

# Automatic inattention to attractive alternatives: the evolved psychology of relationship maintenance

Jon K. Maner<sup>a,\*</sup>, David Aaron Rouby<sup>a</sup>, Gian C. Gonzaga<sup>b,c</sup>

<sup>a</sup>*Department of Psychology, Florida State University, Tallahassee, FL 32306-4301, USA*

<sup>b</sup>*eHarmony Labs, Pasadena, CA 91101, USA*

<sup>c</sup>*Department of Psychology, University of California Los Angeles, Los Angeles, CA 90095, USA*

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## Abstract

There can be important reproductive benefits to maintaining a long-term romantic relationship. As a result, humans may possess evolved psychological mechanisms designed to help them maintain their commitment to a long-term mate, particularly when faced with attractive alternative relationship partners. The current study identifies a relationship maintenance process that involves being inattentive to alternative relationship partners. Experimentally eliciting thoughts and feelings of romantic love—an emotion thought to have evolved for the purpose of relationship maintenance—reduced attention to alternative partners at an early, automatic stage of visual perception. Consistent with evolutionary models of mate selection, this reduction in attention was observed only for opposite sex targets displaying high levels of physical attractiveness. This research illustrates the utility of integrating evolutionary models of mating with theory and method from cognitive science.

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## 1. Introduction

Throughout evolutionary history, the maintenance of long-term mating relationships may have played an important role in human reproductive processes. One difficulty in staying committed to a long-term relationship, however, involves the presence of alternative mating partners. The temptation of alternative sexual and romantic partners can threaten one's satisfaction with and commitment to an existing romantic relationship (Kenrick, Neuberg, Zierk, & Krones, 1994; Miller, 1997; Rusbult, 1983).

Although there can be reproductive benefits to engaging in extrapair partnerships (e.g., Gangestad & Thornhill, 1997; Greiling & Buss, 2000), there are also benefits to maintain-

ing commitment to a current long-term partner (Gonzaga, Keltner, Londahl, & Smith, 2001). Compared to the offspring of many other mammals, human offspring have benefited from high levels of investment from both parents (e.g., Daly & Wilson, 1983), which usually requires some degree of long-term relationship investment and commitment. Moreover, staying committed to a long-term relationship can provide benefits from engaging in continued social alliances associated with the relationship (e.g., the presence of extended family). Indeed, maintaining long-term mating relationships provides clear fitness benefits pertaining to both offspring care and coalition-building. As a result, psychological mechanisms may have evolved to help people maintain their commitment to a long-term relationship, particularly when faced with desirable alternatives to their current partner (e.g., Gonzaga et al., 2001).

Researchers have identified a number of psychological processes that may help people maintain their commitment in the face of alternative relationship partners (Gonzaga, Turner, Keltner, Campos, & Altemus, 2006; Johnson & Rusbult, 1989; Lydon, Fitzsimons, & Naidoo, 2003;

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\* Corresponding author. Tel.: +1 850 645 1409; fax: +1 850 644 7739.  
E-mail address: maner@psy.fsu.edu (J.K. Maner).

Simpson, Gangestad, & Lerma, 1990). While evolutionary perspectives imply that adaptive psychological mechanisms are present at all levels of cognition, however, studies of relationship maintenance have focused almost exclusively on “higher-order” forms of cognition—overt judgments, evaluations, choices and the like (e.g., Campbell, Simpson, Kashy, & Fletcher, 2001; Fletcher, Simpson, Thomas, & Giles, 1999). There are strong theoretical reasons to suspect that processes designed for relationship maintenance occur also at lower-order stages of social perception. The current research, therefore, integrates evolutionary theories of mating with insights from cognitive science to examine automatic, early-stage perceptual processes that may help protect long-term relationships from the threatening presence of alternative relationship partners.

