Spatial Distance Regulates Sex-Specific Feelings to Suspected Sexual and Emotional Infidelity

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Abstract: The present study investigates the hitherto neglected influence of the spatial distance between the jealous person, the partner, and a potential rival as a proximate contextual factor regulating emotion intensity. The study tested four predictions. (1) The jealousy mechanism responds with mild negative feelings at most as long as the partner is close to the jealous person. (2) The negative feelings increase when the partner is far from the jealous person but the rival is close. (3) The most uncomfortable feelings result when the partner and the rival are close together and both far from the jealous person. (4) Based on the evolutionary psychological considerations, men report stronger negative feelings than women when suspecting sexual infidelity. Conversely, women report stronger negative feelings than men when suspecting emotional infidelity. The results confirmed predictions 1 and 4. Reversing predictions 2 and 3, the close rival consistently elicited the most uncomfortable feelings. Implications and limitations of the present study are discussed and suggestions for future research are provided.

Keywords: jealousy, sexual infidelity, emotional infidelity, evolutionary psychology, sex differences, spatial distance, proximate contextual factor

Introduction

Jealousy has often been considered a dangerous emotion because it motivates a wide range of behavior including spousal violence and abuse (e.g., Buss, 1988; Buss and Shackelford, 1997; Daly, Wilson, and Weghorst, 1982). It is therefore a major task of jealousy research to identify potential determinants of jealousy-motivated behavior. One such potential determinant is the intensity of the jealousy feeling. It appears reasonable to assume that mild jealousy feelings
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promote rather innocuous mate retention tactics such as heightened vigilance. In contrast, very intense feelings are more likely to evoke ferocious reactions including violence and abuse.

Several determinants of jealousy intensity have been identified. First, sneaking suspicions of a partner’s infidelity appear to result in mild, anxious-insecurity like jealousy feelings (Parrott, 1991), whereas the certainty of actual infidelity is associated with intense, rage-like jealousy feelings. Secondly, based on evolutionary psychological considerations, Buunk and his colleagues provided substantial empirical evidence that rival characteristics affect jealousy intensity. These authors found that a (potential) rival’s high physical attractiveness elicits more jealousy in women than in men. In contrast, a (potential) rival high in social and physical dominance and social status evokes more jealousy in men than in women (e.g., Dijkstra and Buunk, 2002; see also Buunk and Dijkstra, 2004, 2005; Massar and Buunk, 2009). Third, a fundamental factor contributing to the intensity of jealousy concerns the infidelity type the partner engages in. Empirical evidence continues to accumulate confirming the evolutionary psychological hypothesis (Buss, Larsen, Westen, and Semmelroth, 1992; Daly et al., 1982; Symons, 1979) that men respond with more intense jealousy than women to a mate’s sexual infidelity whereas, conversely, women respond with more intense jealousy than men to a mate’s emotional infidelity (e.g., Buss et al., 1992; 1999; Buunk, Angleitner, Oubaid, and Buss, 1996; Edlund, Heider, Scherer, Farc, and Sagarin, 2006; Guadagno and Sagarin, 2010; Groothof, Dijkstra, and Barelds, 2009; Pietrzak, Laird, Stevens, and Thompson, 2002; Sagarin, Becker, Guadagno, Nicastle, and Millevoi, 2003; Schützwohl, 2007; Wiederman and Kendall, 1999).

Although the infidelity type is a major determinant of jealousy intensity, a mate’s sexual or emotional infidelity is typically not just simply revealed. Rather, as the unfaithful partner most likely tries to conceal his or her infidelity, the jealousy mechanism often needs to rely on indirect evidence from which a mate’s infidelity can be inferred. An important source of such indirect evidence consists of sudden and conspicuous changes in the partner’s behavior. Shackelford and Buss (1997) identified numerous such behavioral changes that were more diagnostic of either emotional or sexual infidelity. Moreover, within each infidelity type, those cues to infidelity varied in their diagnostic value, that is, in the likelihood of the respective infidelity type given that cue. Both the suspected infidelity type and the diagnostic value of the cue combine in determining the intensity of the jealousy feeling as men needed fewer cues to sexual infidelity whereas women needed fewer cues to emotional infidelity to respond with intolerably intense jealousy feelings (Schützwohl, 2005).

