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The implicit cognition of relationship maintenance: Inattention to attractive alternatives

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ABSTRACT

The temptation of alternative mating partners can threaten satisfaction with and commitment to an existing romantic relationship. Consequently, people exhibit cognitive processes that help protect their relationship when faced with desirable relationship alternatives. Previous studies have focused primarily on processes that involve explicit, higher-order cognitive mechanisms such as overt judgments and choices (e.g., judging the alternative as less attractive). The current studies, in contrast, examined automatic, early-stage attentional processes that may help protect against threats posed by exposure to alternative mating partners. Whereas single participants responded to implicit mating primes by increasing early-stage attention to physically attractive opposite sex targets, participants in a committed romantic relationship were inattentive to those attractive alternatives. This research provides a novel approach for studying implicit cognitive mechanisms involved in maintaining close relationships.

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Committed, long-term romantic partnerships can bring tremendous love and happiness, and they serve key functions related to child rearing and social affiliation. The temptation of alternative mating partners, however, can threaten people's satisfaction with and commitment to their existing romantic relationship (Finkel, Rusbult, Kumashiro, & Hannon, 2002; Kenrick, Neuberg, Zierk, & Krones, 1994; Miller, 1997; Rusbult, 1983). Consequently, people display psychological processes that help them maintain their level of relationship-esteem in the face of desirable alternatives (e.g., Lydon, Fitzsimons, & Naidoo, 2003; Simpson, Gangestad, & Lerma, 1990).

Previous research has focused primarily on relationship maintenance processes that involve explicit and conscious psychological mechanisms—overt judgments, evaluations, choices, and the like. Because of this nearly exclusive focus on explicit, higher-order cognition, the question remains: Do biases associated with relationship maintenance necessarily require conscious, effortful processing? Or, instead, might they occur also at automatic, “lower-order” stages of social perception? The current research integrates theories of close relationships with insights from cognitive science to examine automatic, early-stage perceptual processes that may help protect relationships from the threatening presence of desirable relationship alternatives.

Cognitive processes involved in relationship maintenance

Exposure to alternative mating partners can undermine relationship commitment and success. This is especially true for relationship alternatives that are physically attractive (e.g., Gangestad & Thornhill, 1997; Greiling & Buss, 2000; Haselton & Gangestad, 2006). Hence, people display cognitive biases that help protect relationship commitment in the face of highly attractive alternative partners. For example, individuals who are in committed romantic relationships sometimes “devalue” alternative partners – they judge alternatives as being less attractive than single people do (Lydon, Meana, Sepinwall, Richards, Mayman, 1999; Simpson et al., 1990). Negative evaluations of alternative partners can help reduce perceived relationship threat and aid in maintaining commitment to one's current partner.

Some research suggests that simply limiting one's attention to attractive alternatives can enhance relationship success. Miller (1997) asked participants in romantic relationships to inspect an array of magazine photographs 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 chose to spend less time looking at those photos reported greater relationship adjustment and satisfaction, and were less likely to have broken up, at two-month follow-up.

Thus, several lines of research suggest that cognitive biases—including inattention to attractive alternatives—may aid in long-term relationship success. Virtually all of these studies have focused on processes that involve overt, higher-order

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cognition – explicit judgments, preferences, and choices. Even Miller's (1997) study on attention involved explicit attentional processes—processes that presumably are under a high degree of conscious control. Fewer studies have examined the more automatic, early-stage perceptual processes that may be involved in maintaining close relationships. In the current study we examined early-stage attentional processes possibly involved in relationship maintenance.

Automatic attentional biases

Attentional processes are adaptively tuned, such that important features of the environment automatically capture attention (McArthur & Baron, 1983; Posner & Peterson, 1990). Specifically, perceivers tend to be relatively inefficient at pulling their attention away from stimuli that are particularly relevant to the perceiver's current needs and goals (Fox, Russo, Bowles, & Dutton, 2001). Attention literally becomes “stuck” on important self-relevant stimuli, a phenomenon we have referred to as attentional adhesion (Maner, Gailliot, Rouby, & Miller, 2007).

