

## The Role of Stimulus Specificity on Infidelity Reactions: Seeing is Disturbing

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Published online: 1 August 2007  
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**Abstract** Past research has found that males are more distressed by imagined scenarios of sexual infidelity compared with females, while females are more distressed by imagined scenarios of emotional infidelity. Expanding on the methodology originally employed by Buss et al. (*Psychological Science*, 3, 251–255, 1992), we examined sex differences in reactions to imagined infidelity by addressing the effects of visual images of potential interlopers. Additionally, this research measured affective responses in a continuous format by examining psychological discomfort. Participants in high-visual imagery and control conditions imagined infidelity (both emotional and sexual) and then reported levels of discomfort. Further, two indices of autonomic nervous system responding were assessed (skin conductance and pulse rate). Ninety-three (53 females, 40 males) college students participated. Visual stimuli produced greater psychological distress than thought-produced stimuli for all participants, especially males. Sex differences in reactions to infidelity consistent with past research were obtained for the categorical and continuous psychological indices. Implications for research in this area are discussed.

**Keywords** Stimulus specificity · Infidelity reactions · Sexual infidelity · Emotional infidelity

This research examined psychological and physiological components of jealousy by elaborating on research conducted by Buss et al. (1992), which addressed jealousy in the context of evolutionary theory. The current research examined the effects of image-specificity and relationship status on affective reactions to imagined infidelity. Primarily, we were interested in whether a visually vivid image of an interloper would bolster affective responses to imagined infidelity across both sexes and across

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kinds of imagined infidelity (sexual and emotional). Further, in an effort to bolster construct validity, we examined multiple ways of operationalizing these affective reactions including a continuous affective measure and a physiological measure in addition to the standard categorical forced-choice measure. This methodology was designed to allow for an assessment of the effects of vividness on reactions to infidelity across multiple modalities.

In the original set of studies on this topic, Buss et al. (1992) asked men and women who were involved in monogamous relationships to choose, in a forced-choice format, which kind of infidelity (emotional or sexual) they would find more distressing. Males tended to report perceiving sexual infidelity as more distressing than females and vice versa. In a second study, these authors found that males showed stronger autonomic nervous system responses to imagined sexual infidelity than females whereas females showed stronger such reactions to imagined emotional infidelity compared with males. These authors explained these findings in a manner consistent with predictions from an evolutionary perspective. Namely, as males cannot be sure of paternity due to internal fertilization in our species, males have been selected to be particularly sensitive to issues regarding female partners cheating sexually—such an adaptation would reduce the likelihood of an individual male having to bear the genetic costs of raising another male's offspring. Further, according to this explanation, females have been selected to be sensitive to signs that male partners are potentially diverting resources to other females (as obtaining biparental care is crucial in providing offspring with an advantage). Thus, females are more concerned about the possibility of male partners forming emotional (rather than short-term sexual) bonds with competing females.

A great deal of research has followed since the original study of Buss et al. (1992). Much of this subsequent research supports their original conceptualization regarding the evolutionary underpinnings of jealousy (for example, Shackelford and Buss 1997) whereas other research has raised questions about the validity of the evolutionary infidelity research paradigm and ensuing implications drawn from such research (for example, DeSteno and Salovey 1996a, b; Harris and Christenfield 1996). In recent years, two studies by DeSteno et al. (2002) have challenged the notion of evolved sex differences in response to infidelity-laden stimuli. These authors found evidence that the standard sex difference in infidelity responses does not exist for participants who are under high cognitive-load conditions. These researchers take this finding as implying that reactions to infidelity are the same across the sexes when framed in terms of automatic, unconscious responses—it is only when higher order cognitive processes come into play that said sex differences emerge. These findings call into question whether jealousy does indeed comprise an innate specific module that results directly from natural selection.

