

# Intrasexual Vigilance: The Implicit Cognition of Romantic Rivalry

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Four experiments tested the hypothesis that concerns about infidelity would lead people, particularly those displaying high chronic levels of romantic jealousy, to display a functionally coordinated set of implicit cognitive biases aimed at vigilantly processing attractive romantic rivals. Priming concerns about infidelity led people with high levels of chronic jealousy (but not those low in chronic jealousy) to attend vigilantly to physically attractive same-sex targets at an early stage of visual processing (Study 1), to strongly encode and remember attractive same-sex targets (Study 2), and to form implicit negative evaluations of attractive same-sex targets (Studies 3 and 4). In each case, effects were observed only for same-sex targets who were physically attractive—individuals who can pose especially potent threats to a person's own romantic interests. These studies reveal a cascade of implicit, lower order cognitive processes underlying romantic rivalry and identify the individuals most likely to display those processes. At a broader conceptual level, this research illustrates the utility of integrating social cognitive and evolutionary approaches to psychological science.

**Keywords:** social cognition, emotion, attention, memory, evaluation

Jealousy can no more bear to lose sight of [its] objects than love.

—George Eliot

The opening quotation by English novelist Mary Ann Evans (writing under the penname of George Eliot) reflects an essential tension in many romantic relationships. On one hand, long-term relationships can bring tremendous love and happiness and can help satisfy people's fundamental need for positive social bonds (Baumeister & Leary, 1995; Gonzaga, Keltner, Londahl, & Smith, 2001; Simpson & Rholes, 1998). On the other hand, romantic relationships also bring the possibility of pain and heartache, especially when a member of the relationship is unfaithful. The threat of infidelity can evoke strong feelings of distress and jealousy and can lead to painful and destructive consequences for both members of a romantic partnership (Amato & Booth, 2001; Buss & Shackelford, 1997; Finkel, 2007; Shackelford, Goetz, Buss, Euler, & Hoier, 2005; Wilson & Daly, 1998). Consequently, in addition to caring for their partner—the object of their love—people may also devote substantial energy to warding off romantic rivals—the objects of their jealousy.

In the present research, we tested the hypothesis that concerns about infidelity will fundamentally bias the way people perceive and think about members of their own gender. Consider, for example, a man at a cocktail party with his wife and imagine he has an inkling that his wife might be romantically interested in someone else at the party. What perceptual processes might ensue? A small body of evidence suggests that the man might pay particular attention to other men at the party, who might be perceived as

romantic competitors (e.g., Maner, Gailliot, Rouby, & Miller, 2007). Such evidence, however, falls far short of telling the whole story. Simply attending to members of one's own gender, on its own, is unlikely to protect the man's relationship or to reduce the likelihood of infidelity. Attention can be fleeting: Sometimes people capture initial attention, only to be quickly forgotten (e.g., Becker, Kenrick, Guerin, & Maner, 2005). Thus, it would behoove the man not only to attend to possible rivals but also to strongly encode their whereabouts and to remember their individuating features so that they can be identified later on.

Moreover, the man's initial perceptions of other men might be infused with negative affect. If a person is worried about infidelity, then he or she may come to view other members of his or her gender as posing direct relationship threats. In turn, the early stage perception of same-sex individuals may be tinged with negative affect—affect that provides the basis for rapid social evaluation and alerts the perceiver to the presence of possible threat (cf. Schwarz & Clore, 1983). Such implicit feelings would provide evaluative content to people's perceptions and, thus, would help reveal the mate-guarding-related functions those perceptions are designed to serve (Ferguson & Bargh, 2004).

In summary, concerns about infidelity may evoke a functionally coordinated cascade of cognitive biases, each aimed at guarding against threats posed by possible romantic competitors. Focusing exclusively on any one of these biases falls short of revealing the myriad processes underlying intrasexual rivalry. In the present research, therefore, we examined a range of processes that may be elicited by concerns about infidelity. Our studies focus on a suite of processes that operate at implicit, lower order stages of social perception—initial attention, encoding, memory, and implicit evaluation. Moreover, we used a variety of social psychological and evolutionary theories to generate predictions pertaining to the specific types of social targets that may be preferentially processed when concerns about infidelity are salient, as well as the specific

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types of perceivers most likely to process possible rivals in biased ways.

### Mate Guarding: Adaptive Solutions to the Problem of Infidelity

Humans, like many other sexually reproducing species, are naturally polygamous and sometimes are disinclined from maintaining romantic relationships that are completely monogamous (Baresh & Lipton, 2007; Betzig, 1985). As a result, people sometimes find themselves susceptible to infidelity or to having their mate leave them for another relationship partner. In response to the threat of infidelity, people often experience strong pangs of jealousy and engage in behaviors intended to ward off potential rivals (e.g., Sheets, Fredendall, & Claypool, 1997). From a social psychological perspective, guarding one's partner from potential rivals can be an important part of maintaining a long-term romantic relationship (Amato & Booth, 2001; Sabini & Silver, 2005). From an evolutionary perspective, guarding a romantic partner from rivals serves key relationship and child-rearing functions that can enhance one's reproductive success (e.g., Buss & Shackelford, 1997; Haselton & Gangestad, 2006).

Much of the literature on mate guarding has focused on explicit emotional and behavioral reactions that result from concerns about infidelity (e.g., Buss, Larsen, Westen, & Semmelroth, 1992; DeSteno, Valdesolo, & Bartlett, 2006; Harris, 2000; Sabini & Green, 2004; Vandello & Cohen, 2003). In contrast, few studies have directly examined cognitive processes associated with mate guarding, and even fewer have focused on processes involving automatic, lower order forms of social perception such as memory or implicit evaluation. The lower order psychological mechanisms we examined in the present research are important, in part because they serve as the building blocks for high-order cognition and action. A direct focus on basic perceptual processes adds a novel dimension to research on close relationships.

### Hypothesized Biases in Intrasexual Vigilance

The overarching hypothesis guiding this research is that when people are primed with concerns about partner infidelity, they will display a functionally coordinated set of lower order perceptual biases that could help identify and guard against threats posed by romantic rivals. People are expected to pay particular attention to possible rivals, to preferentially encode and remember them, and to form strong implicit negative evaluations of them. Just as concerns about self-protection can enhance the processing of possible predators who pose threats to one's physical safety (Öhman & Mineka, 2001), concerns pertaining to infidelity may enhance the processing of possible romantic rivals who could pose threats to one's relationship.

The vigilant processing of potential rivals, however, may be directed selectively at particular members of one's own gender. Indeed, intrasexual vigilance is likely to carry with it certain costs. Negatively evaluating all members of one's own gender, for example, would create clear difficulties for maintaining same-sex friendships and other types of same-sex relationships. Moreover, being vigilant to possible rivals requires an expenditure of cognitive resources—resources that could otherwise be devoted to alternative activities and goals. For cognition to be both functional

and efficient it should be selective—people should selectively process those same-sex individuals who seem to pose an immediate and realistic threat to one's relationship.

Evolutionarily inspired research helps generate predictions about what particular members of one's gender might be perceived as posing potent relationship threats. Studies of mate selection suggest that both men and women tend to place a premium on the physical attractiveness of extrapair relationship partners (Greiling & Buss, 2000; Haselton & Gangestad, 2006; Li & Kenrick, 2006; Scheib, 2001). Theories of good genes sexual selection suggest that women prefer physically attractive men in part because physical attractiveness serves as a potential sign of high genetic fitness (e.g., Gangestad & Simpson, 2000; Scheib, Gangestad, & Thornhill, 1999). Evolutionary theories suggest that men tend to prefer physically attractive women in part because a woman's attractiveness can signal her level of health and fertility (e.g., Buss & Schmitt, 1993; Kenrick & Keefe, 1992; Singh, 1993). Because both men and women tend to prioritize the physical attractiveness of extrapair relationship partners, physically attractive members of one's own gender can pose especially potent threats to one's own reproductive fitness (Gangestad & Thornhill, 1997). Indeed, there is evidence that both men and women tend to focus their infidelity-related concerns on same-sex individuals who are highly attractive (Dijkstra & Buunk, 2001). Thus, there are clear reasons for thinking that, when concerns about infidelity are salient, cognitive resources will be directed toward selectively processing same-sex individuals who are physically attractive.