Recent evidence suggests that, among some people, mating primes can increase attentional adhesion to desirable mating partners. In one set of studies, for example, mating primes led the attention of sexually unrestricted individuals (who tend to seek multiple mating partners) to stick on physically attractive members of the opposite sex (Maner, Gailliot, & DeWall, 2007). The extent to which committed individuals might alter their attention to attractive alternatives in response to mating primes is not known.

Previous evidence suggests that, under baseline circumstances, committed individuals may not be automatically inattentive to attractive alternatives. Although committed individuals do appear to attend away from attractive alternatives when given the opportunity to deliberately process stimuli (e.g., Miller, 1997), several studies suggest that in the case of quick and automatic attentional biases, committed individuals are just as attentive as single individuals to attractive members of the opposite sex (e.g., Maner, Rouby, & Gonzaga, 2008; Maner et al., 2003, 2007). Few studies, however, have directly examined factors that might lead committed individuals to reduce their attention to attractive alternatives. The current studies address this issue by examining whether implicit mating primes lead single versus committed individuals to alter their early-stage attention to attractive members of the opposite sex.

The current research

Although some people have been shown to respond automatically to mating primes with increased attention to potential mates, we predicted that people already committed to a romantic relationship might remain inattentive to alternative relationship partners, because their relationship goals are presumably already being met to some extent. To examine this prediction, we report on two experiments in which we used priming procedures to activate mental representations associated with mating, and examined effects on automatic, early-stage attentional processing.

The priming procedures were based on theories of semantic priming, which imply that mental representations can be activated automatically when cues that are associatively linked with those representations are perceived (e.g., Bargh & Chartrand, 1999). The priming procedures in these studies were designed to activate implicit mental representations associated with mating. After undergoing priming, participants performed a dot probe visual cueing task, allowing us to measure the extent to which attention was automatically captured by images of same sex and opposite sex targets that varied in their level of physical attractiveness.

We predicted interactions between the mating primes and participants' relationship status, such that the primes would increase attentional adhesion to physically attractive opposite sex targets among single participants, but not among participants already in a committed romantic relationship. If anything, we anticipated that the mating primes might decrease attention to attractive alternatives among committed individuals, as a means toward down-regulating relationship threat. That is, consistent with previous research, we anticipated no differences between single and committed participants under baseline conditions, but expected to see differences in the mating prime conditions, such that committed participants would attend less than single participants to attractive opposite sex targets.

Study 1

Methods

Participants

One-hundred and twenty heterosexual undergraduate students (64 women, 56 men) participated in exchange for course credit.¹ Participants reported whether they were (1) married, (2) in a committed relationship, (3) single, but dating, (4) single, and not currently dating. Thirty-six participants (19 women, 17 men) were married or in a committed relationship. These participants rated their relationship on the following dimensions: permanent, serious, stable, secure, and committed (1 = not at all, 9 = very much) ($\alpha = .83$). Preliminary analysis confirmed that these participants were, on average, highly committed ($M = 7.92$, $SD = 1.01$).

Initial priming

Participants were run individually and were told that the study investigated cognitive ability. Participants initially viewed a series of masked priming words designed to prime either mating or a neutral state. Each priming word was preceded by a mask (“BZRMQW”). Mask presentation time varied from 1000 to 2500 ms so that participants would not anticipate the appearance of the priming word. After the mask, a priming word was presented for 40 ms—a length of time on the edge of conscious perception. In the mating condition, participants were primed with words pre-rated as highly relevant to mating (e.g., *kiss*, *lust*). In the control condition, participants were primed with neutral words (e.g., *talk*, *floor*). Each priming word was followed by a 250 ms mask. Participants were told that this procedure assessed baseline response tendencies and were instructed to press the “k” key on the keyboard whenever they saw the letters flicker. This instruction was designed simply to keep attention on the screen during priming. A total of 60 word primes were presented (each priming word was repeated several times, in random order).

