

Sex Differences in Jealousy: An Evolutionary Perspective on Online Infidelity

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This study examined whether sex differences in jealousy would generalize to online infidelity. Based on the evolutionary psychological explanation for sex differences in jealousy (ancestral men's challenge of paternal uncertainty vs. ancestral women's challenge of ensuring paternal investment), we expected that men and women would perceive online infidelity similarly to conventional infidelity. The experimental design was a 2 (Infidelity Context: online or conventional) \times 2 (Participant Sex) \times 2 (Infidelity Type: emotional vs. sexual) mixed factorial. Participants were 332 (132 male, 200 female) undergraduates who completed a questionnaire assessing their responses to potential infidelity. As predicted, online and conventional infidelity elicited the same sex difference in jealousy. Implications for social scientists who study online behavior are discussed.

It is a well established research finding that men and women differ in the extent to which they experience jealousy in response to emotional versus sexual infidelity (for reviews, see Buss, Larson, & Westen, 1996; Sagarin, 2005). Specifically, men and women are hypothesized to differ in their responses to infidelity, depending on the type of infidelity in which their partners engage. Men, relative to women, are expected to be more distressed at the thought of their romantic partner engaging in a sexual infidelity as compared with forming a strong emotional bond with another individual. Likewise, women, relative to men, are expected to be more distressed by emotional infidelity than sexual infidelity.

This is theorized to stem from ancestral men's challenge of parental uncertainty and ancestral women's challenge of ensuring paternal investment (Buss, Larsen, Westen, & Semmelroth, 1992; Daly, Wilson, & Weghorst, 1982; Symons, 1979). That is, it is particularly threatening to the survival of a man's genes if there is a chance that his partner has become pregnant by someone else, whereas it is particularly threatening to the survival of a woman's genes if there is a chance that her partner is investing his resources in the children of another woman. It should be noted that it is neither necessary nor likely that ancestral women and men were consciously aware of

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these threats to their genetic fitness. The reproductive benefits accrued as a result of the increased jealousy without the need for any awareness of the process.

These predicted sex differences in jealousy were supported empirically by Buss et al. (1992), who found a large sex difference among participants who were asked to choose which option would make them feel more jealous: the thought of their romantic partner having sexual intercourse with someone else, or the thought of their romantic partner forming a deep emotional attachment with someone else. Consistent with predictions, a larger proportion of men than women chose the sexual infidelity as more distressing. These forced-choice results were replicated in a second study in which men showed signs of more physiological arousal when imagining their partners having sexual intercourse with another person, whereas women showed more physiological arousal when imagining their partners forming an emotional attachment with another person. This sex difference in jealousy has been replicated in numerous studies, primarily employing Buss et al.'s forced-choice methodology (for a meta-analysis, see Harris, 2003).

In addition to examining which type of infidelity makes men and women the most distressed, researchers have also examined specific emotional reactions to sexual and emotional infidelity. For instance, Becker, Sagarin, Guadagno, Millevoi, and Nicastle (2004) asked participants to report the amount of jealousy, hurt, anger, and disgust they felt in response to the different types of infidelity. Consistent with the evolutionary psychological explanation for sex differences in jealousy, women reported feeling more jealousy in response to emotional infidelity as compared with sexual infidelity; whereas men reported feeling more jealousy in response to sexual infidelity as compared with emotional infidelity. Different patterns emerged for the other emotions. Both men and women reported feeling more disgust and anger but less hurt over sexual infidelity as compared with emotional infidelity. Finally, participants currently in a committed relationship generally reported stronger emotional reactions to the prospect of their partners cheating as compared with individuals who were not in a relationship. Overall, the results of this study support the findings from forced-choice measures and suggest that jealousy in response to infidelity is a unique response and is not replicated by other emotions.²

²It should be noted that the evolutionary psychological explanation for sex differences in jealousy is not without its critics. The sex difference appears to be robust and replicable using the forced-choice response format (Harris, 2003), but is more elusive using continuous measures (Harris, 2003, 2005; Sagarin, 2005). In addition, a number of alternative explanations have been proposed, including DeSteno and Salovey's (1996) double-shot hypothesis (also see Harris & Christenfeld, 1996); DeSteno, Bartlett, Bravermann, and Salovey's (2002) conclusion that sex differences disappear under cognitive constraint; and Harris' (2000) critique of Buss et al.'s