In addition to aspects of the potential rival, the extent to which other people are perceived as posing relationship threats is also likely to be shaped by aspects of the perceiver. Some people, particularly those displaying high chronic levels of jealousy, tend to worry about the threat of infidelity and to view same-sex individuals as posing significant relationship threats (e.g., Easton, Schipper, & Shackelford, 2007). Other people are less inclined to worry about infidelity, and are less likely to view even highly attractive same-sex individuals as posing immediate relationship threats (e.g., Pillsworth & Haselton, 2006). Indeed, although all people may share the capacity for worrying about the success of their relationships, a social cognitive perspective implies the presence of individual differences in chronic social schemas, such that some people are more inclined than others to view individuals as immediate sources of relationship threat. Hence, we expected concerns about infidelity to promote intrasexual vigilance primarily among people who tend to worry about relationship threats posed by possible rivals—that is, people displaying high levels of chronic jealousy, for whom the perceived threat of infidelity is especially realistic and distressing. Intrasexual vigilance should be less likely to occur among people who tend not to worry about infidelity and who tend not to view members of their own gender as posing significant relationship threats.

### The Present Research

In the present research, we tested the hypothesis that, among people displaying high levels of chronic jealousy, concerns about infidelity will elicit a suite of implicit, lower order perceptual biases directed selectively at processing physically attractive members of their own gender. Concerns about infidelity are expected to produce a cascade of cognitive responses that may help identify

and guard against threats posed by possible romantic rivals. The present studies were designed to distill these cognitive responses into some of their constituent parts, including early stage attention, selective encoding and memory, and implicit evaluation. We describe below specific hypotheses pertaining to each of these cognitive processes.

First, when concerns about infidelity are primed, people who tend to worry about relationship rivals are expected to attend vigilantly to attractive same-sex individuals at an early stage of visual perception. A growing social psychological literature suggests that preconscious attentional processes are adaptively tuned (Duncan et al., 2007; Maner, Gailliot, & DeWall, 2007; Moskowitz, 2002; see also Miller, 1997). Functionally important features of the environment tend to capture attention quickly and automatically, whereas less relevant features are more likely to be ignored. We expect, therefore, that when people high in chronic jealousy are concerned about infidelity, their attention will be quickly and automatically captured by highly attractive same-sex individuals. This would replicate one previous experiment suggesting that concerns about infidelity led participants worried about potential romantic rivals to attend preferentially to attractive same-sex targets (e.g., Maner, Gailliot et al., 2007, Study 3).

Second, concerns about infidelity may affect the extent to which attractive same-sex targets are encoded and remembered. Having one's attention initially grabbed by a romantic rival is unlikely on its own to reduce relationship threat. Attention can be fleeting; sometimes people attend preferentially to attractive others but then quickly forget them (e.g., Maner et al., 2003). Individuals concerned with infidelity therefore may also encode the identifying features of an attractive rival so that the person can be identified later on. Like other cognitive processes, encoding and memory are adaptively tuned. Over and above any attentional biases, people who pose particular social threats tend to be encoded and remembered especially well, whereas other less relevant individuals are more likely to be forgotten (e.g., Ackerman et al., 2006; Becker et al., 2005; Klein, Cosmides, Tooby, & Chance, 2002; Kurzban, Tooby, & Cosmides, 2001). Therefore, we expect that, among people high in chronic jealousy, concerns about infidelity will strengthen encoding and memory for highly attractive members of their own gender.

Third, concerns about infidelity might shape the manner in which people implicitly evaluate members of their own gender. For initial social perceptions to alert a perceiver to possible threat, those perceptions should be infused with negative affective. Because attractive members of one's own gender can pose potent relationship threats, concerns about infidelity should lead individuals high in chronic jealousy to form implicit negative evaluations of highly attractive same-sex individuals (cf. Kenrick, Montello, Gutierrez, & Trost, 1993). This would be consistent with evidence that people's needs and goals shape the manner in which they implicitly evaluate goal-relevant objects (Ferguson & Bargh, 2004), as well as with theories suggesting that such evaluations are designed to promote adaptive social behaviors (e.g., Shah & Kruglanski, 2003). Implicit negative evaluations of attractive same-sex targets could signal the presence of a relationship threat and promote efforts at guarding one's partner.

In the pages that follow, we report on four experiments in which we investigated the extent to which priming concerns about infidelity would lead people high in chronic jealousy to display

vigilance to potential rivals. We examined biases in attention (Study 1), encoding and memory (Study 2), and implicit evaluation (Studies 3 and 4).

## Study 1

After undergoing a priming procedure in which participants visualized and wrote about a time in which they experienced infidelity-related concerns, they completed a visual cueing task that assessed biases in attentional disengagement—the fluency with which perceivers are able to pull their attention away from particular social targets. We expected that, among participants high in chronic jealousy, the priming procedure would increase attention to attractive same-sex targets so that participants would be slower at pulling their attention away from those targets. No effects were expected for other social targets, or among participants low in chronic jealousy.

## Method

**Participants.** One hundred ninety-three undergraduate psychology students (100 women, 93 men; age ranged from 17 to 39) participated in exchange for course credit.

**Design and materials.** Participants were randomly assigned to undergo a procedure designed to prime either concerns about infidelity or a neutral control state. After this procedure, participants performed the attention task, which included target photographs of (a) highly attractive men, (b) highly attractive women, (c) average-looking men, and (d) average-looking women. Fifteen exemplars from each target category were included, with participants viewing a total of 60 color facial photographs. All photographs were pretested by an independent group of undergraduate students (18 women, 14 men; ranging from 1 [*very unattractive*] to 9 [*very attractive*]). Average ratings were as follows: attractive women ( $M = 7.52$ ,  $SD = 1.39$ ); attractive men ( $M = 7.31$ ,  $SD = 1.35$ ); average women ( $M = 4.77$ ,  $SD = 1.61$ ); average men ( $M = 4.64$ ,  $SD = 1.74$ ). Stimulus images were carefully standardized with respect to facial expression (all were neutral), image size, color, contrast, brightness, and background. In each of the subsequent studies, different subsets of this stimulus set were used to increase generalizability, and because the tasks called for different numbers of stimulus photos. In each study, care was taken to maintain consistent separation between attractiveness ratings of attractive versus average-looking targets and to equate ratings of male and female targets.

**Procedure.** Participants were told that the study investigated the relationship between memory and cognitive performance. Participants assigned to the infidelity condition briefly described in writing four or five incidents in which they felt romantically jealous and were concerned about possible infidelity and then wrote in greater detail about the most salient and distressing of those events. Participants assigned to the control condition instead described four or five activities they engaged in yesterday and then wrote about one of those activities in greater detail. Participants were given 15 mins to complete this task.