Visual cueing task

After initial priming, participants performed the visual cueing task, which assessed attentional disengagement—how efficient participants were at pulling their attention away from particular faces. The task included facial 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. Photographs were pre-tested by an independent group of participants ($n = 32$; 1 = very unattractive to 9 = very attractive). Mean ratings were: attractive females ($M = 7.52$, $SD = 1.39$); attractive males ($M = 7.31$, $SD = 1.35$);

¹ A screening measure assessed participants' sexual orientation. So as not to exclude gay, lesbian, or bisexual students, all individuals were allowed to participate. Non-heterosexual participants, however, were excluded from analysis because the hypotheses pertained only to heterosexual participants.

average females ($M = 4.77$, $SD = 1.61$); average males ($M = 4.64$, $SD = 1.74$).

Throughout the task, participants were again primed with either mating-related words or neutral words, in order to maintain the strength of the prime. Prior to each trial, participants were presented with a priming (or control) word (40 ms), situated between a forward and back mask (each presented for 490 ms). Then, the procedure for each trial was as follows: First, a fixation cross ("X") 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 (upper-left, lower-right, etc.). 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").² When this object appeared, the participant categorized it as a circle or square, by pressing the "a" or "k" key (respectively). 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 pull their attention away from the location of the target face to a different point on the screen. The response latency between the appearance of the object and the participant's response provided a measure of attentional adhesion: Larger response times indicate that it took longer to shift attention away from the location of the target face. After each trial, there was a 2000 ms break before the next trial.

Participants completed 20 practice trials (e.g., household furniture) and three blocks of 20 experimental trials. Each block of experimental trials consisted of five photos from each target type 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. At the end of the session, participants were carefully probed for suspicion with a funneled suspicion probe.³

The reaction time (ms) 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 (2% of trials).

Results

Preliminary analyses indicated no main effects or interactions involving participant sex, and thus we have collapsed across sex in subsequent analyses. An Analysis of Variance (ANOVA) with priming condition and relationship status as between-subjects factors revealed the predicted interaction, $F(1, 116) = 5.43$, $p = .02$, $\eta^2 = .045$ (see Fig. 1). No other significant effects were observed (all $ps > .37$). The form of the interaction was as we anticipated: The mating prime increased attentional adhesion to attractive opposite sex targets, but only among single participants, $F(1, 116) = 4.52$, $p < .05$ ($\eta^2 = .04$). No significant effect of the prime was observed among committed participants, $F(1, 116) = 1.98$, $p = .16$; if anything, the pattern was reversed such that committed participants responded to the prime by reducing their attention to attractive alternatives. There was no difference between single and committed participants in the control condition, $F(1, 116) = 1.11$, $p = .30$. In the mating prime condition, however, committed individuals were significantly less attentive

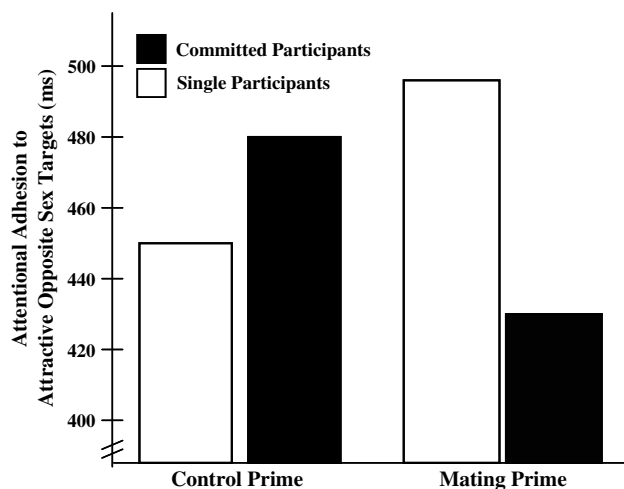


Fig. 1. Study 1: Although no significant difference between single and committed participants was observed in a control condition, committed participants were significantly less attentive than single participants to attractive opposite sex targets in the mating prime condition.

than single participants to attractive opposite sex targets, $F(1, 116) = 4.89$, $p < .05$ ($\eta^2 = .04$).