While a great deal of current literature addresses issues regarding the utility of an evolutionary perspective on understanding jealousy, the current research is not designed to address the veridicality of any particular position regarding the evolutionary underpinnings of jealousy. Rather, this research was primarily designed to address the utility of the imagination-based methods used in this line of research and to examine sex differences in responses to infidelity using a novel procedure. Research in this area typically asks participants to simply imagine some generic interloper. The current work manipulated interloper specificity based on the prediction that, across sex and across

kinds of infidelity, a highly specific interloper would lead to a relatively strong affective response to infidelity compared with a relatively generic one.

### Image Specificity

The current work is largely designed to examine the effects of image specificity on affective reactions to imagined infidelity scenarios. An interesting animal model regarding the effects of visual specificity on reactions regarding potential interlopers may be found in the work of Barash (1975) on mountain bluebirds. Barash elicited behavior from male bluebirds that parallels jealousy in humans (conceptualized specifically by Barash as “mate-guarding behavior”) by placing a model male bluebird close to an established nest while males were absent. He observed what he defined as severe and prolonged aggressiveness toward the model and the female. In this case, the interloper was not a real threat to paternity, or even real at all, but was perceived to be a threat to paternity once positioned in proximity of the female. Relevant to the current work, note that high degrees of mate guarding here (parallel to jealousy in humans) were elicited by the introduction of a specific, observable stimulus. This example from the animal behavior literature may be useful in thinking about human research on reactions to interlopers. The introduction of a highly specific target may have effects on human reactions to infidelity that parallel the mate-guarding behavior of the mountain bluebird.

Across studies dealing with imagined infidelity, the specificity of the imagined interloper varies. Generally, research on this topic has relied on the use of a relatively generic, hypothetical methodology in presenting infidelity scenarios (for example, Buss et al. 1992). Some research, however, has used procedures that increase the specificity of the stimulus in research along these lines. For instance, Strout et al. (2005) manipulated the specificity level of stimulus presentation by having some participants read relatively generic descriptions of infidelity while others had the infidelity scenarios read aloud to them by an experimenter in an effort to increase the salience of the scenarios. These researchers found that sex differences in infidelity (consistent with those found by Buss et al. (1992)) were more pronounced in the sample of participants who had the infidelity scenarios read aloud. Thus, increases in image specificity were associated with increases in reactions to infidelity.

The current study used an alternative means to increase the salience of the scenario by using a visual stimulus-based manipulation. Further, in addition to simply providing a visual stimulus of imagined interlopers, a social psychological manipulation was incorporated. Participants in the current study were asked to choose a photograph of a same-sex target (of 20 such photographs) whom they believed represented the most attractive of the different potential targets. They were then instructed to imagine the chosen target as the interloper in the imagined infidelity scenarios. This procedure was designed to increase participants’ investment in the study and to further underscore the specific nature of the infidelity-based stimulus. In other words, this stimulus was designed to be particularly specific/salient (a) because it included a specific face and (b) because it was the face of someone judged by the participant him or herself as highly attractive to members of the opposite sex.

## Relationship Status

An additional variable examined in the current research is that of a participant's current relationship status. Prior studies have shown that participants exhibit greater distress in response to stimuli when they are involved in committed sexual relationships at the time of the study (Buss et al. 1992). Strzyzewski-Aune's (1997) findings on a study of this topic indicated that the intensity of jealousy, as well as the perceived appropriateness of jealousy, increased as relationships grew in length and interdependence.

Voracek (2001) found that relationship status was even a greater predictor of sexual jealousy than the sex of the participant. Specifically, married males were less likely to be concerned about sexual infidelity than unmarried men who were either in committed relationships or not presently in committed relationships. In fact, married men responded similarly to married women in regard to sexual jealousy, with 27.1% of married males, and 27.7% of married females responding to sexual jealousy as more distressing than emotional jealousy. Such results are not inconsistent with evolutionary theories, as Voracek explains; male sexual jealousy is predicted to vary with the fecundity, or reproductive potential of the female. A younger, non-pregnant female (higher reproductive potential) is predicted to be more intensely guarded than older or pregnant females (lower reproductive potential).