After completing the essay, participants performed the attention task, a visual dot probe procedure (e.g., MacLeod, Mathews, & Tata, 1986), which has been used widely for assessing the presence of attentional bias. The task assessed how efficiently participants

were able to disengage their attention from particular faces. The procedure for each trial was as follows: First, a fixation cross ("X") appeared in the center of the computer screen for 1,000 ms. Next, a target face was displayed for 500 ms in one quadrant of the computer screen (i.e., upper left, upper right, lower left, lower right). Concurrent with the disappearance of the target photo, a categorization object (circle or square) appeared in either the same location as the picture ("filler trials") or in a different quadrant ("attentional shift trials"). When this object appeared, the participant's task was to categorize the object as a circle or square by pressing the *a* or *k* key (respectively) on the keyboard. Participants were instructed to respond as quickly and accurately as possible. Thus, on attentional shift trials (which were the trials of interest), participants were required to shift their attention away from the location of the target face to a different point on the screen. The latency between the appearance of the categorization object and the participant's response provided a reaction time measure of attentional disengagement: Larger response latencies indicate that it took the participant longer to shift his or her attention away from the location at which the target face was pictured. Participants were given a 2,000-ms break between trials.

After completing practice trials, participants completed three blocks of 20 experimental trials. Each block consisted of five photos from each target type (e.g., attractive opposite-sex targets) presented in random order. Each block contained 5–6 filler trials and 14–15 attentional shift trials. The order of trial type and object type (circle or square) was randomized.

After completing the task, participants completed a brief questionnaire that included demographic information as well as a measure assessing chronic levels of jealousy. Participants were then debriefed. In this and each of the present studies, a careful suspicion probe was conducted to ensure that participants did not recognize the link between the priming procedure and the subsequent cognitive measures. No participants recognized this link.

**Attentional bias measure.** The reaction time (in milliseconds) with which participants responded on attentional shift trials served as the dependent variable. Separate indices of attention to attractive and average-looking members of the same and opposite sex were calculated by averaging reaction times within target type. Trials in which the participant incorrectly categorized the object (less than 2% of trials) were excluded, as were outlying response times greater than twice the interquartile range above the median response time for each participant.

**Chronic jealousy.** The eight-item Emotional Jealousy subscale from the Multidimensional Jealousy scale (Pfeiffer & Wong, 1989) was used to assess individual differences in chronic jealousy. Participants considered a current or past relationship partner ("XX") and indicated the extent to which they would be upset ranging from 1 (*very pleased*) to 7 (*very upset*) by a number of ambiguous events involving their partner (e.g., "XX smiles in a very friendly manner to someone of the opposite sex"; "XX works very closely with a member of the opposite sex [in school or office]"; "XX hugs and kisses someone of the opposite sex"). Participants indicated how they would feel generally, most of the time. A composite measure was calculated by averaging responses across items ( $\alpha = .84$ ). Higher scores indicate greater levels of chronic jealousy and greater concerns about threats posed by possible romantic rivals. In none of these studies did responses to

this scale vary by experimental condition, indicating that they were unaffected by the priming manipulations.

## Results

**Manipulation checks.** To check the effectiveness of the manipulation, an independent group of undergraduate students (53 women, 27 men) underwent the priming manipulation. Following priming, participants rated how jealous, angry, agitated, happy, and sad they felt (using 5-point Likert scales ranging from 1 [*not at all*] to 5 [*extremely*]). Because concerns about infidelity are inextricably linked with jealousy, we expected the infidelity procedure to increase levels of jealousy. Results confirmed that, compared with control participants ( $M = 1.24$ ,  $SD = 0.63$ ), participants in the infidelity condition experienced substantially higher levels of jealousy ( $M = 2.98$ ,  $SD = 1.78$ ),  $F(1, 76) = 29.90$ ,  $p < .001$ ,  $\eta^2 = .28$ . In addition, participants in the priming condition also reported more anger,  $F(1, 76) = 15.39$ ,  $p < .001$ ,  $\eta^2 = .17$ ; sadness,  $F(1, 76) = 8.49$ ,  $p < .01$ ,  $\eta^2 = .10$ ; and agitation,  $F(1, 76) = 16.87$ ,  $p < .001$ ,  $\eta^2 = .18$ , although these increases were relatively smaller than the increase in jealousy.

**Attentional bias.** See Table 1 for descriptive statistics. We regressed attention to attractive same-sex targets hierarchically on priming condition, level of chronic jealousy, participant gender, and all centered interactions. Results indicated a main effect of participant gender ( $\beta = .26$ ,  $p < .001$ , semipartial  $r^2 = .07$ ) such that women attended more to attractive same-sex targets than did men. More important, at a second step we observed the hypothesized 2-way interaction between priming condition and chronic jealousy ( $\beta = .14$ ,  $p < .09$ , semipartial  $r^2 = .02$ ; see Figure 1). Among individuals high in chronic jealousy (one standard deviation above the mean;  $M = 5.31$ ,  $SD = 0.85$ ), the infidelity prime (compared with control) increased attention to attractive same-sex targets ( $\beta = .22$ ,  $p = .04$ , semipartial  $r^2 = .02$ ). We did not observe a priming effect for participants low in chronic jealousy (one standard deviation below the mean) ( $\beta = -.18$ ,  $p = .13$ , semipartial  $r^2 = .01$ ).

This increase in attention was specific to attractive same-sex targets. We did not observe an interaction between priming and chronic jealousy for same-sex targets who were average looking ( $\beta = .10$ ,  $p = .18$ ) or for attractive or average-looking opposite-sex targets (all  $\beta$ s  $< .12$ ,  $ps > .11$ ). In addition, we did not observe main effects of priming for any target. Even among participants high in chronic jealousy, we did not observe effects of priming for any other type of target (all  $\beta$ s  $< .14$ ,  $ps > .20$ ). Thus, the only reliable effect was an increase in attention to attractive same-sex

Table 1  
Study 1: Mean (and Standard Deviation) Reaction Times  
(in Milliseconds), by Priming Condition and Target Category

Variable	Control prime ( <i>n</i> = 96)	Jealousy prime ( <i>n</i> = 97)
Attractive same-sex targets	512 (149)	531 (172)
Average same-sex targets	520 (156)	526 (171)
Attractive opposite-sex targets	519 (172)	535 (188)
Average opposite-sex targets	503 (140)	550 (191)

Note. Greater reaction times indicate greater attention.



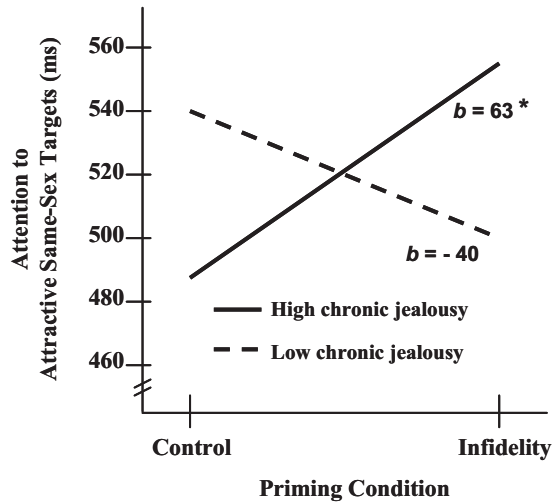


Figure 1. An infidelity prime led participants high (but not low) in chronic jealousy to increase their attention to attractive same-sex targets at an early stage of visual processing. Unstandardized regression coefficients are reported. \*  $p < .05$ .

targets among participants displaying high levels of chronic jealousy.

### Discussion

Findings from Study 1 suggest that, among participants high in chronic jealousy, concerns about infidelity elicited selective attention to attractive same-sex targets. This increase in attention was observed at an automatic, lower order stage of visual processing—attention stuck on images of attractive same-sex targets within the first half a second of stimulus presentation, such that participants were less efficient at pulling their attention away from those targets. Notably, we observed the attentional bias only for same-sex targets who were attractive, even though nothing about attractiveness was mentioned in the study materials.

