



Contents lists available at SciVerse ScienceDirect

Personality and Individual Differences

journal homepage: www.elsevier.com/locate/paid

Experimental activation of anti-cuckoldry mechanisms responsive to female sexual infidelity

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ARTICLE INFO

Article history:

Received 5 December 2012

Received in revised form 30 January 2013

Accepted 6 February 2013

Available online 6 March 2013

Keywords:

Partner infidelity

Sperm competition

Cuckoldry

Jealousy

ABSTRACT

Recent research indicates that men may have evolved mechanisms dedicated to detecting and responding to the risk of partner infidelity. Because activation of these “anti-cuckoldry” mechanisms depends on partner infidelity, or the perception of partner infidelity, existing evidence for such mechanisms relies on correlational data. The current study tests several predictions regarding men’s anti-cuckoldry mechanisms in an experimental design. As predicted, the results demonstrated: (1a) experimental activation of men’s anti-cuckoldry mechanisms by presenting them with a vignette depicting a female partner’s sexual infidelity; (1b) no activation of men’s anti-cuckoldry mechanisms by presenting them with a vignette depicting a sexual encounter without female infidelity; (2) experimental activation of men’s anti-cuckoldry mechanisms was influenced by their perceived risk of partner infidelity; and (3) women were not influenced by the partner infidelity manipulation.

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1. Introduction

Psychological adaptations have evolved over human evolutionary history in response to specific problems of survival and reproduction (see Buss, 2012). One particularly costly problem for men has been the risk of cuckoldry – or unwitting investment in offspring to whom a man is not genetically related. A cuckolded man risks investing finite resources in promoting the survival of a rival’s offspring, resulting in a failure to pass on the cuckolded man’s genes to the next generation.

Given the costs of cuckoldry, men are hypothesized to have evolved psychological mechanisms dedicated to reducing the risk of cuckoldry (for review, see Platek & Shackelford, 2006). These anti-cuckoldry mechanisms function by motivating behaviors directed toward reducing the risk of investment in genetically unrelated offspring. One category of cuckoldry-reducing mechanisms accomplishes this via the promotion of sperm competition tactics. As female sexual infidelity may result in rival male sperm occupying a woman’s reproductive tract, a man whose partner has been sexually unfaithful is at an increased risk of cuckoldry (Parker, 1970; see Birkhead & Møller, 1998). A man who detects this risk of cuckoldry and places his sperm in competition with rival sperm

may successfully avoid investment in genetically unrelated offspring, thus out-reproducing men who either do not detect a risk of cuckoldry or detect the risk but do not address it. Consequently, men are hypothesized to have evolved mechanisms dedicated to detecting and responding to the risk of cuckoldry.

Empirical evidence supports this hypothesis. For example, Shackelford, Goetz, McKibbin, and Starratt (2007) documented a relationship between the risk of cuckoldry and psychological responses motivated by anti-cuckoldry mechanisms. Following previous research (e.g., Baker & Bellis, 1989; Shackelford et al., 2002; Starratt, Shackelford, Goetz, & McKibbin, 2007), the risk of partner infidelity was operationally defined as the proportion of time a man had spent apart from his partner since the last time the couple had sex. The greater the proportion of time a man spends apart from his partner, the greater the chance that she has had sex with a rival male. In addition to reporting on this objective risk of partner infidelity, participants were asked to imagine a situation in which their partner rejected their request for sex and then report how distressed they would feel in response to that rejection. The results indicated a positive relationship between the objective risk of partner infidelity and distress in response to sexual rejection, such that the greater the proportion of time a man had spent apart from his partner since the last time the couple had sex, the greater distress he reported.