One of Voracek's major arguments was that the majority of research conducted on jealousy involved undergraduate students, and therefore should not be generalized to other populations. Voracek's study used participants from a more general population, with an age range of 18 to 58. Rather than suggesting that the standard sex difference of the Buss et al. (1992) study is a constant, generalizable trait, Voracek proposed that variability in jealousy would occur as the need to guard a mate varies.

Relationship status may be particularly relevant given the high prevalence of mate poaching that has been found to characterize our species (for example, Schmitt and Shackelford 2003). Generally, a surprising high number of partners in long-term heterosexual relationships tend to start out as partners of others included in the same social circle, providing evidence for high levels of mate poaching. Given the obvious genetic costs of mate poaching, one's relationship status should be critical in affecting one's responses to infidelity-based scenarios.

Vis-à-vis such research that underscores the effects of relationship status on affective reactions to infidelity, relationship status was included as an independent variable in the current work.

## Measures of Affective Responses to Infidelity

While the current work was designed to address the independent variables of sex, relationship status, and stimulus specificity, we were also interested in issues regarding dependent variables used in this line of research; in other words, ways of measuring affective reactions to infidelity. While most research on this topic has used the standard forced-choice measure of reactions to infidelity, some research has tried to measure such reactions using a continuous affective index (for example, DeSteno and Salovey 1996a, b). Additionally, some research on this topic has employed indices of autonomic arousal to tap physiological reactions to infidelity.

Generally, researchers have found it easier to replicate the standard sex differences by using the forced-choice measure; efforts to replicate the findings of Buss et al. (1992) with continuous psychological measures and with indices of autonomic arousal have been less consistent (for example, Harris 2000). The current research employed indices of each of these dependent variables (forced-choice, continuous affective measure, and autonomic arousal) to examine the effects of stimulus specificity across each of the ways of operationalizing affective reactions to infidelity.

## Goals of Current Work

This work was primarily designed to examine the effects of stimulus specificity on reactions to imagined infidelity. The first hypothesis predicted that a highly specific “model” interloper (in other words, high in visual specificity) would elicit greater psychological and physiological responses (in other words, more jealousy) than a thought-produced, non-specified interloper. It was predicted that the more specific stimuli (visual images of potential interlopers) would elicit greater distress across both sexual and emotional infidelity conditions than thought-produced, mental images.

The second hypothesis examined whether participants who were involved in a committed sexual relationship would exhibit greater psychological and physiological distress in response to stimuli than those not involved in a committed sexual relationship. The current research sought to examine if jealousy effects were moderated as a function of relationship status of participants.

The third hypothesis was that the standard sex difference in reactions to infidelity would be replicated across the different dependent variables. Males were predicted to show more distress to sexual, rather than emotional infidelity. The opposite pattern was predicted for females across multiple dependent variables. Further, each of these effects was predicted to be moderated by stimulus specificity; highly specific stimuli were predicted to lead to relatively pronounced reactions for both male and female participants across kinds of infidelity.

## Method

### Participants

Participants were recruited from the State University of New York at New Paltz. Some participants were recruited from psychology classes; they obtained research credits. Other participants were recruited as they traveled between classes on the college campus. Throughout the term, data were collected from 93 undergraduate students (40 males<sup>1</sup> and 53 females). The age of participants ranged from 19 to 44. Informed consent was obtained from all participants. Further, due partly to the sensitive nature of the data, it was made clear to all participants that their

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<sup>1</sup> Note that the *N* for all physiological measures is 18; 22 males who participated did not complete these measures.

participation was entirely voluntary and that they were allowed to terminate their participation at any time for any reason.

## Materials

*Survey* All surveys, data-collection forms, instructions, measures, indices, and scenarios described below were organized into four different booklets; two booklets for the visual-stimulus condition and two booklets for the thought-produced condition. The order of the infidelity scenarios (emotional versus sexual presented first) was counterbalanced across conditions.