In addition to being target specific, the attentional bias was observer specific, in that it was seen only in people high in chronic jealousy—people who tend to worry about relationship threats posed by romantic rivals. This pattern replicates the one observed by Maner, Gailliot, et al. (2007) using a different infidelity priming procedure and further clarifies the relationship maintenance function of the bias—only people for whom infidelity is a salient and distressing concern increased their attentional vigilance to potential rivals.

The priming manipulation increased self-reported anger and sadness as well as jealousy. This is consistent with research indicating that anger and sadness reflect key components of jealousy (e.g., Sharpsteen, 1991). A limitation of this study, however, pertains to the nature of the control condition—it was not matched with the priming condition on general affective valence or level of arousal. Although these variables do not easily provide an alternative explanation for the highly specific pattern of findings, we nevertheless used a better control condition in the subsequent studies.

### Study 2

In Study 2, we tested the hypothesis that, among people high in chronic jealousy, priming concerns about infidelity would strengthen the level of encoding and memory for highly attractive same-sex targets. After undergoing a priming procedure, participants performed a memory task adapted from previous research (Becker et al., 2005). This task, a variant of the classic matching game *Concentration*, assesses whether a participant recognizes a particular face as well as where the face was initially seen. Thus, above and beyond traditional recognition memory paradigms, which measure only the extent to which a face can be retrieved from long-term memory, the present method assesses the strength with which a target's location is encoded.

### Method

**Participants.** One hundred forty-two undergraduate psychology students participated in exchange for course credit. Three participants were excluded because they reported prior knowledge of the hypothesis. Twelve participants were excluded due to computer malfunctions that resulted in loss of their data. A total of 127 participants remained for analysis (64 women, 63 men; age ranged from 18 to 30). Sixty-four participants described themselves as being in a committed romantic relationship; 63 were single.<sup>1</sup>

**Design and procedure.** Participants were run in individual sessions. To prime concerns about infidelity, participants underwent a guided imagery priming procedure used in previous research (Maner, Gailliot, et al., 2007). Participants were randomly assigned to either an infidelity priming condition or a control condition. In the infidelity condition, participants were asked to think of their current romantic partner or someone toward whom they had strong romantic feelings and then to imagine a scenario in which that person was observed flirting with and being intimate with another person at a party. To enhance the strength of the manipulation, participants paused at four points in the scenario to write about how they pictured the situation and how they would feel. In the control condition, participants performed a similar guided imagery task but instead imagined an anxiety-producing scenario in which they took and failed an important academic exam along with a group of other students. This control condition was chosen because it reflects an unpleasant high-arousal social situation and therefore was intended to match the infidelity prime on affective valence and level of arousal.

After the manipulation, participants completed the Brief Mood Introspection Scale (BMIS; Mayer & Gaschke, 1988), a 15-item scale that provides measures of affective valence and arousal. Participants also indicated the extent to which they felt jealous and responded to three questions pertaining to how strongly they visualized the scenarios (how emotionally powerful the visualization was, how vivid the visualization was, and how well they were able to put themselves into the moment during the visualization; 1 = *not at all*; 7 = *extremely*;  $\alpha = .82$ ).

Participants then performed the memory task. They were presented with a  $4 \times 5$  array of cards on a computer screen. Under

<sup>1</sup> In this and each of the subsequent studies, we tested for differences between participants who were versus were not currently in a committed romantic relationship, but no significant effects were found.

each card appeared a target face. Each target was pictured twice. The participant's task was to begin "flipping" over cards, two at a time, in order to complete a match. After a successful match, the two cards were removed from the array. After an incorrect match, the two cards were flipped back over (so that neither face was visible), and the participant proceeded with the next attempted match. Participants continued until they had matched all the cards in the array. This task is designed such that, when a face and its location stand out well in memory, that face tends to be matched with relative ease and, therefore, with relatively few errors. As in previous research (Becker et al., 2005), the total number of matching errors for each category of target face served as the dependent variable, with lower numbers indicating better memory.

Participants completed four separate arrays, two consisting of male faces and two consisting of female faces. Each array consisted of 5 attractive faces and 5 average-looking faces, each pictured twice (see Study 1 for additional details about the stimulus faces). Different faces were pictured in each array. The location of each face was randomized across participants, and the order in which male and female arrays were presented was counterbalanced. Once participants finished the memory task, they provided a measure of chronic jealousy (the same measure that was used in Study 1), were carefully probed for suspicion, and were debriefed.

## Results

**Manipulation check.** To evaluate effects of the manipulation, self-reported jealousy, affective valence, level of arousal, and strength of visualization were predicted from experimental condition and level of chronic jealousy. Compared with the control condition ( $M = 1.44$ ,  $SD = 0.84$ ), participants in the priming condition reported feeling significantly more jealous ( $M = 2.77$ ,  $SD = 1.47$ ),  $F(1, 123) = 4.48$ ,  $p = .04$ . This effect did not depend on level of chronic jealousy. No differences between conditions were observed for affective valence or arousal ( $F_s < 1$ ). The two conditions were equivalent with regard to strength of the visualization ( $p > .35$ ).

**Memory effects.** See Table 2 for descriptive statistics. We used hierarchical regression analyses to test hypotheses; we included counterbalancing order as a covariate in all analyses. Average number of memory errors was regressed on priming condition, chronic jealousy, participant gender, and all centered interactions. For attractive same-sex targets, we observed main effects of gender ( $\beta = .20$ ,  $p = .02$ , semipartial  $r^2 = .04$ ) and chronic jealousy ( $\beta = -.18$ ,  $p = .03$ , semipartial  $r^2 = .03$ ), such that female

participants remembered attractive same-sex targets better than did male participants, and individuals high in chronic jealousy remembered attractive same-sex targets better than did participants low in chronic jealousy. Assessing the interactions at a second step revealed the predicted interaction between priming condition and chronic jealousy ( $\beta = -.20$ ,  $p = .04$ , semipartial  $r^2 = .03$ ) (see Figure 2). No other interactions were significant.

To interpret the interaction, we assessed the simple effect of priming among people high (one standard deviation above the mean) and low (one standard deviation below the mean) in chronic jealousy ( $M = 5.13$ ,  $SD = 0.84$ ). As expected, among individuals high in chronic jealousy, the infidelity prime (compared with control) led to increased memory (i.e., fewer mismatches) for attractive same-sex faces ( $\beta = -.26$ ,  $p = .04$ , semipartial  $r^2 = .03$ ). No such effect emerged for individuals low in chronic jealousy ( $\beta = .14$ ,  $p = .27$ , semipartial  $r^2 = .01$ ).

We conducted additional analyses to examine potential effects on other types of targets. No effects of the priming procedure or of chronic jealousy were found. Across all other targets, the only significant effect was a main effect of participant gender on memory for average-looking opposite-sex targets, such that male participants displayed better memory for these targets than did female participants ( $\beta = -.20$ ,  $p = .03$ , semipartial  $r^2 = .04$ ).

## Discussion

As predicted, an infidelity prime led participants high in chronic jealousy to display enhanced encoding and memory for attractive same-sex targets. Consistent with the pattern in Study 1, no effect of priming was observed for participants low in chronic jealousy, thus providing evidence for observer specificity. Moreover, as in Study 1, no effects of priming were observed for any other type of target, thus providing evidence for target specificity. Indeed, effects were highly selective, focused only on same-sex targets who were highly attractive and who therefore could pose particularly strong relationship threats. Thus, findings suggest that, above and beyond any biases in attention, concerns about infidelity strengthen encoding and memory for possible romantic rivals.

## Study 3

After being primed with either an infidelity scenario or a control scenario, participants in Study 3 performed the Affect Misattribution Procedure (AMP; Payne, Cheng, Govorun, & Stewart, 2005), a well-validated means of assessing implicit positive and negative evaluations. We expected that infidelity priming would lead participants high (but not low) in chronic jealousy to display heightened implicit negative evaluations of attractive same-sex targets.