Subsequent research demonstrated a similar relationship between objective measures of risk of partner infidelity and sexual coercion – a class of anti-cuckoldry behavior. Men’s partner-directed sexual coercion could function to quickly place his sperm in

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competition with rival sperm to thereby reduce the risk of cuckoldry. McKibbin, Starratt, Shackelford, and Goetz (2011) demonstrated that men's objective risk of partner infidelity, measured as the proportion of time spent apart from their partner since the last time the couple had sex, is positively related to men's sexually coercive behavior. As the risk of partner infidelity increases, so too does men's use of sexually coercive behaviors. In addition, this research demonstrated that the relationship between objective risk of partner infidelity and anti-cuckoldry behavior was moderated by the *perceived* risk of partner infidelity. The proportion of time spent apart since the last time a couple had sex was related positively to the man's partner-directed sexually coercive behaviors, but *only* for men who perceived themselves to be at some risk of partner infidelity.

Empirical evidence from a variety of other sources supports the existence of men's anti-cuckoldry mechanisms (e.g., Buss & Shackelford, 1997; Goetz & Shackelford, 2006; Wilson, Johnson, & Daly, 1995). However, because activation of these mechanisms depends on partner infidelity or the perception of partner infidelity, both of which are beyond the scope of ethical manipulation, existing evidence for such mechanisms often relies on *ex post facto* research designs. Some experimental evidence for men's anti-cuckoldry mechanisms does exist in the literature addressing jealousy as the output of evolved mechanisms, but this evidence is limited by several design features.

Much of the jealousy research employs designs that generate support for anti-cuckoldry mechanisms by comparing sexual jealousy, the output of proposed anti-cuckoldry mechanisms, to emotional jealousy, which is less directly related to cuckoldry risk. Results that document sex differences in response to a partner's sexual infidelity versus emotional infidelity, with men reporting sexual infidelity as more upsetting, are consistent with the hypothesis that sexual jealousy is generated by anti-cuckoldry mechanisms (e.g., Buss, Larsen, Westen, & Semmelroth, 1992). Critics, though, have claimed this difference to be an artifact of forced-choice methodology (i.e., forcing participants to choose either sexual infidelity or emotional infidelity as more upsetting), and some have failed to find the difference using non-forced choice methodologies (see Harris, 2003; Nannini & Meyers, 2000). Proponents of the anti-cuckoldry hypothesis, in response, have demonstrated support for the hypothesis using a variety of methods (e.g., Sagarin, Vaughn Becker, Guadagno, Nicastle, & Millevoi, 2003). Another argument against sexual jealousy as generated by anti-cuckoldry mechanisms claims that whatever sex difference exists disappears under high cognitive load, suggesting that any sex difference in jealousy is the result of sex-differences in effortful decision strategies rather than differences in evolved mechanisms responsive to evidence of infidelity (DeSteno, Bartlett, Braverman, & Salovey, 2002).

Most of the research on jealousy as produced by anti-cuckoldry mechanisms makes use of self-report questionnaires that require supposition about how a person would feel in response to a hypothetical infidelity occurring in their own past, present, or future relationship. However, some evidence suggests that responses to hypothetical infidelity may not mirror responses to actual infidelity. For example, as a part of a larger study on infidelity, Harris (2002) collected data from participants on how they would respond to a hypothetical sexual infidelity or emotional infidelity as well as how they had responded to an actual infidelity in their past. The results suggested that there was no clear relationship between responses to hypothetical infidelity and actual infidelity.

The current study addresses some of the limitations of previous research by testing hypotheses about anti-cuckoldry mechanisms in a within-participant, non-forced choice, experimental design that does not rely on participants to hypothesize about being victims of infidelity. Specifically, we hypothesized that (1a) we could

experimentally activate men's anti-cuckoldry mechanisms by presenting them with a vignette depicting a female partner's sexual infidelity and that (1b) men's anti-cuckoldry mechanisms would not be activated by presenting them with a vignette depicting a sexual encounter without female infidelity. Furthermore, given that previous research demonstrates that men's responses to objective risk of partner infidelity are influenced by their perceived risk of partner infidelity, we hypothesized that (2) men's responses to the infidelity manipulation would be influenced by their perceived risk of partner infidelity. Finally, because women cannot be cuckolded and so are not expected to have equivalent cuckoldry-relevant adaptations, we hypothesized that (3) women would not be influenced by the partner infidelity manipulation in the same manner as men.

