly, providing humans with tools that improve both their chances of survival and the quality of their lives. One very recent development is the growth of the Internet. In the past two decades, the Internet has become available to the general public in developed society, and become overwhelmingly popular. During the 1990s, the Internet grew by 100% per year, with a brief period of especially explosive growth in 1996 and 1997. Today, worldwide well over one billion people have access to the Internet (e.g. www.internetworldstats.com).

Among other things, the Internet allows people to communicate all over the world, by means of e-mail, webcams, weblogs, and chat boxes. The use of the Internet as a communicative tool poses both new opportunities and challenges for couples. The Internet has made it easier than ever to simul-

taneously enjoy both the stability of a committed pair bond and the advantages of infidelity (Mileham, 2007). Indeed, *sex* is reported to be the most frequently searched topic on the Internet (Cooper, Delmonico, & Burg, 2000; Freeman-Longo & Blanchard, 1998), and married individuals can use the Internet to meet strangers, flirt and engage in sexualized conversations or sexual behaviours, with or without a webcam (e.g., Young, Griffin-Shelley, Cooper, O'Mara, & Buchanan, 2000). There are even chat rooms geared specifically for married people who wish to engage in sexual conversations and activities with someone else (e.g., Yahoo's *Married And Flirting* and MSN's *Married But Flirting* chat rooms). Although spouses who participate in such activities often rationalize online sexual acts as being acceptable because there is no physical contact, Whitty (2005) found that most people believe cybersex (describing sexual acts, typically while masturbating), hot chatting (i.e. erotic text-based "talk" that moves beyond light-hearted flirting), and viewing pornography on the Internet are all acts of betrayal and adultery. In a similar vein, Schneider (2003) found that women who are partners of Internet addicts consider online sexual activities the same as real-life adultery. In addition, emotional disclosure to someone else over the Internet, for example by means of e-mail or chats, is also often seen as an act of infidelity. Illustrative is a study by Whitty (2005), who presented participants with a short scenario, describing a couple that had been going out for over a year, after which one of them realizes that the other has developed a relationship with someone else over the Internet. Of the participants, 84% labelled the partner's behaviour as an act of infidelity.

The relevance of studying online infidelity

Although online acts of infidelity are often experienced as extremely hurtful by partners, in many cases leading to separation or divorce (e.g. Schneider, 2003), research on Internet infidelity has appeared only recently. From a theoretical perspective, studying online infidelity is important because it can help identify potential differences in the consequences of online infidelity and offline infidelity, and the processes that underlie it, for both partners and/or the relationship. Consequently, the present research investigates the extent to which the evolutionarily based mechanism that triggers offline jealousy also applies to the modern reality of the Internet. More specifically, it was investigated whether Internet infidelity evokes a similar sex difference as has previously been found for acts of offline infidelity.

From a practical perspective, our study is relevant because treatment models of Internet infidelity are still in the developmental stages (Hertlein & Piercy, 2006; Millner, 2008). Uncovering the patterns that characterize reactions to Internet infidelity may help therapists develop more effective treatment for couples who struggle with it and/or its aftermath. Specifically, learning about the impact of types of online infidelity – sexual or emotional – and any sex differences there might be may help therapists assist partners of unfaithful individuals. In sum, the growing number of people involved in Internet infidelity necessitates that we learn more about the aftermath of virtual affairs. The present study is designed to help reach that goal.

The present study

The present study examined whether the sex difference in jealousy due to the type of infidelity (i.e. sexual versus emotional) consistently found in offline infidelity also holds for online acts. That is, when infidelity occurs over the Internet, do men, more than women, find a mate's cybersex with someone else more upsetting than signs of their mate's emotional infidelity? In addition, do women, more than men, find signs of their mate's emotional infidelity over the Internet more upsetting than their mate's cybersex with someone else?