## Method

**Participants.** One hundred fifty-one undergraduate psychology students participated for course credit. Five participants were excluded because they reported prior knowledge of the hypothesis. Thus, 146 participants remained for analysis (106 women, 40 men age ranged from 18 to 23). Of these participants, 59 were in a committed romantic relationship, and 87 were single.

**Design and procedure.** Participants were run in individual sessions. To mask the true nature of the experiment, participants

Table 2

Study 2: Mean (and Standard Deviation) Number of Matching Errors, by Priming Condition and Target Category

Variable	Control prime ( $n = 66$ )	Jealousy prime ( $n = 61$ )
Attractive same-sex targets	3.02 (0.95)	2.84 (0.79)
Average same-sex targets	3.10 (1.02)	3.06 (1.01)
Attractive opposite-sex targets	2.85 (0.71)	2.90 (0.77)
Average opposite-sex targets	2.86 (0.71)	2.68 (0.66)

Note. Lower numbers of trials indicate better memory.

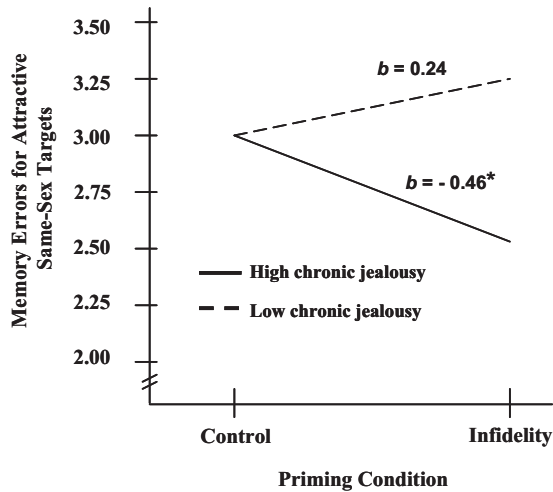


Figure 2. Among participants high (but not low) in chronic jealousy, an infidelity prime increased memory for attractive same-sex targets on a face matching task. Unstandardized regression coefficients are reported. \*  $p < .05$ .

were told they would be participating in two unrelated studies—the first on imagination and visual imagery and the second on judging abstract art and symbols. Participants then completed a guided imagery exercise (ostensibly, the first study), which constituted the priming manipulation. As in Study 2, participants envisioned and responded to either a scenario in which their partner was intimate with someone else at a party or one in which the participant flunked an important academic exam. After completing the guided imagery task, participants indicated their current affective valence and level of arousal (with the BMIS; see Study 2), their level of jealousy, and how powerful and engaging their visualization had been (using the same measures as in Study 2).

The experimenter then informed participants that they had completed the first study and would begin the second study, which involved making quick judgments of abstract symbols. Participants were instructed to view briefly presented pictures on the computer screen and to indicate whether each picture was more or less pleasant than average. Participants were told that pictures would consist of people and Chinese characters but that they would evaluate only the Chinese characters because the pictures of people were for a different version of the experiment.

The judgment task was actually the AMP, a sequential priming task that provides measures of implicit evaluations. The AMP consisted of 60 trials. In each trial, an attitude object (i.e., a prime) was presented briefly, yet supraliminally (75 ms). There were five categories of primes: 12 each of attractive men, average-looking men, attractive women, average-looking women, as well as a neutral filler prime (a gray square). The prime was then replaced by a blank mask (125 ms). Next, an ambiguous judgment object (a randomly selected Chinese character) was presented for 100 ms and then backward masked. The participant's task was to indicate whether the Chinese character was more pleasant or less pleasant than the average Chinese character by pressing either the *e* key (more pleasant) or the *i* key (less pleasant). Once a response was recorded, participants were given a 2,000-ms rest before the next trial.

This task is designed such that participants tend to misattribute their implicit evaluations of the target faces to the Chinese characters, leading them to judge the characters as either more or less pleasant than average. Consistent with previous research (Payne et al., 2005), the total number of “more pleasant” responses was calculated for each target category. Thus, a lower number on this measure indicates greater negative evaluations of the target. Note that because “more pleasant” and “less pleasant” were dichotomous response options, they were perfectly correlated, and therefore analyses conducted on either measure are identical. After completing the AMP, participants provided a measure of chronic jealousy (the same measure as in the first two studies). Participants were then carefully probed for suspicion and debriefed.

## Results

**Manipulation checks.** To evaluate effects of the manipulation, self-reported jealousy, affective valence, level of arousal, and strength of visualization were predicted from experimental condition and level of chronic jealousy. For self-reported jealousy, we observed an interaction between condition and level of chronic jealousy that approached significance,  $F(1, 142) = 2.94, p = .09$ . Although individuals high in chronic jealousy (one standard deviation above the mean) ( $\beta = .56, p < .001$ , partial  $r^2 = .16$ ) and low in chronic jealousy (one standard deviation below the mean) ( $\beta = .29, p = .01$ , partial  $r^2 = .05$ ) both reported feeling more jealous in the infidelity condition compared with the control condition, this effect was somewhat larger among those high in chronic jealousy.

No significant effects were observed for participants' level of arousal. An interaction between priming condition and chronic jealousy did emerge, however, for the measure of affective valence,  $F(1, 142) = 8.08, p = .005$ . Individuals high in chronic jealousy displayed greater negative affect in the jealousy condition than in the control condition ( $\beta = -.33, p = .006$ , partial  $r^2 = .05$ ). No such effect was observed for individuals low in chronic jealousy ( $\beta = .17, p = .17$ , partial  $r^2 = .01$ ). A similar pattern was observed for the strength of participants' visualization: Individuals high in chronic jealousy reported that their visualization was more intense in the jealousy condition than in the control condition ( $\beta = .86, p = .001$ , partial  $r^2 = .08$ ). No such effect emerged for individuals low in chronic jealousy ( $\beta = -.10, p = .40$ , partial  $r^2 < .01$ ). To ensure that any effects of priming would be observed over and above variance associated with affective valence or strength of visualization, we included these variables as covariates in all analyses.

**Implicit evaluation effects.** Descriptive statistics are provided in Table 3. As in the previous studies, we used hierarchical regression to test our hypotheses, which focused on implicit evaluations of attractive same-sex targets. At the first step, we observed a main effect of participant gender, such that male participants evaluated attractive same-sex targets more negatively than did female participants ( $\beta = -.20, p = .02$ , semipartial  $r^2 = .04$ ). At a second step, we observed the predicted interaction between priming condition and level of chronic jealousy ( $\beta = -.21, p = .03$ , semipartial  $r^2 = .03$ ) (see Figure 3). No other significant effects were observed.

To interpret this interaction, we assessed the simple effect of the priming manipulation among participants high (one standard de-

Table 3  
Study 3: Mean (and Standard Deviation) Number of “More Pleasant” Responses, by Priming Condition and Target Category

Variable	Control prime ( <i>n</i> = 76)	Jealousy prime ( <i>n</i> = 70)
Attractive same-sex targets	5.33 (2.83)	5.06 (2.82)
Average same-sex targets	4.51 (2.75)	4.23 (2.90)
Attractive opposite-sex targets	6.00 (2.42)	6.21 (2.51)
Average opposite-sex targets	4.25 (2.44)	4.39 (2.56)

Note. Higher numbers indicate greater positive evaluations.

viation above the mean) and low (one standard deviation below the mean) in chronic jealousy ( $M = 4.96$ ,  $SD = 0.97$ ). As expected, the infidelity prime (compared with control) led individuals high in chronic jealousy to display greater implicit negative evaluations of attractive same-sex targets ( $\beta = -.27$ ,  $p = .03$ , semipartial  $r^2 = .03$ ). No such effect was found for individuals low in chronic jealousy ( $\beta = .15$ ,  $p = .24$ , semipartial  $r^2 = .01$ ).

