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Sex differences in multiple dimensions of jealousy

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Abstract

The present study distributed surveys to 98 college students (31 freshmen, 28 sophomores, 25 juniors, and 14 seniors) to explore both evolutionary psychology and social cognitive theories on jealousy. To examine the relationship between sexes in multiple dimensions of jealousy, Pfeiffer and Wong's Multidimensional Jealousy Survey was given to measure cognitive, behavioral, and emotional jealousy (1989). There were no significant differences between sexes and any of the jealousy subscales. The traditional forced-choice scenario was given to see if there was a sex difference between emotional and sexual jealousy. As predicted, female participants reported that emotional jealousy was more distressing, while male participants reported that sexual jealousy was more distressing. The Subjective Happiness Scale by Lyubomirsky and Lepper (1997) was given to explore the relationship between happiness and jealousy, and a negative correlation was found. Participants also had their second and fourth digits measured on both hands to obtain a 2D:4D ratio. This ratio was used to see if there was a correlation between testosterone levels and jealousy. There was no significant difference found between digit length and jealousy. Future research could explore different types of jealousy between sexes and their responses in the event of jealousy.

Keywords: romantic jealousy, sex differences, college students, evolutionary theory, social cognitive theory, 2D:4D ratio

Introduction

Through research, we have gradually become aware of sex differences in complex behaviors, cognitions, traits, and personalities. As technology has advanced and resources are being fully utilized, we can research the population and find a large array of sex differences in behaviors. Often times we are able to find a significant sex difference, but sometimes the difference is more subtle. One interesting sex difference that is worth noting is the sex differences in a romantic relationship.

From the moment we are born, we are constantly forming and developing relationships with those around us. While relationships tend to be our support and comfort, they can also be sources of insecurity, anger and hostility, and distrust. When these relationships go wrong, it can trigger feelings of animosity and even jealousy. Currently, there are three different theories that hypothesize why jealousy occurs in a romantic relationship. The current study will explore the elements of each theory and provide previous research and support for each. An evolutionary standpoint, social cognitive view, and biological inheritance will be explored to create a multi-faceted approach.

Jealousy can be defined as an "aversive emotional response to a partner's real, imagined, or potential attraction for a third person" (Bringle & Buunk, 1986, p. 226). White (1981) defines romantic jealousy as "complex thoughts, feelings, and actions which follow threats to self-esteem and/or threats to the existence or quality of the relationship (p. 24)." Romantic jealousy has many components such as sexual, cognitive, behavioral, and emotional jealousy. When analyzing males versus females, there might be a sex difference when it comes to the different components of jealousy in a relationship. While Sagarin and Guadagno (2004) have found that there is no sex difference in the magnitude or frequency of jealousy, it would be interesting to see if there is a sex difference in magnitude in each of the different components of jealousy. It can be then speculated to see if the perceived differences developed from an evolutionary standpoint, social cognitive explanation, or biological inheritance.

Evolutionary psychologists have carried out multiple studies that examine the sex differences in sexual and emotional jealousy. Several studies by Buss (1995), Buunk, Angleitner, Oubaid, and Buss (1996), Cramer, Abraham, Johnson, and Manning-Ryan (2002), Russell and Harton

(2005), Shackelford, Voracek, Schmitt, Buss, Weekes-Shackelford, and Michalski (2004) have replicated the finding that women are more likely to be distressed by emotional jealousy, while men are more likely to be distressed by sexual jealousy. For example, women are more likely to be distressed by a man forming an "emotional attachment" (a friendship or close relationship to another woman), while men are more likely to be distressed by a "one night stand or sexual encounter" (Shackelford et al., 2004, p. 292). Evolutionary psychologists such as Buss, Larsen, and Westen (1996) suggest that these outcomes are due to the different types of threats to the relationship. A woman's main threat is the loss of resources. If her partner starts to befriend another woman and forms an emotional attachment, then she risks losing his attention, involvement, commitment, time, and resources (Buss, 1995). All of these are vital pieces of a relationship, especially if he has fathered children with her. For men, their main threat pertains to sexual infidelity. When it comes to bearing children, there is no question about maternity since gestation occurs internally. Men are more distressed by sexual acts because it could compromise paternity (Wiederman & LaMar, 1998). This would result in wasted time, energy, and resources to an offspring that was another man's (Buss, Larsen, & Westen, 1996).