Although there is a large body of research supporting the evolutionary perspective on sex differences in jealousy, no one to date has examined whether the ways in which men and women respond to the prospect of their partners cheating generalizes to other contexts, such as interactions with people online. Clearly, online infidelity differs from conventional infidelity in a number of important ways. Most notably, and most relevant from an evolutionary perspective, a sexual infidelity conducted online cannot result in pregnancy. Nevertheless, because of the Internet's brief existence on an evolutionary scale, it is highly unlikely that an evolved mechanism would be sensitive to the differential risks posed by online versus offline affairs. Given this, it seems plausible that evolved sex differences in jealousy, which were selected for and are relevant to the risks posed by conventional infidelity, might also manifest in response to online infidelity.

Romance Online

In recent years, finding romantic partners online has become increasingly common. The Internet has been called one of the most exciting contemporary locations for social interaction and romance (Ben-Ze'ev, 2004). A recent survey showed that 11% of all Internet users have looked for a romantic partner online. Of those online daters, 17% of them reported entering into a long-term relationship with an individual they met through these services (Maden & Lenhart, 2006). In addition to specifically seeking out romantic partners using online forums (e.g., dating websites), people have also reported meeting romantic partners in online video games (Yee, 2006) and through online chat, newsgroups, and forums for special interests (McKenna & Bargh, 1999; McKenna, Green, & Gleason, 2002).

Online communication provides a unique combination of privacy, relative anonymity, and convenient access to a wide variety of interaction partners and is accessible from the comfort of our homes and offices (for detailed reviews of this issue, see Bargh & McKenna, 2004; McKenna & Bargh, 2000). This combination of privacy, relative anonymity, and convenience may increase the likelihood that dissatisfied or bored individuals in monogamous relationships will seek out new sexual, romantic, or emotional bonds with individuals they meet online. Indeed, online infidelity is increasingly becom-

(1992) physiological data. Although Buss et al. (1999) provided evidence refuting the double-shot hypothesis, and Sagarin reanalyzed DeSteno et al.'s (2002) data finding evidence of a sex difference under cognitive constraint, evolutionary psychologists have yet to respond to Harris' (2000) alternative explanation for the physiological data (however, see Takahashi, Matsuura, Yahata, Koeda, Suhara, & Okubo, 2006, for a demonstration of different patterns of brain activation when women and men imagine sexual and emotional infidelity).

ing a reason cited for divorce (Atwood, 2005; Ben-Ze'ev, 2004), and another report indicated that online affairs account for nearly one third of all divorces (Infidelity Check, 2002). Additionally, a study of Swedish Internet users indicated that, regardless of relationship status, nearly one third of their participants reported engaging in online sexual activities (Daneback, Cooper, & Mansson, 2005).

What constitutes an online infidelity? A recent review of the literature indicated that while there is a great deal of debate and disagreement on the definition of online infidelity, secrecy is one important component (Atwood, 2005; Hertlein & Piercy, 2006). For the purposes of this study, we are orienting on two types of online infidelity regularly described in the literature: (a) engaging in cybersex with an individual online; or (b) forming a close emotional attachment with an individual online. Our operational definition of *cybersex* is as follows: online sexual activity wherein two or more people engage in small talk online for the purpose of sexual pleasure and may or may not involve masturbation (Daneback et al., 2005).

These trends in online social interaction beg the following questions: How do people view online cheating? Do they see it as the same as conventional infidelity? A study by Whitty (2003) addressed this issue. Participants were asked to rate their perceptions of different varieties of online and conventional cheating. Their responses were then examined with a factor analysis. The results indicated that people perceived online and offline sexual relationships as being in the same category of infidelity. However, the study did not examine whether people feel the same intensity of jealousy or other emotions when the infidelity is online.

Other research on this topic has indicated that participants see online cheating as a real act of betrayal and that women have more intense affective reactions to online cheating than do men (Whitty, 2005). Additionally, Whitty (2004) demonstrated that people perceive online flirting in a manner similar to conventional, offline flirting. Finally, it should be noted that, while the majority of these relationships stay online, a small number of them also transition into offline, conventional affairs (Rotunda, Kass, Sutton, & Leon, 2003).