However, the sudden and conspicuous changes in the partner’s behavior as factors contributing to jealousy intensity and thus determinants of jealousy-motivated behavior have several limitations. First, these behavioral changes are often ambiguous with respect to the infidelity type (e.g., the clothing style suddenly changes; he or she stops returning your phone calls), thus presumably requiring complex inference processes that are prone to errors. Second, some if not most of these behavioral cues to infidelity were certainly not available during our ancestors’ past, (e.g., the clothing style suddenly changes; he or she stops returning your phone calls). As a consequence, they could not have shaped the jealousy mechanism during its evolutionary history. Finally, although these cues contribute to the intensity of jealousy and thus to the regulation of jealousy-motivated behavior, they remain mute as to which specific behavior is most appropriate in a given situation. To illustrate, what is the appropriate response to sudden changes in the clothing style or in sleeping habits? What should be done when he or she is unusually apologetic or when he or she says “I love you” either more or less frequently than he or she used to (Shackelford and Buss, 1997)?
These considerations raise the question whether there are possible additional cues to infidelity that do not suffer from the limitations mentioned above. The present study picks up this question and examines a hitherto neglected but fundamental proximate contextual factor in jealousy research: The spatial distance between the persons involved in the “eternal triangle” (Buss, 2000), that is the partner, the potential rival and the jealous person. Spatial distance between the three persons (a) was recurrently available to our ancestors and thus could have been exploited by the jealousy mechanism throughout our evolutionary past, (b) can be clearly detected, (c) is not ambiguous and thus does not require complex inferential processes, (d) informs rather directly about appropriate mate guarding behavior (e.g., moving closer to the partner; increasing the distance between the partner and the potential rival or stepping between the partner and the potential rival).

Several lines of research suggest that spatial distance is an important input regulating the intensity of emotions in general and jealousy in particular. Construal Level Theory (Trope and Liberman, 2010) assumes that spatial distance is closely related to psychological distance as a decrease in spatial distance intensifies emotions dealing with immediate threats. Accordingly, spatial proximity and thus personal closeness between the partner and the potential rival signals an immediate threat that should result in intense jealousy. In the same vein, Ortony, Clore, and Collins (1988) construe spatial closeness in terms of psychological proximity, which in turn gives rise to more intense emotions. Psychological distance and proximity in these examples refer to the distance between the self and another person or object. Williams and Bargh (2008) extended this view in showing that the mere priming of spatial closeness and distance even without reference to the self elicits more intense emotions with the closeness prime. Finally spatial distance has been established as the crucial input regulating distress responses in a jealousy-related psychological mechanism, the attachment system (Ainsworth, Blehar, Waters, and Wall, 1978). Like the jealousy mechanism, the attachment system is also activated by the separation or the threat of separation from a closely related person and that evolved to establish and maintain an affectional bond in close relationships (e.g., Hazan and Shaver, 1987; Sharpsteen and Kirkpatrick, 1997).

The present research focuses on three spatial arrangements systematically varying the distances between the three persons involved in the eternal triangle. In each arrangement one distance is always short and the other two distances are long. Specifically, in one arrangement the partner is close to the jealous person (in the present study: the participant) while the potential rival is in the distance. The second arrangement presents the potential rival and the jealous person in close proximity but both far from the partner. Finally, in the third arrangement the partner and the potential rival are close together and both are far from the jealous person.

The present study introduces new scenarios designed to raise suspicions of either sexual or emotional infidelity, respectively. These scenarios describe a rather familiar situation at a party, thus increasing the ecological validity of the procedure. Over the course of this party, the partner’s behavior more and more clearly signals either a partner’s physical attraction to a potential rival or a close emotional attachment to a potential rival without using the terms sexual and emotional infidelity. After the scenario-based induction of suspected sexual or emotional infidelity, the participants were asked to rate how (un-)comfortable they would feel in response to various spatial arrangements between themselves, the partner and the potential rival. We referred to the emotional feelings as uncomfortable because the scenarios were designed to implement sneaking suspicions of a partner’s infidelity expected to result in rather mild, anxious-insecurity like jealousy feelings rather than more intense and rage-like jealousy feelings. We
expected that this would allow the participants a more subtle differentiation of the intensity of the negative feelings in response to the various spatial arrangements than the use of jealousy as jealousy appears to imply a very high intensity of the emotional feeling (cf. Edlund et al., 2006). Additionally, the use of jealousy-related emotion terms such as distress and upset as indicators of jealousy intensity is common practice in jealousy research (see e.g., most of the research inspired by Buss et al., 1992; cf. also White and Mullen, 1989).