In order to find significance from an evolutionary standpoint, evolutionary psychologists have given their participants a classic forced-choice scenario in order to find which type of jealousy was more distressing. They had to pick from the following two choices: "A. Imagining your partner forming a deep emotional attachment to another person, or B. Imagining your partner enjoying passionate sexual intercourse with another person" (Cramer, Abraham, Johnson, & Manning-Ryan, 2001, p. 331; Sagarin & Guadagno, 2004, p.325; Shackelford et al., 2004, p. 288). Repeated studies have found that women are more likely to pick option A, the emotional component, as more distressing, while men are more likely to pick option B, the sexual component, as more distressing.

While evolutionary psychologists argue that the sex difference in jealousy is due to evolutionary psychology, social cognitive psychologists consider it biased as a result of the forced-choice response (DeSteno, Bartlett, Braverman, & Salovey, 2002). When participants select an option, it requires a cognitive process about the infidelity, which is why social cognitive psychologists believe it deals with cognition, not evolution (Maner & Shackelford, 2007). Ward and Voracek (2004) state that the social cognitive view elucidates that the sex difference is the result of acquired beliefs about men and women in romantic relationships. To demonstrate that cognitive processes are involved in decision making, DeSteno and colleagues (2002) gave participants a cognitive load by asking them to remember a string of seven digits. They were then asked to indicate whether emotional or sexual was more distressing. Once they answered the question participants were asked to recall the string of numbers. Males with and without the cognitive load both indicated that the sexual jealousy option was more distressing, concluding that there was no difference. When the female participants were presented with the cognitive load, they chose sexual jealousy as more distressing. However, female participants that had no cognitive load indicated that emotional jealousy was more distressing. This experiment provided support for the social cognitive theory by demonstrating how the

presence of a cognitive load, or lack thereof, could affect the participants' answer.

DeSteno and Salovey (1996) also found that when presented with a choice, it creates a false dichotomy. This is the belief that one event implies the existence of the other, creating a "double-shot" of infidelity. For example, a man can assume that if a woman is having sexual intercourse then she is in love. In the same regard, if a man is in love then he is probably having sexual intercourse as well (Russell & Harton, 2005). These social constructs imply that the choice is based off of social learning and learned cognition (Ward & Voracek, 2004), rather than evolutionary influences.

Evolutionary and social cognitive psychologists continue to debate the reasoning of perceived jealousy in each of the sexes. One point of view that is overlooked by both sets of theorists is a biological perspective. This view states that the interpretation of jealousy stems from our genetics, and not an evolutionary or social cognitive view. One area where there is a biological sex difference is regarding digit length in the second and fourth digit. The 2D:4D ratio is obtained by dividing the length of the second digit by the length of the fourth digit. It is a sexually dimorphic trait with males typically exhibiting a lower ratio than females (Coyne, Manning, Ringer, & Bailey, 2007; Fussell, Rowe, & Park 2011; Lutchmaya, Baron-Cohen, Raggatt, Knickmeyer, & Manning, 2004; Manning, Bundred, Newton, & Flanagan, 2003; Voracek, Dressler, & Mannong, 2006). Manning and colleagues (2003) state that the 2D:4D ratio is negatively related to prenatal testosterone and positively related to estrogen. If the 2D:4D ratio is lower than one, it indicates that there were higher levels of testosterone while in utero.