The Present Study

The present investigation seeks to explore whether people feel as jealous when imaging their partners engaging in cybersex or forming a close emotional bond with an online partner as they do when imaging their partners engaging in a sexual or emotional relationship in an offline context. The present investigation also seeks to determine whether sex differences in jealousy typically reported in the evolutionary psychological literature extend to

online relationships. Specifically, building off of Buss et al.'s (1992) forced-choice paradigm, we seek to examine whether sex differences in response to sexual or emotional infidelity will generalize to contexts in which the infidelity occurs online.

In the conventional infidelity context condition, we expect to replicate the well established sex difference in the forced-choice measure of jealousy (Buss et al., 1992; Harris, 2003) that a higher proportion of men than women will choose sexual infidelity as more distressing than emotional infidelity. In the online infidelity context condition, the two perspectives discussed previously make different predictions. On the one hand, the differences in conventional versus online infidelity—most notably the impossibility of an online sexual infidelity resulting in pregnancy—suggests that the sex difference in jealousy might not manifest in response to an online infidelity. On the other hand, the implausibility of an evolved sex difference in jealousy being sensitive to the distinctions between online and offline affairs suggests that the sex difference might emerge both online and offline. Thus, the manifestation (or lack thereof) of a sex difference in jealousy in the online infidelity context condition will provide evidence regarding the accuracy of these perspectives.

Method

Participants

Participants were 332 undergraduates (132 male, 200 female) who received course credit for their participation. Their mean age was 19.2 years ($SD = 1.9$).³ Participants' average amount of time spent online was 12.4 hours per week ($SD = 11.8$).⁴

Design and Variables

The experimental design was a 2 (Infidelity Context: online or conventional) \times 2 (Participant Sex) \times 2 (Infidelity Type: emotional vs. sexual) mixed factorial. Type of infidelity (sexual vs. emotional) was a repeated-measures variable, and participant sex and infidelity context were between-subjects factors.

³We removed 13 participants from the sample based on their responses to the sexual orientation question. Specifically, 5 provided no response, 5 indicated that they were gay or lesbian, and 3 indicated "other."

⁴There were no differences in the amount of time spent online by gender or by experimental condition.

Male and female participants were randomly assigned to one of two levels of infidelity context, and all participants were asked about their reactions to both emotional and sexual infidelity. They either read a series of questions that asked about their hypothetical responses to emotional and sexual infidelity that took place online or were in a conventional face-to-face format.

Building off of Buss et al.'s (1992) paradigm, we first asked participants to consider the following:

Please think of a serious, committed romantic relationship that you have had in the past, that you currently have, or that you would like to have. Imagine that you discover that the person with whom you've been seriously involved became interested in someone else [who they only interact with online]. What would distress or upset you more?

Once participants read the scenario, they were asked to select what would make them feel more distressed or upset: imagining their partner forming a deep emotional attachment to that person, or imagining their partner enjoying passionate sex with that other person. Because the purpose of this study is to examine whether participants will use the same mental model of online infidelity as comparable conventional, offline infidelity, we sought to design online infidelity conditions that were both consistent with our operational definition and comparable to the conventional infidelity condition. As such, in the online conditions, the phrases "through online interactions" and "through cybersex" were added to the choices.

Next, we assessed how *jealous*, *angry*, *hurt*, and *disgusted* the participants would feel about both sexual and emotional infidelity on a 7-point scale ranging from 1 (*not at all*) to 7 (*extremely*). Participants were then asked a series of questions about their behavior online (e.g., how many hours per week they spent online, whether they had ever met anyone online and then dated them). Included in these questions were items assessing whether they had ever cheated on their partners, either through conventional methods or via cybersex, and whether a partner had ever cheated on them using those methods.

Participants were then asked to complete three items assessing whether they believe that engaging in cybersex with someone other than their partner, engaging in phone sex with someone other than their partner, and viewing pornography online while in a committed relationship constitutes cheating on a 7-point scale ranging from 1 (*totally disagree*) to 7 (*totally agree*). Finally, we asked participants to report on their relationship status and to provide other demographic information.

Procedure

Data were collected in a classroom setting where upper-division undergraduate psychology students were asked to complete the questionnaire in exchange for extra credit in their class. All responses were anonymous. The participants elected to participate and were randomly assigned to one of the two infidelity context conditions. Once they completed the questionnaire, the participants were debriefed and dismissed.