The present research examined sex differences in response to two scenarios on offline dilemmas developed by Buss, Larsen, Westen, and Semmelroth (1992) and four scenarios on online infidelity based on the scenarios of Buss et al. (1999) in two samples of individuals involved in a serious heterosexual relationship. Study 1 utilized a sample of Dutch undergraduate students, whereas Study 2 examined a sample of adult men and women from the general population in the Netherlands. We chose to limit ourselves to individuals involved in intimate relationships because, according to Buss et al. (1992), jealousy is activated more strongly when one has experienced a committed sexual relationship. Imagining a partner being unfaithful is probably easier and more realistic when one is actually involved in a serious relationship.

Study 1

Method

Participants and procedure. University of Groningen students ($n = 335$) completed a questionnaire for course credit. A total of 81 participants were excluded because they were either not heterosexual or not currently involved in a heterosexual relationship. Of the remaining 254 undergraduate students, 201 were women and 53 were men (mean age = 19.85, $SD = 1.86$). The participants' average relationship duration was 18 months ($SD = 17.07$).

Measures. Following several demographic measures, the participants were presented with six forced-choice dilemmas assessing what type of infidelity, emotional or sexual, would upset them most. The first two dilemmas concerned a partner's emotional and sexual offline infidelity and were based on Buss et al. (1992). Participants were asked to indicate which form of infidelity would upset them most: that in which their partner (1) has passionate sexual intercourse with someone else or (2) forms a deep emotional attachment to someone of the opposite sex. In the second dilemma: that in which their partner (1) is trying different sexual positions with someone else or (2) is falling in love with someone else.

The participants were then presented with four dilemmas (adapted from Buss et al., 1999) concerning a partner's emotional and sexual infidelity over the Internet. In Dilemma 3, the participants were asked to indicate what

would upset them most: that their partner (1) has passionate sexual contact with someone else over the Internet or (2) forms a deep emotional attachment with someone of the opposite sex over the Internet. In Dilemma 4, the participants were forced to choose between: their partner (1) performs different sexual actions with someone else in front of the webcam and (2) falls in love with someone with whom he or she has contact over the Internet. In the fifth dilemma, Internet infidelity types were made mutually exclusive. The participants had to choose between: their partner (1) has once-only cybersex with someone else, without any chance that he/she develops an emotional attachment with that person and (2) develops an emotional attachment with someone else over the Internet, without any sexual actions. The final dilemma assessed which aspect of Internet infidelity would upset them most, given that both types occurred. Dilemma 6 read: "Imagine, that your partner maintains a relation with someone over the Internet. Your partner has a strong emotional attachment with this person. At the same time, they perform sexual actions during the contact. Which aspect of your partner's relationship would upset you most?" (1) the sexual aspect of the contact or (2) the emotional aspect of the contact.

Results

Responses to offline infidelity

Data from the first dilemma exhibited a significant sex difference as to whether participants chose sexual and emotional infidelity as more upsetting. More men than women indicated that a partner's sexual involvement would upset them more than a partner's emotional bonding with someone else (86.8% versus 71.1%; $\chi^2(1) = 5.39, p = .02; \Phi = .15$). The same pattern appeared even more clearly for the second dilemma. More men than women reported being more upset when their partner would try different sexual positions with someone else than when their partner would fall in love with someone else (60.4% versus 28.9%; $\chi^2(1) = 18.22, p < .001; \Phi = .27$). Thus, on the dilemmas assessing the responses to offline infidelity, we replicated the sex difference that has been found in many more studies. It must be noted, however, that in Dilemma 1 the majority of both men and women felt that the sexual infidelity was most upsetting.