*Index of psychological Discomfort* Elliot and Devine's (1994, personal communication) index of Psychological Discomfort was administered three times to each participant; once to establish baseline, and once after each presentation of each infidelity scenario. The index included 24 adjectives to describe the current mood of the participant. Participants recorded the degree to which each adjective (for example, *uneasy*) described their current feelings on a one-to-five scale. This scale yields an overall psychological discomfort score on a scale of 24 (low discomfort) to 120 (high discomfort). The average inter-item reliability for this scale (across the three times it was administered in this study) was quite adequate ( $\alpha=0.96$ ).

*Emotional and sexual infidelity scenarios* The emotional and sexual infidelity scenarios followed those employed by Nannini and Meyers (2000), which were modified from DeWeerth and Kalma's (1993) measure of sexual jealousy and its triggers. For control participants (in the non-visual-stimulus condition), the sexual infidelity manipulation was worded as follows:

Try to imagine the following hypothetical situation:

Please think of a serious relationship that you currently have (if you are not currently involved in such a relationship, please think of one that you would like to have).

Now imagine the following situation:

Your boyfriend/girlfriend arrives home from a week-long vacation only to inform you that he/she finds another individual to be very physically attractive. Although they have few common interests they have engaged in sexual intercourse within the last week. You are sure that your partner loves you and values your relationship together. Your partner has reassured you that the attraction to this person was purely physical.

Try to feel the feelings you would have if you actually found yourself in this situation.

Press "ENTER" on the computer keyboard when you have the image clearly in mind; you will need to sustain this image for 20 seconds from this point.

Similarly, for control participants, the emotional infidelity manipulation was worded as follows:

Try to imagine the following hypothetical situation:

Please think of a serious relationship that you currently have (if you are not currently involved in such a relationship, please think of one that you would like to have).

Now imagine the following situation:

Your boyfriend/girlfriend arrives home from a week-long vacation only to inform you that he/she finds another individual to be very intriguing. They enjoy spending time together exploring common interests. You are sure that your partner loves you and values your relationship together. Your partner has reassured you that they have not engaged in sexual intercourse with each other.

Try to feel the feelings you would have if you actually found yourself in this situation.

Press “ENTER” on the computer keyboard when you have the image clearly in mind; you will need to sustain this image for twenty seconds from this point.

For participants in the visual-stimulus condition, these sexual and emotional manipulations were worded identically as for the control participants with the exception of additional instructions that asked these experimental participants to consider the interloper in the scenarios as being the specific person in the photograph they chose (prior) as a same-sex, high mate-value (attractive) individual.

*Visual-image selection instructions* Prior to testing conditions, participants in the visual stimulus condition were asked to choose one picture of an individual (wallet-size facial photograph) of 20 color photographs of faces (of individuals who were the same sex as the participant). The photographs were taken from various dating websites and printed on wallet-sized photo paper. The participants were then instructed to choose a target whom they perceived to be most attractive. The particular target chosen for each participant was then framed as the “potential interloper” for all subsequent jealousy scenarios and judgments.

*Forced-choice measure* The original forced-choice measure of Buss et al. (1992) was also employed. Participants were asked to choose which of two scenarios (depicting sexual and emotional infidelity) would be more distressing to themselves.

*Background survey* A background survey was used to determine sex, age, sexual orientation, and relationship status.

*Physiological apparatus* We used a Psylab System, Model Five, manufactured by Contact Precision Instruments to measure electrodermal activity and pulse rate (heart beats per minute). As for the specific components, electrodermal activity is measured by the SC5 Skin Conductance amplifier, and pulse is measured by the PPA2 Pulse Plethysmograph. The software program used was Psylab 7.0.

## Design and Procedure

First, participants were connected to instruments designed to measure electrodermal activity and pulse rate. Participants then acclimated to the laboratory for 5 min. Next, an experimenter prompted participants to open the survey (described above) which instructed each participant to “imagine a time when you were walking to class, feeling neither good nor bad, just neutral” (as per Buss et al. 1992). The participant was prompted to press a keyboard button when the neutral image had been attained. A baseline measurement of electrodermal activity and pulse was recorded for a 20-s time period (also as per Buss et al. 1992). Following the physiological baseline measurements, participants were prompted to complete Elliot and Devine’s (1994, personal communication) index of Psychological Discomfort to establish a baseline for psychological discomfort.