Results

Forced-Choice Measure

As predicted, collapsed across infidelity context, we replicated the traditional sex difference in jealousy, with a higher proportion of men than women choosing the sexual infidelity as more distressing (56.8% vs. 30.8%), $\chi^2(1, N = 303) = 20.10, p < .001$. In both conventional and online infidelity contexts, the same pattern emerged. In the conventional infidelity condition, 62.3% of men versus 33.7% of women found the prospect of their partners engaging in sexual infidelity more distressing, $\chi^2(1, N = 153) = 12.12, p < .001$. In the online infidelity context condition, 50.9% of men versus 28.0% of women reported that they were more distressed at the thought of their partners engaging in sexual infidelity, $\chi^2(1, N = 150) = 8.00, p < .01$. The results for this measure are presented in Table 1, broken down by participant sex and infidelity context condition.

Emotional Responses to Infidelity

We examined participants' emotional reactions to infidelity in a series of mixed-design ANOVAs with type of infidelity (sexual vs. emotional) as a

Table 1

Results of the Forced-Choice Measure for Men and Women in the Online and Conventional Infidelity Context Conditions

Infidelity	Men		Women	
	Sexual	Emotional	Sexual	Emotional
Conventional	62.3% (38/61)	37.7% (23/61)	33.7% (31/92)	66.3% (61/92)
Online	50.9% (29/57)	49.1% (28/57)	28% (26/93)	72% (67/93)

Table 2

Estimated Marginal Means by Participant Sex and Relationship Status for Each Emotion: Conventional Infidelity Context Condition

	Men				Women			
	Sexual		Emotional		Sexual		Emotional	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Not in a relationship	<i>n</i> = 24				<i>n</i> = 23			
Jealous	6.00	1.41	5.54	1.02	5.26	1.79	5.65	1.53
Angry	6.04	1.27	5.20	1.47	5.43	2.06	5.30	1.99
Hurt	5.95	1.43	5.63	1.58	5.65	2.08	6.17	1.40
Disgusted	5.63	1.44	4.00	1.91	5.13	2.20	4.83	2.04
Casually dating	<i>n</i> = 14				<i>n</i> = 22			
Jealous	5.57	1.60	4.85	1.92	5.95	1.13	6.00	1.02
Angry	5.79	1.48	4.92	1.94	6.05	1.33	5.73	1.42
Hurt	5.50	1.34	5.35	1.74	6.55	0.91	6.18	1.18
Disgusted	5.07	1.73	4.64	1.69	6.00	0.82	4.45	1.79
Committed relationship	<i>n</i> = 26				<i>n</i> = 54			
Jealous	5.96	1.61	5.76	1.31	6.26	1.20	6.16	1.16
Angry	6.50	0.94	5.92	1.13	6.22	1.19	5.93	1.19
Hurt	6.35	1.23	6.12	1.28	6.54	1.04	6.67	0.61
Disgusted	6.31	1.16	5.04	1.15	6.09	1.34	5.07	1.62
Collapsed across relationship status	<i>N</i> = 64				<i>N</i> = 100			
Jealous	5.89	1.52	5.48	1.39	5.94	1.39	6.01	1.22
Angry	6.17	1.22	5.43	1.50	5.98	1.49	5.72	1.47
Hurt	6.01	1.35	6.56	1.48	6.14	1.44	6.26	1.10
Disgusted	5.76	1.44	4.80	1.60	5.89	1.54	5.05	1.73

repeated-measures variable and participant sex and infidelity context as between-subjects factors. Means in the conventional infidelity context condition are displayed in Table 2, while means in the online infidelity context condition are displayed in Table 3. We will present results for each of the four

Table 3

Estimated Marginal Means by Participant Sex and Relationship Status for Each Emotion: Online Infidelity Context Condition