We conducted additional analyses to evaluate the target specificity of this effect. An omnibus mixed-design ANOVA was conducted, which included a within-subjects contrast to compare attention to attractive opposite sex targets with attention to all other targets combined. The expected 3-way interaction between this target contrast, priming condition, and relationship status was not significant, $F(1, 116) = 1.52$, $p = .22$ ($\eta^2 = .013$). Nevertheless, target-specific analyses indicated that the pattern observed for attractive opposite sex targets was not observed for any of the other target types. No significant effects of priming, relationship status, or their interaction, were observed for average-looking opposite sex targets, attractive same-sex targets, or average same-sex targets (all $ps > .11$).

Discussion

Findings from Study 1 provide preliminary support for relationship maintenance processes among romantically committed individuals. Whereas single participants responded to a mating prime by increasing attention to physically attractive opposite sex targets, committed participants did not. When primed with mating, committed individuals were significantly less attentive than single participants to attractive opposite sex targets. A lingering question remains, however, regarding the target-specificity of the priming effects. Although priming effects were not observed for other types of social targets, an omnibus test that directly compared targets to one another did not reach significance. We therefore report on a second study to evaluate further the presence of attentional bias to physically attractive members of the opposite sex.

Study 2

Study 2 again tested for priming effects among single and committed participants, but used a different implicit priming manipulation (a sentence unscrambling task) to prime mating.⁴

² Filler trials encouraged participants to attend to the faces until they disappeared. On filler trials, response times did not depend on experimental condition or face type, indicating that neither the prime nor the target influenced simple processing fluency.

³ Seven participants indicated noticing one or more of the priming words. None of these participants were aware of the hypotheses or the purpose of the attention task, and inferential results were equivalent regardless of whether these participants were included; we therefore report analyses including all participants.

⁴ The study comprised a reanalysis of data reported in Maner, Gailliot, Rouby, and Miller, 2007 (Study 2). Although relationship status was not included as a factor of interest in that study, the current analyses focus on moderating effects of relationship status.

Methods

Participants

One-hundred and sixty-six heterosexual undergraduates participated in exchange for course credit. Four participants were excluded because of equipment malfunction and two were excluded because they failed to follow procedural instructions. The remaining sample consisted of one-hundred sixty participants (92 women, 68 men). Fifty participants were committed to a current relationship; one hundred-ten participants were single.

Design and procedure

Participants were told that they would be taking part in two (ostensibly) unrelated experiments, the first on visual processing and the second on linguistic ability. After receiving instructions, participants performed a block of practice trials on the dot probe attention task (see Study 1). After completing these trials, the experimenter told the participant that he or she had completed the first study.

The experimenter then introduced the task for the second study: a sentence unscrambling task (e.g., Chartrand & Bargh, 1996), which included the priming manipulation. Participants were randomly assigned to either a mating prime condition or a control prime condition. Participants in both conditions were presented with 15 sets of five words and were instructed to unscramble the words to produce grammatically correct four-word sentences. Priming words were embedded in 12 of these word sets. Priming words were pre-tested by an independent sample of participants ($n = 20$): although the mating words and control words were judged as having equivalent valence (pleasant–unpleasant) and level of arousal (calm–exciting), only the mating words were judged to be relevant to mating. Example word sets were “develop exposed won’t erotic film” (mating) and “develop exposed won’t exciting film” (control).

After the priming task, the experimenter apologized and said that she had forgotten to administer part of the first task (the dot probe task), and asked the participant if he or she would be willing to complete it before leaving. Participants then performed the experimental portion of the dot probe task, which provided measures of attentional adhesion to highly attractive and average-looking members of the same and opposite sex. Participants then were carefully debriefed and probed for suspicion. No participants reported awareness of the purpose or hypotheses of the experiment.