Voracek, Dressler, and Manning (2006) have found that prenatal testosterone has an organizational effect on the brain, and in turn, behavior. This can affect the structures of the amygdala, hippocampus, and the hypothalamus. With a more "masculinized" brain structure, there are predicted sex differences in romantic jealousy (Fussell, Rowe, & Park, 2011). Low 2D:4D ratios in females reveal patterns of promiscuity, sensation and adventure seeking behaviors, as well as conflict related behaviors. In males, it is reported to show dominance, competitiveness, and aggression. Fusell, Rowe, and Park (2011) found a significant negative correlation between the 2D: 4D ratio and happiness levels, which could indicate that there is a correlation between testosterone and sexual jealousy. This is a biological mechanism, an influence of natural selection, which supports the evolutionary perspective on sexual jealousy. However, in contrast, it is hard to identify the results as direct measurements of prenatal testosterone levels. Perceived jealousy is also subject to influence of cultural norms and various sex roles.

The research behind prenatal testosterone is gradually rising and is highly important. While prenatal testosterone may seem irrelevant to jealousy levels, research by Coyne et al. (2007) has found that higher levels of testosterone results in higher levels of aggression. Aggression is a key factor that results in domestic violence and spouse murder from jealousy (Ward & Voracek, 2004). One of the leading causes of battery and homicide in romantic relationships is sexual jealousy (Paul & Galloway, 1994). In order to understand cases that involve spouse battering, it is vital to understand influences which contributed to this behavior. Finding the mechanisms and motives behind jealousy would be highly beneficial to society.

After reviewing previous research, the current study was executed to understand the sex differences in multiple dimensions of jealousy. While previous research has found that there is no difference in the amount of jealousy experienced in each sex, it is intriguing to see if there is a sex difference when breaking jealousy down into different components. It was also conducted to see if the present theories of jealousy pertained to the college student population. The current study explored three main hypotheses. The first hypothesis is that there will be a sex difference in the overall magnitude of jealousy. The second hypothesis is that there will be a sex difference in emotional and sexual jealousy. It is hypothesized that when given a forced-choice scenario, women will indicate emotional jealousy as more distressing, while men will indicate that sexual jealousy is more distressing. The final hypothesis is that there will be a correlation between the 2D:4D ratio and the magnitude of jealousy in each sex.

Method

Participants

Participants were recruited from Monmouth College, a small, four-year, Liberal Arts College in Monmouth, IL. A total of 98 surveys were distributed to a convenience sample. The convenience sample was made up of students who were easily accessed by the researcher, and were recruited from Psychology classes. While the participation in the experiment was completely voluntary, extra credit was offered in the Psychology classes. This was the only means of compensation for the participation in the experiment. In an effort to obtain more participants, participants were also recruited via email. The average age of the participants was 19.5 years (females: M=19.2, SD=1.25) (males: M=20.2, SD=1.08) and included 68 females and 30 males. Of the 98 participants, there were 31 freshmen, 28 sophomores, 25 juniors, and 14 seniors. To gather more demographic data, participants were also asked their ethnicity. The majority of the participants were Caucasian (n=64), 15 were African American, 14 were Hispanic and 5 identified as Other.

Materials

Each participant was given a packet with various surveys. First, they were given the Multidimensional Jealousy Survey (MJS) (Pfeiffer & Wong, 1989; see Appendix). The MJS asked participants about jealousy in three different components: cognitive, emotional, and behavioral jealousy. Each subscale asked eight different questions about jealousy. Due to computer error, two questions were deleted in the emotional and cognitive subscales. In an effort to have the same number of questions in each subscale, a random question was selected in the behavioral jealousy subscale and was deleted. Participants were asked to answer seven out of the eight different questions in each of the subscales about jealousy. The cognitive subscale asked how often the participant had suspicions about their partner. The behavioral subscale asked participants how often they take part in certain behaviors. The cognitive and behavioral subscales were presented in a seven-point Likert-scale (1=*never,* 3=*sometimes,* 5=*often,* 7=*all the time).* In order to prevent response bias, the cognitive subscale was reverse scored. The third component asked questions about emotional jealousy and participants were asked how upset they would be in response to hypothetical situations. A seven-point Likert-scale was also given for the emotional component (1=*very pleased,* 3= *pleased,* 5=*upset,* 7=*very upset).*