	Men				Women			
	Sexual		Emotional		Sexual		Emotional	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Not in a relationship	<i>n</i> = 30				<i>n</i> = 35			
Jealous	5.43	1.48	5.27	1.20	4.54	1.93	5.28	1.13
Angry	5.53	1.53	5.37	1.24	5.42	1.93	5.54	1.42
Hurt	5.25	1.66	5.30	1.39	5.48	1.63	5.65	1.30
Disgusted	5.57	1.27	4.95	1.49	5.80	1.45	5.17	1.54
Casually dating	<i>n</i> = 6				<i>n</i> = 20			
Jealous	4.83	1.83	5.00	1.67	5.60	1.67	5.45	1.47
Angry	4.50	1.38	4.17	1.60	6.15	1.53	5.85	1.42
Hurt	4.50	1.64	5.33	2.25	6.00	1.59	5.95	1.32
Disgusted	4.67	1.75	4.17	1.60	6.15	1.73	5.70	1.75
Committed relationship	<i>n</i> = 31				<i>n</i> = 45			
Jealous	5.87	1.43	5.81	0.98	5.40	1.83	5.78	1.29
Angry	6.25	1.26	5.61	1.17	6.00	1.37	5.91	1.14
Hurt	6.16	1.29	5.83	1.36	6.24	1.28	6.44	0.89
Disgusted	6.13	1.43	5.35	1.50	5.98	1.56	5.11	1.64
Collapsed across relationship status	<i>N</i> = 68				<i>N</i> = 100			
Jealous	5.53	1.55	5.48	1.17	5.14	1.86	5.54	1.28
Angry	5.76	1.47	5.35	1.29	5.83	1.56	5.77	1.30
Hurt	6.61	1.57	5.56	1.46	5.93	1.50	6.07	1.18
Disgusted	5.73	1.43	5.02	1.56	5.95	1.55	5.25	1.64

emotions (i.e., jealousy, anger, hurt, disgust), starting with the mixed-design results (i.e., results relevant to differences in emotional reactions to sexual vs. emotional infidelity), followed by the between-subjects results (i.e., results that collapse across infidelity type).

For jealousy, there was a significant infidelity type by participant sex interaction, $F(1, 318) = 8.06, p = .005$. Consistent with the evolutionary psychological explanation for sex differences in jealousy and with the forced-choice results, men reported more jealousy at the thought of their partners having passionate sex with another person as compared with forming a close emotional bond with another individual (sex, $M = 5.61$; emotion, $M = 5.37$), whereas women showed the opposite trend: They were more jealous at the thought of their partners forming a close emotional bond than having passionate sex with another individual, (emotion, $M = 5.72$; sex, $M = 5.50$).

Additionally, there was a significant infidelity type by infidelity context interaction, $F(1, 318) = 4.56, p = .033$, indicating that people responding to the conventional infidelity reported more jealousy at the thought of their partners having passionate sex with another person as compared with forming a close emotional bond with another individual (sex, $M = 5.92$; emotion, $M = 5.80$), whereas people responding to the online infidelity showed the opposite pattern: They were more jealous at the thought of their partners forming a close emotional bond online than having passionate cybersex with another individual (emotion, $M = 5.52$; sex, $M = 5.30$). In terms of between-subjects effects, there was a significant main effect for infidelity context, $F(1, 318) = 8.41, p = .004$, indicating that participants reported more jealousy in response to the prospect of their partners engaging in conventional infidelity as compared with online infidelity ($M = 5.83$ vs. $M = 5.42$).

For anger, there was a significant main effect of infidelity type, $F(1, 318) = 22.17, p < .001$. Overall, participants felt angrier at the thought of their partners having passionate sex with another individual as compared with forming an emotional bond ($M = 5.93$ vs. 5.61). This was qualified by a significant infidelity type by participant sex interaction, $F(1, 318) = 7.04, p = .008$, indicating that, when compared to men, women reported significantly more anger in response to emotional infidelity ($M = 5.75$ vs. 5.40), but there was no sex difference in anger in response to the thought of their partners engaging in sexual infidelity ($M = 5.91$ vs. 5.96). There were no significant interactions, nor was there a significant main effect in the repeated-measures examination of hurt in response to sexual versus emotional infidelity.

In terms of between-subjects effects, there was a significant main effect of infidelity context, $F(1, 318) = 6.71, p = .01$, indicating that participants felt more hurt at the prospect of their partners engaging in conventional infidelity as compared with online infidelity ($M = 6.14$ vs. 5.79). Additionally, there was a significant main effect of participant sex, $F(1, 318) = 11.55, p < .001$, indicating that, when compared to men, women felt more hurt at the prospect of their partners engaging in infidelity ($M = 6.20$ vs. 5.74).