We conducted additional analyses to examine potential effects for other types of targets. No effects of the priming procedure or level of chronic jealousy were found for any other type of target. All we observed were main effects of participant gender on implicit evaluations of attractive opposite-sex targets ( $\beta = .20$ ,  $p = .02$ , semipartial  $r^2 = .04$ ) and average-looking opposite-sex targets ( $\beta = .22$ ,  $p = .01$ , semipartial  $r^2 = .05$ ), such that male participants evaluated those targets more positively than did female participants.

## Discussion

Study 3 provides the first evidence that concerns about infidelity lead initial perceptions of attractive same-sex targets to become affectively tinged so that perceivers implicitly evaluate those targets in a negative way. As in the previous studies, the effect was both observer specific (seen only in those high in chronic jealousy) and target specific (seen only for same-sex targets high in physical attractiveness). These findings extend those of the earlier studies in an important way: Attractive same-sex targets become not only more salient in attention and memory but also are implicitly perceived in a negative light. The manner in which these individuals are initially perceived provides online evaluative input that may help identify them as a potential threat.

## Study 4

Study 4 was designed to replicate the findings of Study 3 by using a different method to assess implicit social evaluations. After undergoing an infidelity priming manipulation, participants performed a go/no-go association task (Nosek & Banaji, 2001). As in the previous study, we expected that, among participants high in chronic jealousy, the priming manipulation would elicit implicit negative evaluations of attractive same-sex targets.

## Method

**Participants.** Ninety undergraduate psychology students (56 women, 34 men) participated and received course credit. Of the

participants, 38 were in a committed romantic relationship, and 52 were single.

**Design and procedure.** As in the previous study, participants were told that they would be participating in two (ostensibly) unrelated studies. Participants then underwent the same guided imagery priming manipulation used in the two previous studies: Participants were randomly assigned to either an infidelity priming condition or an anxiety control condition. After completing the guided imagery task, participants were told that they had completed the first study and would begin the second study, which purportedly involved the relationship between personality and learning styles. Participants then completed a go/no-go association task designed to assess implicit evaluations of attractive and average-looking same- and opposite-sex targets.

For the go/no-go task, participants were told that they would see words and pictures of faces appearing in the center of the computer screen. Participants were instructed to press the space bar (indicating a “go” response) as quickly as possible if the stimulus on the computer screen matched a prespecified target type. Target types referred to male faces or female faces and positive words (e.g., *terrific*, *wonderful*, *pleasure*) or negative words (e.g., *horrible*, *terrible*, *hate*) and varied across blocks of trials. For example, in one block of trials, participants were to indicate a go response whenever a male face or a positive word appeared. In another block of trials, participants were to indicate a go response whenever a female face or negative word appeared. If the word did not match the target type (e.g., a negative word appearing during a positive word block; a female face appearing during a male block), participants were instructed to refrain from pressing any key (indicating a no-go response).

Prior to each block of trials, participants were given two targets: a gender target (man or woman) and a word target (positive or negative). For each block, participants were to indicate a go response if they saw one of the two specified target types appear on the computer screen (e.g., a male face or a negative word). In all, participants performed eight blocks of trials, corresponding to

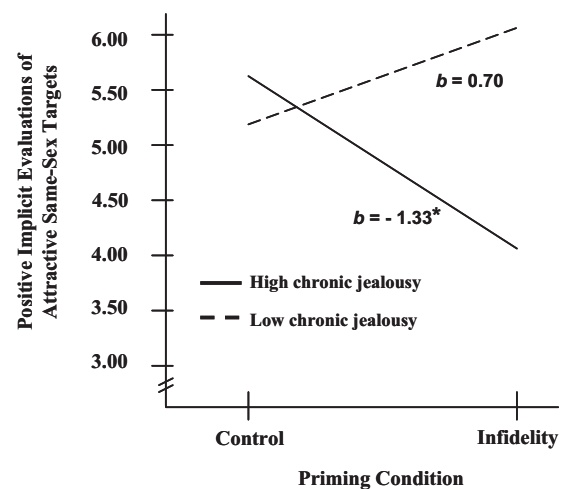


Figure 3. An infidelity prime led participants high (but not low) in chronic jealousy to form less positive implicit evaluations of attractive same-sex targets. Unstandardized regression coefficients are reported. \*  $p < .05$ .



two pairings each of target gender with target word (e.g., female faces paired with negative words). For half of the blocks, target faces were attractive-looking; for the other half of the blocks, target faces were average looking. This enabled us to manipulate target attractiveness without mentioning anything about attractiveness to the participant. Across all blocks of trials, the order with which faces and words were presented was determined randomly. The response time with which participants responded on correct go trials was recorded.

The go/no-go task measures the degree of facilitation versus interference resulting from the pairing of particular face types with positive or negative words. In turn, the task enabled us to assess the degree of positive or negative implicit evaluation associated with each type of target face. Implicit negative evaluations of attractive same-sex targets, for example, should result in facilitation of responses during the block in which attractive same-sex targets were paired with negative words and interference of responses during the block in which those targets were paired with positive words. The average reaction time difference (in milliseconds) between these two blocks constituted the primary dependent variable, with higher numbers reflecting greater negative evaluations, relative to positive evaluations. As in the last study, implicit evaluations for the other target types were also assessed (attractive opposite-sex targets; average-looking same- and opposite-sex targets).

After performing the go/no-go task, participants completed the same measure of chronic jealousy used in the earlier studies. Participants then were carefully probed for suspicion, debriefed, and dismissed.

## Results

Descriptive statistics are provided in Table 4. We excluded outlying response times greater than twice the interquartile range above the median response time within each trial block. We used hierarchical regression to test a priori hypotheses pertaining to implicit evaluations of attractive same-sex targets. In addition to a main effect of participant gender at Step 1, such that male participants evaluated attractive same-sex targets more negatively than did female participants ( $\beta = .39, p < .001$ , semipartial  $r^2 = .15$ ), we observed the predicted interaction between priming condition and level of chronic jealousy ( $\beta = .20, p = .05$ , semipartial  $r^2 = .05$ ) (see Figure 4). No other significant effects were observed. Replicating the findings of Study 3, the infidelity prime (compared with control) led individuals high in chronic jealousy (one standard

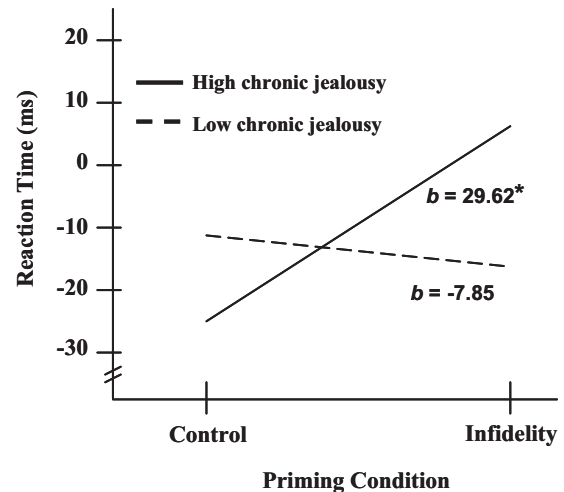


Figure 4. An infidelity prime led participants high (but not low) in chronic jealousy to respond more slowly to positive words (relative to negative words) paired with images of attractive same-sex targets, thus reflecting negative implicit evaluations. Unstandardized regression coefficients are reported. \*  $p < .05$ .

deviation above the mean) to display greater implicit negative evaluations of attractive same-sex targets ( $\beta = .31, p = .03$ , semipartial  $r^2 = .05$ ). No such effect was found for individuals low in chronic jealousy (one standard deviation below the mean) ( $\beta = -.10, p = .48$ , semipartial  $r^2 = -.01$ ).