This new procedure allows for the testing of the following predictions. (1) When suspecting a partner’s (potential) infidelity, the jealousy mechanism is predicted to respond with only mild negative feelings at most as long as the partner is close to the jealous person. (2) However, the negative feelings should increase when the partner is far from the jealous person and the rival is close to the jealous person and thus far from the partner. (3) The most uncomfortable feelings are predicted when the partner and the rival are close together but both are far from the jealous person. (4) Importantly, however, the sex-differences in the negative feelings to these spatial arrangements are predicted to depend on the suspected infidelity type. Based on the evolutionary psychological view on jealousy, men are predicted to report stronger negative feelings for each arrangement than women when suspecting the partner’s sexual infidelity. Conversely, women are predicted to report stronger negative feelings than men when suspecting the partner’s emotional infidelity. In sum, these predictions amount to a significant three-way interaction between the participants’ sex, the suspected infidelity type and the distances between the three persons necessarily involved in jealousy.

Materials and Methods

Participants

The participants were 38 female and 42 male students, academic staff and visitors at Brunel University. Their age ranged from 19 to 53 years (M = 31.9; SD = 10.4). Asked for their current relationship status, 35 reported being married, 40 having a partner, and 5 were divorced. The participants covered diverse ethnical backgrounds: 16 were British, 10 Irish, 8 Scottish, and 3 Welsh. Moreover, 19 reported an Indian, 9 a Pakistani and 8 a Bangladeshi background. The remaining 7 participants reported miscellaneous ethnical backgrounds. They were not paid for their voluntary participation.

Material and Procedure

The participants were individually approached in the public areas of the university and asked whether they would be willing to participate in a short study on jealousy amongst couples. They were tested individually in one of two lab rooms by either a female or a male experimenter. The participants were randomly assigned to one of two conditions where they were led to either suspect the partner developing an emotional attachment to a potential rival or a sexual interest in the potential rival (subsequently referred to as the emotional and sexual infidelity condition, respectively). Instructions were presented on a 20’ computer monitor. The scenarios in both conditions began with the following two sentences (female version): “You and your boyfriend are at a friend’s house party and all is going well. The music is lively, everyone is socializing with one-another.” The scenario in the emotional infidelity condition then continued: “You are talking to some of your friends on the outskirts of the dance-floor when in the corner of your eye you notice that your boyfriend is in the garden with another woman, alone. They seem to just be talking but you can see that your boyfriend is really interested in this other person. They’ve been
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in the garden for quite some time now, talking, and when they finish you notice that they have a moment where they are both just looking at one another. They hug each other almost tenderly which makes your stomach feel funny. Then he returns to you. However, it is abundantly clear that his mind is elsewhere.”

In contrast, the instructions in the sexual infidelity condition continued as follows: “You are talking to some of your friends on the outskirts of the dance-floor when in the corner of your eye you notice your boyfriend on the other side of the dance-floor dancing very closely with another woman. However, at first you think nothing of it. Then you notice that their bodies are getting closer and closer and their hands are all over each other. You evidently become very uncomfortable with this to the point that your heart beats faster and your stomach churns making you feel extremely nauseous.”

Subsequently, the participants were informed that they “will now be presented with a series of triangles that represent this scenario. The three persons involved in this scenario (you, your boyfriend and the other woman) are located at the corners of the triangle. The lines of the triangles represent the spatial distance between yourself, your boyfriend and the other woman. Thus, the shorter the line the shorter the distance and the longer the lines the longer the distance.”