Participants were then asked to complete a background survey to determine sex, age, sexual orientation, and relationship status. To this point, participants in each testing condition have followed the same procedures.

At this point, participants in the *visual-image* condition were presented with a manila envelope containing 20 pictures of individuals of the same sex as themselves. They were then asked to choose the individual whom they believed was most attractive. Once the participants had selected a picture, they recorded the picture’s corresponding number in the data-collection booklet and returned the remaining pictures back inside the envelope. The “chosen” picture remained displayed throughout the experiment.

Participants were then presented with one of the infidelity scenarios. Participants in the *thought-produced* condition went straight to this step following the background survey. The order of the infidelity scenarios was counterbalanced across both visual-image and thought-produced conditions.

The scenarios, representing either emotional or sexual infidelity (described in detail in *materials* section), were basically the same in content, with the introduction of the chosen picture as a potential interloper in the *visual-image* condition, as opposed to a *fully imagined* interloper for the *thought-produced* condition.

Following the first scenario, participants were prompted to “feel the feelings” they would have if they were actually in that situation. When they attained this image, they pressed a keyboard button, and physiological measurements were recorded for a 20-s time period. Following the physiological measurements, participants were prompted to once again complete Elliot and Devine’s (1994, personal communication) index of Psychological Discomfort.

Before participants read the second scenario, they again visualized a neutral scenario and repeated the baseline physiological measurements. Following the reading of the second scenario, physiological (electrodermal activity) and psychological (Elliot and Devine’s [1994, personal communication] index) measurements were once again recorded.

Next, participants were asked to complete a forced-choice measure to determine which kind of infidelity was most distressing; sexual or emotional. The measure consisted of mutually exclusive statements of each condition of infidelity. The participants were asked to choose which of the two they felt was the most distressing. The statements used were the same as the statements used in the original Buss et al. (1992) study.



## Results

This research examined several effects based on psychological variables in addition to effects based on physiological measures. In addition to addressing the issue of order effects, analyses address these two classes of variables, psychological and physiological, in turn.

### Checking for Order Effects

Recall that the sexual and emotional infidelity scenarios were counterbalanced such that some participants (chosen at random) received the sexual scenario first while other participants (also chosen at random) received the emotional scenario first. Psychological discomfort scores post-emotional scenario and post-sexual scenario were computed for all participants. To assess if the order affected responses on either of these dependent variables, two factorial ANOVAs were computed. The first ANOVA included order and sex as between-groups variables and psychological discomfort in response to the emotional scenario as a dependent variable. There was neither a significant order effect  $F(1, 89)=0.68$ , ns, nor a significant order-by-sex interaction  $F(1, 89)=3.21$ , ns. Similar results were obtained when we computed an ANOVA with order and sex as between-groups factors and psychological discomfort in response to the sexual scenario as the dependent variable. For this analysis, there was neither a significant order effect, nor a significant order-by-sex interaction. Thus, subsequently described findings are not likely by-products of order effects.

### Psychological Effects

The primary analysis included post-manipulation composite discomfort scores (across both the emotional and sexual manipulations) as a within-subject (two-level) factor and participants' sex, image-specificity level (high versus low), and level of participant involvement in a relationship (involved or not) as between-subject factors with baseline discomfort score as a covariate. A within-subject effect regarding type of manipulation (emotional or sexual) was obtained across all levels of the between-group variables (see Table 1). Specifically, participants were significantly more distraught when thinking about sexual ( $M=66.90$ ,  $SD=23.60$ ) compared with emotional infidelity ( $M=61.3$ ,  $SD=21.11$ ,  $F(1, 85)=10.11$ ,  $p<0.05$ ,  $\eta^2=0.11$ ).