Finally, for disgust, there was a significant main effect of infidelity type, $F(1, 318) = 114.40, p < .001$, indicating that participants felt more disgust at

the thought of their partners engaging in passionate sex than forming a close emotional attachment to another person ($M = 5.84$ vs. 4.95). This main effect was qualified by an infidelity type by infidelity context interaction, $F(1, 318) = 5.52$, $p = .019$, indicating that participants felt significantly more disgusted at the thought of their partners engaging in emotional infidelity when it was online as compared with conventional ($M = 5.49$ vs. 4.25), but there was no difference between the two infidelity contexts in the amount of disgust reported in response to sexual infidelity ($M = 5.86$ vs. 5.81). There were no significant between-subjects effects on this measure. It is also important to note that across all four emotions, we did not find a three-way interaction for participant sex, infidelity type, and infidelity context, suggesting that participants' reactions to infidelity in online versus conventional context may be more similar than they are different; or we did not have sufficient power to detect a three-way interaction.

Exploratory Analyses on Impact of Relationship Status

Participants were asked to report their relationship status, and their responses ranged from not being in a relationship to being married (see Table 1). Consistent with past research (Becker et al., 2004), we collapsed the seven categories into three (i.e., *not currently in a relationship*, *casually dating*, or *in a committed relationship*) and included this as an independent variable in a second set of analyses. Specifically, for this set of analyses, we examined participants' emotional reactions to infidelity in a series of mixed-design ANOVAs with type of infidelity (sexual vs. emotional) as a repeated-measures variable and participant sex, infidelity context, and relationship status as between-subjects factors.

Across the emotional responses, we found that people in committed relationships had more intense responses to the prospect of their partners engaging in infidelity. Specific effects for each emotion are described here.

For the measure of jealousy in response to infidelity, there was a significant main effect for relationship status, $F(2, 318) = 6.04$, $p = .003$, indicating that people in a committed relationship reported significantly more jealousy than did those who were casually dating or not in a relationship ($M_s = 5.87$, 5.41 , and 5.37 , respectively). This main effect was qualified by a significant Participant Sex \times Relationship Status interaction, $F(2, 318) = 3.16$, $p = .044$, indicating that there were different patterns of jealousy for men and women, depending on their relationship status. Specifically, compared to women who were not in a relationship, men who were not in a relationship reported significantly more jealousy at the prospect of their partners engaging in infidelity ($M = 5.56$ vs. 5.18), $F(1, 318) = 3.46$, $p = .043$. However, for partici-

pants in casual and committed relationships, there was no significant difference between men and women in the amount of jealousy reported at the prospect of their partners engaging in infidelity.

For the measure of anger in response to jealousy, we found that there was a main effect of relationship status, $F(2, 318) = 8.87, p = .001$, with people in a committed relationship feeling angrier than people in a casual relationship or not in a relationship ($M_s = 6.04, 5.39, \text{ and } 5.48$, respectively). This main effect was qualified by a significant Participant Sex \times Relationship Status interaction, $F(2, 318) = 4.75, p = .009$, indicating that, when compared to men, women in casual relationships reported more anger in response to the prospect of their partners cheating on them ($M = 5.94 \text{ vs. } 5.54$), $F(1, 318) = 4.99, p = .015$. The differences between men and women in committed relationships and not in a relationship were not significant. In terms of hurt in response to infidelity, there was a significant main effect of relationship status, $F(2, 318) = 11.32, p = .001$, indicating that, compared to participants not in a relationship or in a casual relationship, participants in committed relationships felt more hurt ($M_s = 6.29, 5.67, \text{ and } 5.64$, respectively).

Finally, in terms of disgust in response to infidelity, there was a significant main effect of relationship status, $F(2, 318) = 5.17, p = .006$, indicating that participants in committed relationships felt more disgust at the prospect of their partners engaging in infidelity than did participants in casual relationships or those who were not in relationships ($M_s = 5.63, 5.13, \text{ and } 5.11$, respectively).

Online Activity

When participants were asked to report whether they had ever talked on the phone with someone they had first met online through e-mail, instant messaging, or in a chat room, 33% (110/331)⁵ of them said *yes* and 67% (221/331) said *no*. When participants were asked to report whether they had ever met someone in person with someone they had first met online through e-mail, instant messaging, or in a chat room, 24.2% (80/331) of participants said *yes* and 75.8% (251/331) said *no*. In response to the question of whether they had ever dated someone that they first met online through e-mail, instant messaging, or in a chat room, 8.5% (28/331) of participants said *yes* and 91.5% (303/331) said *no*. There were no significant sex differences in response to any of those questions, nor did differences in these actual online experiences moderate any of the sex or infidelity context differences in jealousy or any of the other emotions examined.

⁵Data from 1 participant were missing.