The next section of the compiled packet included a few questions pertaining to emotional and sexual infidelity. Participants were given two hypothetical situations and were asked to choose the option that would distress or upset them more (Buss et al., 1992; see Appendix). The first option pertained to emotional infidelity while the second option pertained to sexual infidelity. In order to prevent forced-choice bias, participants were also given a Likert-scale to identify how jealous they would be in each of the hypothetical scenarios, from 1 (*not at all jealous*) to 7 (*extremely jealous*). The final scale that participants were given was the Subjective Happiness Scale (SHS) (Lyubomirsky & Lepper, 1997; see Appendix). The SHS asked four questions pertaining to happiness. In order to prevent response bias, question number four was reverse scored. To complete the study, participants were then asked to have their second and fourth digits measured. This is an indirect measure of prenatal testosterone. A digital caliper was used and measured the distance from the basal crease to the tip of the finger.

Procedure

Participants were asked to report to a room that contained six small secluded rooms. After signing the informed consent, they were given a packet of surveys compiled with demographic information, the MJS, the Buss scenario, and the SHS. Participants were instructed to take the survey privately in one of the small rooms. Upon completion of the surveys, the participants were instructed to bring the packet back and have their fingers measured. Using a digital caliper, the second and fourth digit was measured on both the left and right hand. Measurements to the nearest hundredth of a millimeter were recorded. The length of index finger was divided by the length of the ring finger in order to obtain the 2D:4D ratio.

Results

To begin data analysis, a Two Sample *t* test was conducted to examine sex differences in jealousy. Participants were given were given the MJS which contained 24 questions about jealousy. There was no sex difference between females' overall jealousy (M=69.5, SD=15.4) and the males' overall jealousy levels (M=68.8, SD=16.3), $t(96)$=.20, p= .84. To further explore possible sex differences, a Two Sample *t* test was conducted for each of the subscales: cognitive, emotional, and behavioral jealousy. When the cognitive subscale was examined, there was no difference in the amount of jealousy females reported (M=17.37, SD=7.20) compared to males (M=17.03, SD=7.89), $t(96)$=.20, p= .84. The emotional subscale was examined, and there was no difference in the amount of emotional jealousy females reported (M=34.99, SD=6.15) compared to males (M=34.97, SD=5.64), $t(96)$=.01, p= .84. Upon examination, the behavioral subscale for jealousy also revealed no sex difference between females (M=17.15, SD=6.75) males (M=16.80, SD=5.60), $t(96)$=.26, p= .79. Similarly to Pfeiffer and Wong (1989), a correlation was run to see if there was a relationship between jealousy and happiness. Data analysis supported previous research and there was a negative relationship between happiness and jealousy ($r(68) = -.21$, p=.04).

To examine Buss' forced-choice scenario, a Chi Square test was run to compare the options of emotional versus sexual jealousy. It was hypothesized that women would select option "A" (emotional jealousy), while men would select option "B" (sexual jealousy). There was a

significant difference as 52 (76.5%) of the women selected the emotional jealousy option and 21 (70%) of the men selected the sexual jealousy option, χ^2 (2, N=96) = 19.2, p<.001. In order to remove the forced-choice response, a Likert-scale was also given to conceptualize the amount of emotional and sexual jealousy. A Two Sample t test was conducted between Sex and Buss' Emotional option. While it was in the direction Buss predicted, there was no significant difference between females (M=5.13, SD=1.67) and males (M=4.97, SD=1.83), t(96)=.44, p= .66. Another Two Sample t test was used to analyze Sex and Buss' Sexual option. There was no significant difference between females (M=5.37, SD=1.88) and males (M=5.70, SD=1.82), t(96)=-.82, p= .41.

The final series of tests were conducted to see if there was a relationship between the 2D:4D ratio and jealousy. A Two Sample t test was used to see if there was a sex difference in the digit ratio. Previous research was supported and the results indicated that men (M=0.97, SD=0.04) had a lower 2D:4D ratio than women (M=1.00, SD=0.05), t(96)=3.39, p= .001. Using Pearson's correlation, there was no correlation found between overall jealousy and the digit length for either males (r(30) = .03, p=.89) or females (r(68) = .03, p=.78).