### *1.1. The threat of physically attractive relationship alternatives*

Evolutionary theories of mating help generate precise predictions about which particular members of the opposite sex might threaten one's commitment to a current relationship partner. Evolutionary 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; Pillsworth & Haselton, 2006; Scheib, Gangestad, & Thornhill, 1999). Sexual strategies theory (Buss & Schmitt, 1993) suggests that men tend to prefer physically attractive women because a woman's attractiveness can signal her level of health and fertility (see also Kenrick & Keefe, 1992; Singh, 1993). Because both men and women tend to prioritize the physical attractiveness of extrapair relationship partners, highly attractive members of the opposite sex can threaten one's commitment to a current long-term mate (Gangestad & Thornhill, 1997; Kenrick et al., 1994). Thus, psychological mechanisms designed to reduce threats posed by relationship alternatives may focus selectively on individuals who are physically attractive.

Consistent with this reasoning, there is evidence that people in committed romantic relationships tend to rate alternative partners as being less attractive than single people do (Simpson et al., 1990; see also Lydon, Meana, Sepinwall, Richards, & Mayman, 1999). Negatively evaluating the physical attractiveness of alternative partners may reduce relationship threat and help people maintain commitment to their current partner.

Some research has shown that remaining inattentive to attractive alternatives might enhance relationship commitment. Miller (1997) asked participants in romantic relationships to peruse magazine advertisements that included images of physically attractive members of the opposite sex. Compared with participants who spent a lot of time

gazing at the attractive opposite sex photos, participants who spent less time looking at those photos reported greater relationship adjustment and satisfaction and were less likely to have broken up at 2-month follow-up.

Thus, several lines of research suggest that cognitive processes—including inattention to attractive alternatives—may aid in long-term relationship success. The vast majority of these studies, however, have focused on processes that involve conscious, higher-order cognition. Even Miller's (1997) study on attention involved overt and explicit attentional processes—processes that presumably are under a high degree of conscious control.

There is less evidence that committed participants are inattentive to highly attractive alternatives at more automatic stages of attention. Several studies have shown that committed individuals are not necessarily less inclined than single individuals to attend quickly and automatically to physically attractive members of the opposite sex (Maner, Gailliot, Rouby, & Miller, 2007; Maner, Gailliot, & DeWall, 2007). Other research has shown that, although committed people gaze less than single people do at attractive opposite sex targets over an extended period of time, committed people may be just as likely as single people to attend to attractive targets at quicker and more automatic stages of attention (Maner et al., 2003).

Few studies, however, have directly manipulated factors that might lead committed individuals to reduce their attention to attractive alternatives at early stages of social perception. The current study begins to fill this hole in the literature by testing the hypothesis that experimentally eliciting thoughts and feelings of romantic love for one's partner may reduce early-stage attention to physically attractive relationship alternatives.

### *1.2. The role of romantic love*

Emotions like love play a critical role in the maintenance of relationships (Keltner & Kring, 1998; Simpson, Campbell, & Berscheid, 1986). Evolutionary theories suggest that love is designed to act as a commitment device, in part by helping individuals relinquish attractive alternatives that pose a threat to the long-term benefits of the relationship (Frank, 1988, 2001; Hirshleifer, 1987; Sabini & Silver, 2005). Momentary surges of love between relationship partners promote shared activity and long-term relationship planning (Gonzaga et al., 2001, 2006). Moreover, feelings of romantic love are associated with the release of oxytocin (Gonzaga et al., 2001, 2006), a hormone designed to facilitate social bonding in humans and other species (Taylor et al., 2000). Thoughts and feelings of romantic love also have been shown to help people suppress conscious thoughts of physically attractive relationship alternatives (Gonzaga, Haselton, Smurda, Davies, & Poore, 2008). Thus, theory and research suggest that the emotion of romantic love has been designed to foster long-term pair bonding, in part by helping people reduce their interest in attractive relationship alternatives. In the current study we investigate if this disinterest extends to automatic attentional processes.