The participant (the jealous person) was symbolized in the triangle as “Me”, the partner as “P” and the potential rival as “R”. An equidistant triangle with a side length of approximately 15 cm was shown to illustrate a situation where the distances between the three persons are all the same. Participants were then instructed to indicate for each triangle how (un)comfortable they were with the arrangement of the distances between the three persons on a separate answer sheet. The 10-point rating scale provided for each triangle’s rating ranged from −5 (extremely uncomfortable) to +5 (extremely comfortable). Zero was not an option. Additionally, the participants were informed that the presentation time of each triangle would be short because we were interested in their first and immediate impression.

These instructions were followed by the presentation of five new triangles which were presented in one of four random orders. Two of the triangles with more or less similar, intermediate distances between the three persons were presented as fillers. Of most importance, however, were the three triangles (here referred to as Triangles A, B and C) in which the distances between two persons were long, whereas the third distance was short. The long distances varied between 20.5 cm and 22.5 cm and the short distances between 8.5 cm and 10.5 cm. As Figure 1 illustrates, in Triangle A the distance between the jealous person and the partner was short but their distances to the potential rival were equally long. In Triangle B the distance between the jealous person and the potential rival was short, while their distances to the partner were equally long. Triangle C showed the partner and the potential rival close together and both were depicted equally far from the jealous person. Finally, the presentation time of each triangle was fixed at 5 seconds. Immediately after each presentation of a triangle, the participants provided their rating on the separate answer sheet. To start the presentation of the next triangle, the participants had to press the space bar.
Results

Some of the participants occasionally failed to provide a rating on a given triangle. To ensure a constant number of participants in the following analyses, participants with missing data were not considered. It should be noted, however, that the inclusion of these participants’ evaluations leaves the results unchanged. In a first analysis step, a three-way analysis of variance (ANOVA) with the participants’ sex, suspected infidelity type (sexual vs. emotional) as the between-subjects factors and the (un)comfortableness ratings for Triangles A, B and C as the within-subjects factor yielded significant main effects for each factor, $F_s > 39.34$, $p_s < .001$, partial $\varepsilon^2_s > .412$. The two-way interactions between the participants’ sex and the suspected
infidelity type as well as the interaction between the suspected infidelity type and the (un)comfortableness ratings for the three triangles were also significant, \( F_s > 9.13, ps < .001 \), partial \( \varepsilon^2 > .129 \). More importantly, however, these significant effects were modified by the predicted three-way interaction between the participants’ sex, infidelity type and the (un)comfortableness ratings for the three triangles, \( F(2, 112) = 28.80, p < .001 \), partial \( \varepsilon^2 = .340 \). This interaction will subsequently be further analyzed with two-way ANOVAs of the ratings separately for the three triangles with participants’ sex and infidelity type (sexual vs. emotional) as the between-subjects factors.

The men’s and women’s mean (un)comfortableness ratings for the three triangles in the sexual and emotional infidelity condition are presented in Table 1. Figures 2 and 3 illustrate the mean ratings separately for the sexual and the emotional infidelity condition.

### Table 1. Men’s and women’s mean (un)comfortableness ratings for Triangles A, B and C in the sexual and emotional infidelity condition (SDs in parentheses)

|                  | Triangle A | Triangle B | Triangle C |
|------------------|------------|------------|------------|
| **Sexual infidelity** |            |            |            |
| Men              | 1.65 (1.12) \(^a\) | - 3.82 (0.73) \(^b\) | - 3.35 (1.12) \(^b\) |
| Women            | - 0.13 (2.09) \(^a\) | - 2.75 (1.07) \(^b\) | - 1.69 (2.21) \(^ab\) |
| Combined         | 0.79 (1.87) \(^a\) | - 3.30 (1.05) \(^b\) | - 2.55 (1.91) \(^c\) |
| **Emotional infidelity** |            |            |            |
| Men              | 0.77 (1.30) \(^a\) | 0.62 (2.10) \(^a\) | 1.69 (1.25) \(^b\) |
| Women            | 0.64 (1.34) \(^a\) | - 3.29 (0.99) \(^b\) | - 2.71 (1.14) \(^b\) |
| Combined         | 0.70 (1.30) \(^a\) | - 1.41 (2.55) \(^b\) | - 0.59 (2.53) \(^c\) |
| **Total**        | 0.75 (1.62) \(^a\) | - 2.45 (2.09) \(^b\) | - 1.67 (2.40) \(^c\) |