Discussion

Consistent with previous research, the current study did not find any sex differences in the magnitude of jealousy. Findings were also consistent with each of the subscales: behavioral, cognitive, and emotional, as there were no sex differences. When looking at a biological perspective, there was no significant sex difference between the 2D:4D ratio and jealousy. This study contributes significant research to the field as strong evidence was found for the evolutionary theory in the forced-choice scenario. As predicted, women indicated the emotional jealousy option as more distressing, while men indicated that the sexual jealousy option was more distressing (Cramer, Abraham, Johnson, & Manning-Ryan, 2001; Sagarin & Guadagno, 2004; Shackelford et al., 2004). While support was found for the evolutionary theory's forced-choice scenario, the social cognitive "double-shot" hypothesis was also supported (DeSteno, Bartlett, Braverman, & Salovey, 2002). When participants were given the sexual and emotional jealousy question in a Likert-scale, there were no sex differences found in the magnitude of each option.

When collecting data, sometimes it is hard to justify how certain results were obtained. In this study, both the evolutionary and social cognitive theories were supported. If jealousy is multi-faceted, it is beneficial to analyze all the components which include: cognitive, physiological, and behavioral responses (Shackelford & Maner, 2008). Social cognitivists credit a false dichotomy for the forced-choice scenario, but perhaps it isn't a false at all. Perhaps it is a dichotomy, or combination of both theories. Research by Buss (1995) supported his hypothesis when heart rate, frowning, and electrodermal activity were measured when asking participants to imagine the forced-choice scenario. The same results were produced, men showed a greater physiological arousal to the sexual scenario while women showed more arousal to the emotional scenario. While this may support the evolutionary theory, it shows that measured responses were obtained due to cognitions and supports the social cognitive theory. It could be logical to infer that humans have evolved their behaviors and cognitions over time (Shackelford & Maner, 2008).

While there were significant data found, there were some limitations in the study. One limitation that could have affected the results was the age of the sample. Participants were recruited out of college Psychology classes, with the average age of the sample being 19.5 years old. Therefore, the sample could be too young to understand the various aspects of jealousy in a relationship. Shackelford and colleagues (2004) found a significant difference in a study between a younger and older sample. Another reason that the sample could have been too young is because the college student sample is not in the process of courting one another. Previous research by Buss, Larsen, and Westen (1996), shows that women are more jealous of a man's emotional relationship with another woman, because it could result in a loss of his time and resources for their offspring. They also explain that men are more jealous of a woman's sexual relationship because it would compromise paternity, and in turn, waste his time and resources. These courting aspects may not be applicable to the college student population. Future research could accommodate age by designing a study that included a continuum of ages. A between groups study, with younger and older sample representatives, can determine if age is a factor.

Another limitation in this study was sex. There was a considerable amount of women, compared to men, which could have influenced the results. Another limitation may be derived from perceived jealousy. Real jealousy and infidelity is much different than something that is imagined. Reacting to a scenario or imagined jealousy is significantly different than experiencing the feelings of actual jealousy. Aylor and Dainto (2001) reported that there is a difference between jealousy experience and expression. How a participant perceives jealousy and rates it on a scale could result in a reporting bias.

Although there were a few limitations, the current study was reliable and consistent with current research. Future research is highly important so that we can understand why jealousy occurs, and potentially develop preventative measures against domestic violence. One possibility for future research is looking at how participants react to jealousy rather than what makes them jealous. This could be a preventative measure that will identify harmful behaviors and then target coping strategies. Another potential aspect of research may be to focus on the jealousy associations, rather than the sex differences. For example, it could be beneficial to take a look at personality traits to see if there is a correlation with reacting to jealousy. Levels of happiness could also be explored more in depth since there was a negative correlation with jealousy and happiness. To further this study it would be interesting to give participants a cognitive load before answering each question. It would be intriguing to see if the forced-choice scenario still had significance when participants are asked to do another task. Jealousy is a complex issue that encompasses several different perspectives. Whether it is part of evolutionary theory, social cognitive theory, a biological perspective, or a combination, it is important to take a look at all aspects that create the bigger picture.

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