Perceptions of Types of Cheating

Participants were next asked a series of questions designed to assess the extent to which they believe phone sex, viewing pornography, and cybersex constitute cheating in a committed relationship on a 7-point scale ranging from 1 (*totally disagree*) to 7 (*totally agree*). Our results indicate that women were more likely than men to agree that phone sex is cheating ($M = 6.07$ vs. 5.69), $F(1, 331) = 6.27$, $p < .05$. There were no significant differences by infidelity context or participant sex for the question about viewing pornography. Consistent with prior research (Whitty, 2003), most people did not think that viewing pornography was cheating ($M = 2.33$, $SD = 1.49$).

Although both men and women scored over the scale midpoint, suggesting that they perceive cybersex as cheating, women were significantly more likely to agree that cybersex is cheating than were men ($M = 5.68$ vs. 5.24), $F(1, 331) = 5.80$, $p < .001$. Additionally, participants who were in the online infidelity condition were more likely to agree with this statement than were participants in the conventional infidelity condition ($M = 5.82$ vs. 5.10), $F(1, 331) = 16.21$, $p < .001$. We recommend that this finding be interpreted with caution, as it is likely an indication of the salience of the exemplar caused by the questions and scenarios about online infidelity that participants had just completed.

Finally, we examined whether perceptions of cybersex as cheating moderated our results on the forced-choice and continuous measures of jealousy. Because infidelity context impacted perceptions of cybersex as cheating, we examined this issue within each infidelity context condition. Our results indicate that, across both infidelity context conditions, perceptions of cybersex as cheating did not moderate the relationship between participant sex and jealousy in response to emotional or sexual infidelity.

Experience With Infidelity

Women were significantly more likely to report having been cheated on in a past relationship than were men (59.3% vs. 42%), $\chi^2(1, N = 330) = 9.49$, $p < .001$. Additionally, although the percentages were low, women were marginally more likely to report having engaged in cybersex than were men (5% vs. 1.6%), $\chi^2(1, N = 327) = 2.64$, $p = .089$.

Discussion

Overall, the results of this study indicate that, in some respects, people perceive online infidelity in a manner similar to conventional infidelity, while

in other respects, they do not. Specifically, as predicted, the results for infidelity context indicate that, in general, individuals experience less negative affect about online infidelity as compared with conventional infidelity with one notable exception: Participants reported significantly more disgust in response to the prospect of their partners forming close emotional attachments online. This may be due to the secrecy, relative anonymity, and convenience that online relationship formation affords. This particular aspect of our findings is consistent with Cooper's Triple-A Engine of Online Sexual Activity (Cooper & Griffin-Shelley, 2002), which states that individuals engage in online sexual behavior because it is affordable, anonymous, and accessible.

More relevant to the central point of the present investigation, the sex difference in jealousy emerged across both online and offline contexts. In both contexts, men were more likely than women to report greater distress at the prospect of their partners enjoying sex with another person than at the prospect of their partners forming a deep emotional attachment to another person. This finding was replicated in the continuous measure of jealousy as well, as has been reported in previous work (Sagarin, Becker, Guadagno, Nicastle, & Millevoi, 2003).

The finding that women were more jealous at the thought of their partners forming an emotional attachment in either infidelity context is not surprising, because an emotional attachment formed online may be just as threatening to parental investment as one formed in a conventional context. In contrast, there were two findings that were somewhat surprising. Specifically, men did not show a distinction between the infidelity contexts in the amount of jealousy they reported over the prospect of their partners engaging in sexual intercourse with another individual, and both men and women did not show a difference in infidelity context in the amount of disgust they felt in response to a sexual infidelity. These results suggest that an act of sexual intercourse that is purely text-based and that does not threaten parental certainty (for men) or threaten health through contagion is enough to evoke a response predicted by the evolutionary psychological explanation for sex differences in jealousy.

In terms of the exploratory analyses with relationship status, across all four emotions and consistent with prior research (Becker et al., 2004), both men and women in committed relationships had more intense emotional reactions in response to infidelity as compared to those who were not in a relationship or who were casually dating. This may be because men and women in committed relationships had a highly salient exemplar for the hypothetical infidelity scenarios (i.e., their current relationship partners). Additionally, these participants might be in a psychological state that is more oriented toward relationship protection and maintenance than participants

who are not in a committed relationship. Future research should examine this question further.