Means in the same row with different superscripts differ significantly from each other, \( p < .05 \)

**Triangle A**

Triangle A is characterized by a short distance between the jealous person and the partner who both are separated from the potential rival by a large distance. The main effect for participants’ sex and the interaction between participants’ sex and infidelity type were significant, \( F(1, 56) = 5.80, p = .019 \), partial \( \varepsilon^2 = .094 \), and \( F(1, 56) = 4.35, p = .041 \), partial \( \varepsilon^2 = .072 \), respectively. The main effect of infidelity type was not significant, \( F < 1 \). Separate t-tests for sexual and emotional infidelity revealed no sex differences for emotional infidelity, \( t(28) = .25 \). However, as can be seen from Table 1, in the sexual infidelity condition men considered the arrangement in Triangle A as more comfortable than women, \( t(22.57) = 3.01, p = .006 \) (see also Figure 2).
**Triangle B**

A short distance between the jealous person and the rival who both are separated from the partner by a large distance characterizes Triangle B. The two-way ANOVA revealed significant main effects, $F_{s}(1, 56) > 18.15$, $ps < .001$, partial $\epsilon^2$s $> .244$. The interaction between the participants’ sex and infidelity type was again significant, $F(1, 56) = 56.22$, $p < .001$, partial $\epsilon^2 = .501$. As predicted, men reported more uncomfortable feelings than women in the sexual infidelity condition, $t(31) = 3.40$, $p = .002$. In contrast, in the emotional infidelity condition, women but not men reported uncomfortable feelings, $t(16.83) = 6.09$, $p < .001$.

**Figure 2.** Men’s and women’s mean (un)comfortableness ratings for Triangles A, B and C in the sexual infidelity condition

![Graph showing comfortableness ratings for different triangles and conditions for men and women.](image)

**Triangle C**

Triangle C is characterized by a short distance between the partner and the rival who both are separated from the jealous person by a large distance. The two-way ANOVA yielded significant main effects, $F_{s}(1, 56) > 12.09$, $ps \leq .001$, partial $\epsilon^2$s $> .177$. More importantly, the interaction between the participants’ sex and infidelity type was also significant, $F(1, 56) = 59.38$, $p < .0001$, partial $\epsilon^2 = .515$. As in Triangle B, in the sexual infidelity condition men reported more uncomfortable feelings than women, $t(21.85) = 2.71$, $p = .013$. In contrast, in the emotional infidelity condition, women but not men reported uncomfortable feelings, $t(25) = 9.58$, $p < .001$. 
Within-sex comparisons between the Triangles

As shown in Table 1, across participants’ sex and suspected infidelity type, contrary to our predictions the most intense negative feelings were reported for Triangle B (close rival, distant partner), followed by Triangle C (partner and rival close in the distance). As predicted, Triangle A (close partner, distant rival) did not result in negative feelings. The same pattern can be found across participants’ sex at the level of suspected sexual and emotional infidelity (see Table 1).

More specifically, men in the emotional infidelity condition reported no uncomfortable feelings for any of the triangles. Moreover, post-hoc comparisons of men’s ratings in the emotional infidelity condition revealed marginally significantly less comfortable feelings for Triangles A and B than Triangle C (0.77 and 0.62 vs. 1.69). In contrast, men’s ratings in the sexual infidelity condition show pronounced uncomfortableness ratings for Triangles B and C which differ significantly from the ratings for Triangle A (− 3.82 and − 3.35 vs. 1.65), \( ps < .001 \). Triangle B was rated only marginally significantly more uncomfortable than Triangle C, \( p = .083 \).