### 1.3. Automatic attentional processes

Attentional processes are adaptively tuned, such that important features of the environment quickly and automatically capture attention (Fox, Russo, Bowles & Dutton, 2001; Öhman & Mineka, 2001; Posner & Peterson, 1990). Several previous studies suggest that physically attractive members of the opposite sex can capture people's attention at early stages of visual perception (Duncan et al., 2007; Maner et al., 2003). In particular, perceivers experience difficulty when pulling their attention away from images of physically attractive members of the opposite sex, a phenomenon previously referred to as "attentional adhesion" (Maner, Gailliot, Rouby, et al., 2007). This attentional process occurs early in the stream of visual perception and is under substantially less conscious control than attentional processes that occur over longer periods of cognitive processing. If processes designed for relationship maintenance produce disinterest in attractive relationship alternatives at lower-order stages of social perception, one might expect this disinterest to be reflected in reduced attentional adhesion to attractive relationship alternatives.

### 1.4. The current research

To what extent might thoughts and feelings of romantic love toward one's partner reduce early-stage attention to alternative relationship partners? To answer this question, we conducted an experiment in a sample of participants who were currently in a committed relationship. We used a priming procedure to elicit thoughts and feelings of romantic love for their current partner and examined effects on attentional adhesion to alternative relationship partners. Consistent with previous research (e.g., Maner, Gailliot, & DeWall, 2007), we did not expect participants to be especially inattentive to attractive alternatives in a control condition. However, we expected that the romantic love manipulation would decrease attention to alternative relationship partners (i.e., opposite sex targets). Moreover, consistent with evolutionary theories of mate selection, we expected that this effect would be limited to opposite sex targets displaying high levels of physical attractiveness.

## 2. Method

### 2.1. Participants

One-hundred twenty-four undergraduate psychology students participated in exchange for course credit. All participants were currently in a committed romantic relationship. Eleven participants were excluded because, due to equipment malfunction, their data were unusable. The final sample consisted of 113 participants (75 women, 38 men).

### 2.2. Design and materials

Participants were randomly assigned to undergo a procedure shown in previous research to elicit thoughts

and feelings of romantic love toward one's partner (Gonzaga et al., 2008). After undergoing this procedure (or a control procedure), participants performed a dot-probe attention task, which included target photographs of (1) highly attractive men, (2) highly attractive women, (3) average-looking men, and (4) average-looking women.

Fifteen exemplars from each target category were included, with participants viewing a total of 60 color facial photographs. Photographs were pretested by an independent sample of participants ( $n=32$ ; 1=very unattractive to 9=very attractive). Attractiveness ratings were matched across target sex. Average ratings were as follows: attractive females (mean=7.52, S.D.=1.39); attractive males (mean=7.31, S.D.=1.35); average females (mean=4.77, S.D.=1.61); average males (mean=4.64, S.D.=1.74).

### 2.3. Procedure

Participants were informed that the study investigated cognitive performance. As in previous research (Gonzaga et al., 2008), participants assigned to the romantic love condition began by writing a brief essay about a time in which they experienced strong feelings of love for their current partner. Participants assigned to the control condition instead wrote a brief essay about a time in which they felt extremely happy. This control condition was designed to match the priming condition on level of positive affect and arousal. All participants were given 15 min to complete the essay-writing task.

After completing the essay, participants performed the attention task. This task was a version of the visual dot-probe procedure, which has been used widely for assessing the presence of attentional bias (e.g., Maner, Gailliot, & DeWall, 2007). The dot-probe task assessed how efficiently participants were able to shift their attention away from one stimulus location to another. The procedure for each trial was as follows: first, a fixation cross ("×") appeared in the center of the computer screen for 1000 ms. Next, a target face was displayed for 500 ms in one quadrant of the screen. Concurrent with the disappearance of the target face, 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"). (Filler trials were included to encourage participants to fix their attention on the face until it disappeared.) 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 location on the screen. The response latency between the appearance of the categorization object and the participant's response provided a reaction time measure of attentional adhesion. Larger response latencies indicate that it took the participant longer to shift his or her attention away from

the location of the target face. A 2000-ms break was provided after each trial.