Responses to online infidelity

Similar to the first two situations, in Dilemma 3, the case of infidelity over the Internet, more men than women indicated that their partner's sexual involvement would upset them more than a partner's emotional bonding with someone else (81.1% versus 58.7%; $\chi^2(1) = 9.01, p = .003; \Phi = .19$). The women were nearly equally split in choosing between types of online infidelity. Similarly, data from Dilemma 4 showed that more men than women indicated that it would upset them more if their partner was trying different sexual actions with someone in front of a webcam than if their partner was falling in love with someone he or she has contact with over the Internet (66.0% versus 40.3%; $\chi^2(1) = 11.20, p = .001; \Phi = .21$). This

pattern was replicated in Dilemma 5, in which Internet infidelity types were mutually exclusive. More men than women indicated that once-only cybersex with someone else, without any chance that their partner develops an emotional attachment with that person, would upset them more than when their partner develops an emotional attachment with someone else over the Internet, without any sexual activity (71.7% versus 42.3%; $\chi^2(1) = 14.53$, $p < .001$; $\Phi = .24$). Finally, Dilemma 6 showed that when both types of Internet infidelity were occurring, more men than women indicated that the sexual aspect of the Internet infidelity would upset them more than the emotional aspect of the Internet infidelity (81.1% versus 52.2%; $\chi^2(1) = 14.40$, $p < .001$; $\Phi = .24$), with women being almost equally split in choosing between both types of infidelity.

In sum, the same sex difference appeared when participants responded to descriptions of both offline infidelity and Internet infidelity. Across both contexts and all dilemmas, more men than women indicated that sexual infidelity would upset them more than emotional infidelity. The same pattern of results was found on the original dilemmas from Buss et al. (1992), on the dilemma in which sexual and emotional infidelity were made mutually exclusive, and on the dilemma in which both sexual and emotional infidelity had occurred.

One limitation of this study was its student sample. Study 2 aimed to replicate these findings in a sample from the general population currently involved in a heterosexual relationship.

Study 2

To increase generalizability, we validated Study 1 in a sample of older individuals from the general population. This is important, because sex differences in jealousy may stabilize, increase or weaken with age. To our knowledge, only one study has investigated this issue. Among older people (mean age 67 years), Shackelford et al. (2004) found the predicted sex difference in jealousy. In addition, they found older women to be more likely than younger women to select a partner's emotional infidelity as more distressing than a partner's sexual infidelity. To assure that the older participants had experience with the Internet, Study 2 was conducted among a sample from an online research panel.

Method

Participants and procedure. Eight hundred Dutch members of a research panel who were living with their partner and/or their children were invited to complete an online questionnaire. For their participation, they received credit points that would allow them to receive certain gifts (e.g. movie tickets or a book). The participants ($n = 537$) completed the measures (response rate = 67%). A total of 54 participants not currently involved in a heterosexual relationship were deleted from the final sample. Of the remaining 483 participants, 50.1% were male and 49.9% were female. The mean age was approximately 48 years ($SD = 15.5$). Of the participants, 1.4%

of the participants had only lower education (primary school), 37.3% had followed up on this with secondary education, 28.4% had followed up on their secondary education with vocational education, 21.1% had a bachelor degree, and 11.8% had a master degree. Concerning their relationship status, 74.3% of the participants were married, 21.5% were cohabiting, 3.1% were living-apart-together, and 1.0% were regularly dating. The average relationship length was 21.43 years ($SD = 14.98$). The participants indicated that they spend, on average, nearly three hours a day ($SD = 2.6$) on the Internet, both on typical days during the week and during the weekend.

Measures. The participants were presented with the same demographic measures and six forced-choice dilemmas as in Study 1.

Results

Responses to offline infidelity

In the first dilemma, more men than women indicated that a partner's sexual involvement would upset them more than a partner's emotional bonding with someone else (80.2% versus 73.0%; $\chi^2(1) = 3.43$, $p < .05$; one-tailed; $\Phi = .084$). On the second dilemma, more men than women reported that it would upset them more if their partner was trying different sexual positions with someone else than if their partner had fallen in love with someone else (66.5% versus 55.6%; $\chi^2(1) = 6.07$, $p < .01$; one-tailed; $\Phi = .11$). Thus, also in a sample from the general population, the general sex difference in the events that elicit jealousy in response to offline infidelity was replicated. It must be noted that, both in Dilemmas 1 and 2, the majority of women indicated that they were most upset by sexual infidelity.