2. Methods

2.1. Participants

Participants included 182 women and 220 men, each of whom was at least 18 years of age and reported being currently in a committed, heterosexual relationship for at least six months. Women reported a mean age of 25.6 years ($SD = 6.7$), a mean partner age of 29.0 ($SD = 8.7$), and a mean relationship length of 3.4 years ($SD = 4.3$). Men reported a mean age of 22.9 years ($SD = 6.8$), a mean partner age of 22.4 ($SD = 6.6$), and a mean relationship length of 2.6 years ($SD = 3.8$). No other demographic information was collected.

2.2. Materials and procedures

All data were collected via online survey. Participants were recruited from undergraduate psychology courses, and from links posted on the researchers' professional websites. After clicking the link, criteria questions were asked and an online consent form provided. Potential participants who were over the age of 18 years, currently in a committed, heterosexual relationship, and provided consent to participate in the study were directed to the survey. Any participants who did not fit the inclusion criteria, or failed to provide consent, were thanked for their time and directed out of the study.

2.2.1. Pre-manipulation Data

All participants provided demographic information, including their age, their partner's age, and the length of their current relationship. To assure anonymity and promote the veracity of responses, no additional demographic information was collected.

Following Shackelford et al. (2007), three questions assessed the amount of distress following a partner's sexual rejection. Instructions (for men) were as follows:

Think about the next time that you suggest to your partner that you would like to have sexual intercourse with her. Your suggestion of sexual intercourse doesn't have to be in words, but may be a certain look that she knows or something you do that leads her to believe that you want to have sexual intercourse. Imagine now that she declines your request for sexual intercourse, either in words or with her body language.

The wording of the instructions was altered to suit the sex of the participant (i.e., "her" was changed to "him" and "she" to "he"). Participants were then asked to answer the following three questions: *How angry would you feel if your partner declined your request for sexual intercourse?* *How frustrated would you feel if your partner declined your request for sexual intercourse?* and *How upset would you feel if your partner declined your request for sexual*

intercourse? Responses were provided using a 30-point, non-numbered scale anchored by “Not at all likely” and “Extremely likely.” Responses were recorded by clicking one of 30 radio buttons arrayed across the page.

Following McKibbin et al. (2011), we assessed perceived likelihood of partner infidelity by asking participants “How likely do you think it is that your current partner will in the future have sexual intercourse with someone other than you, while in a relationship with you?” Responses were provided by again using a 30-point, non-numbered scale anchored by “Not at all likely” and “Extremely likely”.

2.2.2. Manipulation

After completing the pre-manipulation questions, participants were presented with one of two vignettes about a couple in a committed relationship. Each vignette contained details about a day in the life of a cohabitating couple in a committed, heterosexual, intimate relationship. Participants in the control condition read a version of the vignettes which alluded to a sexual encounter between the members of the couple (no partner infidelity). Participants in the experimental condition read a version of the vignettes in which two words were changed so that the sexual encounter was now outside of the couple (partner infidelity). In the experimental condition, the sexual encounter involved a member of the opposite sex, such that men read about a woman being unfaithful, and vice versa.

2.2.3. Post-manipulation data

After being presented with the vignette, participants were asked two questions to verify that they had read the vignette and understood the nature of the relationship among the characters in the story. Participants were then presented with a series of the same questions that were presented pre-manipulation. Upon completing the post-manipulation questions, the participants were thanked for their time and directed out of the study.