Participants completed a block of 20 practice trials and three blocks of 20 experimental trials. Stimuli for the practice trials consisted of neutral items (e.g., household furniture). Each block of experimental trials consisted of five faces from each target type (e.g., attractive opposite sex targets). The order of trial type and object type (circle or square) was randomized.

Before debriefing, a careful suspicion probe was conducted to ensure that participants did not recognize the link between the experimental manipulation and the attention task. No participant recognized this link or the hypothesis of the study.

### 3. Results

The reaction time (milliseconds) with which participants responded on attentional shift trials served as the dependent variable. Separate indices of attentional adhesion to attractive and average-looking members of the same and opposite sex were calculated. Trials in which the participant incorrectly categorized the object were excluded (less than 2% of trials).

An omnibus mixed-design analysis of variance (ANOVA) tested a hypothesized pattern in which (a) the romantic love procedure (compared to control) decreased attention to physically attractive opposite sex targets, and (b) this change was selective (i.e., the decrease was larger than any changes in attention to other targets). Target type served as a repeated-measures factor; a planned contrast compared attractive opposite sex targets to all other targets. Priming condition and participant sex served as between-subjects variables. As predicted, we observed a significant interaction between priming condition and type of target [ $F(1,109)=6.27, p=.01, \eta^2=.054$ ] (see Fig. 1). This interaction was not qualified by participant sex ( $F<1$ ). No main effect of the priming manipulation was observed [ $F(1,109)=1.29, p=.26, \eta^2=.01$ ].

We used a planned contrast to compare the degree of attention to attractive alternatives vs. other targets separately within each experimental condition. In the control condition, participants paid just as much attention to attractive alternatives as they did to the other types of targets [ $F(1,55)=0.37, p=.55, \eta^2=.007$ ]. In the romantic love condition, however, participants' attention was captured substantially less by attractive alternatives than by other targets [ $F(1,56)=8.28, p=.006, \eta^2=.13$ ].

Looking at the pattern of data in another way, we conducted a planned 2 (experimental condition)  $\times$  2 (participant sex) ANOVA to examine the extent to which the romantic love procedure affected attention to attractive opposite sex targets. Our main prediction was that the romantic love procedure (compared with control) would decrease attention to attractive members of the opposite sex. Indeed, it did:  $F(1,109)=4.14, p<.05, \eta^2=.037$ . Although the

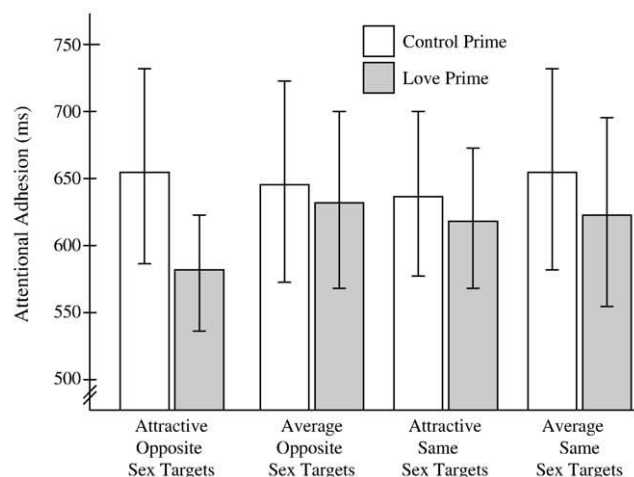


Fig. 1. Among committed individuals, priming thoughts and feelings of romantic love reduced attention to attractive alternatives (i.e., attractive members of the opposite sex). Attention to other social targets remained unaffected. Error bars reflect 95% confidence intervals.

interaction with participant sex did not approach significance [ $F(1,109)=1.25, p=.27$ ], we noted that the priming effect was somewhat larger among male participants (a reduction in attention of 134 ms) than among female participants (a reduction in attention of 40 ms).