Responses to online infidelity

With regard to the third dilemma, no sex difference was found ($\chi^2(1) = 1.01$ *ns*, $\Phi = .05$); 69.8% of the men and 65.6% of the women reported that sexual infidelity over the Internet would upset them more than emotional infidelity. In their responses to the fourth dilemma, more men than women reported that it would upset them more if their partner was trying different sexual actions with someone in front of a webcam than if their partner had fallen in love with someone he or she has contact with over the Internet (70.7% versus 61.4%; $\chi^2(1) = 4.61$, $p < .05$; one-tailed; $\Phi = .10$). With regard to the fifth dilemma, in which Internet infidelity types were made mutually exclusive, no sex difference was found ($\chi^2(1) = 1.29$ *ns*, $\Phi = .05$); 54.5% of the men and 49.4% of the women reported that the sexual aspect of the Internet infidelity would upset them most ($\chi^2 = .052$). Dilemma 6 showed that when both types of Internet infidelity were occurring, more men than women indicated that the sexual aspect of the Internet infidelity would upset them more than the emotional aspect of the Internet infidelity (68.6% versus 61.0%; $\chi^2(1) = 3.06$, $p < .05$; one-tailed; $\Phi = .08$).

In summary, the general sex difference was replicated with a sample from the general population. Consistently, although not uniformly, more men

than women indicated that sexual infidelity over the Internet would upset them more than emotional infidelity over the Internet. The sex difference, however, was less pronounced than in Study 1.

General discussion

Since Buss et al.'s (1992) study, many studies have shown that men and women differ in the events that elicit jealousy (see Buss, 2008, for an overview). These studies consistently show men's jealousy, more than women's jealousy, to be triggered by signs of a mate's sexual infidelity, and women's jealousy, more than men's jealousy, to be triggered by signs of a mate's emotional infidelity. The present study examined to what extent this sex difference occurs when individuals are confronted with a mate's emotional and/or sexual infidelity over the Internet. Both studies showed that, as for offline acts of infidelity, men, compared to women, are more upset by a mate's sexual infidelity over the Internet, whereas women, more than men, are more upset by a mate's emotional infidelity over the Internet.

Our results are consistent with Whitty's (2005) qualitative data that women expressed more problems with emotional infidelity over the Internet than did men. The present results suggest that the psychological mechanism of jealousy is not only triggered by offline infidelity, but also by online infidelity. Our finding suggests that the jealousy mechanism that has evolved in our evolutionary past also underlies the responses to infidelity occurring in a modern virtual world. A possible explanation is that our brain registers virtual and physical acts in the same way and responds accordingly (e.g. Mathiak & Weber, 2006). Thus, from a cognitive point of view, individuals may become involved in cyber affairs in a similar manner to offline affairs. This may also be true for the partner: when the infidelity is uncovered, the partner may respond similarly to if the affair were an offline one. Support for this explanation has, for instance, been found by studies on violent video games. In response to violent video games, the brain responds as if the threat and violence are real, stimulating the body to produce more testosterone and cortisol (e.g. Mazur, Susman, & Edelbrock, 1997). An alternative explanation is that infidelity over the Internet, either sexual or emotional, often leads to offline infidelity. Schneider (2003), for instance, found that about 18% of her sample of married individuals involved in cyber sex activities had progressed from virtual affairs to life sexual encounters with other people. This 18% contained, however, only those people who admitted their offline infidelity to their partner. It is, therefore, likely that for many more individuals Internet infidelity is the first step towards offline infidelity. Similarly, offline extra dyadic sexual behaviour may be continued online. Indeed, for nearly 31% of the Schneider (2003) sample, the online sexual activities were a continuation of pre-existing extra dyadic sexual behaviours, such as seeing prostitutes and heavy involvement with pornography. Because online and offline infidelity seem to be so closely connected, the sex difference in offline infidelity may simply extend to situations of Internet infidelity.