3. Results and discussion

A pre-manipulation rating of distress in response to imagined sexual rejection by a partner was calculated for each participant by averaging responses to the following questions: *How angry would you feel if your partner declined your request for sexual intercourse?*; *How frustrated would you feel if your partner declined your request for sexual intercourse?*; and *How upset would you feel if your partner declined your request for sexual intercourse?* Parallel ratings of distress in response to imagined sexual rejection by a partner were calculated for responses to the same questions provided post-manipulation.

A repeated-measures ANOVA was conducted to test the difference between the pre-manipulation and post-manipulation ratings of distress in response to a partner's imagined sexual rejection for participants in each condition. The ANOVA included ratings of the perceived likelihood of partner infidelity as a covariate. Results showed no overall main effect for distress in response to a partner's infidelity. However, the interaction between distress and likelihood of partner infidelity was significant, but only for men in the experimental group (see Table 1).

The results supported all four hypotheses. We experimentally activated men's anti-cuckoldry mechanisms by presenting them with a vignette depicting a female partner's sexual infidelity. If the experimental manipulation was ineffective, we would have detected no difference between pre-manipulation and post-manipulation scores in any of the four groups. Because we did detect a pre-post difference in reported distress in response to a partner's sexual rejection, however, this suggests that our manipulation

Table 1

Repeated measures ANOVA testing the difference between the pre-manipulation and post-manipulation ratings of distress in response to a partner's imagined sexual rejection, with perceived likelihood of partner infidelity as a covariate.

Repeated measures ANOVA	F	(df _B ,df _W)	p	Partial η^2
<i>Female control</i>				
Distress	1.37	(1,95)	.245	.01
Distress × infidelity	0.06	(1,95)	.812	.00
<i>Female experimental</i>				
Distress	1.67	(1,72)	.200	.02
Distress × infidelity	0.44	(1,72)	.510	.01
<i>Male control</i>				
Distress	0.36	(1,126)	.551	.00
Distress × infidelity	0.85	(1,126)	.675	.00
<i>Male experimental</i>				
Distress	2.74	(1,83)	.101	.03
Distress × infidelity	9.65	(1,83)	.003	.10

was successful (hypothesis 1a). The fact that the pre-post difference was evident in the male experimental condition and not the male control condition suggests activation of mechanisms specifically responsive to risks of cuckoldry, and not generally responsive to depictions of sexual activity (hypothesis 1b). Additionally, men's responses to the partner infidelity manipulation were influenced by their perceived risk of partner infidelity (hypothesis 2). This is in line with existing literature on men's anti-cuckoldry mechanisms, and further supports the need to account for individual differences when investigating evolved psychological mechanisms.

Women's reports of distress in response to a partner's sexual rejection were not influenced by the infidelity manipulation (hypothesis 3). This should not be taken to imply that women are not responsive to infidelity. Rather, this suggests that women are not responsive to infidelity *in the same manner as are men*. As women are not at any risk of cuckoldry, women are not hypothesized to have evolved mechanisms devoted to the adaptive problem of cuckoldry and so should not be expected to demonstrate a psychological response to a variable specifically hypothesized to be cuckoldry-relevant. We may, however, hypothesize women to demonstrate responsiveness to variables relevant to adaptive problems women were likely to face over evolutionary history, such as a partner's social rejection or restriction of access to resources. Though worthy of future investigation, those hypotheses are beyond the purview of the current study.

These results provide further evidence for the existence of evolved male mechanisms dedicated to the adaptive problems of female sexual infidelity and cuckoldry without reliance on forced-choice methodologies or participants imagining themselves as victims of hypothetical infidelity. If the manipulated mechanisms were responsive generally to depictions of infidelity, we would have detected pre-post differences among both male and female participants who were exposed to the partner infidelity manipulation. However, because a difference was detected only among men in the experimental group, and this difference was moderated in a way that mirrored existing literature on anti-cuckoldry mechanisms (McKibbin et al., 2011; Starratt et al., 2007), we interpret these results as experimental support for the existence of male anti-cuckoldry mechanisms.

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