Additional ANOVAs confirmed that the romantic love manipulation did not affect attention to any other type of target. The manipulation had no significant effect on attention to average-looking opposite-sex targets [ $F(1,109)=0.41, p=.52, \eta^2=.004$ ], attractive same-sex targets [ $F(1,109)=0.85, p=.36, \eta^2=.008$ ], or average-looking same-sex targets [ $F(1,109)=0.68, p=.41, \eta^2=.006$ ]. Thus, the observed decrease in attention was highly specific to physically attractive members of the opposite sex.

We conducted ancillary analyses to rule out the possibility that mere affective valence or level of arousal may have been responsible for the manipulation's effect. No effect of the manipulation was observed for either affective valence [ $F(1,109)=1.10, p=.30, \eta^2=.010$ ] or arousal [ $F(1,109)=0.35, p=.55, \eta^2=.003$ ]. Moreover, including these variables as covariates did not reduce the effect of the manipulation on attention to attractive alternatives [ $F(1,107)=4.62, p=.03, \eta^2=.041$ ].

### 4. Discussion

#### 4.1. Evolved mechanisms for relationship maintenance

The current study is one of the first to investigate the basic perceptual aspects of relationship maintenance. When experimentally primed with thoughts and feelings of love for their partner, participants reduced their attention to attractive alternatives at an early stage of visual processing. When experiencing feelings of romantic love, participants' attention seemed repelled, rather than captured, by highly



attractive members of the opposite sex. Notably, no effects were found for any other type of target, thus providing strong discriminant validity for the observed effect.

Romantic love decreased attention only to opposite sex individuals who were physically attractive. This is consistent with evolutionary models of mate selection, which suggest that both men and women tend to place a premium on the physical attractiveness of extrapair relationship partners. Highly attractive members of the opposite sex can threaten one's commitment to a relationship, and so strong feelings of love for one's partner seem to reduce attention to attractive alternatives as a way of down-regulating threats to one's relationship commitment. The current findings are consistent with previous evidence that romantic love led participants who suppressed thoughts of an attractive alternative to display poorer memory for attractiveness-related details (e.g., fitness and beauty cues) but not attractiveness-irrelevant details (Gonzaga et al., 2008). Together with the current study, these findings suggest that romantic love may inhibit the perceptual processing of physical attractiveness cues—the very same cues that often pose a high degree of relational threat.

The likelihood with which committed individuals display relationship maintenance biases probably depends on an array of factors. Some studies suggest, for example, that the likelihood of infidelity is determined in part by the sexual attractiveness of one's current partner relative to alternatives (Haselton & Gangestad, 2006). The reproductive benefits of staying committed to a long-term relationship partner may also depend on other factors such as the length of the relationship and whether or not the relationship has borne offspring. There are reproductive tradeoffs associated with monogamy, and mating decisions likely weigh both the costs and benefits associated with staying committed to a long-term monogamous relationship. We suspect that cognitive biases for relationship maintenance are displayed primarily when the benefits of maintaining the relationship outweigh the costs, although further studies are needed to test this directly.

The current research adds to the evolutionary literature on mating. Although many evolutionarily inspired studies of mating have focused on mate selection (e.g., Kenrick & Keefe, 1992) and mate guarding (e.g., Buss & Shackelford, 1997), relatively fewer studies have focused on processes associated with maintaining one's own commitment to a long-term relationship. Those studies that do focus on relationship commitment often rely on correlational designs, for example, comparing people who are in relationships to those who are not (Maner et al., 2003; Simpson et al., 1990). One strength of the current research is that it used an experimental design to identify specific circumstances that may cause people to display biases associated with relationship maintenance. The current research thus extends the literature on cognitive processes associated with maintaining close relationships (see also Agnew, Van Lange, Rusbult, & Langston, 1998; Campbell et al., 2001; Fletcher et al., 1999;

Menzies-Toman, Lydon, & Gaines, 2005; Murray, Holmes, & Collins, 2006).