Tests of between-subject effects revealed a significant main effect and a significant interaction. Specifically, image-specificity level revealed a main effect ( $F(1, 85)=9.53$ ,  $p<0.05$ ,  $\eta^2=0.10$ ). Based on the Tukey test, participants in the visual condition reported significantly more distress across both the emotional-scenario ( $M[\text{visual}]=67.66$ ,  $SD=20.21$ ;  $M[\text{non-visual}]=53.91$ ,  $SD=19.88$ ) and the sexual-scenario conditions ( $M[\text{visual}]=71.78$ ,  $SD=21.64$ ;  $M[\text{non-visual}]=61.23$ ,  $SD=24.74$ ) compared with control participants. Additionally, a sex-by-image-specificity interaction was observed. This interaction, found across levels of the within-subjects factor, indicated that while female discomfort responses varied between the visual ( $M=65.67$ ,  $SD=22.24$ ) and non-visual ( $M=60.83$ ,  $SD=24.06$ ) conditions, the visual manipulation had a larger effect for male judgments across levels of the within-subject factor. Males' discomfort scores in the visual condition ( $M=76.07$ ,  $SD=$

**Table 1** Psychological discomfort scores for the post-emotional and post-sexual infidelity scenarios across levels of sex, relationship status, and image specificity (visual vs. non-visual)

Sex	Image type	Mean discomfort score <sup>a</sup>	SD	N
Emotional infidelity scenario				
Female	Visual	63.50	21.24	26
	Thought	56.59	21.48	27
	Total	59.98	21.45	53
Male	Visual	72.16	18.40	24
	Thought	49.37	16.49	16
	Total	63.05	20.79	40
Sexual infidelity scenario				
Female	Visual	66.00	23.11	26
	Thought	59.00	21.84	27
	Total	64.24	24.78	53
Male	Visual	78.04	18.40	24
	Thought	59.00	21.84	16
	Total	70.42	21.74	40

<sup>a</sup>Based on Elliot and Devine's (1994, personal communication) 24-item, 5-point Likert scale; high scores correspond to more psychological discomfort.

20.67) were significantly greater than the scores of males in the non-visual condition ( $M=53.58$ ,  $SD=19.17$ ,  $F(1, 85)=3.99$ ,  $p<0.05$ ,  $\eta^2=0.05$ ); such a significant difference was not found for females. Males seemed to be more affected by the high image-specificity manipulation compared with females (see Table 1).

From a purely descriptive standpoint, it is noteworthy that the participants who showed the highest levels of psychological discomfort were involved males considering *sexual jealousy* in the *visual* condition ( $N=9$ ,  $M=84.56$ ,  $SD=18.13$ ) whereas the participants who showed the lowest levels of discomfort were involved males considering *emotional infidelity* in the *non-visual* condition ( $N=10$ ,  $M=47.60$ ,  $SD=17.66$ ). Female means varied much less across levels of the image-specificity variable (see Table 1).

To further address the possibility of sex differences in response to the emotional versus sexual infidelity scenarios, repeated-measures *t*-tests (with discomfort scores for emotional versus sexual infidelity) were computed separately for males and females. In both cases, discomfort scores were higher for the sexual infidelity scenario than the emotional infidelity scenario. However, this difference was not significant for females ( $M$ [emotional]=59.98,  $SD=21.45$ ;  $M$ [sexual]=64.25,  $SD=24.78$ ,  $t[52]=1.90$ , ns) whereas this difference was significant for males ( $M$ [emotional]=63.05,  $SD=20.79$ ;  $M$ [sexual]=70.43,  $SD=21.74$ ,  $t[39]=2.92$ ,  $p<0.05$ ). Further, the effect-size estimate for females here was relatively small ( $d=0.18$ ) compared with the effect-size estimate for males ( $d=0.35$ ). Given the current methodological paradigm, males are considerably more distressed by thoughts of sexual infidelity compared with thoughts of emotional infidelity. Females are not.