Results and discussion

As in Study 1, preliminary analysis indicated no significant effects of participant sex and we therefore collapsed across sex in subsequent analyses. An ANOVA with priming condition (mating versus control) and relationship status (committed versus single) as between-subjects factors revealed a (marginally significant) interaction between priming condition and relationship status, $F(1, 156) = 3.52$, $p = .06$, $\eta^2 = .022$ (see Fig. 2). No other effects were observed (all $ps > .19$). The form of the interaction was the same as in Study 1: There was no difference between single and committed participants in the control condition, $F < 1$. In the mating prime condition, however, committed individuals were significantly less attentive than single participants to attractive opposite sex targets $F(1, 156) = 4.97$, $p < .05$ ($\eta^2 = .03$).

Looking at this interaction another way, the mating prime (marginally) increased attention to attractive opposite sex targets among single participants, $F(1, 156) = 2.92$, $p < .10$ ($\eta^2 = .02$). No effect of the prime was observed among committed participants, $F(1, 156) = 1.24$, $p = .27$ and, as in Study 1, the direction of the

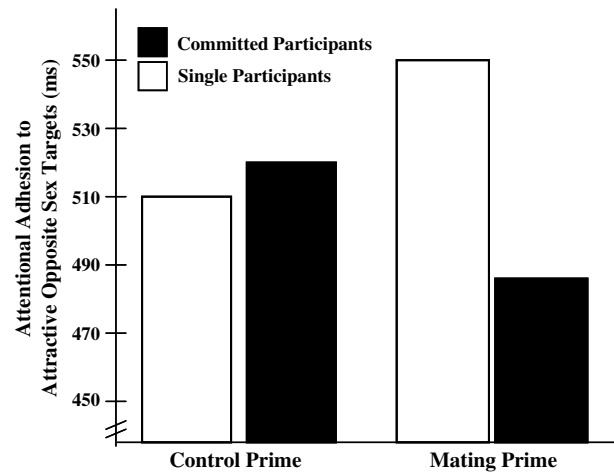


Fig. 2. Study 2: Although no difference between single and committed participants was observed in the control condition, committed participants were significantly less attentive than single participants to attractive opposite sex targets in the mating prime condition, thus replicating the pattern from Study 1.

pattern indicated that, if anything, committed participants reduced their attention to attractive alternatives in response to priming.

Additional analyses evaluated the target-specificity of this effect. An overall mixed-design ANOVA was conducted, which included a within-subjects contrast to compare attention to attractive opposite sex targets with attention to all other targets combined. The expected 3-way interaction between this target contrast, priming condition, and relationship status was significant, $F(1, 156) = 4.28$, $p = .04$ ($\eta^2 = .027$). Target-specific analyses confirmed that no effects approached significance for average-looking opposite sex targets, attractive same sex targets, or average same sex targets (all $ps > .15$).

Meta-analysis

The similar design of the two studies allowed us to meta-analyze their results. We examined across studies the statistical significance and size of the observed effects, weighting each study by its df (Rosenthal & Rosnow, 1991). Across the two studies, the test of the interaction between priming condition and relationship status was significant, $z = 2.86$, $p = .002$, $\eta^2 = .032$. Although there were no differences between single and committed participants in the control conditions, $z = 0.95$, $p = .17$, $\eta^2 = .004$, single participants were significantly more attentive than committed participants to attractive opposite sex targets in the priming conditions, $z = 2.85$, $p = .002$, $\eta^2 = .035$. This reflected the very different patterns of attention between single and committed participants in response to priming. Whereas single participants became more attentive to attractive opposite sex targets when primed with mating, $z = 2.62$, $p = .004$, $\eta^2 = .027$, committed participants became less attentive, $z = 1.72$, $p = .04$, $\eta^2 = .012$. To evaluate target-specificity, we meta-analyzed across studies the 3-way interaction between priming condition, relationship status, and target type (attractive opposite sex targets versus others): This interaction was significant, $z = 2.37$, $p < .01$, $\eta^2 = .021$, indicating that the interaction between priming and relationship status was specific to attractive opposite sex targets.

General discussion

The current article is one of the first to investigate the automatic, lower-order perceptual aspects of relationship maintenance. Although single participants responded to mating primes with

greater attention to attractive opposite sex targets, participants already in a committed romantic relationship did not. Indeed, when primed with mating, committed participants were less attentive than single participants to images of attractive opposite sex targets. These findings thus begin to delineate the lower-order perceptual processes that may aid in maintaining relationship commitment when people are faced with desirable relationship alternatives.