An additional strength of the current study pertains to the nature of the dependent variable. Whereas many previous studies have focused on mating-related processes that occur at higher-order stages of cognition and action, the current study is one of the first to identify aspects of relationship cognition at the level of basic social perception. Indeed, it appears that committed individuals may down-regulate the threat of attractive alternatives by being inattentive at an early and automatic stage of visual processing. Furthermore, because the dependent variable in this study reflected an attentional process that was relatively automatic—and therefore not under a great deal of conscious control—it is unlikely that the findings were produced by participant demand, social desirability, or other self-presentational factors.

The current research also extends evolutionary theories of emotion. Evolutionary theories imply that emotions are designed to serve specific functions (Buck, 1999; Plutchik, 1980; Panksepp, 1982). As such, emotions are expected to promote functionally specific patterns of social cognition (Maner et al., 2005). This expectation is consistent with our findings as they pertain to the selective processing of attractive alternatives. Romantic love—an emotion designed to promote long-term pair bonding and to reduce interest in alternative partners (Gonzaga et al., 2001, 2006)—evoked a highly specific pattern of attentional bias, one that could help reduce relationship threats posed by alternative relationship partners.

#### 4.2. Limitations and future directions

Several limitations of the current study provide useful directions for future research. One limitation involves the link between attentional biases and relationship outcomes. Although the current findings suggest that romantic love reduces attention to romantic alternatives, we did not examine the extent to which this reduced attention would translate into positive relationship outcomes such as increased commitment and relationship longevity. Although previous research has provided evidence for these links (e.g., Miller, 1997), it remains for future studies to examine more closely the relationships between automatic perceptual biases of the sort we document here and actual relationship outcomes.

Another limitation pertains to the specific target trait we chose to investigate—physical attractiveness. Physical attractiveness may be only one of several mating-related characteristics that are selectively processed at lower-order stages of social perception. Consistent with evolutionary models of mating (e.g., Buss & Schmitt, 1993), 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). Furthermore, there are reasons for thinking that women can reap benefits from engaging in extrapair

relationships with dominant men (Smuts, 1985; Symons, 1979). Future research therefore would benefit from investigating the extent to which traits other than physical attractiveness (e.g., dominance) are processed in service of maintaining commitment to a current relationship.

A third limitation involves the specific perceptual process we chose to examine—visual attention. Psychological mechanisms designed for relationship maintenance may operate at several different lower-order stages of cognition. Previous research suggests, for example, that people display selective memory for other people who are highly attractive (e.g., Becker, Kenrick, Guerin, & Maner, 2005), and some studies suggest that selective memory can serve adaptive functions associated with relationship maintenance (Gonzaga et al., 2008; Schützwohl & Koch, 2004; see also Klein, Cosmides, Tooby, & Chance, 2002). Therefore, one might predict that romantic love would decrease memory for attractive alternative partners. Future research would benefit from testing models of mating-related cognition by focusing on a range of lower-order processes such as memory, attention, and encoding.

## 5. Conclusion

The integration of evolutionary theories with cognitive science provides a novel approach for investigating the adaptive cognition of social relationships. Evolutionary theories are important not only because they suggest the existence of psychological mechanisms aimed at maintaining long-term mating relationships, but also because they help generate precise predictions about what might threaten relationship commitment (e.g., physically attractive relationship alternatives), as well as what factors may buffer against relationship threat (e.g., romantic love). Cognitive science, on the other hand, provides a strong empirical approach for identifying basic perceptual processes that might aid in protecting long-term relationships. The integration of evolutionary and cognitive theories provides a powerful framework for studying both proximate and ultimate features of the adapted social mind.

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