Additional analyses confirmed that effects were specific to attractive same-sex targets. No effects of the priming procedure or level of chronic jealousy were found for any other type of target. In no case did the interaction between priming condition and chronic jealousy approach significance, nor did any of the simple effects among participants high in chronic jealousy approach significance.

## Discussion

The results of Study 4 replicate those of Study 3 and provide further evidence that concerns about infidelity produce implicit negative evaluations of attractive same-sex targets. As in Study 3, the effect was both observer specific (seen only among those high in chronic jealousy) and target specific (seen only for same-sex targets high in physical attractiveness). These studies thus provide consistent evidence that concerns about infidelity lead those inclined to worry about potential rivals to display initial negative affective reactions to highly attractive target persons—target persons who may be especially likely to pose relationship threats.

## General Discussion

Throughout human history, infidelity has posed significant threats to people's long-term romantic relationships. Social psychological and evolutionary theories alike suggest that people react to the possibility of infidelity in ways designed to guard against threats posed by potential romantic rivals. The present article is one of the first to shed light on the basic cognitive processes that arise from concerns about infidelity. The findings demonstrate that

Table 4  
Study 4: Mean (and Standard Deviation) Response Time for Negative Priming Words (Relative to Positive Words), by Experimental Condition and Target Category

Variable	Control prime ( $n = 49$ )	Jealousy prime ( $n = 41$ )
Attractive same-sex targets	-19.93 (53.57)	-8.10 (41.45)
Average same-sex targets	-17.85 (40.14)	-6.93 (41.21)
Attractive opposite-sex targets	8.09 (34.72)	-1.78 (44.96)
Average opposite-sex targets	-1.23 (51.81)	2.60 (38.50)

Note. Higher numbers indicate greater negative evaluations.

concerns about infidelity promote intrasexual vigilance—cognitive biases and attunements directed at selectively processing attractive members of one's own gender. These findings provide a rich picture of the basic cognitive processes associated with intrasexual rivalry.

Although previous research has provided clues that people may attend preferentially to perceived romantic competitors, the present article is the first to shed light on the suite of implicit, lower order cognitive processes that arise from concerns about infidelity. Not only did people attend to attractive same-sex targets, they preferentially encoded and remembered them, and evaluated them negatively at an early stage of implicit cognition. The vigilant processing of possible rivals is anything but fleeting—their individuating characteristics stand out strongly in people's minds and thus are easily identified later on.

The findings pertaining to implicit evaluation are particularly important. There are many reasons why some people may grab attention and stand out in memory, and thus these processes on their own do not unambiguously reveal the meaning of people's perceptions. Implicit evaluations, however, directly reflect the affective content of people's initial social perceptions and, therefore, help reveal the functions those perceptions are designed to serve. The implicit evaluation findings from the present studies suggest that the selective processing of attractive same-sex individuals is meant not only to bring potential rivals to the forefront of the perceptual field but also to help people appraise them as possible threats. Notably, negative evaluations of attractive rivals can be contrasted with what one would normally predict for evaluations of attractive targets: Attractive people are usually evaluated positively, not negatively (Eagly, Ashmore, Makhijani, & Longo, 1991).

A consistent Person  $\times$  Situation interaction pattern was observed in these studies, a pattern that implies a high degree of target specificity and perceiver specificity. Consistent with theories of selective cognition, concerns about infidelity led participants to process vigilantly only members of their own gender who were highly attractive. This fits with a large body of evolutionarily inspired research suggesting that physically attractive competitors can pose especially potent threats to people's relationships and, ultimately, to their reproductive success. Indeed, it would seem counterproductive and even dysfunctional to begin mistrusting all members of one's own gender, even when one is concerned about possible infidelity.

Findings from these studies were perceiver specific as well. In each study, priming effects were moderated by individual differences in chronic jealousy. The vigilant processing of attractive intrasexual rivals was observed only in people for whom the threat of infidelity was particularly salient. No effects were observed in people less inclined to worry about the threat of infidelity. These findings fit with theory and evidence suggesting that, although all people may possess psychological mechanisms designed to deal with important social challenges, factors that activate these mechanisms can interact with a person's chronic social schemas to guide adaptive social cognition (e.g., Schaller, Park, & Mueller, 2003; Shah & Kruglanski, 2003).

There are a number of ways to interpret the moderating effects of chronic jealousy. One possibility is that, in response to the priming manipulations, individuals high in chronic jealousy were better able than those low in chronic jealousy to conjure powerful

jealousy-evoking images related to infidelity. We saw inconsistent findings in this regard, with high (vs. low) chronically jealous participants sometimes reporting equivalent visualization strength and increases in self-reported jealousy (Study 2) and sometimes reporting somewhat greater visualization strength and increases in jealousy (Study 3). This inconsistency may reflect limitations on the subjective nature of these self-report measures.

Another possible interpretation is that individuals high in chronic jealousy are more likely than those low in chronic jealousy to perceive same-sex individuals as posing immediate sources of relationship threat. Chronically worrying about infidelity, for example, could lead one to see members of one's own gender as having untoward intentions toward one's current romantic partner. This would be consistent with evidence that self-protective motives can lead perceivers to see others as possessing the very intentions that the perceiver fears most (Maner et al., 2005).

A third possibility is suggested by evidence that, compared with those low in chronic jealousy, people high in chronic jealousy tend to be somewhat less attractive (Brown & Moore, 2003). Although we did not measure the link between attractiveness and chronic jealousy in these studies, unattractive people are, in fact, more likely than attractive people to suffer from infidelity (Haselton & Gangestad, 2006). Moreover, people tend to view as relationship threats particularly individuals who are more attractive than they are (Pillsworth & Haselton, 2006), and thus people who are less attractive may tend to feel threatened by a relatively greater proportion of same-sex individuals. Hence, insofar as chronically jealous people tend to be relatively unattractive, chronically jealous people could have a lower threshold for perceiving same-sex others as posing realistic relationship threats.

In addition to potentially reflecting participants' attractiveness, the measure of chronic jealousy used in these studies may represent an amalgam of situational and relationship-specific variables working in concert to shape people's chronic propensity toward jealousy. Aside from having a dispositional quality, chronic jealousy may reflect the nature of a person's current or past relationships. Suffering problematic relationships or previous infidelities, for example, may increase people's chronic propensity for jealousy (Sagarin, Becker, Guadagno, Nicastle, & Millevoi, 2003). Conversely, people who tend to view their relationships as trusting and committed may develop strategies for warding off feelings of doubt or insecurity (e.g., Murray, 1999; Murray, Holmes, & Collins, 2006). Indeed, although effects among participants low in chronic jealousy were not statistically significant in these studies, they were consistently in the opposite direction from effects seen in highly jealous individuals. This lack of vigilance to attractive same-sex targets could reflect a relationship maintenance strategy aimed at defusing feelings of relationship threat, although further research is needed to examine this directly.

### *Implications of the Present Research*

This work contributes to a number of lines of research in social psychology and evolutionary psychology and adds a novel dimension to researchers' understanding of close relationships. The dependent variables in these studies reflect processes occurring at implicit, lower order stages of cognition, and, as such, they tap processes that are not likely to be under a great deal of conscious control. The findings thus add a new and important dimension to

research on intrasexual competition and relationship maintenance, research that has tended to focus primarily on explicit, higher order psychological processes. This research supplements other studies aimed at understanding the psychological and interpersonal processes through which people protect their relationships from forms of relationship threat (e.g., Campbell, Simpson, Boldry, & Kashy, 2005; Fletcher & Simpson, 2000; Gable, Gonzaga, & Strachman, 2006; Gonzaga, Turner, Keltner, Campos, & Altemus, 2006; Lehmiller & Agnew, 2006; Lydon, Fitzsimons, & Naidoo, 2003; Maner, Gailliot, & Miller, in press; Rusbult, Johnson, & Morrow, 1986; Simpson, Gangestad, & Lerma, 1990).