The finding that women agreed more strongly that cybersex and phone sex constitute cheating is not surprising, as women, compared to men, tend to be less open, on average, to having sexual relationships without commitment (Simpson & Gangestad, 1991). What is surprising, however, is that women were marginally more likely to admit to engaging in cybersex, particularly since prior research and data from the present investigation have indicated that women rate cybersex as a more serious form of cheating, compared to men (Parker & Wampler, 2003). This is a finding that should be explored in future research as this field of inquiry emerges.

While the purpose of the present investigation was to examine online infidelity from an evolutionary psychological perspective, we also acknowledge other theories in the literature that seek to explain online infidelity, most of which would make similar predictions, as we derived from the evolutionary psychological perspective. First, there is the aforementioned Triple-A Engine of Online Sexual Activity (Cooper & Griffin-Shelley, 2002) which has already been described. And as we reported previously, although this study was designed from an evolutionary perspective, some of our results are consistent with this theoretical model.

The second theoretical perspective purposed to explain online infidelity posits that interaction in cyberspace is not quite real, and this lack of reality facilitates role-playing. Specifically, Whitty and Carr (2005, 2006) proposed that while there are many important similarities in online and offline relationship formation, there are also important differences. They argued that the Internet provides individuals with an opportunity to engage in roles that they do not or cannot adopt in an offline context. For instance, online, men often try on the role of being a woman (called *gender bending*). As such, Whitty and Carr (2005, 2006) argued that online infidelity is not the same as conventional infidelity because the interactants do not perceive the acts as real and, therefore, do not perceive these acts as betrayals. In essence, they perceive a split between who they are offline versus online.

The present investigation was not designed to examine online infidelity from this perspective. However, we recommend that future research include dependent variables to test this theoretical model. For instance, if this theory is accurate, then there should be moderating factors, such as amount of Internet use. Additionally, we might expect that heavy Internet users may experience less of a split than do novice users because experience has taught them that there are repercussions for their online behavior. For instance, recent news stories about online behavior provide a myriad of examples of people engaging in behavior online that has a negative impact on their offline lives. There are stories of people who have been fired for writing about their

jobs (Perez, 2005; Twist, 2004), admitting to the crimes that they committed (Healy, 2007; Poulsen, 2005), attacking others (Valenti, 2007), and admitting to affairs and betrayals (Bailey, 2004). It may well be that these individuals vary in Internet use or some other individual difference, and this may help determine the conditions under which online infidelity and other online acts are perceived as play and unreal.

In the future, we recommend that more research on online infidelity be conducted, as much of the existing literature comes from the realm of clinical psychology or clinical social work and takes the perspective that online infidelity, particularly cybersex, is an abnormal behavior associated with Internet addiction (e.g., Cooper & Griffin-Shelley, 2002). This is in contrast to the perspective in media psychology that what has been labeled "Internet addiction" is actually a failure of the self-regulation process (LaRose, Lin, & Eastlin, 2003).

Finally, there are a number of limitations to the present research. First, because we limited our sample to heterosexual individuals, it is unknown whether these results would generalize to non-heterosexual populations. In fact, some research has suggested that patterns of jealousy change in non-heterosexual populations (Bailey, Gaulin, Agyei, & Gladue, 1994). To address this, we recommend that future research examine online infidelity with samples from populations that engage in more diverse sexual practices.

Second, as with all studies that contain self-report data, there is always concern over the veracity of participant responses. Future research can address this issue by using methods other than self-report, such as through physiological measures that can examine behavior without measuring social desirability concerns, or through real-time staged experiments in which a romantic partner sees a rival approach his or her mate in a chat room, or through an archival examination of divorce patterns to determine which partner initiates the divorce and whether infidelity was cited as a reason for the divorce.

Third, these data were collected with a student sample, and it remains to be seen if the results will generalize beyond college students. This is a particularly important limitation to acknowledge, as there are mixed findings as to whether the forced-choice results generalize to older adults (Green & Sabini, 2006; Harris, 2003; Sabini & Green, 2004). It may be that infidelity concerns change over the lifespan.

We would like to acknowledge one final potential confound to the results of this study. It may be that some participants assumed that an online infidelity, regardless of its nature (i.e., sexual or emotional), may lead to a conventional infidelity. Although data from previous research (Rotunda et al., 2003) and the results of our study have indicated that only a small

proportion of relationships transition from online to “offline,” it does still happen. As such, we recommend that future research examine these expectations as a potential moderator of sex differences in jealousy in online relationships.

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