In addition to the aforementioned psychological effects, this research examined the standard forced-choice effect (Buss et al. 1992). The forced-choice measurement yielded results consistent with the predicted sex difference. Of the male

participants, 63% ( $N=38$ ) chose sexual infidelity as more distressing than emotional infidelity. Of the female participants, 88% ( $N=45$ ) chose emotional infidelity as more distressing than sexual infidelity ( $\chi^2[1]=25.74, p<0.05$ ).

### Physiological Effects

To examine whether the infidelity manipulation and sex affected autonomic nervous system responses, four 2-by-2 ANOVAs were computed. For each ANOVA, image type (highly specific/visual vs. control) and sex of participant served as the independent variables. The four separate dependent variables included, in order, mean non-specific skin conductance (in microSiemen) in response to the emotional scenario, mean non-specific skin conductance (in microSiemen) in response to the sexual scenario, mean pulse rate in response to the emotional scenario, and mean pulse rate in response to the sexual scenario. For each ANOVA, the appropriate baseline autonomic nervous system index served as a covariate (for example, for the analysis using pulse rate in response to the sexual scenario as the dependent variable, baseline pulse served as the covariate). For each such ANOVA, no significant effects were obtained for sex, image type, or the interaction between these independent variables. In other words, participant's sex, experimental condition nor the interaction between these variables had significant effects on any of the autonomic-based dependent variables.

### Discussion

Three primary findings of interest emerged from the results. First, image-specificity had a strong effect on self-reported psychological discomfort across the sexes for both the sexual and emotional infidelity scenarios. Simply stated, participants in the high image-specificity condition reported more distress when considering each kind of infidelity compared with control participants. Second, a significant sex-by-image-specificity interaction emerged such that image-specificity affected males more than females. Finally, using this novel methodology, sex differences regarding affective responses to sexual versus emotional infidelity were observed, providing support for the general nature of this sex difference.

In addition to the aforementioned findings, a salient feature of the current study is the fact that autonomic nervous system responses did not show any reliable pattern across the sexes in response to the different classes of infidelity scenarios.

### Image Specificity

The primary hypothesis of the current work was that participants who encountered highly specific and personal interloper images would report more distress to the infidelity scenarios compared with control participants. This hypothesis was strongly supported. In response to both emotional and sexual infidelity scenarios, males and females responded more strongly to the highly specific interloper compared with the non-descript, control interloper. These findings parallel, to some extent, the study by

Strout et al. (2005) which found that reactions to infidelity were stronger for participants who encountered relatively salient stimuli compared with participants who simply read hypothetical scenarios. In their study, specificity was manipulated by having the experimenter read the scenarios aloud. In the current research, interloper specificity was manipulated very differently—but with similar results.

The manipulation in the current study may have been so effective as it included both a visual component *and* a social psychological component. Participants in the image-specific condition not only encountered a photograph of a potential interloper, but the photograph was, by design, one that they themselves chose as most attractive to members of the opposite sex (prior to knowing the subsequent details of the procedure). In combination, this methodology worked, showing that a highly specific (visually represented) and personal (chosen by self as attractive) interloper elicits stronger reactions to infidelity compared with less specific and personal stimuli. As the stimuli in this kind of research approach actual infidelity, it makes sense that affective reactions should increase in strength. Future research on this point could benefit from teasing apart the visual and social psychological effects that are combined in the current procedure to provide information regarding the differential impact of each component on reactions to infidelity.

### Sex-by-Imagery Interaction

While image specificity affected both males and females for both kinds of infidelity scenarios, it affected males more than females in the current study. One possible explanation for this outcome pertains to the possibility that males are more visual than females (Fisher 2004) when it comes to intimate relationships, thus making them more affected by visual-based stimuli. Research consistent with this explanation pertains to Ellis and Symons' (1990) research on sex differences in sexual fantasies. These researchers found that men's sexual fantasies were more likely to contain visual imagery than women's fantasies. Some evolutionary theorists believe that this visual sex difference may have evolved because ancestral males were selected to be romantically and sexually aroused by visual cues closely associated with fitness indicators such as youth and health (for example, clear, white scleras; smooth, unwrinkled skin) (Symons 1979, 1995). A higher reliance on visual stimuli in the domain of mating may pre-dispose males to be more affected by a mating-relevant visual stimulus compared with females.