It is important to understand the psychological processes associated with mate-guarding and intrasexual rivalry not only because these processes may serve to protect one's own relationship interests but also because they can produce damaging consequences. Mate-guarding has been linked to aggressive behavior in close relationships (DeSteno et al., 2007; O'Leary, Smith Slep, & O'Leary, 2007), and concerns about infidelity serve as one of the main triggers for relationship violence (Amato & Booth, 2001; Puente & Cohen, 2003; Vandello & Cohen, 2003). The present research begins to uncover the basic cognitive processes that may underlie these types of negative relationship outcomes. Vigilantly attending to, remembering, and negatively evaluating attractive same-sex individuals, as people concerned with infidelity did in the present studies, could lead people to overestimate the presence of relationship threat (see Burriss & Little, 2006). Exaggerated perceptions of threat, in turn, could lead to relationship-damaging behaviors, although future research is needed to examine this possibility directly.

Indeed, although the cognitive biases identified in the present studies may be adaptive, in the sense that they could help people identify and protect against real relationship threats, these processes also could amplify negative consequences associated with over-perceiving relationship threat. In addition to possibly harming one's relationship, selectively processing attractive same-sex individuals could harm one's sense of self-worth and perceived level of desirability (Gutierrez, Kenrick, & Partch, 1999; Park, 2007). These outcomes could be particularly problematic for people already experiencing relationship insecurities, for whom the most pronounced cognitive biases were observed in these studies.

The present research also highlights the important role that emotions play in close relationships. Emotions such as jealousy and romantic love play critical roles in maintaining long-term romantic relationships (e.g., Frank, 1988, 2001). The present research fits with studies suggesting that these emotions can powerfully evoke motivational and cognitive processes—processes designed specifically to ward off particular kinds of relationship threat (e.g., Gonzaga et al., 2006).

At a broader conceptual level, this research integrates evolutionary and social cognitive theories of close relationships. The present studies build on an emerging literature aimed at identifying adaptive social cognitive mechanisms operating at lower order stages of social perception (see also Ackerman et al., 2006; Duncan et al., 2007; Kurzban et al., 2001; Maner et al., 2003). Although evolutionary theories commonly imply that the mind is equipped with cognitive mechanisms designed to enhance reproductive success, only recently have researchers begun to examine these mechanisms directly. Conversely, social cognitive approaches have tended to use rigorous methods to examine prox-

imate cognitive processes without necessarily attempting to link those processes to the underlying adaptive functions they are designed to serve. The present research bridges these two approaches by considering not only proximate factors that shape the psychology of intrasexual rivalry but also how this psychology is linked to the recurrent reproductive challenges encountered by humans throughout history.

### *Limitations and Future Directions*

Several limitations of the present studies provide useful directions for future research. One limitation pertains to the specific target trait we chose to investigate—physical attractiveness. When people are concerned about infidelity, physical attractiveness may be only one of several characteristics that might be preferentially processed. Consistent with evolutionary models of mating (e.g., Buss & Schmitt, 1993), recent evidence suggests that women are attuned to signs of social dominance in men and that attention to dominant men may actually trump attention to attractive men (Maner, DeWall, & Gailliot, 2008). One might therefore predict that men who are concerned about infidelity would preferentially process cues to social dominance in other men. Future research would benefit from investigating the extent to which a range of traits are selectively processed when concerns about infidelity are salient.

Another limitation pertains to the fact that attention, encoding, memory, and evaluation—the processes we investigated in the present research—represent only a subset of the processes that might be engaged when concerns about infidelity are salient. For example, in one previous study, men whose partners were in the fertile phase of the menstrual cycle, and therefore might be particularly inclined to cheat (Haselton & Gangestad, 2006), tended to overperceive the level of dominance in other men's faces (Burriss & Little, 2006). Although there are several reasons why men might overperceive another man's dominance, the finding is consistent with the possibility that men who are at risk for suffering an infidelity are inclined to overperceive intrasexual threat. Future research would benefit from examining initial social judgment and interpretation of ambiguous social behavior, for these processes also might be recruited in service of guarding against relationship threats posed by potential rivals.

The present studies were designed to distill the cognitive aspects of intrasexual rivalry into some of their constituent components. Although this strategy was useful for providing a rigorous examination of specific cognitive processes, it precluded an examination of how these processes may interact with and influence one another. Attention, for example, determines what social information is initially encoded and therefore available for further processing. Future research would benefit from investigating the ways in which basic cognitive processes associated with intrasexual rivalry might influence one another dynamically and, moreover, how these processes might feed into behavioral outcomes such as relationship violence or aggression toward perceived romantic competitors.

Another useful avenue for future research pertains to the way people attend to and think about their current partner (Schützwohl, 2008). One previous study, for example, suggested that people display strong recall for partner behaviors that seem to indicate potential infidelity (Schützwohl & Koch, 2004). Although the

present studies provide evidence only for vigilance to perceived rivals, there are also reasons for thinking that concerns about infidelity may influence the way people attend to, evaluate, interpret, and remember aspects of their current partner.

Although the focus of the present article was on perceptions of romantic rivals, at a broader level there are many different types of social threats—and opportunities—that other people can pose. People can pose threats to one's romantic relationships, to one's status or level of social acceptance, or to one's physical safety. Conversely, whereas some people may be viewed as threats, others may be viewed as posing important social opportunities (e.g., mates, friends, allies). The present article provides a novel theoretical and empirical framework for investigating a range of processes involved in the perception of important social threats and opportunities. Future research might benefit from applying this framework to a range of social domains.

### Conclusion

In the opening quotation to this article, the English novelist Mary Ann Evans suggested that, when people are feeling jealous, it might behoove them to attend carefully to potential romantic rivals. Indeed, throughout human history, romantic interlopers have placed the success and longevity of close romantic relationships at risk. The present work provides a rich picture of the cognitive processes that may be involved in protecting relationships from potential romantic rivals. In these studies, priming the threat of infidelity promoted intrasexual vigilance—a functionally organized cascade of lower order cognitive processes aimed at preferentially processing highly attractive, and therefore highly threatening, members of one's own gender. Participants primed with infidelity vigilantly attended to, encoded and remembered, and negatively evaluated attractive same-sex individuals. Although future research is needed to examine links between these processes and behavioral acts of mate-guarding and relationship violence, these studies provide a springboard from which to undertake such investigations.

Notably, cognitive aspects of intrasexual vigilance were apparent only among people displaying chronic concerns about infidelity. This type of Person  $\times$  Situation interaction is a hallmark of adaptive social cognition; intrasexual vigilance was observed only in those for whom the threat of infidelity was perceived to be an immediate and realistic threat. One can understand why the threat of infidelity may have been especially salient for Mary Ann Evans when one considers that for much of her adult life she was romantically involved with a married man (the philosopher and literary critic George Henry Lewes), whose wife had herself engaged in multiple affairs and mothered children with several other men.

At a broader conceptual level, this work adds to a growing empirical literature integrating social cognitive and evolutionary approaches to psychological science. In examining processes associated with relationship maintenance, we have considered proximate factors that shape relationship cognition as well as how cognitive mechanisms for preventing infidelity are tied to the recurrent mating-related challenges experienced throughout human history. The continued integration of social cognitive and evolutionary perspectives holds great promise for shedding new light on the psychology of close relationships.

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