Women’s ratings differentiated between the triangles in both the sexual and emotional infidelity condition resulting in significant post-hoc comparisons. In the sexual infidelity condition, women considered Triangle B significantly more uncomfortable than Triangle A (− 2.75 vs. − 0.13). The other comparisons failed to be significant. In the emotional infidelity condition, the spatial arrangements shown in Triangles B and C were rated significantly more uncomfortable than Triangle A (− 3.29 and − 2.71 vs. 0.64), \( ps < .001 \). Ratings for Triangle B and C did not significantly differ.
Discussion

The present results confirm the central assumption underlying this research that the jealousy mechanism uses spatial information about the partner and the (potential) rival as input to regulate emotion intensity. Moreover, men and women use this input differently when led to suspect either a partner’s sexual or emotional infidelity, especially when the partner is no longer in close proximity to the jealous person. As predicted, the spatial arrangement depicting the partner close to the jealous person while the potential rival is far away (Triangle A) is considered non-threatening as the participants mostly report feeling comfortable, with one exception. This exception concerns the women suspecting sexual infidelity who contrary to our prediction report very mild negative feelings whereas the men do not.

Once the distance between the jealous person and the partner is increased and the threat presumably increases, the emotional responses change considerably. First, the emotional responses are mostly rather negative and second the sex-specific influence of the infidelity type predicted by the evolutionary approach becomes apparent. Considering first the arrangement depicting the rival close to the jealous person (Triangle B), suspecting sexual infidelity men report more intense uncomfortable feelings than women. Conversely, suspecting emotional infidelity women report substantial uncomfortable feelings but men still feel comfortable. Lastly, the spatial arrangement showing the partner and potential rival close together but at the same time both far from the own person (Triangle C) reveals the same pattern: suspecting sexual infidelity men report more intense uncomfortable feelings than women, whereas suspecting emotional infidelity women but not men feel uncomfortable.

Contrary to our prediction, the spatial arrangement presented in Triangle C did not result in the most pronounced uncomfortable feelings. Rather, it appears that both men and women respond with the most intense uncomfortable feelings if the potential rival is close to the own person. One reason for this unexpected finding might be that the pure physical presence of a (potential) rival is a salient threat cue eliciting strong negative feelings. Additionally, a close rival but a distant partner as depicted in Triangle B might be considered as more difficult to deal with as a partner who is close to the rival albeit distant from the jealous person, as illustrated in Triangle C. Finally, as pointed out by a reviewer the proximity of the rival could be most upsetting because the jealous person feels impelled to interact with or confront the rival.

It is also important to emphasize that the participants of the present sample not only cover a wide age range accompanied by considerable relationship experience. They also represent a highly diverse ethnical background. It speaks to the robustness of the present findings supporting the evolutionary view of sex-differences in jealousy in the presence of factors which might contribute to individual differences in the attitudes towards emotional and sexual infidelity potentially blurring the sex-specific differences. In fact, additional statistical analyses using age and ethnical background as covariates revealed virtually identical results.

Another noteworthy aspect of the present study apparently concerns the ease with which the sex-specific jealousy mechanisms can be triggered by hypothetical scenarios explicitly avoiding the terms infidelity, jealousy, sexual and emotional. Clear sex-differences emerged with men even not reporting any negative feelings at all when asked to imagine a scenario emphasizing an emotional attachment between the partner and a potential rival, but strong negative feelings when asked to imagine a physical attraction between the partner and a potential rival.
Limitations of the present study suggest directions for future research. First, the present study relies on hypothetical scenarios leading the participants to suspect their partner’s emotional or physical attraction to a potential rival. Thus, it would be interesting to extend the present research to more realistic encounters of suspicions of a partner’s sexual or emotional infidelity. Second, verbal reports about the (un-)comfortableness elicited by the various spatial arrangements of the persons involved in the eternal triangle serve as the indicator of the output of the jealousy mechanism, reflecting the intensity of the emotional response. Although verbal reports are widely used in jealousy research (e.g., Buss et al., 1992) additional measures of the functioning of the jealousy mechanism should be assessed. For example, cortisol levels could be used as hormonal indicators of the participants’ stress response elicited in the current scenarios. Moreover, mate guarding strategies presumably motivated by the negative emotional responses to the various spatial arrangements are important behavioral measures of the jealousy mechanism (e.g., Buss, 1988; Buss, Shackelford, and McKibbin, 2008). Third, as men’s mate guarding efforts appear to increase near their partner’s ovulation (Haselton and Gangestad, 2006) it would also be important to know whether men’s emotional responses to our scenarios would reveal a similar ovulation-contingent sensitivity of the jealousy mechanism.

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