An additional potential explanation regarding why the specificity manipulation affected males more than females pertains to the fact that interlopers in any capacity have asymmetrical effects across the sexes given that cuckoldry only is possible for males (never for females). Thus, males should be particularly attuned to the presence of interlopers overall in comparison with females. As such, a manipulation that underscores an interloper in a highly personal manner (as per the manipulation used in the current research) should affect males more than females.

### Sex Differences

In regard to the primary dependent variables, the distress variables computed separately for the emotional and sexual-infidelity scenarios, males and females both

showed more distress to the sexual compared with the emotional scenarios. On the surface, this fact seems to cast doubt on whether sex differences consistent with prior work by evolutionists on this topic were obtained. A closer examination, however, revealed that this difference was significant for males but not for females. Thus, males were significantly more distressed by sexual compared with emotional infidelity, whereas females were not. This finding is important because it replicates the standard sex difference in reactions to infidelity using a very different methodology compared with past research.

These findings are somewhat consistent with those obtained by DeSteno et al. (2002) in that results described by those authors also found that sexual infidelity was found to be more distressing than emotional infidelity by both males and females. However, in the current study, males showed a larger and statistically significant difference across this within-subject factor whereas females did not. This pattern does not replicate the null effects found for this sex difference by DeSteno et al. (2002). In other words, DeSteno et al. did not find sex differences in reactions to infidelity with their continuous measures whereas we did. One possible explanation for this discrepancy in findings pertains to the fact that the current research used a 24-item scale (developed in 1994 by Elliot and Devine, personal communication) and had extremely high internal reliability ( $\alpha=0.96$ ) whereas their research used a six-item scale which had lower internal reliability. Whatever the reason, the findings from the current research demonstrate that sex differences in reactions to infidelity can be found using continuous measures.

Further, as is true in much research on this topic, we replicated the standard sex difference in reactions to infidelity using categorical measures. This particular finding is quite robust. On the flip side, findings from our physiological measures failed to show any sex differences in response to emotional versus sexual infidelity whatsoever. These findings seem to either provide no novel information on whether autonomic responses differ across the sexes with regard to sexual versus emotional infidelity or these findings may suggest that such differences in autonomic responding may not truly exist in a reliable manner. These findings are somewhat consistent with some past work on this topic (for example, Harris 2000) and they suggest that further research is definitely needed to provide some decisive portrait of the differential effects of infidelity on autonomic responses across the sexes.

### Future Directions

The current research provides insights into reactions to infidelity in several ways. This work showed that image-specificity of the interloper has a strong effect on reactions to infidelity. Further, this research showed that such effects are more pronounced for males than for females. Finally, this research replicated the standard sex difference in reactions to infidelity using a continuous index of distress—a point that supports the general nature of these sex differences and one that provides a model for how to study these sex differences using continuous outcome measures.

This research failed to replicate some findings as well. As mentioned prior, the autonomic nervous system findings presented by Buss et al. (1992) did not replicate in this research. Further, effects of relationship status on reactions to infidelity (for example, Voracek 2001) were not found in the current work. One of Voracek's

arguments was that many studies conducted on jealousy had used undergraduate samples, and his findings suggested that results from such sampling could not be generalized to the general population. As the current research used an undergraduate sample, and no effect for relationship status was found, these results are consistent with the argument presented by Voracek.

In sum, sex differences in reactions to infidelity were replicated in the current research with two of the three dependent variables, providing evidence supporting the general nature of these sex differences (for example, Shackelford and Buss 1997). Further, this research provides evidence that image specificity has a pronounced effect on reactions to infidelity, particularly for males. Future research on reactions to infidelity would benefit from utilizing images of interlopers that are both visual and personal in nature. Additionally, this research opens the door for work that examines sex differences in the degree to which different levels of interloper specificity affect reactions to infidelity.

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