The attention task used in these studies taps attentional processes that are automatic and occur within the first few hundred milliseconds of stimulus perception. In addition, the implicit priming tasks were designed to prime mating without bringing to mind salient thoughts or feelings about romantic relationships. It therefore seems unlikely that findings from these studies reflect deliberate or conscious response biases on the part of committed participants. Rather, findings appear to reflect processes that occur at an automatic stage of initial social perception.

Findings from the current research can be contrasted with previous studies that have focused on more explicit and conscious means of devaluing attractive alternatives (e.g., Lydon et al., 1999; Simpson et al., 1990). Previous evidence suggests, for example, that highly committed individuals may be inattentive to attractive alternatives in everyday circumstances (e.g., Miller, 1997). This fits with the notion that staring at an attractive opposite sex stranger may indicate, both to oneself and to others, that one is romantically interested in the person, and thus committed individuals who are interested in maintaining their relationship may regulate their behavior so as to avoid attending to highly attractive relationship alternatives. In contrast, the current studies suggest that, under baseline conditions, even highly committed individuals attended to attractive alternatives at initial and automatic stages of perception. Only once committed individuals were primed with mating did committed individuals display automatic inattention to desirable alternatives. Thus, at initial and automatic stages of social perception, committed individuals may not avoid attending to attractive alternatives unless there is reason to do so (e.g., when people are in a mating frame of mind and alternatives are perceived as posing a threat to one's relationship).

Indeed, the current studies help identify the conditions under which committed individuals might implicitly devalue attractive alternatives. Consistent with previous studies (e.g., Maner et al., 2007), committed individuals did not seem inclined to attend away from attractive alternatives under baseline circumstances (in the control conditions). Committed individuals were significantly less attentive than single participants, however, when they were primed with mating. One possible explanation is that the mating prime increased the threat posed by alternative relationship partners, and therefore motivated committed individuals to devalue those alternatives at an early stage of perceptual processing. This would be consistent with previous evidence that people devalue attractive alternatives primarily when those alternatives are perceived as posing a salient threat to people's relationships (Lydon et al., 1999; Lydon et al., 2003). Another possibility is that, for committed individuals, the mating primes activated cognitions associated with their current partner, as opposed to cognitions about alternative relationship partners, and this could have defused any potential interest in attractive alternatives. Either way, these findings demonstrate that committed individuals are less inclined than single individuals to respond to situational mating cues with increased attention to attractive members of the opposite sex. Future research is needed to clarify further the specific mechanism(s) underlying the inattentiveness of committed individuals.

One limitation of this research is its reliance on static images on a computer screen. Although these methods provide direct insight into cognitive processes associated with relationship maintenance, future studies are needed to examine these processes under more ecologically valid circumstances. Future research might also benefit from exploring the connections between the implicit biases observed in these studies and other, more conscious relationship maintenance processes observed in previous research. Do the same people tend to devalue attractive alternatives at both implicit and explicit stages of cognition? What role do implicit or explicit biases play in promoting positive relationship outcomes? These questions provide useful and interesting directions for future investigation.

In sum, the current research adds new insight to the literature on relationship maintenance processes (Agnew, Van Lange, Rusbult, & Langston, 1998; Campbell, Simpson, Kashy, & Fletcher, 2001; Fincham & Beach, 1999; Fletcher, Simpson, Thomas, Giles, 1999; Gonzaga, Keltner, Londahl, Smith, 2001; Menzies-Toman, Lydon, & Gaines, 2005; Murray, Holmes, & Griffin, 1996; Rusbult, Johnson, & Morrow, 1986). Whereas previous studies have demonstrated a variety of processes involved in protecting long-term relationships, the current article is one of the first to identify relationship processes that occur at early stages of social perception. It appears that committed individuals devalue attractive alternatives not just at the level of overt judgments and choices, but also at the level of implicit social cognition. This integration of social psychology and cognitive science reflects a novel approach for investigating the basic cognition of close relationships.

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