It must be noted, however, that the sex difference in Study 2 was less pronounced, both on the responses to offline infidelity and Internet infidelity, than the sex difference in Study 1. Older women (Study 2) seemed to be more “masculine” in their jealousy responses, when compared to younger women (Study 1); they relatively often chose a mate’s sexual infidelity, either offline or over the Internet, as the more upsetting event. A possible explanation is that, with age, women become more masculine in general, either through biological changes, sociocultural developments or both. For instance, women in their 40s and 50s possess more masculine traits, such as assertiveness and self confidence, than women in their 20s (e.g. Helson, Jones, & Kwan, 2002). As a result, women may also become more masculine in their response to jealousy-evoking events, more often choosing sexual jealousy as the most upsetting event. It is also possible that, with age, women come to find a mate’s sexual infidelity more upsetting, because of the greater fear that their partner will leave them for a younger and more beautiful woman.

Our findings are somewhat inconsistent with Shackelford et al.’s (2004) study that found older women to be more likely to choose emotional infidelity than younger women. A possible explanation is that, on average, Study 2’s participants were almost 20 years younger than those investigated by Shackelford et al. (2004). Strough, Leszczynski, Neely, Flinn, and Margrett (2007) found that women over 80 are less likely than middle-aged women to endorse masculine traits. Thus, there may be a curvilinear relationship between age and women’s masculinity, where they become more masculine through middle age; however, this trend may reverse itself over time. Consequently, their responses to jealousy-evoking situations may change accordingly.

Limitations and contributions

Our study suffers from several limitations. The most important one is that the sex difference found by the present study may, partially, depend upon the use of the forced-choice paradigm. Harris (2003, 2005), for instance, observed that results obtained by the forced-choice method hardly correlated with results obtained by other self-report measures (e.g. Likert scales and psychophysiological measures; see also Sagarin, 2005). For instance, Wiederman and Allgeier (1993) reported different sets of results from forced-choice dilemmas and rating scales to assess the upsetting nature of (offline) emotional and sexual infidelity. Using the forced-choice paradigm, they found the predicted sex difference. Data from rating scales found that men and women both rated sexual infidelity to be more upsetting than emotional infidelity (see also Buunk & Dijkstra, 2004). Thus, it is possible that our findings regarding Internet infidelity are limited to the used paradigm and may not be replicated by means of rating scales or other measures. An important avenue for future research is, therefore, to examine the extent to which different measures of jealousy in response to Internet infidelity are correlated and, if the correlation is small, what is the best way to measure these jealousy responses. The use of rating scales would also have made it

possible to investigate the *intensity* of the jealousy participants experienced. Although individuals may respond with a similar *pattern* to acts of online and offline infidelity, our study does not inform us whether, for instance, individuals find online infidelity as, less or more upsetting than acts of life infidelity. It is, however, evident that online infidelity is not merely a trivial event. Online acts of infidelity are often experienced as extremely hurtful by partners, in many cases leading couples to separate or divorce (e.g. Schneider, 2003). A possible avenue for future research may therefore be to compare the emotional impact of acts of offline and online infidelity: is one more upsetting and hurtful than the other?

A final limitation of the present research is that the questions assessing online behaviour might have been too ambiguous. For instance, in Dilemma 4 participants might have wondered whether the extra-dyadic sex in front of the webcam was performed in one location, i.e. with both sex partners on one side of the webcam, or whether the sex took place in two locations, with the webcam connecting the sex partners. However, since the present research investigated sex differences, this ambiguity did not impede the testing of the main hypotheses. Yet, in future research these items could be stated more clearly.

Despite these limitations, for several reasons, we feel that the present study contributes significantly to the literature on jealousy. First, in contrast to previous research that merely relied on college-age populations, the present research included a sample of older individuals from the general population (see Harris, 2003). Second, using the forced-choice paradigm made it possible to demonstrate concurrence with prior research on offline infidelity, showing that Internet infidelity evokes a similar response to offline infidelity. Third, the present study examined a topic, i.e. Internet infidelity, which, because of its potentially devastating consequences, is an important one but nonetheless has been only scarcely examined. We hope our study inspires other researchers to examine this important topic and that it may help therapists face the difficult challenge of developing effective treatment models for Internet infidelity.

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